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FINAL ADDENDUM TO REMEDIAL ACTION WORK PLAN SOIL EXCAVATION SITE 7  
FORMER STP LOCATION NAS SOUTH WEYMOUTH MA  
04/01/2014  
TETRA TECH

**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007  
CONTRACT TASK ORDER NO. WE02**

**FINAL  
ADDENDUM TO REMEDIAL ACTION WORK PLAN  
SOIL EXCAVATION AT SITE 7 FORMER STP LOCATION  
FORMER NAVAL AIR STATION  
SOUTH WEYMOUTH, MASSACHUSETTS**

**July 2014**



*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, Virginia 23462

<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	7/24/14	R. Claydon	B. Corbett	All

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## ABBREVIATIONS AND ACRONYMS

APP	Accident Prevention Plan
bgs	below ground surface
COC	contaminants of concern
CONCOM	Conservation Commission
CQCP	Contractor Quality Control Plan
ECM	Erosion Control Matting
µg/Kg	micrograms per kilogram
MassDEP	Massachusetts Department of Environmental Protection
mg/Kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
NAS SOWEY	Naval Air Station South Weymouth
NAVFAC	Naval Facilities Engineering Command
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
RAC	Remedial Action Contract
RAOs	remedial action objectives
RAWP	Remedial Action Work Plan
RGs	remediation goals
SSTTDC	South Shore Tri-Town Development Corporation
STP	Sewage Treatment Plant
TtEC	Tetra Tech EC, Inc.
TtNUS	Tetra Tech NUS, Inc.
USEPA	U.S. Environmental Protection Agency
Work Plan	Remedial Action Work Plan

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## **1.0 INTRODUCTION**

Tetra Tech EC, Inc. (TtEC) has prepared this Remedial Action Work Plan (RAWP) Addendum for Former Sewage Treatment Plant (STP) Site 7 under the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Remedial Action Contract (RAC) N62470-13-D-8007. The objective of this Work Plan is to describe additional removal actions within STP Site 7. This addendum supplements the Final RAWP for Soil Excavation at Former STP Site 7 (TtEC 2009), prepared on July 17, 2009, under RAC No. N62472-99-0032.

## **2.0 SITE DESCRIPTION AND BACKGROUND**

### **2.1 Location**

STP Site 7 is located at Naval Air Station, South Weymouth (NAS SOWEY), as shown in Figure 2-1. The additional activities described in this Addendum will be performed in the areas shown on Figure 2-2. For additional location description, refer to the Final RAWP for Soil Excavation at Former STP Site 7 (TtEC 2009).

### **2.2 Site Background**

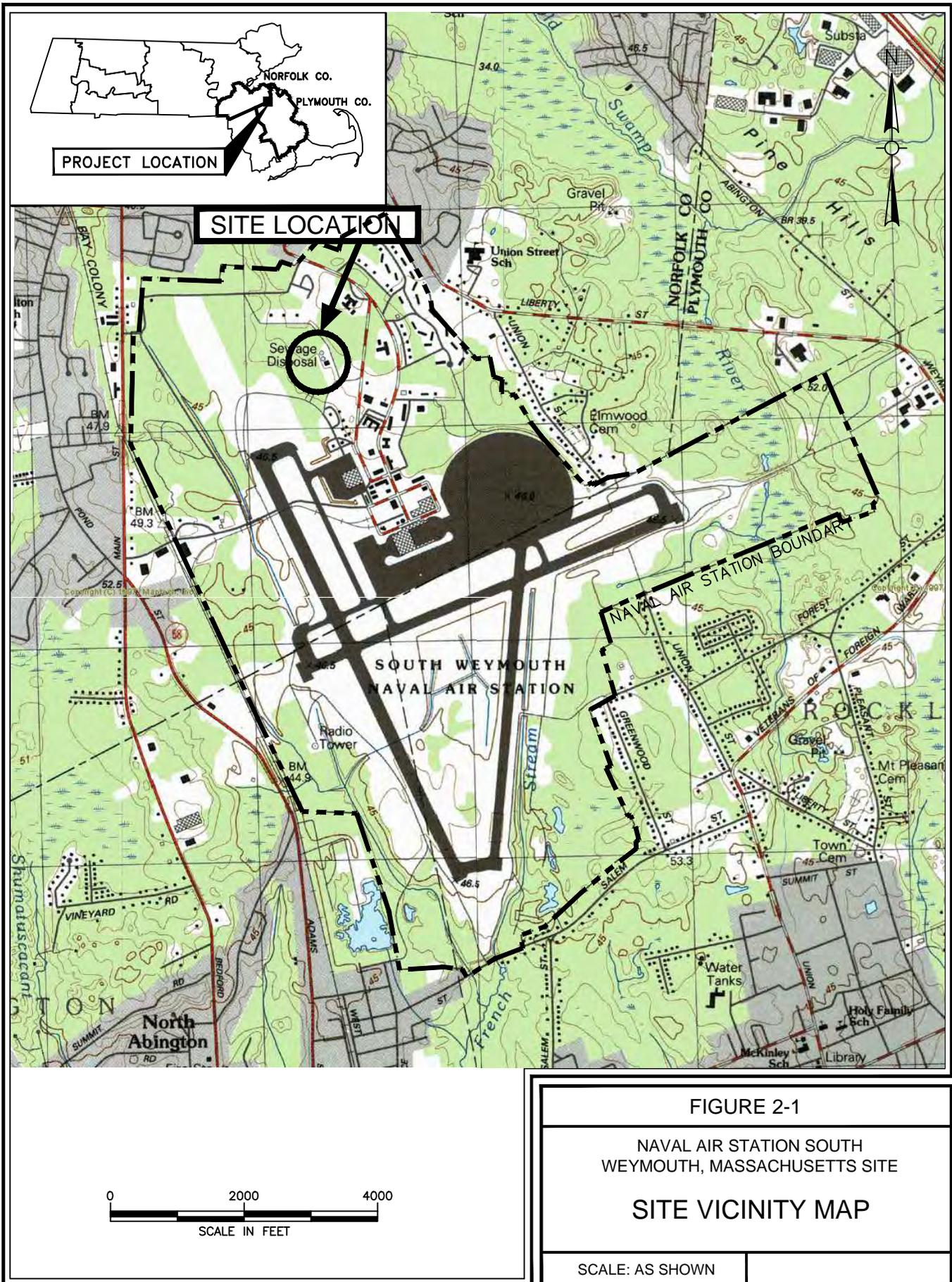
The initial remedial action commenced in July 2009 to address COCs identified in soil and sediment. The COCs addressed for soil are as follows:

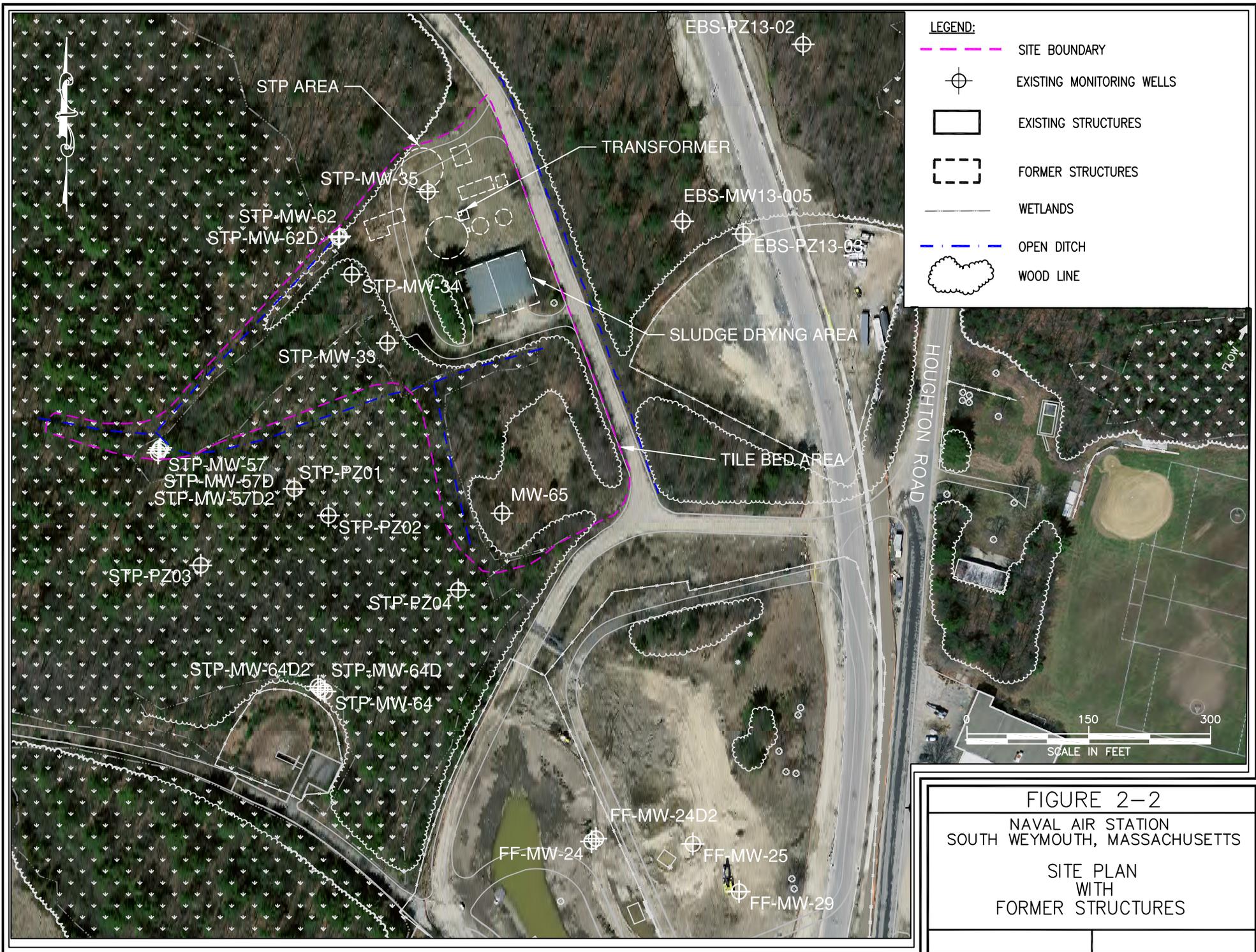
- Arsenic
- 4,4'-DDT
- Dieldrin
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene

The COCs addressed for sediment are as follows:

- Arsenic
- 4,4'-DDD
- 4,4'-DDE
- 4,4'-DDT
- Dieldrin

Since the initial remedial action effort, additional investigative sampling was conducted, as described in Section 2.3 to re-assess the extent of the contamination and to determine if areas within the drainage swale downgradient of the contaminated piping have been re-contaminated. Refer to the Final RAWP for Soil Excavation at Former STP Site 7 (TtEC 2009) for additional Site Background information.





## **2.3 Previous Investigations**

Several post excavation investigations have been conducted to assess the extent of contamination remaining at STP Site 7. Below is a summary of investigations performed since the 2009 remedial action effort. Additional information regarding site investigations prior to June 2009 is provided in the Final RAWP for Soil Excavation at Former STP Site 7 (TtEC 2009).

A supplemental Pre-Design Investigation Effort and Report was completed between April 2011 and September 2012. During this effort, additional sampling was performed to further delineate the lateral and vertical extent of soil contamination. Soil samples from each of the pipes and at the headwall were also collected. Based on the investigation findings, new site-specific preliminary remedial goals (PRGs) were calculated for the COCs that contribute significantly to the cancer risk for each receptor exposed to media onsite. A comparison of the data to the PRGs demonstrated that the remaining contamination poses a potential health impact, sufficient to conduct additional soil sampling and remedial action.

In 2013, an Additional Soil Delineation investigation was performed to follow up on the 2009 RA and the 2011 Supplemental PDI results. to further define the extent of residual contamination. The additional Soil Delineation investigation was conducted in July 2013 and the final report was issued in February 2014. Sample results indicated that contaminants of concern remain above the remedial goals defined in the ROD. The contaminants of concern for soil include Arsenic, 4,4'-DDT, Dieldrin, Benzo(a)anthracene, Benzo(a)pyrene, and Benzo(b)fluoranthene. The contaminants of concern for sediment include Arsenic, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and Dieldrin.

This work plan addresses COCs included in the ROD that have been identified in shallow soils/sediments. Additional contaminants identified during subsequent remedial activities that are not collocated with the ROD COC's to be excavated in this work plan will be addressed in a ROD amendment following this removal of shallow soils/sediments.

## **3.0 WORK SCOPE DETERMINATION**

This section presents the Remedial Action Objectives (RAOs) and cleanup level goals.

### **3.1 Remedial Action Objectives**

The RAOs are identified in Section 3.1 of the Final RAWP (TtEC 2009). The same RAOs apply to eliminate potential human and ecological receptor exposure to COCs present in the soil and sediment at concentrations above the selected remediation goals (RGs).

#### **3.1.1 Cleanup Levels for Soil and Sediment**

Table 3-1 summarizes the RGs for the human health risk-based and ecological risk-based COCs identified in soil and sediment.

**Table 3-1 Summary of Remediation Goals**

Contaminants of Concern	Units	Site RG	Selection Basis
<b>Soil</b>			
Arsenic	mg/Kg	9.08	cumulative human health cancer risk = $10^{-5}$
4,4'-DDT	µg/Kg	2,800	ecological risk
Dieldrin	µg/Kg	876	cumulative human health cancer risk = $10^{-5}$
Benzo(a)anthracene	µg/Kg	14,500	cumulative human health cancer risk = $10^{-5}$
Benzo(a)pyrene	µg/Kg	1,829	background
Benzo(b)fluoranthene	µg/Kg	14,500	cumulative human health cancer risk = $10^{-5}$
<b>Sediment</b>			
Arsenic	mg/Kg	23.7	ecological risk
4,4'-DDD	µg/Kg	730	background
4,4'-DDE	µg/Kg	234	background
4,4'-DDT	µg/Kg	290	background
Dieldrin	µg/Kg	5,730	cumulative human health cancer risk = $10^{-5}$
<b>Surface Water – Not a Medium of Concern</b>			
<b>Groundwater – Not a Medium of Concern</b>			

#### 4.0 IMPLEMENTATION OF SITE ACTIVITIES

This Work Plan Addendum describes the additional field operations that will be implemented with the objective to reduce the levels of the COCs in the remaining soil and sediment to below the RGs. Following removal of the impacted material, confirmatory samples will be collected to document the remaining levels of the COCs at each location.

The following sections of this Work Plan detail the specific activities related to each task below.

1. Mobilization and Site Preparation
2. Excavation Activities (including include pipe and headwall removal)
3. Groundwater Management
4. Field Screening
5. Confirmation Sampling
6. Transportation and Disposal
7. Site Restoration
8. Demobilization

Prior to the start of construction activities, a site walk will be conducted with the CONCOM representative to evaluate/delineate potential wet areas and to discuss applicable restoration requirements.

## **4.1 Mobilization and Site Preparation**

Prior to mobilization activities, Dig Safe utility mark-out service will be notified to obtain the locations of any utilities in the general vicinity of the work area. The USEPA and MassDEP will be notified a minimum of seven days in advance of the field activities. The South Shore Tri-Town Development Corporation (SSTTDC) will be notified of the planned clearing, excavation, and restoration operations.

The NAS SOWEY Caretaker Office will be used as an on-site office. The site will be accessed by the paved road off Shea Memorial Drive, located to the north of the site. The site access route is shown on Figure 2-1 of the Final RAWP (TtEC 2009).

### **4.1.1 Site Preparation**

Site zones will be established to prevent contaminant migration. An exclusion zone, a contamination reduction zone, and a support zone will be established. The preliminary areas designated for access/egress to and from the site will be evaluated and defined. Temporary construction fencing will be installed to delineate the work zone and to prevent trespassers from entering the site.

### **4.1.2 Laydown Areas**

In preparation for this area to stage contaminated material, 10-mil polyethylene will be placed on the ground surface.

### **4.1.3 Clearing and Erosion Controls**

Limited vegetation clearing will be completed to allow access to the upland and drainage ditch excavation areas. Vegetation clearing will include mowing, brush removal, and tree felling. All cleared material may be chipped and placed in designated areas located outside of the access corridor. Cleared material will remain in the immediate area where clearing is conducted and will not be moved or transported off-site. Tree-grubbing is not anticipated to be required as part of the clearing effort. Trees will be removed as necessary. Large trees and stumps located within excavation areas will either be chipped and spread onsite at an approved area or removed and disposed of at an offsite location. Erosion and sediment controls (hay bales and silt fence) will be installed after clearing and prior to excavation. The proposed site layout is shown on Figure 2-2.

### **4.1.4 Site GPS Stakeout**

Prior to removal efforts, a site stakeout will be performed to identify the headwall, pipes to be removed, and excavation areas. The stakeout will be performed using a handheld GPS and by visual observation. There is a wetlands area within the site. The limits of the wetlands area will also be identified. Excavations to be performed within the limits of the wetlands area will require coordination with the SSTTDC.

## 4.2 Excavation Activities

To avoid recontamination the excavation activities follow the contours of site starting with the highest elevation and working to the lowest elevation. The Upland Areas will be addressed first followed by the Previous Remediation Area Removal, the Pipes and Headwall and finally the Drainage Ditch.

### 4.2.1 Upland Areas

Former sample locations A2-B04 and A2-B05, contained within the former trickling filter structure, will also be addressed. These samples are currently at the surface (previously excavated down to 2.5 feet bgs). Given the limited amount of soil within these locations due to the concrete structure located within the middle of the trickling filter and the presence of stone within the area (limiting the amount of soil), a 5 foot X 5 foot X 2 foot excavation is proposed but may be obstructed by stone or subsurface structures. Five confirmatory samples will be collected (one bottom and 1 on each sidewall). These locations are depicted on Figure 4-1.

### 4.2.2 Additional Removal Activities

#### 4.2.2.1 *Previous Remediation Area Removal*

A previous remediation area from former work conducted at STP Site 7 will require additional surficial excavation. The location and excavation limits are shown in Figure 4-1.

### 4.2.3 Pipe and Headwall Excavation

An excavator will be used to remove the surface soils until the pipes are exposed. The pipes and surrounding soil will be disturbed as little as possible when first exposed so that a careful visual inspection can be conducted to identify pipe breaches and defects that could have provided pathways for migration of contaminants from the inside the pipes to subsurface media. After inspection, sections of pipe will be removed from the trench and staged on poly sheeting adjacent to the trench.

#### 4.2.3.1 *Pipe 1 Removal/Soil Excavation*

Pipe 1 – This pipe will be excavated to its origin and a determination will be made whether other sources of contamination remain. Source material will be removed where feasible. Estimated length is 100 feet. Estimated depth is 0 feet to 12 feet below ground surface (bgs). Pipe 1 is approximately 6 inches in diameter. The soil located above the pipe will be staged separately from that below the pipe for use as potential backfill, pending sample results for COC analyses. Soils will be staged adjacent to the excavation on 6-mil poly material. If the soil is very wet, the laydown area will be constructed that the water discharges back into the excavation while the stockpiled material is settling.

#### *4.2.3.2 Pipe 4 (unnamed) Removal/Soil Excavation*

Pipe 4 (unnamed pipe) – This eight-inch diameter pipe is co-located with Pipe 1 and will be excavated to its origin and a determination will be made whether other sources of contamination remain. Source material will be removed where feasible. The pipe is made of corrugated steel with a length of approximately 100 feet. The estimated depth of this pipe is 0 feet to 12 feet bgs. The soil located above the pipe will be staged separately from that below the pipe for use as potential backfill, pending sample results for COC analyses. Soils will be staged adjacent to the excavation on 6-mil poly material. If the soil is very wet, the laydown area will be constructed that the water discharges back into the excavation while the stockpiled material is settling.

#### *4.2.3.3 Pipe 2 Removal/Soil Excavation*

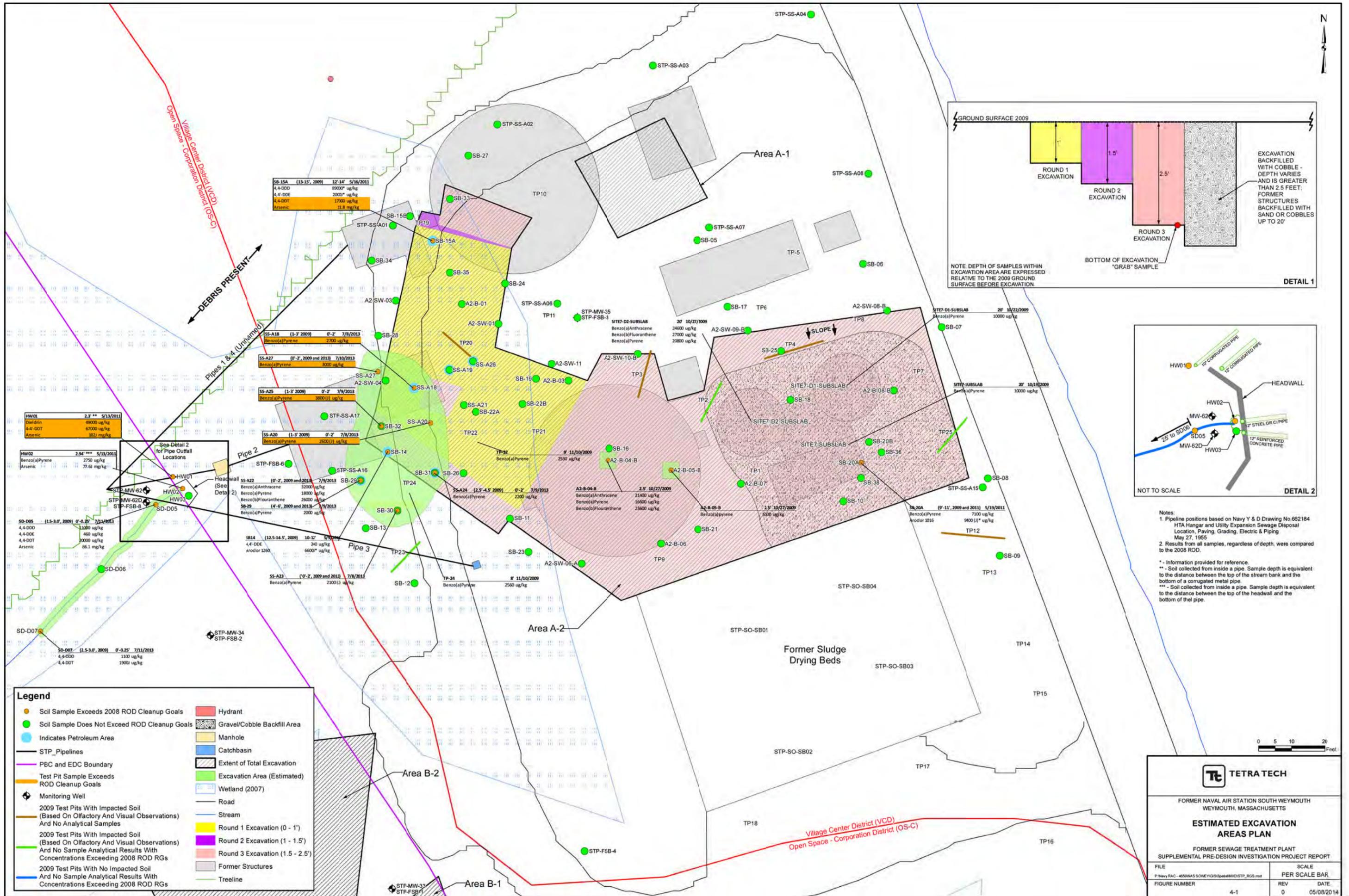
Pipe 2 – Pipe 2 is an effluent pipe that penetrates the headwall. This STP system effluent pipe will be removed from the headwall back to the first manhole. Any pipes that extend upslope of the manhole will be assessed to determine if further removal is warranted, and whether any waste material is present. Any waste material that is identified will be removed or secured to prevent further releases. This pipe has an estimated length of 30 feet with an estimated depth of 4 feet to 8 feet bgs. The soil located above the pipe will be staged separately from that below the pipe for use as potential backfill, pending sample results for COC analyses. Soils will be staged adjacent to the excavation on 6-mil poly material. If the soil is very wet, the laydown area will be constructed that the water discharges back into the excavation while the stockpiled material is settling.

#### *4.2.3.4 Pipe 3 Removal/Soil Excavation*

Pipe 3 – Pipe 3 is a storm drain that penetrates the headwall and is estimated to be 75 feet long at a depth of approximately 4 feet to 8 feet bgs. This storm drain pipe will be removed back to the first catch basin. Any pipes that extend upslope of the first catch basin will be assessed to determine if further removal is warranted, and whether any waste material is present. Any waste material that is identified will be removed or secured to prevent further releases. The soil located above the pipe will be staged separately from that below the pipe for use as potential backfill, pending sample results for COC analyses. Soils will be staged adjacent to the excavation on 6-mil poly material. If the soil is very wet, the laydown area will be constructed that the water discharges back into the excavation while the stockpiled material is settling.

#### 4.2.4 Drainage Ditch

The drainage ditch will be excavated within 50 feet downstream from the head wall and associated piping at 3 feet width and 1 foot depth. Soils will be staged adjacent to the excavation on 6-mil poly material. If the soil is very wet, the laydown area will be constructed so that the water discharges back into the excavation while the stockpiled material is settling.



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#### 4.2.5 Excavation Methodology

- All approximate soil sample locations that exhibit exceedances of the site cleanup levels will be re-established with stakes prior to removal of contaminated soil.
- Soil removal will be performed with a track-mounted excavator.
- If solid waste is encountered during the excavation, the debris will be removed and stockpiled separately.
- Stockpiled soil will be placed on 10-mil polyethylene sheeting to prevent potential migration of COCs to non-impacted soil. To prevent infiltration of rain water and erosion/runoff from the soil pile, the stockpiles will be covered with 10-mil polyethylene sheeting at all times, except when materials are being added or removed.
- Once the proposed limits of excavation are reached, collected samples will be field screened to evaluate if further removal is necessary and will be sent off-site for laboratory analysis as appropriate. Previous Remediation Area Removal samples will be sent directly for off-site analysis.
- Locations where sample results exceed cleanup levels will be over-excavated and resampled for confirmation. Over excavation will be determined by field personnel and as indicated by field screening, as described in Section 4.4.
- The excavations will remain open (surrounded by warning tape) until confirmatory sample results are received. The excavations will be restored as described in Section 4.7.

#### 4.2.6 Decontamination Operations

Refer to Section 4.2.4 of the Final RAWP (TtEC 2009) for decontamination operations.

#### 4.2.7 Groundwater Management

Groundwater is not anticipated to be encountered during excavation of the upland areas. Groundwater may be encountered within the previous remediation area. If water is encountered, soils will be placed on top of poly-sheeting in close proximity to the excavation. This sheeting will allow the water to be directed back into the excavated area. In the event that dewatering of an excavation is necessary, a vacuum truck and/or frac-tanks will be mobilized.

### **4.3 Stockpile Removal**

No additional stockpile removal efforts are required as part of this RAWP Addendum.

### **4.4 Field Screening**

After reaching the proposed removal limits, field screening for pesticides will be performed using an EnviroGard™ Imunoassay kit, along with visual, olfactory observations and PID jar headspace readings will be collected. These field screening results will be used to determine if confirmatory samples should be collected or if additional excavation is needed. Additional field

screening details are provided in the Final RAWP (TtEC 2009) and the Sampling and Analysis Plan (SAP) (Appendix A).

#### **4.5 Confirmatory Sample Collection**

##### **4.5.1 Confirmation Sampling**

Confirmatory samples will be collected from the excavations when field screening methods indicate that all contaminated soil has been removed. Additional information, including sample locations, frequency, and labeling requirements are provided in the SAP (Appendix A).

#### **4.6 Transportation and Off-Site Disposal**

Waste characterization sampling of the excavated soil will be performed in accordance with the disposal facility requirements. Additional details are provided in the SAP (Appendix A). All waste will be handled in accordance with the Waste Management Plan (Appendix B).

The material will be transported in lined and covered trucks equipped with appropriate placarding. Bills of lading will be completed and will accompany the transport of the material from the site to the disposal facility. Transportation and waste disposal documentation will be signed by Navy personnel. Field personnel conducting hauling and trucking operations will ensure that no material adheres to the sides or tires of the transport trucks. If material is observed, it will be removed before the trucks leave the site by dry-brushing and collected for off-site disposal.

#### **4.7 Site Restoration**

##### **4.7.1 Upland Areas**

No additional restoration activities will be performed on upland areas.

##### **4.7.2 Headwall Area**

It is assumed that soil excavated from above the pipes will be suitable for backfill, if required. The excavations related to the removal of the pipes will be backfilled up to the headwall. Pre-existing conditions will be restored to the extent practicable.

##### **4.7.3 Drainage Ditch**

Following completion of excavation and removal of contaminated sediment, the drainage ditch will be contoured naturally using existing side-slope material. No new backfill will be added. Erosion control matting (ECM) will be installed along the length of the drainage ditch to prevent seed migration and aid in restoration.

#### 4.7.4 Re-vegetation

Areas of disturbance will be seeded with an appropriate seed mix of annual and perennial native grasses, sedges, and forbs. Seeded areas will be covered with ECM or straw mulch to prevent seed migration. Refer to Section 4.7.3 of the Final RAWP (TtEC 2009) for approved seed mixtures.

#### 4.7.5 Restoration of Additional Removal Efforts

Soil excavated from above the pipes will be used as backfill, as needed. All areas will be restored to or close the existing topography of the site, and wetland areas will be restored as described in the Wetland Restoration Plan.

#### **4.8 Reinstallation of Removed Monitoring Wells (if applicable)**

Not applicable. Monitoring wells will not be removed as part of this RAWP Addendum.

#### **4.9 Demobilization**

All personnel and equipment will be demobilized from NAS SOWEY upon completion of the required field operations.

### **5.0 FIELD SAMPLING AND LABORATORY TESTING**

Refer to **Appendix A** for the Sampling and Analysis Plan.

### **6.0 POST-EXCAVATION MONITORING**

Post-excavation sediment and groundwater monitoring will not be performed as part of this RAWP Addendum.

### **7.0 PROJECT SCHEDULE**

The expected length of the remedial action is 28 days. Activity durations are as follows:

- |  |         |
|--|---------|
| • Mobilization and site preparation    | 3 days  |
| • Excavation and removal activities    | 16 days |
| • Waste Characterization               | 2 days  |
| • Transportation and off-site disposal | 2 days  |
| • Site Restoration                     | 3 days  |
| • Demobilization                       | 2 days  |

## **8.0 FINAL REPORT PREPARATION AND SUBMITTAL**

Once applicable clean-up criteria have been met, as verified by post-excavation confirmatory soil sampling, TtEC will prepare and submit a completion report addendum. This report will provide a description of the additional work performed, the results of the confirmatory sampling, waste disposal information, and photographic documentation.

## **9.0 CONTRACTOR QUALITY CONTROL PLAN**

The Contractor Quality Control Plan (CQCP) is provided in Appendix C.

## **10.0 ACCIDENT PREVENTION PLAN**

The Accident Prevention Plan (APP) is provided in Appendix D.

## **11.0 REFERENCES**

U.S. Navy. 2008. Record of Decision, Operable Unit 7 – Former Sewage Treatment Plant, Naval Air Station South Weymouth, Weymouth, Massachusetts. April.

TtEC 2009. Final Remedial Action Work Plan for Soil Excavation At STP Site 7 Former Sewage Treatment Plant Location Former Naval Air Station South Weymouth (NAS SOWEY) South Weymouth, Massachusetts. July.

TtNUS 2014. Additional Soil Delineation Investigation Data Report – Former Sewage Treatment Plant, Former Naval Air Station South Weymouth, Weymouth, Massachusetts. February.

**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**  
**July 2014**  
**SOIL EXCAVATION AT SITE 7 FORMER STP LOCATION**  
**FORMER NAVAL AIR STATION**  
**SOUTH WEYMOUTH, MASSACHUSETTS**

**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

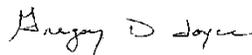
**Prepared by:**

Tetra Tech EC, Inc.  
5250 Challedon Drive  
Virginia Beach, Virginia 23462

**Prepared under:**

Contract No. N62470-13-D-8007  
DCN: 4659-WE02-14-0287  
CTO No. WE02

Review Signature:



\_\_\_\_\_  
Greg Joyce  
TtEC Quality Control Program Manager

07/23/2014

Date

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## **EXECUTIVE SUMMARY**

The Department of the Navy (Navy) has contracted with Tetra Tech EC, Inc. (TtEC) to provide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Massachusetts Contingency Plan (MCP) support at former Naval Air Station South Weymouth (NAS SOWEY), Massachusetts. This project will be conducted under Naval Facilities Engineering Command Mid-Atlantic Remedial Action Contract No. N62470-13-D-8007, Contract Task Order (CTO) No. WE02. The work includes continuation of the CERCLA Remedial Action at Sewage Treatment Plant (STP) Site 7.

This Tier II Sampling and Analysis Plan (SAP), which is Appendix A of the Addendum to the Remedial Action Work Plan (RAWP), has been prepared by TtEC to provide guidance for sampling, analysis, and quality control (QC) in support of sampling activities for STP Site 7. The quality assurance (QA)/QC elements in this SAP were 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**

NAS SOWEY occupies approximately 1,442 acres. Portions of NAS SOWEY extend into the adjacent towns of Abington and Rockland and abut the town of Hingham. NAS SOWEY was developed during the 1940s for dirigible aircraft used to patrol the North Atlantic during World War II. The facility was closed at the end of the war and then reopened in 1953 as a Naval Air Station for aviation training. It remained a Reserve training facility until it was operationally closed on September 30, 1996, and administratively closed on September 30, 1997, as part of the Base Realignment and Closure program.

The STP Site 7 is comprised of two main areas encompassing approximately 3.3 acres: the former Tile Bed Area (0.9 acre) and the adjacent former STP area (2.3 acres). The site, currently owned by the Navy, is unpaved and relatively flat with a gentle slope to the west toward an adjacent drainage channel and wetland area. A small segment of the adjacent, downgradient/downstream wetland area (0.1 acre) is also included within STP Site 7. The site's ground surface is covered by grasses, shrubs, and mixed upland forest with an artificial intermittent stream located in the southern portion of the site. Several small intermittent stream channels flow through the wetland area and transport surface water for eventual discharge into French Stream to the west. French Stream flows south to off-Base properties in Rockland. Forested areas bound the site to the north, while paved roads bound the site to the east and south.

Structures that remain on the site include the metal roof and frame and concrete walls of the former sludge drying bed area, an inactive transformer (polychlorinated biphenyls (PCBs)-free), clay tiles, and riser pipes of the former Tile Bed Area, and various groundwater monitoring wells installed as part of the Navy's investigations previously performed on the site.

The eastern portion of the site is located within a Massachusetts-mapped potentially productive, medium yield aquifer. In this part of the Base, groundwater flows toward the southwest in the direction of French Stream. The water table at the site is shallow, located only a few feet below ground surface (bgs) (1 to 13 bgs, depending on the location and proximity to the wetland area).

The Navy constructed the Tile Bed Area in the 1940s and used it for the treatment and disposal of Base sanitary wastewater until some time prior to 1953, when the STP was constructed on the adjacent land. The STP was used until 1978, when the Base wastewater system was connected to the municipal sanitary sewer system. The Navy removed most of the STP structures by 1992. From the 1980s until 2005, the Navy stored road salt and sand under the canopy that covered the former sludge drying beds. The primary data gathering efforts for the site have been through two comprehensive field studies: (1) a basewide Phase I Remedial Investigation (RI) (conducted primarily in 1996); and (2) a Phase II RI for the STP site (conducted primarily in 1999 and in 2000). The Navy conducted two supplemental investigations in 2006 (supplemental sampling event and risk assessment) and 2008 (pre-design investigation [PDI]) to provide additional information about soil and groundwater contaminants of concern and potential site risks. The remedy for STP Site 7 was initially implemented by TtEC under a previous contract. Additional surface and subsurface contamination was found that required re-evaluation of the remedial plans. Supplemental sampling has been completed by others, and a new plan of action has been developed to remove additional surface soils, discharge piping (and piping content), and associated contaminated soil and sediment, which is discussed in this SAP.

## **REGULATORY OVERSIGHT**

Environmental investigation and remediation activities are being conducted at NAS SOWEY 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) as well as the MCP. 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 United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP).

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## **FIGURES**

- Figure 2-1      Site Vicinity Map
- Figure 2-2      Site Plan with Former Structures
- Figure 4-1      Estimated Excavation Areas Plan

## **ATTACHMENTS**

- Attachment A    Laboratory DoD ELAP Accreditation

## ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
µg/kg	micrograms per kilogram
AES	atomic emission spectrometer
CAS	Chemical Abstracts Service
COC	chain-of-custody
DCN	Document Control Number
DL	detection limit
DoD	Department of Defense
EDD	electronic data deliverable
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
ICP	inductively coupled plasma
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
NAS SOWEY	Naval Air Station South Weymouth
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NIRIS	Naval Installation Restoration Information Solution
PCB	polychlorinated biphenyl
PDF	portable data format
PM	Project Manager
PQCM	Project Quality Control Manager

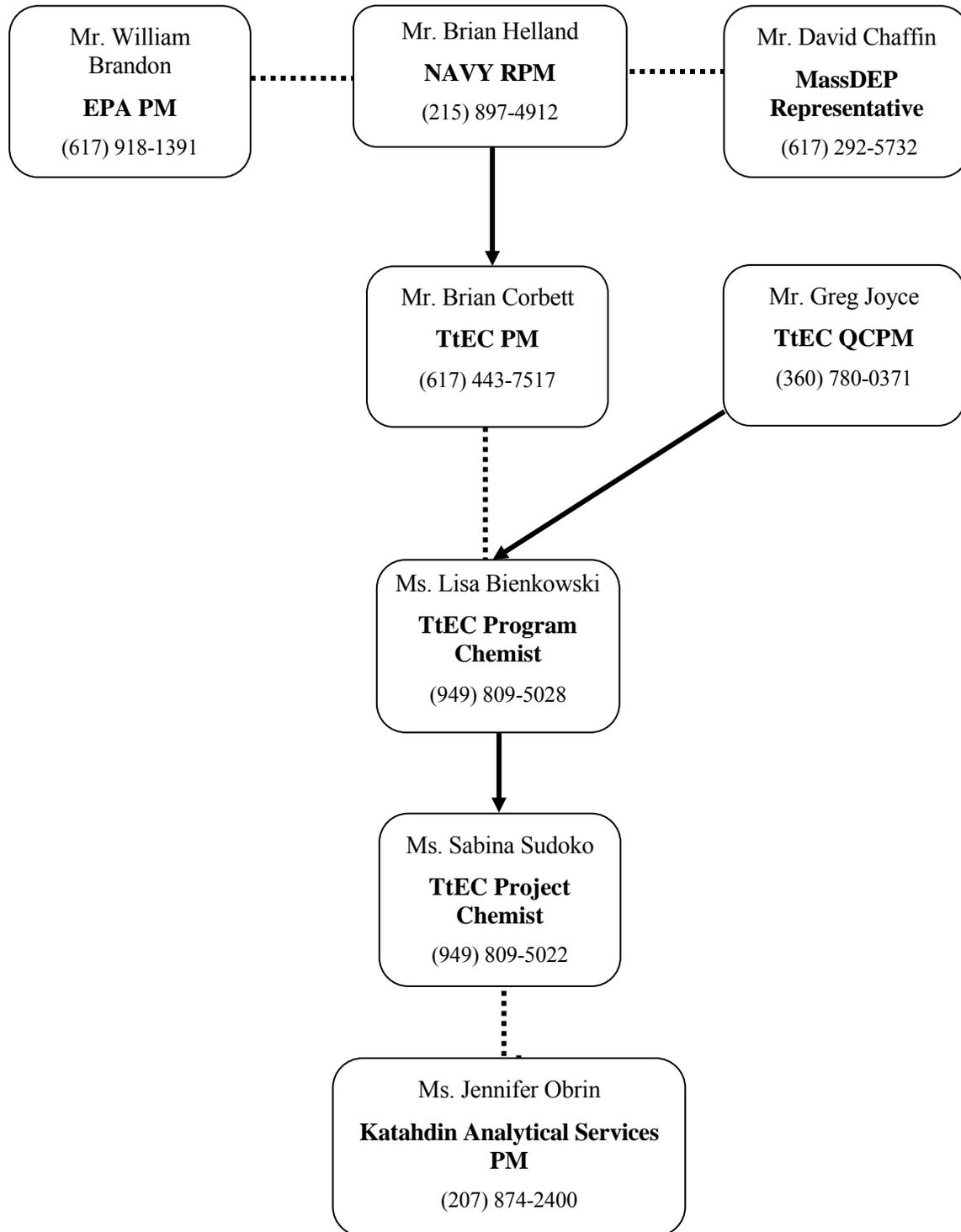
## **ABBREVIATIONS AND ACRONYMS**

(Continued)

PRG	preliminary remediation goals
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QCPM	Quality Control Program Manager
QDC	Quonset Development Corporation
QL	quantitation limit
QSM	Quality Systems Manual
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
TtEC	Tetra Tech EC, Inc.
UFP	Uniform Federal Policy

## Project Organizational Chart (Worksheet #5)

Lines of Authority ————— Lines of Communication



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**Communication Pathways**  
 (Worksheet #6)

<b>Communication Drivers</b>	<b>Responsible Affiliation</b>	<b>Name</b>	<b>Phone Number</b>	<b>Procedure</b>
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. Brian Corbett	(617) 443-7517	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. Brian Helland	(215) 897-4912	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 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. The PM will notify the Navy RPM.
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)

<b>Communication Drivers</b>	<b>Responsible Affiliation</b>	<b>Name</b>	<b>Phone Number</b>	<b>Procedure</b>
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 Project Chemist and Program Chemist within 24 hours. Any corrective actions will be documented and verified by the Program Chemist who will notify in writing the QCPM and PM. The PM will notify the Navy RPM.
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)

A scoping session with the Navy has been completed, and meeting minutes are contained in the project file.

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## Conceptual Site Model (Worksheet #10)

Previous investigations that have been conducted at the STP site are summarized below:

- **Installation Restoration (IR) Program, Department of Defense (DoD) 1983.** In response to the growing awareness of the potential effects of hazardous materials on human health and the environment, the DoD developed the IR Program to investigate and clean up potential problem areas created by past activities at federal facilities. The IR Program was the catalyst for environmental investigations at NAS SOWEY.
- **Preliminary Assessment (PA), Argonne National Laboratory 1988.** The PA included a records search, interviews, and a site walkover. The purposes of the PA were to identify and evaluate past waste practices at NAS SOWEY and make an assessment of the associated potential for environmental contamination. As a result of the study, five sites (not including the STP site) were identified for further environmental study.
- **Site Investigation (SI), Baker Environmental 1991.** The SI included site walkovers, geophysical surveys, installation of groundwater monitoring wells, and the collection of soil, sediment, surface water, and groundwater samples at eight sites at the NAS SOWEY property. The SI was conducted for screening purposes to assess the potential for contaminant migration, provide data for Hazard Ranking System (HRS) scoring, and to provide the information necessary to develop a comprehensive work plan for further study. The SI included a site visit and literature review at the STP site, but no sampling. Further investigation of the STP site was recommended.
- **Phase I RI Study, Brown & Root Environmental 1998.** The Phase I RI included a literature search, a geophysical survey, a soil-vapor survey, immunoassay testing, an ecological assessment, test pit excavation, installation of monitoring wells, well points, and piezometers, hydraulic conductivity testing, groundwater gauging and water level measurements, stream gauging, sampling of surface soil, subsurface soil, groundwater, sediment, surface water, and leachate, and a human health risk assessment.
- **Phase II RI, Tetra Tech NUS (TtNUS) 2002.** The Phase II RI was conducted to address data gaps from the previous investigations. During the Phase II RI, the Tile Bed Area was incorporated into the sampling and investigation programs along with the STP area. The Phase II RI included further ecological assessment, groundwater gauging, water level measurements, sampling of surface soil, subsurface soil, groundwater, sediment, and surface water, and a human health risk assessment.

## Conceptual Site Model (Continued) (Worksheet #10)

- **Supplemental Sampling Event and Risk Assessment Addendum, TtNUS 2006.** The additional field investigation and associated risk calculations included sampling and analysis of soil beneath the former sludge drying beds and groundwater and calculating risk to evaluate the potential risks to future residents from exposure to site surface soils. This supplemental field investigation and additional risk calculations were incorporated into the Final Feasibility Study (TtNUS 2007).
- **Feasibility Study (FS), TtNUS 2007.** The FS identified the Remedial Action Objectives (RAOs) that would be protective of human health and the environment at the site, and developed and evaluated various cleanup alternatives to achieve those objectives. **Record of Decision (ROD) April 2008.** The ROD was executed on April 30, 2008 and selects excavation and off-site disposal (or recycling by asphalt batching) of contaminated soils and sediments.
- **PDI, LFR 2009.** The PDI was conducted to further delineate the types and extent of contaminants of concern in soil and sediment requiring remediation, to verify that surface water is not a medium of concern, to evaluate groundwater flow and to inspect and determine whether there are potential migration pathways that have not been adequately investigated.
- **RA, TtEC 2009.** The RA was conducted to reduce the levels of the contaminants of concern in soil and sediment to below the RGs per the selected remedy identified in the ROD (Navy 2008). Following removal of the impacted material, confirmatory samples were collected to document the remaining levels of the contaminants of concern.
- Several post-excavation investigations have been conducted to assess the extent of contamination remaining at STP Site 7. Below is a summary of investigations performed since the 2009 remedial action effort. Additional information regarding site investigations prior to June 2009 is provided in the Final RAWP for Soil Excavation at Former STP Site 7 (TtEC 2009).
  - A supplemental PDI effort and report was completed between April 2011 and September 2012. During this effort, additional sampling was performed to further delineate the lateral and vertical extent of soil contamination. Soil samples from each of the pipes and at the headwall were also collected. Based on the investigative findings, new site-specific preliminary remediation goals (PRGs) were calculated for the contaminants of concern that contribute significantly to the cancer risk for each receptor exposed to media onsite. A comparison of the data to the PRGs demonstrated that the remaining contamination poses a potential health impact, sufficient to conduct additional soil sampling.

## Conceptual Site Model (Continued)

(Worksheet #10)

- In 2013, an Additional Soil Delineation investigation was performed to follow up on the 2009 RA and the 2011 Supplemental PDI results, which showed areas that needed further investigation. The investigation and report was completed between July 2013 and February 2014. Sample results indicated that contaminants of concern remain. The contaminants of concern for soil include arsenic, 4,4'-DDT, dieldrin, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene. The contaminants of concern for sediment include arsenic, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin.

An evaluation of prior remedial actions at STP Site 7 have led to the determination that additional surface and subsurface contamination are present and that additional surface soils, discharge piping (and piping content), and associated contaminated soil and sediment must be removed to meet the RAOs for the site identified in the ROD (Navy 2008), allowing unrestricted land use following implementation of the remedy. The RAOs for STP Site 7 are to:

- Eliminate potential human and ecological receptor exposure to contaminants of concern present in site soil at concentrations above the selected remediation goals (RGs).
- Eliminate potential human and ecological receptor exposure to contaminants of concern present in site sediment at concentrations above the selected RGs.

RGs, or cleanup goals, were developed in the FS for the identified human health/ecological contaminants of concern in site soil and sediment. The cleanup levels that were used to evaluate the efficacy of the excavation activities for site surface soil and sediment are listed in this SAP in Reference Limits and Evaluation Tables (Worksheet #15). These cleanup goals and RAOs were incorporated into the ROD for this site. In addition to the contaminants of concern identified in the ROD for soil, additional contaminants of concern in soil were identified during the investigations conducted after 2009 that included the following: dibenzo(a,h)anthracene; indeno(1,2,3-cd) pyrene; 4,4'-DDD; 4,4'-DDE, and PCBs. These analytes are added to the Reference Limits and Evaluation Tables (Worksheet #15) in this SAP for soil. Groundwater and surface water were not identified as media of concern at STP Site 7.

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

### **1. State the problem**

An evaluation of prior remedial actions at STP Site 7 have led to the determination that additional surface and subsurface contamination are present and that additional surface soils, discharge piping (and piping content), and associated contaminated soil and sediment must be removed to meet the RAOs for the site identified in the ROD (Navy 2008), allowing unrestricted land use following implementation of the remedy.

### **2. Identify the goal of the study**

Are the analytical results from the confirmation soil/sediment samples collected after excavation below the project action limit criteria (RGs) 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 STP Site 7 vicinity map is provided as Figure 2-1. Figure 2-2 shows the site plan. Figure 4-1 illustrates the areas to be excavated.

*Temporal boundaries:* Not applicable to this project.

### **5. Develop the analytic approach**

If the analytical results from the confirmation soil/sediment samples are below the project action limit criteria (RGs), then the removal action will be considered successful. If the results are above the criteria, then the area that represents those results will be over-excavated and confirmation soil/sediment samples recollected for analysis.

### **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).

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

### **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)

<b>QC Sample</b>	<b>Analytical Group</b>	<b>Frequency</b>	<b>Data Quality Indicators</b>	<b>Measurement Performance Criteria</b>
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	PAHs Pesticides PCBs Metals	1 per 20 samples	Precision/ Accuracy	See criteria listed in Laboratory QC Samples Table (Worksheet #28)
Field Duplicate	PAHs Pesticides PCBs Metals	1 per 20 samples	Precision	Relative percent difference (RPD) $\leq$ 50% when both original and field duplicate concentrations are detected above the limit of quantitation (LOQ)

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## **Sampling Design and Rationale**

(Worksheet #17)

Samples will be collected at a frequency of one sample per sidewall/bottom per 50 feet of excavation. The anticipated number of samples from the pipes and ditch are as follows:

- Pipe 1 – 6 samples (2 from the bottom and one from each of 4 sidewalls)
- Pipe 2 – 3 samples (1 from the bottom and two from the sidewalls)
- Pipe 3 – 6 samples (2 from the bottom and one from each of 4 sidewalls)
- Pipe 4 – 6 samples (2 from the bottom and one from each of 4 sidewalls)
- Ditch – 3 samples (3 from the bottom and one from the sidewall)
- Field QC samples – 2 field duplicates randomly chosen from sample locations above

The anticipated number of samples from the Previous Remediation Area is as follows:

- 8 samples (2 from the bottom and 6 from the sidewalls) ; this number may increase based on additional information provided by the Navy.
- Field QC samples – 1 field duplicate randomly chose from sample locations above

The anticipated number of samples from the excavation of A2-B04 and A-2B05:

- A2-B04 – 5 samples (1 from the bottom and 4 from the sidewalls)
- A2-B05 – 5 samples (1 from the bottom and 4 from the sidewalls)
- Field QC samples – 1 field duplicate randomly chose from sample locations above

To ensure the completeness of the pipe removal excavations, a multi-step screening and confirmation sampling program will be conducted. The pipes and surrounding soil will be disturbed as little as possible when first exposed so that a careful visual inspection can be conducted to identify pipe breaches and defects that could have provided pathways for migration of contaminants from the inside the pipes to subsurface media. Potentially impacted soil will be field screened (e.g., visual, olfactory, photoionization detector, jar headspace readings, and immunoassay testing) to assess the potential presence of contaminant releases. Based on the screening results, confirmation samples will be collected as detailed above to verify that cleanup goals have been attained where releases are most-likely to have occurred (e.g., soil potentially impacted by releases from breaches and defects) or additional soil excavation will be conducted to remove enough impacted material to attain cleanup goals.

To ensure the completeness of the Ditch excavation, the northwest and southeast sidewalls (the longer pair of sidewalls) will be excavated to native material. One confirmation sample will be collected from the downslope (southwest) sidewall to confirm the downslope extent of contamination exceeding cleanup goals was captured. Bottom samples will be collected

## **Sampling Design and Rationale**

(Worksheet #17)

approximately 15 feet, 30 feet, and 45 feet downslope of the headwall location to confirm the vertical extent of contamination exceeding cleanup goals was captured.

If confirmation sample results exceed the cleanup goals, over-excavation of the area will be performed. Then additional confirmation samples will be collected from the over- excavation area to confirm attainment of cleanup goals. Where no evidence of a release is encountered, the area will be subdivided into regularly spaced segments that do not exceed 25 feet in length, and at least one confirmation sample should be collected from the sidewall or bottom location most likely to be contaminated in each segment.

For any excavated soil that may be re-used as backfill, one six-point composite sample per 500 cubic yards will be collected and analyzed for the contaminants of concern. If the RGs are met, the soil may be used as backfill. If the RGs are not met, the soil will re-sampled for disposal as described in the Waste Management Plan (Appendix B of the RAWP Addendum).

## **Field Project Tasks**

(Worksheet #14)

### **SCOPE OF WORK**

The RAWP details the field activities for this project that include:

- Mobilization and site preparation
- Excavation activities (including include pipe and headwall removal)
- Groundwater management
- Transportation and disposal
- Site restoration
- Demobilization

Sampling, data management, and data validation procedures are described below.

### **SOIL/SEDIMENT SAMPLING PROCEDURES**

Prior to performing sampling, personnel will don a new pair of disposable nitrile gloves before collecting samples at each location. Each soil/sediment sample will be obtained with a high density polyethylene (HDPE) scoop. Approximately four times the amount of material required for a sample will be collected into a disposable aluminum pie pan. The material will be homogenized by mixing at least three times. A sample from a horizontal slice of the mixture will then be apportioned into the appropriate sample containers listed in the Sample Details Table (Worksheet #18, 19, 20, and 30). Field QC samples will be collected from this homogenized mixture.

For the six-point composite sample collected per each 500 cubic yards of excavated soil, the following procedure will be followed:

1. Identify six random locations per 500 cubic yards of excavated soil.
2. Collect a grab sample of soil with a HDPE scoop from each of the six locations and place in a disposable aluminum pie pan.
3. Homogenize the soil then collect a sample into containers listed in Sample Details Table (Worksheet #18, 19, 20, and 30).

### **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/mailed 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:

- Pipe confirmation sample collected from bottom: **C-SITE7-PIPEX-B-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - PIPEX – identifier to indicate pipe sample and X is the pipe number (1, 2, 3, or 4)
  - B – identifier to indicate sample from bottom
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)
- Pipe confirmation sample collected from sidewall: **C-SITE7-PIPEX-SW-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - PIPEX – identifier to indicate pipe sample and X is the pipe number (1, 2, 3, or 4)
  - SW – identifier to indicate sample from sidewall
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)
- Ditch confirmation sample collected from bottom: **C-SITE7-DITCH-B-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - DITCH – identifier to indicate ditch sample
  - B – identifier to indicate sample from bottom
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)

## Field Project Tasks (Continued)

(Worksheet #14)

- Ditch confirmation sample collected from sidewall: **C-SITE7-DITCH-SW-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - DITCH – identifier to indicate ditch sample
  - SW – identifier to indicate sample from sidewall
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)
- Previous Remediation Area confirmation sample collected from bottom: **C-SITE7-PRA-B-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - PRA – identifier to indicate Previous Remediation Area
  - B – identifier to indicate sample from bottom
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)
- Previous Remediation Area confirmation sample collected from sidewall: **C-SITE7-PRA-SW-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - PRA – identifier to indicate Previous Remediation Area
  - SW – identifier to indicate sample from sidewall
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)
- Area A2-B04 or A2-B05 confirmation samples collected from sidewall: **C-SITE7-A2-B0X-SW-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - A2-B0X – identifier for area A2-B04 or A2-B05
  - SW – identifier to indicate sample from sidewall
  - Y –consecutive sample number starting with 1 (number of samples collected from each area)
- Area A2-B04 or A2-B05 confirmation samples collected from bottom: **C-SITE7-A2-B0X-B-Y**, where:
  - C – confirmation sample
  - SITE7 – abbreviation for STP Site 7
  - A2-B0X – identifier for area A2-B04 or A2-B05

## **Field Project Tasks (Continued)** (Worksheet #14)

B – identifier to indicate sample from bottom

Y –consecutive sample number starting with 1 (number of samples collected from each area

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 01-FD). For confirmation samples collected after over-excavation of an area, a designator “-A” or “-A1” will be used after the consecutive sample number that represents the location that was over-excavated. If another over-excavation is performed in that same area, the next alphabetical designator (-B or -B1) will be used after the consecutive sample number. 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;

## **Field Project Tasks (Continued)** (Worksheet #14)

- 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 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 sampler, 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

## **Field Project Tasks (Continued)** (Worksheet #14)

### **LABORATORY DOCUMENTATION PROCEDURES**

The laboratory will submit data at the turnaround time to the Project Chemist. This submittal will include the case narrative, analytical results, and basic QC results (method blanks, laboratory control sample [LCS], surrogates, and MS/MSDs). Within 5 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 III-equivalent data package to the Project Chemist. The data packages 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 narrative documenting the resolution of all corrective actions and 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 (STP Site 7 NAS SOWEY) and project number (4659.WE02)
- 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:
  - Organic raw data sequence
    - 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

## **Field Project Tasks (Continued)** (Worksheet #14)

### 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.

#### – Inorganic raw data sequence

- a. Sample results forms, including method blanks
- b. Sample raw data
- 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. TtEC must be notified 30 days before disposal of any relevant records.

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 EDDs and the hardcopy report 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.

## **Field Project Tasks (Continued)**

(Worksheet #14)

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 hardcopy 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 logsheet maintained by the PQCM. In addition, survey data will be recorded to identify all the sample locations.

Field data from the COCs (date and time collected, sample identification, etc.) will be entered into the TtEC database by the Project Chemist. These entries into the TtEC database will be 100 percent verified by the Program Chemist by checking the manual entry against the hardcopy information. In addition, the EDD will be uploaded into the TtEC database. The data will be checked for required values and project-specific requirements by the database. Any discrepancies in the EDD will be corrected by TtEC or the laboratory will be notified to make corrections.

Analytical data are required to be submitted to the Naval Installation Restoration Information Solution (NIRIS) website in Navy Electronic Data Deliverable format when the data can be directly tied to stationary survey sample locations. For this project, analytical results that will be submitted to NIRIS will be associated with the confirmation soil/sediment samples.

### **DATA VALIDATION**

Laboratory data will be validated by TtEC in accordance with EPA Region I Tier II data validation guidelines. Findings will be documented in the completion report for this project.

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## **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)

<b>All samples analyzed by:</b> Katahdin Analytical Services 600 Technology Way Scarborough, ME 04074 Phone: 207-874-2400	<b>Analysis Group</b>	PAHs	Pesticides	PCBs	Metals
	<b>EPA Preparation/ Analytical Method</b>	3550C/8270D SIM	3550C/8081B	3550C/8082A	3050B/6010C and 7471B
	<b>Laboratory SOP Reference</b>	CA-204	CA-302	CA-329	CA-608/CA-611
	<b>Container Type</b>	Two 8-ounce glass jars			
	<b>Preservative</b>	4±2 °C			
	<b>Holding Time (Preparation/ Analysis)</b>	14 days to extract/40 days to analyze			180 days for all metals except mercury is 28 days
<b>Location ID <sup>a</sup></b>	<b>Sample Depth (feet)</b>				
C-SITE7-PIPE1-BT-1	TBD	X	X	X	X
C-SITE7-PIPE1-BT-2	TBD	X	X	X	X
C-SITE7-PIPE1-SW-1	TBD	X	X	X	X
C-SITE7-PIPE1-SW-2	TBD	X	X	X	X
C-SITE7-PIPE1-SW-3	TBD	X	X	X	X
C-SITE7-PIPE1-SW-4	TBD	X	X	X	X
C-SITE7-PIPE2-BT-1	TBD	X	X	X	X
C-SITE7-PIPE2-SW-1	TBD	X	X	X	X
C-SITE7-PIPE2-SW-2	TBD	X	X	X	X
C-SITE7-PIPE3-BT-1	TBD	X	X	X	X
C-SITE7-PIPE3-BT-2	TBD	X	X	X	X
C-SITE7-PIPE3-SW-1	TBD	X	X	X	X
C-SITE7-PIPE3-SW-2	TBD	X	X	X	X
C-SITE7-PIPE3-SW-3	TBD	X	X	X	X
C-SITE7-PIPE3-SW-4	TBD	X	X	X	X
C-SITE7-PIPE4-BT-1	TBD	X	X	X	X
C-SITE7-PIPE4-BT-2	TBD	X	X	X	X
C-SITE7-PIPE4-SW-1	TBD	X	X	X	X
C-SITE7-PIPE4-SW-2	TBD	X	X	X	X
C-SITE7-PIPE4-SW-3	TBD	X	X	X	X
C-SITE7-PIPE4-SW-4	TBD	X	X	X	X
C-SITE7-DITCH-BT-1	TBD	X	X	X	X
C-SITE7-DITCH-BT-2	TBD	X	X	X	X

### Sample Details Table (Continued)

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

<b>All samples analyzed by:</b> Katahdin Analytical Services 600 Technology Way Scarborough, ME 04074 Phone: 207-874-2400	<b>Analysis Group</b>	PAHs	Pesticides	PCBs	Metals
	<b>EPA Preparation/ Analytical Method</b>	3550C/8270D SIM	3550C/8081B	3550C/8082A	3050B/6010C and 7471B
	<b>Laboratory SOP Reference</b>	CA-204	CA-302	CA-329	CA-608/CA-611
	<b>Container Type</b>	Two 8-ounce glass jars			
	<b>Preservative</b>	4±2 °C			
	<b>Holding Time (Preparation/ Analysis)</b>	14 days to extract/40 days to analyze			180 days for all metals except mercury is 28 days
<b>Location ID <sup>a</sup></b>	<b>Sample Depth (feet)</b>				
C-SITE7-DITCH-BT-3	TBD	X	X	X	X
C-SITE7-DITCH-SW-1	TBD	X	X	X	X
C-SITE7-PRA-BT-1	TBD	X	X	X	X
C-SITE7-PRA-BT-2	TBD	X	X	X	X
C-SITE7-PRA-SW-1	TBD	X	X	X	X
C-SITE7-PRA-SW-2	TBD	X	X	X	X
C-SITE7-PRA-SW-3	TBD	X	X	X	X
C-SITE7-PRA-SW-4	TBD	X	X	X	X
C-SITE7-PRA-SW-5	TBD	X	X	X	X
C-SITE7-PRA-SW-6	TBD	X	X	X	X
C-SITE7-A2-B04-SW-1	TBD	X	X	X	X
C-SITE7-A2-B04-SW-2	TBD	X	X	X	X
C-SITE7-A2-B04-SW-3	TBD	X	X	X	X
C-SITE7-A2-B04-SW-4	TBD	X	X	X	X
C-SITE7-A2-B04-BT-1	TBD	X	X	X	X
C-SITE7-A2-B05-SW-1	TBD	X	X	X	X
C-SITE7-A2-B05-SW-2	TBD	X	X	X	X
C-SITE7-A2-B05-SW-3	TBD	X	X	X	X
C-SITE7-A2-B05-SW-4	TBD	X	X	X	X
C-SITE7-A2-B05-BT-1	TBD	X	X	X	X

**NOTES:**

<sup>a</sup> Field QC samples (such as field duplicates and MS/MSDs) and over-excavation samples 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. MassDEP does not require state certification for environmental samples associated with remediation projects.

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## Reference Limits and Evaluation Tables

(Worksheet #15)

**Matrix:** Soil

**Analytical Group:** PAHs

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Benzo(a)anthracene	56-55-3	14,500	Soil ROD criteria	20	20	10	1.9
Benzo(a)pyrene	50-32-8	1,829	Soil ROD criteria	20	20	10	3.3
Benzo(b)fluoranthene	205-99-2	14,500	Soil ROD criteria	20	20	10	2.4
Dibenzo(a,h)anthracene	53-70-3	150	<sup>a</sup>	20	20	10	1.8
Indeno(1,2,3-cd)pyrene	193-39-5	1,500	<sup>a</sup>	20	20	10	1.9

**Matrix:** Soil

**Analytical Group:** Pesticides

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific		
					LOQ (µg/kg)	LOQ (µg/kg)	DL (µg/kg)
4,4'-DDD	72-54-8	20,000	<sup>a</sup>	3.3	3.3	1.65	0.20
4,4'-DDE	72-55-9	1,600	<sup>b</sup>	3.3	3.3	1.65	0.19
4,4'-DDT	50-29-3	2,800	Soil ROD criteria	3.3	3.3	1.65	0.31
Dieldrin	60-57-1	876	Soil ROD criteria	3.3	3.3	1.65	0.22

### Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

**Matrix:** Soil

**Analytical Group:** PCBs

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific		
					LOQ (µg/kg)	LOD (µg/kg)	DL (µg/kg)
Aroclor 1016	12674-11-2	63,000	<sup>a</sup>	17	17	8.5	6.0
Aroclor 1221	11104-28-2	Not established	Not applicable	17	17	8.5	7.9
Aroclor 1232	11141-16-5	Not established	Not applicable	17	17	10	9.3
Aroclor 1242	53469-21-9	Not established	Not applicable	17	17	8.5	5.8
Aroclor 1248	12672-29-6	Not established	Not applicable	17	17	8.5	6.1
Aroclor 1254	11097-69-1	Not established	Not applicable	17	17	8.5	4.7
Aroclor 1260	11096-82-5	2,200	<sup>a</sup>	17	17	8.5	6.0

**Matrix:** Soil

**Analytical Group:** Metals

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)
Arsenic	7440-38-2	9.08	Soil ROD criteria	0.80	0.80	0.50	0.068

## Reference Limits and Evaluation Tables (Continued)

(Worksheet #15)

**Matrix:** Sediment

**Analytical Group:** Pesticides

Analyte	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference	Project Quantitation Limit Goal (µg/kg)	Laboratory-specific		
					LOQ (µg/kg)	LOQ (µg/kg)	DL (µg/kg)
4,4'-DDD	72-54-8	730	Sediment ROD criteria	3.3	3.3	1.65	0.20
4,4'-DDE	72-55-9	234	Sediment ROD criteria	3.3	3.3	1.65	0.19
4,4'-DDT	50-29-3	290	Sediment ROD criteria	3.3	3.3	1.65	0.31
Dieldrin	60-57-1	5,730	Sediment ROD criteria	3.3	3.3	1.65	0.22

**Matrix:** Sediment

**Analytical Group:** Metals

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)
Arsenic	7440-38-2	23.7	Sediment ROD criteria	0.80	0.80	0.50	0.068

**Notes:**

Only analytes listed above will be reported by the laboratory for soil or sediment matrices as indicated.

All results will be percent moisture (dry weight) corrected. Non-detect results will be reported as the LOD and a U qualifier. Results detected between the DL and LOQ will be reported as estimated with a J flag. Results above the LOQ will be reported with no flagging.

<sup>a</sup> These values are from the TtNUS Supplemental PDI report in September 2012. These values are the target cancer risk levels of 1E-05 for hypothetical lifelong residents with a target hazard index of 1.0. These analytes are not identified in the ROD but are contaminants of potential concern based on investigations performed post-ROD.

<sup>b</sup> This value is from the residential EPA Regional Screening Levels table from May 2014 for a hazard index of 1.0 with a cancer risk level of 1E-06.

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**Analytical SOP References Table**  
 (Worksheet #23)

<b>Lab SOP Number <sup>a</sup></b>	<b>Title, Revision Date, and/or Number</b>	<b>Definitive or Screening Data</b>	<b>Matrix and Analytical Group</b>	<b>Instrument</b>	<b>Variance to QSM?</b>	<b>Modified for Project Work? (Y/N)</b>
CA-204	Analysis of Semivolatile Organic Compounds by Capillary Column GC/MS: SW 846 Method 8270, Revision 15, July 2013	Definitive	Soil/Sediment PAHs	GC/MS	None	N
CA-302	Analysis of Pesticides by Gas Chromatography/Electron Capture Detector (GC/ECD): SW 846 Method 8081, Revision 13, February 2013	Definitive	Soil/Sediment Pesticides	GC	None	N
CA-329	Analysis of PCBs as Total Aroclors by Gas Chromatography/Electron Capture Detector (GC/ECD): SW-846 Method 8082, Revision 13, February 2013	Definitive	Soil PCBs	GC	None	N
CA-608	Trace Metals Analysis by ICP-AES Using USEPA Method 6010, May 2013	Definitive	Soil/Sediment Metals	ICP	None	N
CA-611	Digestion and Analysis of Solid Samples for Mercury By USEPA 7471, Revision 9, April 2012	Definitive	Soil/Sediment Mercury	Cold vapor atomic absorption	None	N

**Notes:**

<sup>a</sup> The analytical SOP revision number and date listed are current as of the date this SAP was published. SOPs are available upon request.

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

**Matrix:** Soil/Sediment

**Analytical Group:** PAHs

**Analytical Method/SOP Reference**<sup>a</sup>: EPA 8270D SIM / CA-204

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	<sup>b</sup>	Analyst	Accuracy	Analytes < ½ LOQ
LCS and/or LCSD and MS/MSD	1 per preparatory batch	See following pages	<sup>c</sup>	Analyst	Accuracy/ Precision	See following pages
Surrogate	Per all field and QC samples	2,4,6-Tribromophenol: 35-125% 2-Fluorobiphenyl: 45-105% 2-Fluorophenol: 35-105% Nitrobenzene-D5: 35-100% Phenol-D6: 40-100% Terphenyl-D14: 30-125%	<sup>d</sup>	Analyst	Accuracy	2,4,6-Tribromophenol: 35-125% 2-Fluorobiphenyl: 45-105% 2-Fluorophenol: 35-105% Nitrobenzene-D5: 35-100% Phenol-D5: 40-100% Terphenyl-D14: 30-125%

(Field duplicate criteria is listed on Field QC Samples table in Worksheet #12.)

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

**Method/SOP QC Acceptance Limits and Measurement Performance Criteria for PAHs**

<b>Analyte</b>	<b>LCS/LCSD or MS/MSD Percent Recovery</b>	<b>LCS/LCSD or MS/MSD Relative Percent Difference</b>
2-Methylnaphthalene	45-105	≤ 30
Acenaphthene	45-110	≤ 30
Acenaphthylene	45-105	≤ 30
Anthracene	55-105	≤ 30
Benzo(a)anthracene	50-110	≤ 30
Benzo(a)pyrene	50-110	≤ 30
Benzo(b)fluoranthene	45-115	≤ 30
Benzo(g,h,i)perylene	40-125	≤ 30
Benzo(k)fluoranthene	45-125	≤ 30
Chrysene	55-110	≤ 30
Dibenzo(a,h)anthracene	40-125	≤ 30
Fluoranthene	55-115	≤ 30
Fluorene	50-110	≤ 30
Indeno(1,2,3-cd)pyrene	40-120	≤ 30
Naphthalene	40-105	≤ 30
Phenanthrene	50-110	≤ 30
Pyrene	45-125	≤ 30

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

**Matrix:** Soil/Sediment

**Analytical Group:** Pesticides

**Analytical Method/SOP Reference**<sup>a</sup>: 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	Analytes < ½ LOQ	<sup>b</sup>	Analyst	Accuracy	Analytes < ½ LOQ
LCS and/or LCSD and MS/MSD	1 per preparatory batch	See following page	<sup>c</sup>	Analyst	Accuracy/ Precision	See following page
Surrogate	Per all field and QC samples	Decachlorobiphenyl: 55-130% Tetrachloro-m-xylene: 70-125%	<sup>d</sup>	Analyst	Accuracy	Decachlorobiphenyl: 55-130% Tetrachloro-m-xylene: 70-125%

(Field duplicate criteria is listed on Field QC Samples table in Worksheet #12.)

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

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

<b>Analyte</b>	<b>LCS/LCSD or MS/MSD Percent Recovery</b>	<b>LCS/LCSD or MS/MSD Relative Percent Difference</b>
4,4'-DDD	30-135	≤ 30
4,4'-DDE	70-125	≤ 30
4,4'-DDT	45-140	≤ 30
alpha-BHC	60-125	≤ 30
alpha-Chlordane	65-120	≤ 30
Aldrin	45-140	≤ 30
beta-BHC	60-125	≤ 30
delta-BHC	55-130	≤ 30
Dieldrin	65-125	≤ 30
Endosulfan I	15-135	≤ 30
Endosulfan II	35-140	≤ 30
Endrin	60-135	≤ 30
Endrin aldehyde	35-145	≤ 30
Endrin ketone	65-135	≤ 30
gamma-BHC (Lindane)	60-125	≤ 30
gamma-Chlordane	65-125	≤ 30
Heptachlor	50-140	≤ 30
Heptachlor Epoxide	65-130	≤ 30
Methoxychlor	55-145	≤ 30
Toxaphene	30-122	≤ 30

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

**Matrix:** Soil

**Analytical Group:** PCBs

**Analytical Method/SOP Reference**<sup>a</sup>: EPA 8082A / 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	Analytes < ½ LOQ	<sup>b</sup>	Analyst	Accuracy	Analytes < ½ LOQ
LCS and/or LCSD and MS/MSD	1 per preparatory batch	Aroclor 1016: 40-140% Aroclor 1260: 60-130%	<sup>c</sup>	Analyst	Accuracy/ Precision	Aroclor 1016: 40-140% Aroclor 1260: 60-130%
Surrogate	Per all field and QC samples	Decachlorobiphenyl: 60-125% Tetrachloro-m-xylene: 56-115%	<sup>d</sup>	Analyst	Accuracy	Decachlorobiphenyl: 60-125% Tetrachloro-m-xylene: 56-115%

(Field duplicate criteria is listed on Field QC Samples table in Worksheet #12.)

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

**Matrix:** Soil/Sediment

**Analytical Group:** Metals

**Analytical Method/SOP Reference**<sup>a</sup>: 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	Analytes < ½ LOQ	<sup>b</sup>	Analyst	Accuracy	Analytes < ½ LOQ
Calibration Blank	Before beginning a sample run, after every 10 samples, and at end of the analysis sequence	No analytes detected > 2 × DL	<sup>b</sup>	Analyst	Accuracy	No analytes detected > 2 × DL
LCS and/or LCSD and MS/MSD	1 per preparatory batch	80–120% RPD ≤ 20	<sup>c</sup>	Analyst	Accuracy/ Precision	80–120% RPD ≤ 20
Serial dilution	Each new sample matrix	1:5 dilution must agree within ±10% of original determination.	<sup>e</sup>	Analyst	Accuracy	1:5 dilution must agree within ±10% of original determination.
Post-digestion spike	When serial dilution or matrix spike fails	80-120% for all metals except silver at 75–125%	<sup>f</sup>	Analyst	Accuracy	80-120% for all metals except silver at 75–125%

(Field duplicate criteria is listed on Field QC Samples table in Worksheet #12.)

## Laboratory QC Samples Table (Continued)

(Worksheet #28)

**Notes:**

- <sup>a</sup> Analytical SOP revision numbers listed are current as of the date this SAP was published.
- <sup>b</sup> Any sample associated with a blank that fails the criteria checks will be reprocessed in a subsequent preparation batch, except when the sample analysis resulted in a non-detect. If no sample volume remains for reprocessing, the results will be reported with appropriate data qualifying codes.
- <sup>c</sup> Reprep and reanalyze the LCS/LCSD and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. For MS/MSDs, the data will be evaluated to determine the source of difference and to determine if there is a matrix effect or analytical error.
- <sup>d</sup> Reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available.
- <sup>e</sup> Perform post-digestion spike addition if serial dilution does not meet criteria.
- <sup>f</sup> Reanalyze post-digestion spike.

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**Data Verification and Validation (Steps I and IIa/IIb) Process Table**  
 (Worksheets #34, 35, and 36)

<b>Data Review Input</b>	<b>Description</b>	<b>Responsible for Verification (Title and Organizational Affiliation)</b>	<b>Internal/ External</b>
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
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, Chemtech	E
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, Chemtech	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, Chemtech	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, Chemtech	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, Chemtech	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, Chemtech	E

**Data Verification and Validation (Steps I and IIa/IIb) Process Table (Continued)**  
 (Worksheets #34, 35, and 36)

<b>Data Review Input</b>	<b>Description</b>	<b>Responsible for Verification (Title and Organizational Affiliation)</b>	<b>Internal/ External</b>
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, Chemtech Project Chemist, TtEC	E I
Field and electronic data	One hundred percent of manual entries will be reviewed against the hardcopy information and 10 percent of electronic uploads will be checked against the hardcopy.	Program Chemist, TtEC	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.	Project Chemist, TtEC Program Chemist, TtEC	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
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, Chemtech Project Chemist, TtEC	E I

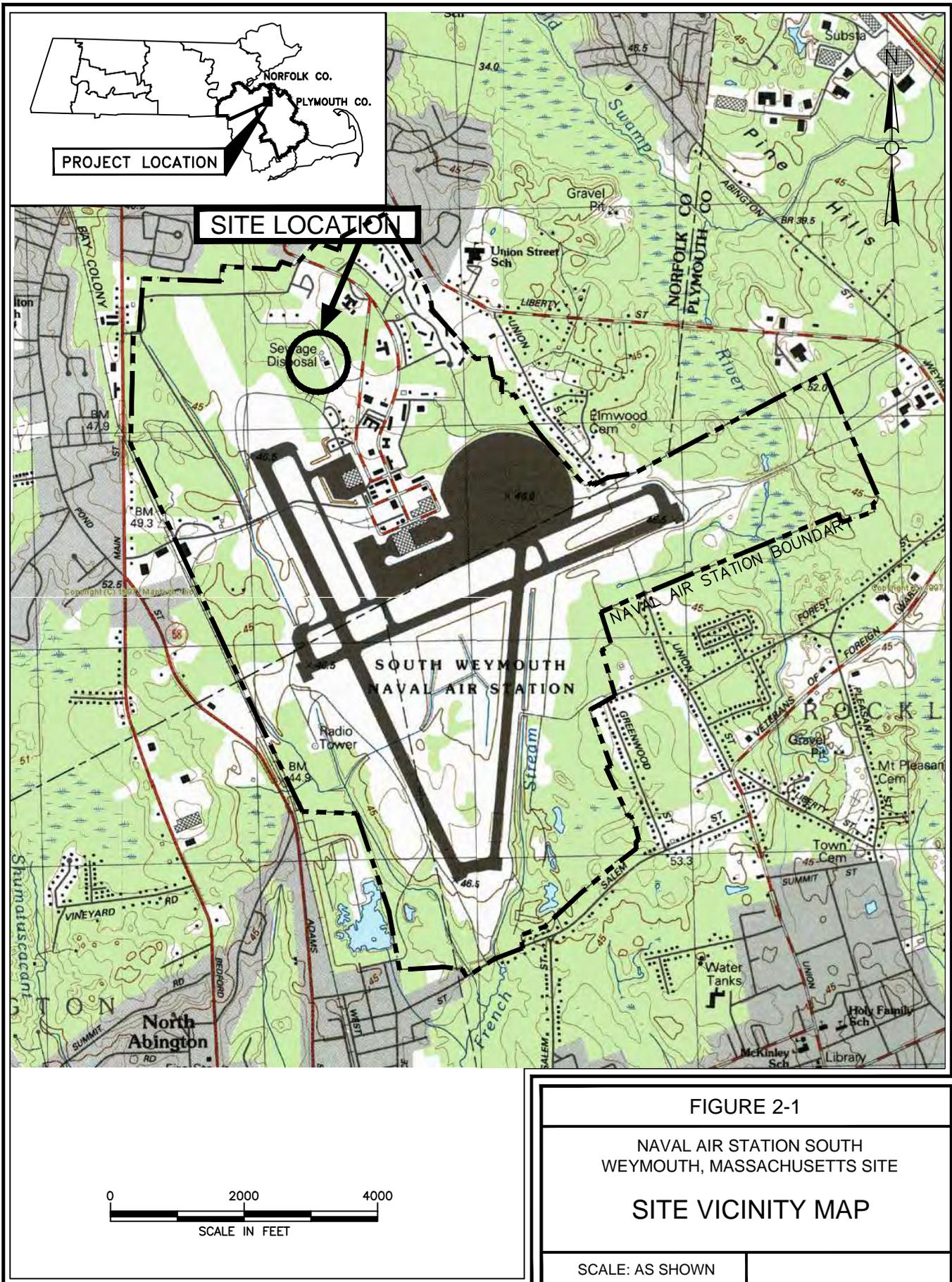
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## **FIGURES**

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PROJECT LOCATION

SITE LOCATION

FIGURE 2-1  
 NAVAL AIR STATION SOUTH  
 WEYMOUTH, MASSACHUSETTS SITE

SITE VICINITY MAP

SCALE: AS SHOWN

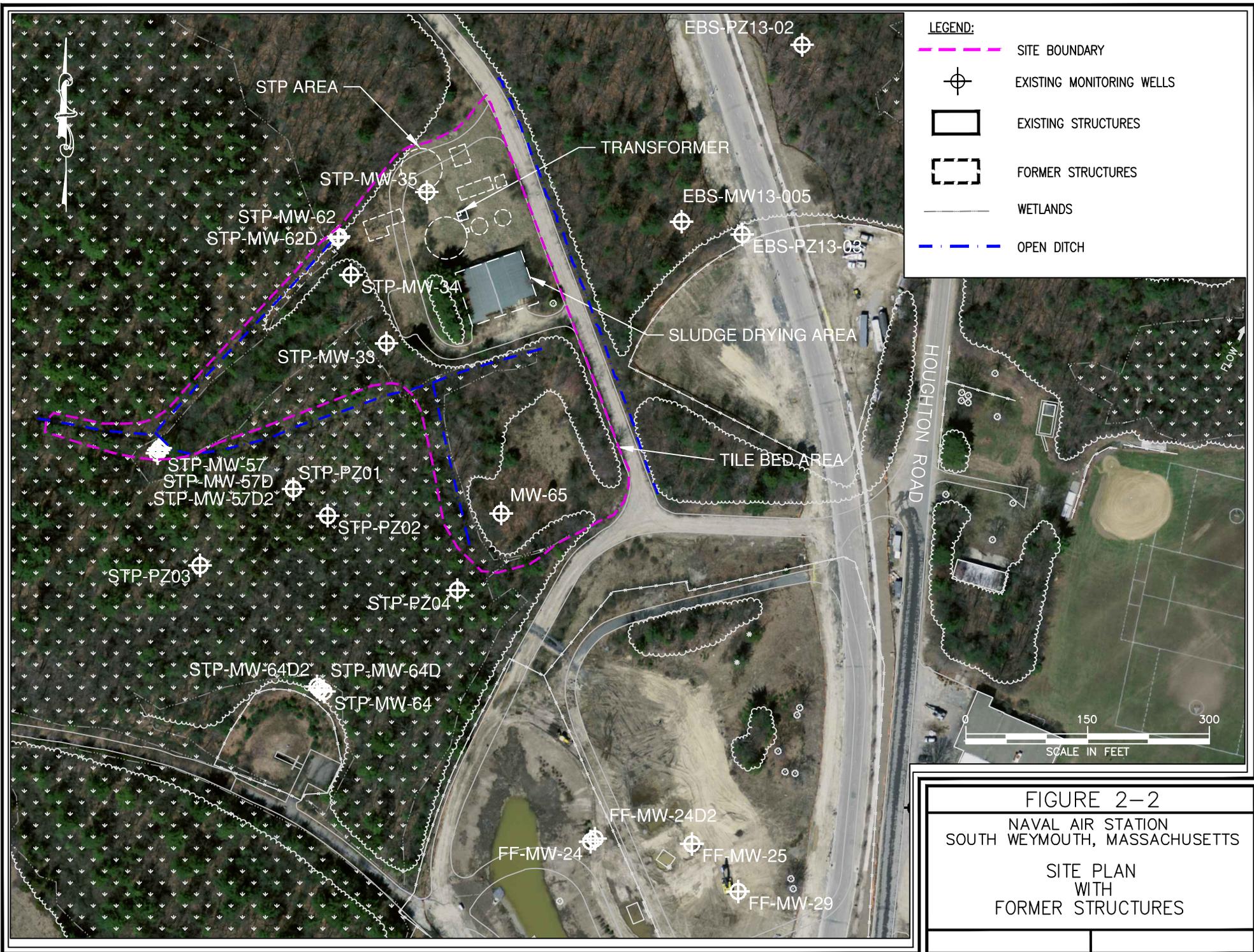
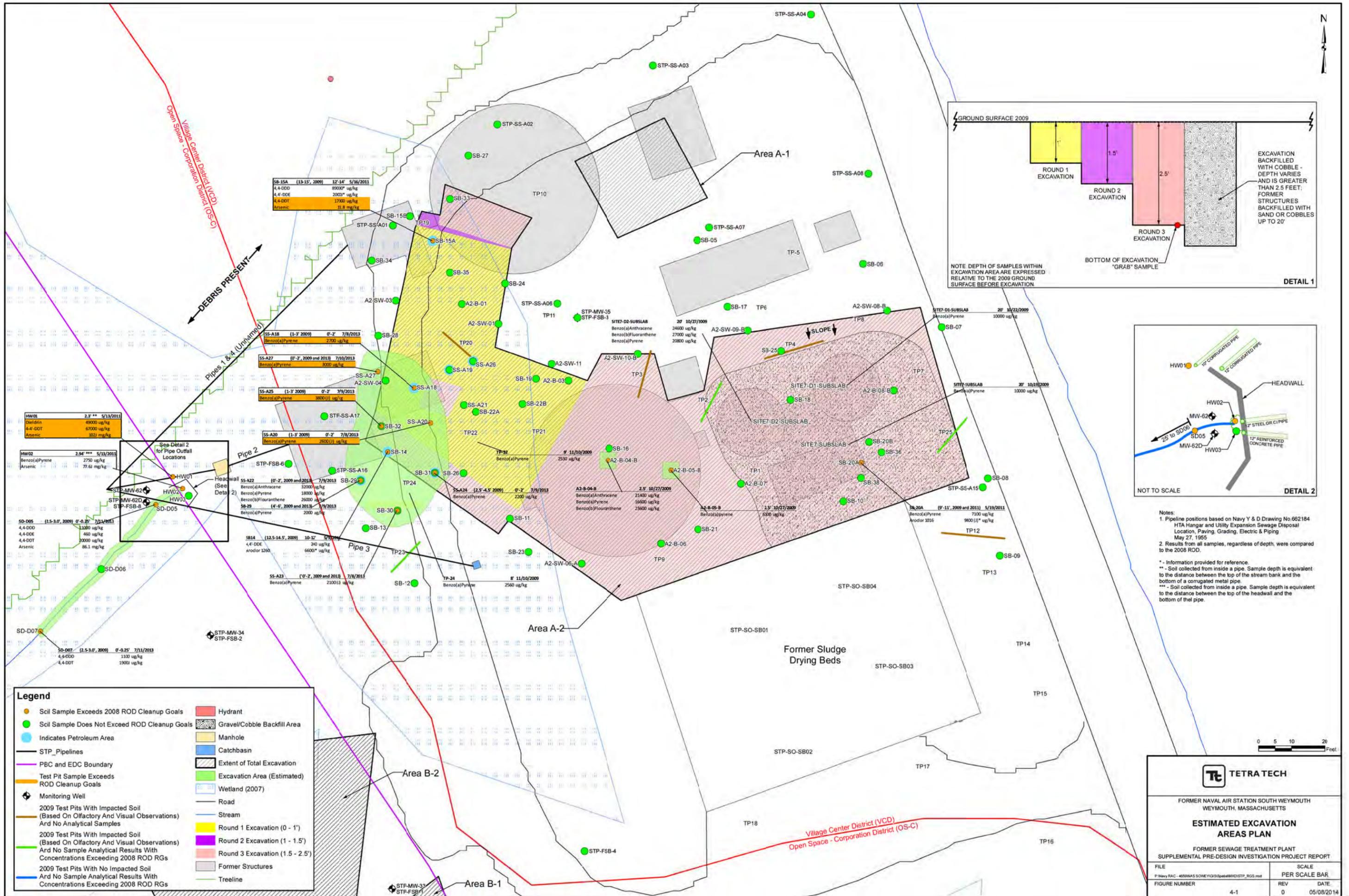


FIGURE 2-2  
 NAVAL AIR STATION  
 SOUTH WEYMOUTH, MASSACHUSETTS  
 SITE PLAN  
 WITH  
 FORMER STRUCTURES



**TETRA TECH**

FORMER NAVAL AIR STATION SOUTH WEYMOUTH  
WEYMOUTH, MASSACHUSETTS

**ESTIMATED EXCAVATION AREAS PLAN**

FORMER SEWAGE TREATMENT PLANT  
SUPPLEMENTAL PRE-DESIGN INVESTIGATION PROJECT REPORT

FILE	SCALE
P:\Navy RAC - 4659\NAS SOWEY\GIS\Spec\BMDISTP_RGS.mxd	PER SCALE BAR
FIGURE NUMBER	REV DATE
4-1	0 05/08/2014

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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 1<sup>st</sup> 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).

## 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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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)

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/ECD	EPA 8151A	Dinoseb
GC/ECD	EPA 8151A	MCPA
GC/ECD	EPA 8151A	MCPPP
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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-butene
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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	Saffrole
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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
Calculation	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 <sub>3</sub> B	Sulfite
Titration	EPA 9034; SM 4500S <sup>2-</sup> 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 4500NH <sub>3</sub> 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 4500NO <sub>3</sub> F	Nitrate + Nitrite
UV/VIS	EPA 353.2; SM 4500NO <sub>3</sub> F	Nitrate as N
UV/VIS	EPA 353.2; SM 4500NO <sub>3</sub> F	Nitrite as N
UV/VIS	EPA 365.2; SM 4500P E	Orthophosphate as P
UV/VIS	EPA 365.4	Phosphorus total

<b>Non-Potable Water</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Preparation</b>	<b>Method</b>	<b>Type</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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)

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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)

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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)

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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-propylbenzene
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-butene
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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)

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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
<b>Preparation</b>	<b>Method</b>	<b>Type</b>
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

<b>Solid and Chemical Waste</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Air</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

<b>Air</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
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

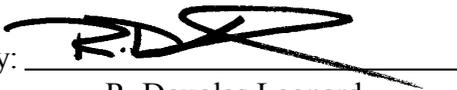
<b>Air</b>		
<b>Technology</b>	<b>Method</b>	<b>Analyte</b>
GC/MS	EPA TO-15	n-Heptane
GC/MS	EPA TO-15	n-Hexane
GC/MS	EPA TO-15	o-Xylene
GC/MS	EPA TO-15	Styrene
GC/MS	EPA TO-15	Tetrachloroethylene (Perchloroethylene)
GC/MS	EPA TO-15	Tetrahydrofuran
GC/MS	EPA TO-15	Toluene
GC/MS	EPA TO-15	trans-1, 2-Dichloroethylene
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-Trichloro 1,2,2-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:   
R. Douglas Leonard  
Chief Technical Officer

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**APPENDIX B**  
**WASTE MANAGEMENT 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. WE02**

**FINAL  
WASTE MANAGEMENT PLAN  
SOIL EXCAVATION AT SITE 7 FORMER STP LOCATION  
FORMER NAVAL AIR STATION  
SOUTH WEYMOUTH, MASSACHUSETTS**

**July 2014**



*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, Virginia 23462

<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	7/24/14	J. Peters	R. Claydon	All

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## ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
COC	contaminant of concern
CMR	<i>Code of Massachusetts Regulations</i>
CSO	Caretaker Site Office
CTO	contract task order
DoN	Department of the Navy
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ESQ	Environmental Safety and Quality
IR	Installation Restoration (Program)
LDR	land disposal restriction
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MSDS	Material Safety Data Sheet
NAS SOWEY	Naval Air Station South Weymouth
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PPE	personal protective equipment
ppm	parts per million
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RG	Remediation Goal
RQ	reportable quantity
SDS	Safety Data Sheet
SHM	Safety and Health Manager
STP	Sewage Treatment Plant
SVOC	semi-volatile organic compound
TCLP	toxicity characteristic leaching procedure
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
TtEC	Tetra Tech EC, Inc.
VOC	volatile organic compound
WMP	Waste Management Plan

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## **1.0 INTRODUCTION**

The Department of the Navy (DoN) contracted with Tetra Tech EC, Inc. (TtEC) to perform Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Massachusetts Contingency Plan (MCP) support at former Naval Air Station South Weymouth (NAS SOWEY), Massachusetts. This work will be conducted under Contract No. N62470-13-D-8007, Contract Task Order (CTO) No. WE02.

The tasks to be performed under this CTO include continuation of the CERCLA Remedial Action at the Sewage Treatment Plant (STP), Site 7.

The purpose of this Waste Management Plan (WMP) is to present the waste management practices and procedures to be followed to manage all waste streams generated during performance of the CERCLA Remedial Action at STP Site 7 under this CTO at NAS South Weymouth.

This WMP identifies onsite waste management activities to be conducted such as waste characterization, accumulation and containerization, profiling, marking, and labeling as well as manifesting and offsite transport and disposal of waste. Another goal of this plan is to ensure that waste minimization practices are followed, to the extent practicable, to reduce the volume of waste that will be generated, stored, and removed from the site for disposal.

### **1.1 Site History**

NAS SOWEY occupies approximately 1,442 acres. Portions of NAS SOWEY extend into the adjacent towns of Abington and Rockland and abut the town of Hingham (see figures in the STP Site 7 Remedial Action Work Plan for STP Site 7 (RAWP) Addendum TtEC 2014a). NAS SOWEY was developed during the 1940s for dirigible aircraft used to patrol the North Atlantic during World War II. The facility was closed at the end of the war and then reopened in 1953 as a Naval Air Station for aviation training. It remained a Reserve training facility until it was operationally closed on September 30, 1996, and administratively closed on September 30, 1997, as part of the Base Realignment and Closure program.

The remedy for STP Site 7 was initially implemented by TtEC under a previous contract. Additional surface and subsurface contamination was found that required re-evaluation of the remedial plans. Further evaluation determined that additional surface soils, discharge piping, and associated contaminated soil and sediment required removal at this site.

Additional information on site history and background, as well as a summary of previous investigations, is included in Section 2 of the RAWP.

## 1.2 Regulatory Framework

Environmental investigation and remediation activities are being conducted at NAS SOWEY 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) as well as the MCP. Under Executive Order 12580, the DoN is the lead agency responsible for implementation of the IR Program and the site investigation and remediation. DoN oversight is provided by United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP).

This WMP identifies the requirements pertaining to substantive waste management activities performed solely onsite as well as the laws and regulations that pertain to offsite actions such as waste transportation and disposal during performance of this CTO.

Only the substantive requirements of the regulations are considered to be applicable or relevant and appropriate requirements (ARARs) for onsite waste management actions because CERCLA on-site response actions do not require permitting or compliance with other administrative requirements for actions that are confined to the site. Any off-site actions, however, such as waste transport and off-site disposal must comply with all applicable regulatory requirements, not just substantive requirements.

In Massachusetts, the MassDEP manages and oversees the Resource Conservation and Recovery Act (RCRA) hazardous waste program. State programs must be equally or more stringent than federal regulations; therefore only MassDEP regulations are cited for waste management criteria.

Project Action-Specific Waste Management ARARs:

If RCRA hazardous waste is generated –

- 310 *Code of Massachusetts Regulations* (CMR) Title 30.683-685 – outlines use and management of containers that are used to contain hazardous waste, including use of containers that are in good condition and compatible with the waste placed within. Containers holding hazardous waste must be closed when not in use and containers must be managed such that they do not rupture or leak. Also contains requirements for separation of incompatible wastes.

The following MassDEP and U.S. Department of Transportation (DOT) laws and regulations are requirements for the actions conducted under this CTO, which pertain to offsite actions to be performed during waste management activities (administrative and substantive) and are not considered to be ARARs:

- CMR Title 30.100 and 110 – require a determination of whether waste generated is a hazardous waste and the criteria for determining which wastes are to be regulated as

hazardous or non-hazardous wastes. All wastes generated on the project require this determination.

- CMR Title 30.151-157 – establishes representative testing methods and tests for characterization of wastes when sampling is required for characterization.
- CMR Title 30.120-125 and 130-136 – determining characteristics of hazardous waste or listing of hazardous waste. If a solid waste is determined to be a hazardous waste as in CMR Title 30.100 and 110, then the characteristics of that waste must be determined.

If RCRA hazardous waste is generated -

- CMR Title 30.300-305 - establishes requirements for generators of hazardous waste, including determination as to whether a waste is hazardous, and offering hazardous wastes for transportation.
- CMR Title 30.310-317 establishes requirements for use of the manifest for hazardous waste.
- CMR Title 30.320-324 – establishes pre-transportation requirements for hazardous wastes.
- CMR Title 30.330 -343 and 30.250-353 – establishes recordkeeping and reporting requirements for large quantity generators of hazardous waste and special generator requirements for small and very small quantity generators.
- CMR Title 30.750 - identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which such wastes may continue to be land disposed.
- CMR Title 30.400 – specifies the requirement for transporters of hazardous waste.

If RCRA hazardous waste is generated, or if any nonhazardous waste (in any one container shipped offsite) contains reportable quantity (RQ) of hazardous substances (e.g., benzo(a)pyrene)-

- 49 *Code of Federal Regulations* (CFR) Sections 107 and 171.1-172.558 - governs transportation of hazardous materials (including hazardous wastes and/or hazardous substances off-site) and proper marking, labeling, and placarding requirements, and assignment of a proper shipping name.
  - 49 CFR Part 171, describes general requirements and hazardous waste shipments
  - 49 CFR Part 172, provides a table of hazardous materials and prescribing labeling and placarding
  - 49 CFR Part 173, provides general requirements for shipping and packaging by shippers
  - 49 CFR Part 177, regulates hazardous material shipment by highways

### **1.3 Remedial Action Objectives**

An evaluation of prior remedial actions at STP Site 7 have led to the determination that additional surface and subsurface contamination are present and that additional removal of

surface soils, discharge piping (and piping content), and associated soil and sediment must be removed to meet the remedial action objectives (RAO) for the site identified in the 2008 Record of Decision (U.S. Navy 2008), allowing unrestricted land use following implementation of the remedy. The RAOs for STP Site 7 are to:

- Eliminate potential human and ecological receptor exposure to contaminants of concern (COC)s present in site soil at concentrations above the selected remediation goals (RGs).
- Eliminate potential human and ecological receptor exposure to COCs present in site sediment at concentrations above the selected RGs.

#### **1.4 UPDATING THE WASTE MANAGEMENT PLAN**

This WMP will be updated as changes in site activities or conditions, wastestreams, or changes in applicable regulations occur. Revisions to this WMP will be reviewed and approved by the DoN.

#### **1.5 Plan Organization**

This WMP is organized as follows:

- **Section 1.0** provides the introduction, site history, regulatory framework, remedial action objectives, requirements for updating this WMP, and plan organization.
- **Section 2.0** describes the anticipated waste streams, site remediation goals, waste characterization sampling and process, and the waste minimization process.
- **Section 3.0** provides information on hazardous and nonhazardous waste accumulation, including waste accumulation areas, and inspections and documentation requirements.
- **Section 4.0** describes the transportation and waste disposal requirements, including disposal facility requirements such as waste profile sheets, land disposal restrictions, manifests, and transportation requirements.
- **Section 5.0** presents the training and certification requirements.
- **Section 6.0** describes the documentation and records retention requirements.
- **Section 7.0** presents the references cited in this document.

#### **2.0 WASTE STREAMS AND CHARACTERIZATION**

Wastes will only be combined or co-mingled if the Caretaker Site Office (CSO) permits and the facility waste profile (based on characterization data) permit them to be combined (with facility approval). The onsite TtEC Waste Coordinator (TBD) will help establish onsite waste tracking and will designate which wastes can be consolidated prior to disposal with CSO and disposal facility coordination. An offsite TtEC Environmental, Safety, and Quality (ESQ) Specialist will be consulted with as required, for assistance and/or technical review of waste characterization of shipping documentation.

The anticipated remediation, non-remediation, as well as investigation-derived waste (IDW) waste streams are listed below, including preliminary characterization requirements for the wastestreams. Project wastes are anticipated to be characterized as nonhazardous waste;

however all waste must be properly characterized, at the point of generation, in a representative manner to make this determination. This waste management plan does address the potential for hazardous waste generation and general hazardous waste management requirements.

At the present time, it is not anticipated that any waste soil or sediment will contain levels of polychlorinated biphenyls (PCBs) at or above 50 mg/kg and that no waste will be subject to the regulatory requirements of the Toxic Substances Control Act (TSCA). Should sampling results show TSCA levels of PCBs in any soil or sediments, this WMP will be updated accordingly to ensure that TSCA requirements are properly addressed and implemented.

## **2.1 Remediation Wastes**

### **2.1.1 Concrete**

Concrete removed from headwalls and other structures during soil and piping removal tasks is considered to be nonhazardous and will be stockpiled in a CSO approved location for reuse onsite in a location approved by the CSO.

### **2.1.2 Soil or Sediment Located above Piping**

Soil and/or sediment that are located above buried piping will be temporarily stockpiled onsite on minimum 6-mil polyethylene sheeting in a designated stockpile area adjacent to each excavation. Each soil and/or sediment stockpile will be sampled as outlined in the RAWP to determine if the soil is suitable for reuse as subgrade backfill within the excavation (ensuring soils are below the RGs for site CoCs (see Table 2-1)).

If the soil or sediment in a particular stockpile is not deemed suitable for backfill use onsite (e.g., are above the soil RGs), it will be sampled to determine characterization and will be profiled for disposed offsite as nonhazardous waste at an approved RCRA Subtitle D (nonhazardous waste) landfill. All soil and/or sediment that will be disposed of offsite will be sampled as specified in Table 2-2; however TtEC will verify the sampling requirements with the intended disposal facility prior to conducting sampling for waste characterization and the sampling requirements may vary. Soil disposed of offsite from the stockpiles will be shipped in bulk and loaded into lined dump truck beds. Each bed will be tarped before it leaves the site.

To prevent infiltration of rain water and erosion/runoff from the soil pile (including by wind), the stockpiles will be covered with 6-mil polyethylene sheeting, except when materials are being added or removed.

### **2.1.3 Contaminated Soil or Sediment Located below Piping**

Soil and/or sediment that are located below the depth of the pipes in the excavation are considered to be contaminated and will not be reused onsite. Contaminated soil or sediment will be placed on minimum 10-millimeter polyethylene sheeting in stockpiles adjacent to the excavation. This soil is anticipated to be nonhazardous waste based on preliminary sample

results and known or prior characterization for the CoCs; however soil or sediment will be sampled for offsite waste characterization as shown in Table 2-2. TtEC will verify the sampling requirements with the intended disposal facility prior to conducting sampling for waste characterization.

Nonhazardous contaminated soil or sediment from below the piping will be disposed of offsite at an approved RCRA Subtitle D (nonhazardous waste) landfill. Soil disposed of offsite will be shipped in bulk and loaded into lined dump truck beds. Each bed will be tarped before it leaves the site.

To prevent infiltration of rain water and erosion/runoff from the soil pile, the stockpiles will be covered with 10-mil polyethylene sheeting, except when materials are being added or removed. If leaching is possible from the soil stockpiles due to soil water content, the stockpiles will be bermed to facility recovery and removal of liquids.

#### 2.1.4 Contaminated Sediment Located within Piping

Sediment that is contained within the piping removed from the excavation is anticipated to contain higher levels of site COCs than the soil located below the piping (concentrated). As the piping is removed, the sediment from within the pipes will be appropriately removed/recovered and placed into DOT-approved 55-gallon steel drums for disposal. The sediment drums will then be sampled in a representative manner for waste characterization as per Table 2-2. This soil is anticipated to be nonhazardous waste based on preliminary sample results for the CoCs; however there is a possibility that the sediment will characterize as hazardous waste if RCRA regulatory levels are exceeded. For this material, waste characterization sampling may include analysis for RCRA regulated constituents by Toxicity Characteristic Leaching Procedure (TCLP) as shown in Table 2-2 due to the higher anticipated levels of contaminants present in the waste.

Nonhazardous sediment will be disposed of offsite at an approved RCRA Subtitle D (nonhazardous waste) landfill. If this sediment is characterized as RCRA hazardous waste, the drums of waste will be managed as hazardous waste and transported offsite in compliance with the MassDEP hazardous waste regulations and DOT hazardous waste transportation requirements to an approved RCRA Subtitle C treatment, storage, or disposal facility (TSDF).

#### 2.1.5 Pipe Debris

Four subsurface discharge pipes (large diameter corrugated steel) will be removed and disposed of offsite. The piping is anticipated to be nonhazardous but may contain residual contaminants, including adhering soil and/or sediment. The piping will either be profiled as its' own wastestream to an offsite RCRA Subtitle D landfill (cut or consolidated to facility required size requirements). As an alternative, the piping may be cleaned onsite (to an appropriate level to remove adhering residual soil or sediments) and can then be recycled at an approved scrap metal recycling facility. Pipe debris disposed of or recycled offsite will be shipped in bulk and loaded into lined roll-off trucks. Each roll off will be tarped prior to leaving the site.

### 2.1.6 Excavation Water or Leachate from Stockpiles

It is possible, that excavation dewatering may be required to facilitate removal of piping and recovery of contaminated soil or sediment due either to groundwater infiltration or rainwater infiltration into the excavation. In addition, it is possible that wet soils (if encountered) that are stockpiled will leach some liquids that will require collection and management for disposal.

Should excavation dewatering be required or leachate from stockpiles be recovered, the water will be pumped into a closed or covered Baker™ tank onsite; though if only small quantities are generated, it is possible that drums will be used rather than bulk containers. The accumulated excavation water will be sampled in a representative manner for waste characterization and analyzed for presence of the site COCs (at a minimum, pesticides, total petroleum hydrocarbons (TPH), metals, PCBs, and polynuclear aromatic hydrocarbons (PAHs)) and, as required, additional requirements of the approved offsite wastewater treatment/disposal facility. It is anticipated that this wastewater will be nonhazardous waste. Wastewater being transported offsite will be via bulk tank truck (or drums as appropriate) to an approved wastewater treatment/disposal facility.

## 2.2 **Non-Remediation Waste and Debris**

### 2.2.1 Construction Debris

Miscellaneous non-hazardous (e.g. non-contaminated debris) will be disposed of offsite at an approved municipal or RCRA subtitle D waste facility. Whenever feasible, debris (such as metal, clean wood, etc.) may alternatively be segregated and recycled at an approved recycling facility. Construction debris disposed of offsite will be shipped in bulk and will either be loaded into dump truck beds or will be loaded into bulk debris bins (e.g., rolloff containers) staged onsite. Each bulk container will be tarped or bins will have closing lids.

### 2.2.2 Ordinary Waste

Ordinary waste (e.g., paper material, plastic cups and bags, trash bags, food waste) will be bagged and placed into an onsite dumpster provided by a TtEC trash disposal vendor. No contaminated site remediation waste will be comingled with this wastestream. The dumpster will be kept closed unless actively adding waste. No contaminated site wastestreams (e.g., soil, piping, etc.) will be placed into this dumpster.

### 2.2.3 Green Waste/Vegetation

Large trees and stumps will be removed from the site and recycled; small vegetation and tree branches will be chipped and used as mulch onsite at a location approved by the CSO.

#### 2.2.4 Sanitary Wastes

Portable toilet and hand washing stations will be managed onsite by a TtEC sanitary service vendor under contract. Routine (at least weekly) maintenance will be performed by the vendor and sanitary wastes will be removed and properly disposed of offsite.

### 2.3 **Investigation-Derived Waste**

#### 2.3.1 Decontamination water

Decontamination water may be generated from personnel or construction equipment decontamination (e.g. excavator bucket if wet decontamination methods are required), personnel, and/or decontamination of reusable sampling equipment.

Very small quantities (e.g., less than 10 gallons) of decontamination water generated from personnel or construction equipment decontamination (if wet decontamination methods are required) are anticipated to be generated. This decontamination water is anticipated to contain only very low possible levels of site COCs and is anticipated to be suitable for co-mingling and disposal with excavation waters addressed above; however if soap is added, this will be determined by consultation with the disposal facility. Alternatively, very small quantities of decontamination water may be sprinkled into soils being disposed of offsite so long as the soil is reasonably dry and that the addition of the water does not cause runoff or leaching to occur.

Decontamination water (small quantities of less than 1 gallon) from sampling activities may contain other constituents (e.g., small amounts of methanol and detergent) as well as low-levels of site COCs. This water will be accumulated into a small container that is maintained separate from other decontamination water. This wastestream is anticipated to be characterized as nonhazardous; however may require sampling to determine proper disposition. Waste characterization for this wastestream will be in part through an evaluation of the decontamination process used and the amount and type of chemicals used in the decontamination process (generator knowledge) and, if required, sampling and analysis (specific analyses to be determined, if required). This decontamination water is anticipated to be nonhazardous (not flammable, not corrosive, and not toxic) and will either be disposed of by addition of small quantities of the water to the nonhazardous soils being shipped offsite or alternatively, with permission of receiving facility, may be added to the excavation waters being disposed of offsite. If not suitable for either alternative (not anticipated), the water will be disposed of offsite to a suitable nonhazardous waste facility as a separate wastestream.

#### 2.3.2 Used Disposable Personal Protective Equipment

Used disposable personal protective equipment (PPE) will be characterized as nonhazardous based on the soil and sediment preliminary characterization as nonhazardous waste and because any adhering soil or sediment is considered to be de minimus. Used disposable PPE will be bagged and, upon approval by the Project Waste Coordinator and CSO, placed in the bin with the nonhazardous construction debris. The addition of PPE will be included in the profile for the

construction debris wastestream. Alternatively, used disposable PPE may also be profiled with the nonhazardous soil wastestream and added to this wastestream if the disposal facility permits. The Project Waste Coordinator will authorize any placement of used PPE into either wastestream in advance of placement.

### 2.3.3 Used Disposable Sampling Supplies and Spent Field Test Kit Waste

Used disposable sampling supplies such as disposable sample scoops are anticipated to be nonhazardous waste because any adhering soil or sediment is likely to be nonhazardous and present in de minimus amounts. However, this wastestream may include spent field test kit waste from the test kits used for field screening of soil or sediment. Because the field test kits that may be used might contain hazardous chemicals, this wastestream requires advanced planning to determine if some spent field test kit waste should be segregated from other field test kit waste (waste minimization) and to determine if the resulting spent field test kit waste is potentially a hazardous waste. To make this determination, the Material Safety Data Sheets (MSDS) and/or Safety Data Sheets (SDS) from the manufacturer will be obtained and reviewed by an ESQ Specialist to determine what potentially hazardous chemicals are contained within the kit and whether the resulting wastestream, after use in field testing might be considered hazardous waste and whether any sampling is required for characterization purposes.

Any nonhazardous used sampling supplies and field test kit waste that is nonhazardous (no liquids), after characterization is made, will be bagged and placed in the bin with the nonhazardous construction debris and included in the profile for the construction debris wastestream. Alternatively, used disposable sampling and/or field test kit waste may also be profiled with the nonhazardous soil wastestream if the disposal facility permits. Sample results and/or MSDS/SDS may be required for waste characterization and if required, will be included with the profile to substantiate the characterization.

If characterization of this wastestream results in a RCRA hazardous waste determination, the waste will be placed in a DOT approved waste container (e.g., small steel drum) and managed according to MassDEP hazardous waste and DOT transportation and disposal requirements for disposal at a RCRA Subtitle C TSDF.

## 2.4 **Site Remediation Goals for Soil and Sediment Reuse**

Site activities will consist of removal of contaminated soil/sediment until the RGs for the site are achieved as shown in Table 2-1. Soil and/or sediment located above the piping that is temporarily stockpiled adjacent to excavations will be sampled to determine whether it is suitable for use as backfill in accordance with the RGs shown in this table. Reuse soil/sediment sampling requirements and confirmation soil/sediment sampling requirements, including CSO and MassDEP (if required) approval for use as backfill are addressed in further detail in the RAWP.

**Table 2-1 Summary of Remediation Goals**

Contaminants of Concern	Units	Site RG	Selection Basis
<b>Soil</b>			
Arsenic	mg/Kg	9.08	cumulative human health cancer risk = $10^{-5}$
4,4'-DDT	µg/Kg	2,800	ecological risk
Dieldrin	µg/Kg	876	cumulative human health cancer risk = $10^{-5}$
Benzo(a)anthracene	µg/Kg	14,500	cumulative human health cancer risk = $10^{-5}$
Benzo(a)pyrene	µg/Kg	1,829	background
Benzo(b)fluoranthene	µg/Kg	14,500	cumulative human health cancer risk = $10^{-5}$
<b>Sediment</b>			
Arsenic	mg/Kg	23.7	ecological risk
4,4'-DDD	µg/Kg	730	background
4,4'-DDE	µg/Kg	234	background
4,4'-DDT	µg/Kg	290	background
Dieldrin	µg/Kg	5,730	cumulative human health cancer risk = $10^{-5}$
mg/kg – milligrams per kilogram			
µg/Kg - micrograms per kilogram			

## 2.5 Soil and Sediment Waste Characterization Sampling

Soil and/or sediment located above the piping that is temporarily stockpiled adjacent to excavations, if not determined to be suitable for use as subgrade backfill (e.g., exceeds RGs shown in Table 2-1) as well as soil and/or sediment located below the piping and within the piping will be sampled for offsite waste characterization as shown in Table 2-2.

A minimum of one six-point composite sample will be obtained for every 500 cubic yards of waste soil/sediment for characterization purposes for soils managed in bulk. It is anticipated that sediment that is drummed will be sampled at the frequency of one composite sample for every 4 drums generated; however the sampling requirements will be evaluated with the intended disposal facility. Waste characterization sampling for the soil will, at a minimum, include the following analyses:

**Table 2-2 Soil or Sediment Waste Characterization Sample Requirements**

<u>Analytical</u>	<u>Method</u>
Total petroleum hydrocarbons (TPH)	EPA Method 8015
Semi-volatile organic compounds (SVOCs) <sup>1/</sup>	EPA Method 8270C
Volatile organic compounds (VOCs) <sup>1/</sup>	EPA Method 8260B
Polychlorinated biphenyls (PCBs)	EPA Method 8082
Pesticides	EPA Method 8081A
RCRA (8) metals <sup>1/</sup>	EPA Method 6010B/7471A

**Analytical**

pH <sup>2/</sup>  
Reactivity sulfide <sup>2/</sup>  
Reactivity cyanide <sup>2/</sup>  
Total organic carbon (TOC) <sup>2/</sup>  
Conductance <sup>2/</sup>

**Method**

EPA Method 9045  
EPA Method 9010  
EPA Method 9030  
EPA Method 9060  
EPA Method 9005A

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<sup>1/</sup> For sediment or soil, RCRA regulated contaminants may be analyzed by TCLP by EPA Method 1311 versus totals analysis. TCLP analysis may be required if total analysis shows concentrations of RCRA regulated contaminants in soil present at or above regulatory levels per 40 CFR 261.24(b)/ CMR Title 30.120-125 and 130-136.

<sup>2/</sup> These analyses may or may not be required by the disposal facility and will be verified prior to sampling.

## **2.6 Waste Characterization Process**

Waste characterization, including profiling of waste to the intended offsite disposal facility based on generator knowledge and/or sampling results will be coordinated with the CSO Representative a minimum of five days prior to transport and disposal; however whenever possible, more time may be required to allow review and approval by CSO as well as review and approval of signed profiles by the disposal facility.

Waste will be sampled, as required, in a representative manner to characterize it in accordance with RCRA and MassDEP regulatory requirements and in accordance with disposal facility requirements, whichever is more stringent. If sufficient generator knowledge can be applied for the characterization (certain wastestreams only), generator knowledge may be used to characterize waste. All project waste is anticipated to be characterized as nonhazardous waste based on known information and prior sampling results regarding site contaminants; however the possibility of RCRA hazardous waste generation does exist for several wastestreams as outlined in Section 2.3 above.

Any samples obtained and analyzed for waste characterization will be in accordance with standard laboratory sample and analytical practices including container requirements, analytical method requirements, and laboratory quality control procedures as well as MassDEP regulation. The off-site analytical laboratory selected to analyze waste samples for this project will be, at a minimum, certified by the State of Massachusetts for all the analytical methods required for the project, as applicable. In addition, the laboratory must have successfully achieved the Department of Defense Environmental Laboratory Accreditation Program certification prior to receipt of samples for analysis and also must maintain current status throughout the duration of the project.

An ESQ Specialist will help determine or verify the sampling and analysis required for the waste streams and will review waste analytical data to assist the onsite Waste Coordinator in determining waste characterization and disposition requirements for each waste stream for waste profiling purposes.

### 2.6.1 Determination of RCRA Hazardous Waste Characteristic

Sample results for waste characterization will be compared with the RCRA characteristics for toxicity in 40 CFR 261.24(b)/ CMR Title 30.120-125 and 130-136. If regulatory levels are exceeded in representative samples, waste will be characterized as hazardous waste and a DOT shipping description will be selected in accordance with 49 CFR 172.101 and the appropriate characteristic waste code would apply (D004-D043). The reportable quantity will also be evaluated to determine if an RQ applies to the waste (see Section 2.6.3 below). This will be determined in reference to 49 CFR 172.101 Appendix A.

If soil or sediment shipped offsite is a RCRA hazardous waste, the proper shipping description selected will be selected from the table in 49 CFR 172.101 as (example is only for solid soils or sediment):

- NA3077, Hazardous Waste Solid n.o.s.<sup>1/</sup> ( ), 9, PGIII

<sup>1/</sup> The constituent(s) that makes the waste a hazardous waste will be listed in parentheses. If an RQ applies, an “RQ” will be associated with the shipping description as well as the waste code for which the RQ applies.

### 2.6.2 Determination if Waste Contains a Hazardous Substance

Even if waste is determined to be nonhazardous waste through sampling and analysis, it is possible that a RCRA nonhazardous waste still be DOT regulated for transportation due to a COC (PAHs or PCBs in particular) being on the list of hazardous substances in 49 CFR 172.101 Appendix A and being present in any one shipping container (e.g., one dump truck bed load, one drum, etc.) in a quantity that exceeds its RQ (discussed in Section 2.6.3). Several PAHs that are COCs in the site soils and/or sediments are listed as hazardous substances and may be present in RQ amounts when transported offsite; including (as example; more COCs may require evaluation) as shown below.

Benzo(a)pyrene	RQ = 1 pound
Benzo(a)anthracene	RQ = 10 pounds
Benzo(b)fluoranthene	RQ = 1 pound
Polychlorinated biphenyls	RQ = 1 pound
Dieldrin	RQ = 1 pound
4,4-DDT	RQ = 1 pound
4,4-DDD	RQ = 1 pound

If a nonhazardous waste contains an RQ of a hazardous substance, the proper shipping description selected will be selected from the table in 49 CFR 172.101 as either:

- RQ UN3077, Environmentally Hazardous Substances Solid n.o.s.<sup>1/</sup> ( ), 9, PGIII; or
- RQ UN3082, Environmentally Hazardous Substances Liquid n.o.s.<sup>1/</sup> ( ), 9, PGIII

<sup>1/</sup> The hazardous substances that are present will be listed in parentheses.

### 2.6.3 Determination if Waste Contains a Reportable Quantity

Determining if reportable quantity is present in any single container or load of waste (required for both RCRA hazardous waste as well as hazardous substances) is required as part of the waste characterization and proper shipping description assignment process. Appendix A contains both a listing of hazardous substances by name and their RQ as well as a list of RCRA characteristic waste codes (D001-D043) and their associated RQ. For instance, if a RCRA hazardous waste is assigned a D004 waste code (arsenic), the RQ would apply if there is (in any one container or truck bed load), an amount of arsenic that exceeds 1 pound – the RQ for D004.

In conjunction with Appendix A of 49 CFR 172.101, a small amount of calculation may be required for determining if hazardous substances are present in an RQ in one container and the weight of waste in the container must also be known.

## 2.7 WASTE MINIMIZATION

To minimize the volume of all waste streams generated during the project, the following general guidelines will be followed:

- TtEC will plan for waste management prior to beginning work tasks and carefully evaluate work processes employed to identify opportunity for waste minimization.
- Waste materials will not be contaminated unnecessarily.
- Waste material will not be commingled with other wastes (e.g., wastes from one site with another site) without consulting the Waste Coordinator and ensuring compatibility with the disposal process and characterization prior to their addition.
- Cleaning and extra sampling supplies will be maintained outside any potentially contaminated area to keep the supplies clean and minimize additional waste generation.
- Mixing of detergents or decontamination solutions will be performed outside potentially contaminated areas.
- Decontamination will be performed when contaminated material or equipment is moved from one site to another or from the contaminated work zone to a clean area to prevent spread of contamination.
- Drop cloths or absorbent material will be used to contain small spills or leaks immediately upon discovery and will be promptly cleaned up.
- Contaminated material will not be placed with clean material.
- Wooden pallets inside the exclusion zone (if used) will be covered with plastic sheeting.
- Stockpiles of contaminated material will be managed as outlined in Section 2.3, including use of liners under stockpiles and liners to cover stockpiles.
- Material and equipment will be decontaminated and reused when practicable.
- Volume reduction techniques will be used when practicable.
- Waste containers will be examined to ensure that they are solidly packed to minimize the number of containers.
- Only waste containers adequately sized to contain the volume of waste generated will be used.

- Less hazardous substances will be used whenever possible (only the volume of standard solutions needed for testing will be brought onto the site; minimal amounts of decontamination water and solvent rinses will be used).
- Personnel will be trained sufficient such that personnel know the basic requirements for management of wastestreams prior to starting work tasks and whom to coordinate with for waste management questions.

### **3.0 HAZARDOUS AND NONHAZARDOUS WASTE ACCUMULATION**

Substantive requirements (for onsite activities) of the state hazardous waste generation, characterization, accumulation, treatment, and management regulations as outlined in Section 1.2 above are applicable to the management of wastes generated during this project's activities. Off-site activities, such as waste transport and off-site disposal, as stated in Section 1.2, must comply with the full regulatory requirements, not just substantive requirements.

#### **3.1 Waste Accumulation and Storage**

Although not considered substantive, some of the RCRA regulations that are administrative in nature are considered to be practices that should be followed as good practice, for instance the specific requirements that apply to the accumulation (inspections of accumulation areas, marking and labeling of hazardous wastes onsite, application of accumulation start dates, etc.). Any RCRA hazardous wastes will be managed on-site in accordance with these regulations, including proper container use and segregation, accumulation times, and marking/labeling requirements.

Nonhazardous wastes will also be managed by proper labeling and marking so that these wastes can be effectively managed and tracked and not unnecessarily contaminated. If the waste generator (CSO) is a large quantity generator at NAS SOWEY, the time limit for on-site accumulation of hazardous waste is less than 90 days from the accumulation start date to the date transported off-site. The CSO is responsible for approving waste accumulation areas on-site, and a representative of the CSO is responsible for signing all profiles, manifests, and land-disposal restriction forms (required for hazardous waste) as Generator of the waste.

##### **3.1.1 Container Labeling**

All project waste will be classified, packaged, marked, and labeled according to State of Massachusetts requirements while onsite. In addition, prior to transport of waste off-site, waste containers must be marked/labeled in accordance with RCRA (as applicable) and DOT Hazardous Material Regulations if it meets one of the nine DOT hazard classifications. This includes labels on non-bulk containers and placards on bulk containers, as required. All RCRA hazardous wastes are DOT hazardous materials. An ESQ Specialist will assist the Project Waste Coordinator as necessary, in the proper classification of waste for transportation and disposal and will review profiles prior to submittal for CSO review and approval. Trained personnel, as required by DOT regulations at 49 CFR Part 172, Subpart H, will conduct all DOT-related functions.

Containers of potential (e.g. drums of sediment from within piping) will be marked or labeled (temporary label) as “Hazardous Waste – Pending Analysis” until the actual waste determination is made based upon receipt of results of waste analysis. An accumulation start date (the date the first drop of material was placed in container) will be marked on any container of potential hazardous waste.

A container log will be used to track contents, accumulation start date, sample identification number, sampling date, and disposal date. If containers are determined, after sample results are received, to contain nonhazardous waste, any temporary labeling will be removed and the containers will be labeled accordingly and segregated from hazardous wastes. If containers are determined to contain hazardous waste, they will immediately either be marked as “Hazardous Waste” including content an primary hazard, accumulation start date will be retained or they will be labeled with a completed “Hazardous Waste” label (actual label is not required until shipped) that will include:

- U.S. Environmental Protection Agency (EPA) identification number of the generator
- Name and address of the generator
- EPA waste code
- DOT shipping name (prior to off-site shipment)
- Description of contents
- Date of generation

An inventory of waste containers will be maintained. In addition, weekly inspections of container storage areas will be conducted and logged while wastes remain in these areas to ensure the integrity of the containers and secondary containment, to check for leaks or spills, and to ensure that labels and markings are in good condition.

### **3.2 Waste Accumulation Areas**

#### **3.2.1 Hazardous Waste Accumulation Area**

If hazardous waste is generated and accumulated on-site, TtEC will implement the following hazardous waste storage area requirements:

- A “Danger Hazardous Waste Area – Unauthorized Personnel Keep Out” sign will be posted at each waste accumulation area at a location that can be seen from any approach. The signs will be legible from a distance of at least 25 feet.
- Aisle space (36 inch minimum) will be maintained to allow unobstructed movement of personnel, fire-protection equipment, spill-control equipment, and decontamination equipment to any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes.
- The following emergency equipment will be located or available to personnel during active waste management activities at each accumulation area:
  - A hand-held two-way radio, capable of summoning emergency assistance

- Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment
- A spill-response kit for minor spills to include a shovel, adsorbent pads and/or “kitty litter,” and a collection container

### 3.2.2 Nonhazardous Waste Accumulation Areas

No prescribed markings or emergency equipment are required for nonhazardous waste storage areas. The general storage requirements for nonhazardous wastes include storage in a manner that does not lead to spread of contamination to adjacent areas or the addition of unauthorized waste to the wastestream, clear segregation of nonhazardous waste from hazardous waste, and the addition of hazard communication information on the container such as signs or labels or writing to indicate the contents of the container. Nonhazardous wastes will not be stored in hazardous waste storage areas unless clearly segregated.

### 3.3 **Inspections and Documentation**

Waste accumulation areas, including stockpiles, will be informally inspected on a daily basis and documented in site logbooks. In addition, if hazardous wastes are generated, formal inspections of these areas will be conducted and recorded at least weekly. The Project Waste Coordinator will conduct inspections. Any hazardous waste storage area(s) will be inspected to ensure the following:

- The containers will be checked for good condition. If a container is not in good condition or appears to be leaking, the waste will be transferred to another container.
- All containers used will be checked to be sure that they are made of material that will not react with, and are otherwise compatible with, the hazardous waste to be stored.
- The containers will be checked to ensure that they remain closed at all times, except when adding or removing waste.
- The container label will be checked to ensure that it is filled out properly and to check the waste accumulation date.
- The inventory log will be verified to ensure that it is current and accurate as to the number of containers and wastestreams in the storage area.

Documentation requirements apply to all waste managed during project activities. Field records will be kept of all waste-generation activities. In addition, the following information will be recorded in the log:

- Description of waste-generating activities
- Location of waste generation
- Type and volume of waste
- Date and time of generation
- Description of any waste sampling
- Known characterization information
- Name of person recording information

- Name of field manager at time of generation

#### **4.0 TRANSPORTATION AND WASTE DISPOSAL REQUIREMENTS**

Elements of off-site transportation and waste disposal include disposal facility selection, waste loading and transportation, and vehicular traffic control related to the loading and the off-site transportation and disposal of project waste, including recordkeeping.

The following subsections present transportation and disposal requirements for project wastes that will be transported from the site.

##### **4.1 Disposal Facility Requirements**

All waste containing CERCLA hazardous substance, pollutant, or contaminant will be disposed of off-site at a facility authorized and permitted to accept CERCLA waste under the CERCLA off-site rule regulation, 40 CFR 300.440. At a minimum, this will include all soil, sediment, and piping material sent offsite for disposal. CERCLA off site rule status is verified by TtEC during the disposal facility review process by a TtEC ESQ Specialist under Environmental, Health, and Safety (EHS) Procedure 1-4 Subcontractor Selection and Management.

Once the waste classification is known and the disposal facility is under subcontract, the type of facility and address, EPA ID number (if required), facility point of contact and phone number, state and/or federal agency point of contact, a list of any and all notices of violations in the last 3 years, date of last inspection, copies of all environmental permits, copies of the facility's weigh scale certificate, and analytical requirements and frequencies for each facility will be provided to the CSO.

##### **4.2 Profile Sheets**

Waste profile sheets will be prepared for solid wastes when required (typically required for most nonhazardous wastes, excluding recyclable materials or ordinary trash). Multiple profiles may be needed, depending on the classification of various waste streams and the manner or location of disposition. Profile sheets must be representative of the whole wastestream that will be disposed of under that profile. Profile sheets will be prepared by TtEC and signed by the Generator (CSO Representative).

All waste will be profiled by a TtEC ESQ Specialist prior to disposal when profiles are required by the disposal facility. Profiles will be prepared specific to the particular disposal facility and will contain process information, characterization decisions, waste composition, and analytical data and/or generator knowledge that is representative of that particular wastestream. Profiles and associated analytical data will be forwarded to the CSO for review and signature a minimum of five days prior to shipment off-site. Once the profile is CSO-approved (a minimum of five days prior to shipment is required to allow the disposal facility time to review and issue a permit), the profile will be sent to the disposal facility for approval. Upon approval of the profile by the disposal facility, the facility (approval is required prior to shipment of the waste) will

issue a profile number or “permit” and will authorize shipment of the waste to the facility. A copy of the signed profile, permit number, and analytical data will be maintained in the project files.

#### **4.3 Land Disposal Restriction**

If the waste is determined to be RCRA-regulated hazardous waste, then the nature of the underlying hazardous constituents and the facility-specific treatment authorizations must be determined. The intended disposal facility must be capable of and permitted to receive the waste as profiled and be capable of treating any underlying hazardous constituents as per the RCRA land disposal restriction (LDR) regulations in 40 CFR 268. A LDR form will be filled out, signed by the Generator, and submitted to the intended disposal facility for any wastestream that is RCRA hazardous waste.

A LDR form will accompany any shipments of RCRA-hazardous waste to the treatment, storage, and disposal facility (TSDF). The TSDF must be notified prior to sending the waste. Copies of LDRs will be provided to the CSO for signature and approval and will be maintained in the project file with the profile sheets.

#### **4.4 Hazardous Waste Manifest**

All hazardous waste transported from the site will be accompanied by a Hazardous Waste Manifest. A DOT-trained individual will prepare Hazardous Waste Manifests with assistance from the ESQ Specialist. The manifest will be submitted to the CSO for review and signature. TtEC does not sign manifests. The CSO representative is responsible for reviewing and signing all waste documentation (profiles, LDR forms, manifests). Prior to the manifest being signed, TtEC will ensure that pretransport requirements of packaging, labeling, marking, and placarding are met according to 49 CFR Parts 100 through 177.

The CSO will receive one original copy (designated at the bottom of the manifest as “generator’s initial copy”) of the manifest; the remaining copies will be given to the transporter. If possible, two good quality photocopies will be made of the top manifest copy after it has been signed by the transporter. One photocopy and the “generator’s initial copy” will be returned to the CSO by the site waste coordinator who will retain one copy for recordkeeping requirements. The second photocopy will be retained on-site in a central project file.

The signed terminal (original) copy of a hazardous waste manifest must be received by the generator no later than day 35 after shipment. If it is not, the exception reporting requirements of CMR 30.333 will be initiated, which includes tracking of the status and location of the waste and potentially preparation of an exception report.

#### **4.5 Nonhazardous Waste Manifests and Weight Slips**

All nonhazardous waste transported from the site will be accompanied by a nonhazardous waste manifest or bill of lading as appropriate. TtEC will forward the manifest or bill of lading to the CSO for review and signature a minimum of five days prior to shipment off-site. The CSO will

be responsible for reviewing and signing all waste documentation, including waste profiles and manifests. TtEC does not sign profiles or manifests. Prior to the manifest being signed, TtEC will ensure that pretransport requirements of packaging, labeling, marking, and placarding (if the nonhazardous waste is classified as a DOT hazardous material) are met according to 49 CFR Parts 100 through 177.

If possible, two good quality photocopies will be made of the top manifest copy after it has been signed by the transporter. The CSO will receive one copy of the manifest and one copy of the signed first cover sheet; the remaining copies will be given to the transporter. The manifest will be returned to the CSO to be placed on file. The photocopy of the manifest will be maintained in a central project file.

TtEC will submit return manifests or bills of lading that have been signed by the disposal facility along with certified weight slips within ten days of waste delivery. The Project Waste Coordinator will track waste shipments to ensure original manifests and weight tickets are returned and to ensure waste is disposed of at the proper designated facility. The certified weight tickets will contain, at a minimum, the gross truck weight, truck tare weight, the net weight of the materials, and the numerical load for the day. The weight tickets will also contain the transportation company name, and the plate numbers of the transportation vehicle.

#### **4.6 Manifest Review**

Manifests will be reviewed by the Site Waste Coordinator immediately prior to shipment to ensure accuracy and that all required fields are filled in. The Site Waste Coordinator will be responsible for ensuring that the CSO has signed and dated the manifest, the transporter has signed and dated the manifest, and that all appropriate fields are filled in and that the original manifest goes with each load that leaves the site. At the end of each day that shipment occurs, the DOT-trained Project Quality Control Manager (or designee) will review all copies of manifests shipped that day to ensure accuracy. If any mistakes are noted, the ESQ Specialist will be contacted as soon as possible.

#### **4.7 Transportation Requirements**

All transportation companies will be approved by TtEC Procedure EHS 1-4, Subcontractor Selection and Management, prior to use to ensure that they are qualified and permitted to transport the particular type of waste being transported and that they are authorized to transport to the designated location (i.e., special authorization is required by the DOT for out-of-state shipments).

The transportation subcontractor will have all appropriate licenses, permits, and registrations appropriate to the type of waste being shipped (including, but not limited to, a MassDEP hazardous waste transporter[s] registration (if required), an EPA identification number (when required), DOT registration, and DOT Hazardous Material Registration) as well as proof of liability insurance coverage. Copies of the DOT motor carrier safety rating and solid and hazardous waste transportation permits for each state in which the material will be transported will be provided to the CSO for each of the transporters used.

Transportation documentation (e.g., manifests or bills of lading) will comply with DOT regulations 49 CFR Parts 100 through 178 and will be prepared by appropriately trained TtEC personnel.

Containers will be marked and labeled prior to off-site transport to meet DOT requirements. TSDF waste profile sheets, waste manifests, and shipping documents (as applicable) will be prepared by properly trained TtEC personnel for the appropriate CSO officials to review and sign.

If an on-site truck scale is not available, only transporters with built-in calibrated scales will be used to ensure that DOT weight restrictions are not exceeded and to provide accurate weights for all waste manifests when required. It will be the dual responsibility of site personnel and the transportation subcontractor to document truck weights before trucks exit NAS SOWEY.

Waste hauling trucks will be lined and covered with tarps prior to leaving the site. Appropriate placards will be placed on each transport vehicle, as required by DOT. In addition, a nonhazardous waste manifest or bill of lading, as appropriate, will accompany all wastes that leave the site.

## **5.0 TRAINING/CERTIFICATION REQUIREMENTS**

Employees involved in waste management operations will be trained at the awareness and function or task-specific level to perform site specific waste management tasks assigned to them under the supervision of the designated and experienced TtEC Project Waste Coordinator. This training will help ensure they are familiar with the requirements of their job assignments related to management of wastes. If hazardous waste is generated, those who oversee the management of hazardous wastes (only a selected few designated persons) will have additional training as required.

Personnel who perform or oversee DOT-related activities (such as selecting packaging, placing markings and labels on packages, or preparing shipping papers for DOT regulated material/waste) will be trained as required by 49 CFR. DOT and waste management training records will be maintained in TtEC Corporate ESQ Department files and will be available, as necessary, to on-site personnel. DOT training for ground transportation of hazardous materials is required every 3 years.

## **6.0 DOCUMENTATION AND RECORDS RETENTION**

This section presents project requirements for waste management documentation and records, and their retention.

### **6.1 Documentation**

The information contained in this section applies to all waste managed during project activities at each site where wastes are generated. Field records will be kept in a bound, numbered field notebook. Information to be recorded includes, but is not limited to, the following:'

- Description of waste-generating activities
- Location of waste generation (including depth, if applicable)
- Type of waste
- Date and time of generation
- Name of person recording information
- Name of field manager at time of generation and at time of disposal
- Sample identification numbers and results or generator knowledge regarding waste characterization
- Inspection logs (hazardous waste)
- Waste documentation, including the following:
  - Signed waste profile sheets
  - Signed waste manifests (hazardous and nonhazardous), terminal copies
  - Signed bills of lading
  - Signed LDR forms (for hazardous waste)
  - Copies of analytical or other generator knowledge used in waste characterization process
  - Weight tickets

## **6.2 RCRA Records Retention**

The CSO's designated representative will be responsible for ensuring that all hazardous waste generator recordkeeping requirements are met, including retention of signed copies of manifests from the designated facility that received the waste. All records must be maintained for at least 3 years from the date the waste was accepted by the initial transporter.

## **7.0 REFERENCES**

TtEC 2014a. Draft Remedial Action Work Plan Addendum for Soil Excavation at STP Site 7 – Former Sewage Treatment Plant, Naval Air Station South Weymouth, Weymouth Massachusetts. *In progress*.

U.S. Navy. 2008. Record of Decision, Operable Unit 7 – Former Sewage Treatment Plant, Naval Air Station South Weymouth, Weymouth, Massachusetts. April.

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**APPENDIX C**  
**CONTRACTOR QUALITY CONTROL 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. WE02**

**FINAL  
CONTRACTOR QUALITY CONTROL PLAN  
SOIL EXCAVATION AT SITE 7 FORMER STP LOCATION  
FORMER NAVAL AIR STATION  
SOUTH WEYMOUTH, MASSACHUSETTS**

**July 2014**

*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

<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	7/24/14	B. Whalen	G. Joyce	All

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## ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
COC	Constituents of Concern
CPR	Contractor Production Report
CQC	Contractor Quality Control
CQCR	Contractor Quality Control Report
CTO	Contract Task Order
DCN	Design Change Notice
DFW	Definable Feature of Work
DN	Deficiency Notice
DON	Department of the Navy
EHS	Environmental Health and Safety
EM	Engineer Manual
FCR	Field Change Request
IR	Installation Restoration
IROD	Interim Record of Decision
LFG	Landfill Gas
LGMS	Landfill Gas Mitigation System
LUC	Land Use Control
MCP	Massachusetts Contingency Plan
MNA	Monitored Natural Attenuation
MSDS	Material Safety Data Sheet
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCR	Non-Conformance Report
NFA	No Further Action
OU	Operable Unit
PM	Project Manager
PMO	Program Management Office
POC	Point of Contact
PQCM	Project Quality Control Manager
QA	Quality Assurance
QC	Quality Control
QCPM	Quality Control Program Manager
RAC	Remedial Action Contract
RPM	Remedial Project Manager
SHM	Safety and Health Manager
SOW	Scope of Work
SS	Site Superintendent
SSHO	Site Safety and Health Officer
STP	Sewage Treatment Plant

TtEC	Tetra Tech EC, Inc.
UFGS	Unified Facilities Guide Specification
USACE	United States Army Corps of Engineers

## **1.0 INTRODUCTION**

This Project Contractor Quality Control (CQC) Plan establishes the procedures and methods to be implemented for performing CERCLA and MCP support at former Naval Air Station (NAS) South Weymouth, Massachusetts (MA). Tetra Tech EC, Inc. (TtEC) has been contracted by the Naval Facilities Engineering Command (NAVFAC) Base Realignment and Closure (BRAC) Program Management Office (PMO) East to perform this work at South Weymouth under Remedial Action Contract (RAC) N62470-13-D-8007, Contract Task Order (CTO) WE02 in accordance with the Comprehensive Environmental Restoration, Conservation, and Liability Act (CERCLA); Executive Order 12580; the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); and Massachusetts Contingency Plan (MCP). The work includes continuation of the CERCLA Remedial Action at Sewage Treatment Plant (STP, Site 7). This CQC Plan fulfills the requirements of the TtEC quality control (QC) system requirements.

### **1.1 Background**

The remedy for STP was initially implemented by TtEC under a previous contract. Additional surface and subsurface contamination was found that required re-evaluation of the remedial plans. Supplemental sampling has been completed by others and a new plan of action has been developed to remove additional surface soils, discharge piping, and associated contaminated soil and sediment.

### **1.2 Purpose**

The purpose of this PCQC Plan is to establish specific procedures and methods for field inspections, and provide an effective QC system to ensure the quality of all work performed by TtEC and its subcontractor personnel during the remedial activities. This plan is applicable to all definable features of work listed in section 3.0 and will be available at the project field office. All work activities will be conducted in accordance with this PCQC Plan and the Work Plan to which it is appended.

## **2.0 PROJECT ORGANIZATION, RESPONSIBILITY, AND POINTS OF CONTACT**

This section describes the organization and authority of project personnel. The organizational structure, functional responsibilities, levels of authority, and lines of communication within the organization have been established to ensure high-quality work. The project organization chart showing the reporting lines for key personnel is provided in Figure 2-1. The responsibilities of key personnel are described in the following subsections. A listing of the point of contact for the project is provided in Section 2.12.

## **2.1 Remedial Project Manager (RPM)**

The Remedial Project Manager (RPM) has primary responsibility with the DON for day-to-day management of the project activities performed under this Work Plan and for its successful completion. The RPM is responsible for the following:

- Perform project management for the DON.
- Ensure the project scope of work requirements are fulfilled.
- Oversee the project cost and schedule.
- Provide formal technical direction to the TtEC project team, as needed.
- Coordinate with other RPMs for other projects being performed to ensure that proper controls are in place.
- Act as lead in interacting with regulatory agencies.

## **2.2 Installation Representative (IR)**

The Installation Representative (IR) is the DON representative with the primary responsibility for providing on-site quality assurance (QA) and safety oversight of contractors. The IR is responsible for the following:

- Verify that all work has been completed per contract and technical specifications prior to final government acceptance.
- Perform ongoing field inspection to verify that all work is in compliance with both contract and technical specifications.
- Notify the contractor of any work not in compliance.
- Notify the contractor of any work being performed in an unsafe manner.
- Interact with the contractor's Project Quality Control Manager (PQCM) on quality-related issues.
- Review and sign waste manifests as the generator's representative.
- Review Contractor Daily Reports for completeness and accuracy.
- Attend preparatory phase, initial phase, pre-final, and final acceptance inspections.
- Attend weekly QC meetings.

## **2.3 Project Manager (PM)**

The Project Manager (PM) is the TtEC representative responsible for the direction, execution, and successful completion of project tasks to achieve overall project goals. The PM has responsibility for and the authority to direct all segments of the project including technical, construction, and administrative activities. The PM is responsible for the following:

- Coordinate work activities of subcontractors and TtEC personnel and ensure that all personnel adhere to the administrative and technical requirements of the project.
- Monitor the status and progress of work and ensure that project deliverables are completed on time and within the project budget.

- Monitor the budget and schedule, and notify the client and the Program Manager of any changes that may require administrative actions.
- Ensure adherence to the quality requirements of the contract, project scope of work, and the QC plans.
- Ensure that all work meets the requirements of the work plans, procedures, and technical specifications and complies with applicable codes and regulations.
- Ensure that all work activities are conducted in a safe manner in accordance with the Accident Prevention Plan (APP) – Safety and Health Requirements (Engineer Manual [EM]-385-1-1) (USACE 2008), and all applicable Occupational Safety and Health Administration regulations.
- Ensure that change conditions are properly identified and documented with the appropriate approvals.
- Serve as the primary contact with the DON and TtEC for actions and information related to the work and make sure to include appropriate TtEC lead and experts in decision-making.
- Coordinate satisfactory resolution and completion of evaluation and acceptance for Nonconformance Reports (NCRs).
- Attend required meetings, including the preconstruction conference, weekly QC meetings, pre- and post-construction site inspections, and other scheduled and unscheduled meetings.

#### **2.4 Safety and Health Manager (SHM)**

The Safety and Health Manager (SHM) is the TtEC representative responsible for implementing and overseeing the Contract Health and Safety Program and for developing, implementing, and approving all APPs. Any changes to the established Contract Health and Safety Program or APP must be at the direction and approval of the SHM, with concurrence of the DON Administrative Contracting Officer. The SHM or designee will not necessarily be on-site during all remedial activities but will be readily available for consultation when required.

The SHM or designee is a Certified Industrial Hygienist (CIH) who is certified by the American Board of Industrial Hygiene. The SHM supervises and directs the activities of the Site Safety and Health Officer (SSHO). The SHM has the authority to stop unsafe operations, remove unqualified personnel from the work area, and approve changes to the APP/SHSP. The SHM is responsible for the following:

- Oversee all aspects of the APP/SHSP from development to implementation.
- Advise the SSHO on all related health and safety matters.
- Review site-specific plans for completeness and compliance.
- Review other site documents as they affect health and safety (e.g., Activity Hazard Analyses [AHAs] and sampling plans).
- Review and evaluate all monitoring results.
- Establish and monitor all related health and safety procedures through site safety inspections and audits.

- Ensure that TtEC employees receive required environmental health and safety (EHS) regulatory training.
- Fulfill specific responsibilities for project EHS personnel that are identified within each EHS procedure.
- Function as a technical resource for all environmental compliance, safety, loss control, and industrial hygiene issues.

## **2.5 Quality Control Program Manager (QCPM)**

The Quality Control Program Manager (QCPM) is the TtEC representative responsible for the oversight of program QC, including field activities and data acquisition. The QCPM is responsible for the following:

- Coordinate and resolve quality concerns.
- Provide quality-related direction and ensure the training of the POCM and others performing quality-related functions.
- Suspend project activities if quality standards are not maintained.
- Interact with the DON on quality-related issues.
- Review audit and surveillance reports.
- Implement the DON technical directives related to quality.

## **2.6 Site Superintendent (SS)**

The Site Superintendent (SS) is a TtEC representative who reports to the PM and is responsible for coordinating, directing, implementing, and supervising site construction activities. The SS or designated representative will be on-site at all times during field activities. The SS is responsible for the following:

- Implement field activities in accordance with the Work Plan.
- Direct support personnel and subcontractors.
- Administer site access and communication.
- Maintain the work site, facilities, vehicles, and equipment.
- Coordinate work activities and ensure all personnel adhere to the administrative and technical requirements of the project.
- Prepare status reports and estimate future scheduling needs.
- Prepare daily Contractor Production Reports.
- Monitor the status and progress of field activities and ensure that project deliverables are completed on time and within the project budget.
- Ensure work activities in the field are conducted in a safe manner in accordance with the APP.
- Investigate with the SSHO all incidents, accidents, injuries, illnesses, and near misses.

## **2.7 Project Quality Control Manager (PQCM)**

The PQCM is the TtEC representative responsible for overall management of project QC and reports to the QCPM. The PQCM has the authority to stop work on site-related issues affecting the quality of the work performed and for directing the correction of all nonconforming work. The PQCM or designated representative will be on-site at all times during field activities. The PQCM is responsible for the following:

- Provide and maintain an effective QC system for all site activities.
- Monitor QC activities to ensure conformance with authorized policies, procedures, contract specifications, required standards, and methods of quality construction.
- Prepare the daily Contractor Quality Control Reports (CQCRs).
- Coordinate and perform the three phases of inspection (preparatory, initial, and follow-up) for all definable features of work (DFWs).
- Responsible for issuance, maintenance, and enforcement of NCRs and other quality actions.
- Ensure that on-site and off-site inspections, testing, and sampling are performed in accordance with the plans, procedures, specifications, and applicable codes.
- Ensure that all required tests and inspections are performed and documented.
- Conduct required QC meetings, including the coordination and mutual understanding meeting, site survey visit, and other scheduled meetings.
- Coordinate and maintain submittal register, photograph log sheet, request for information, and NCR log and other required logs or registers.
- Review and maintain records of approved submittals, Design Change Notices (DCNs), and Field Change Requests (FCRs) for construction activities.
- Inspect material delivery handling and storage in accordance with technical specifications.
- Review and approve submittals and shop drawings and/or forward submittals as information only or for approval.
- Review project plans and procedures for quality issues.
- Confirm the removal or rework of material, equipment, or work activity that is not in compliance with plans and specifications.

A copy of the Delegation of Authority Letter is provided in Appendix A and a copy of the PQCM resume is provided in Appendix B.

## **2.8 Site Safety and Health Officer (SSHO)**

The SSHO is the TtEC representative who reports directly to the SHM and ensures all elements of the APP are implemented and enforced on-site. The SSHO has full authority to issue stop work orders or evacuation orders when work operations or noncompliance(s) may threaten the health and safety of site workers or the public. The SSHO

- Ensure that all personnel understand the requirements of the TtEC EHS program and procedures through training and communication.

- Investigate with the SS all incidents, accidents, injuries, illnesses, and near misses.
- Ensure project personnel are trained in the hazards of substances used on the project, maintain Material Safety Data Sheets (MSDSs) and make them accessible to project personnel, and perform inspections and oversight to ensure the Waste Management Plan is being followed.
- Ensure tailgate safety meetings are conducted daily prior to start of work and are documented.
- Ensure project safety equipment is inspected and in good working order as required by the EHS program.
- Coordinate site health and safety requirements with the SS and PM.
- Ensure that all health and safety monitoring equipment and personal protective equipment are maintained and direct site-monitoring activities.
- Coordinate daily field activities with the SS.
- Coordinate site safety and emergency response duties and verify site communications system with site personnel.
- Report incidents to the IR as required by EM 385-1-1 (USACE 2003).
- Report immediately to the PM, RPM, and IR any fatal injury, persons admitted to a hospital, or damage to government property.
- Ensure all personnel have the required training and medical clearance prior to entering the exclusion zone at the site; inform the SS of any site personnel with medical restrictions.
- Determine and post routes to medical facilities and telephone numbers for emergency transportation to medical facilities.
- Serve as the Project Hazard Communication Coordinator.
- Maintain training records and medical certifications for all on-site personnel, including subcontractors.
- Initiate revisions or changes to the APP to support changing site conditions.
- Maintain site control procedures.
- Maintain current records of certification for first aid and cardiopulmonary resuscitation training for field personnel.
- Attend meetings, including the preconstruction conference, weekly QC meetings, pre- and post-construction site inspections, and other project meetings.

## **2.9 Subcontractors and Vendors**

Qualified subcontractors may be selected to provide various construction services for this project. The subcontractor is required to provide labor, material, and equipment necessary to conduct construction activities as directed by the PM. Subcontractors and vendors will be required to conform to TtEC's quality requirements of all approved procedures, technical specifications, and contract provisions.

The subcontractor is responsible for field inspection of their construction and operating activities. TtEC personnel will monitor, oversee, and make on-site observations and inspections

of work in progress to determine whether the subcontractor’s work is proceeding in accordance with TtEC’s quality requirements.

Subcontractor personnel are responsible for maintaining a daily log of the project activities they perform and for providing information needed to complete the Daily CQC Report. All inspection records, including inspection reports, deficiency reports, and re-inspections of corrective actions, will be documented.

## 2.10 Points of Contact

The following is a list of the key project, DON, and regulatory contacts:

<b>Name and Title</b>	<b>Contact Information</b>
Navy COR, Zane Perry	(757) 322-4777
Navy Contract Specialist, Patricia Elder	(757) 341-1975
RPM/NTR, Brian Helland	(215) 897-4912
TtEC PM, Brian Corbett	(617) 443-7517 (office phone) (617) 470-8651 (cellular phone)
TtEC QCPM, Greg Joyce	(360) 598-8117 (office phone) (360) 780-0371 (cellular phone)
TtEC Safety and Health Manager, Roger Margotto, CIH	(619) 471-3503 (office phone) (619) 988-0520 (cellular phone)
TtEC Site Superintendent, Richard Claydon	(617) 443-7516 (office phone) (857) 272-2020 (cellular phone)
TtEC Site Safety and Health Officer, Richard Claydon	(617) 443-7516 (office phone) (857) 272-2020 (cellular phone)
Facility Fire Department	911
Construction Phase NTR, Robert Krivinskas	(401) 841-1761
Installation Representative, David Barney	(617) 753-4656
State Environmental Representative, David Chaffin	(617) 292-5732
National Response Center	1-800-424-8802

### **Abbreviations and Acronyms:**

CIH – Certified Industrial Hygienist  
 CSP – Certified Safety Professional  
 NTR – Navy Technical Representative  
 SHM-Safety and Health Manager

PM – Project Manager  
 PQCM – Project Quality Control Manager  
 QCPM – Quality Control Program Manager  
 RPM – Remedial Project Manager

## 3.0 DEFINABLE FEATURES OF WORK

A definable feature of work (DFW) is defined as an activity or task separate and distinct from other activities that requires separate control activities. The DFW establishes the control measures required to verify both the quality of work performed and compliance with specified requirements, which include inspecting materials and workmanship before, during, and after each DFW. Preparatory and Initial inspections will be performed on all DFWs, with the

exception of mobilization and demobilization. Activities that will be covered by the PQCM during the inspections are listed in Table 3-1. The following DFWs have been identified for the project:

- Mobilization and Site Setup
- Vegetation Clearing
- Installation of Erosion and Sediment Controls
- Site GPS Stakeout
- Headwall and Pipe Removal
- Soil Excavation
- Groundwater Management
- Sample Collection and Field Screening
- Decontamination
- Transportation and Disposal
- Site Restoration and Demobilization

#### **4.0 SUBMITTALS**

This section describes the review and approval process of submittals. TtEC will institute and maintain a submittal register (Appendix C) to track submittals from issuance to approval. A list of required submittals will be developed at the initiation of project activities and revised as necessary. Submittals will be scheduled, reviewed, certified, and managed in accordance with the procedures defined in this section. The submittal register will be attached to the last Contractor Quality Control Report (CQCR) of each month.

Standard Unified Facilities Guide Specification (UFGS) submittal titles are as follow:

- SD-01 Preconstruction Submittals
- SD-07 Certificates
- SD-11 Closeout Submittals

Descriptions of the submittals listed above are provided in Section 1.1.2 of the UFGS Section 013300 (NAVFAC 2006).

#### **4.1 Review of Submittals**

Submittals will be reviewed to ensure completeness, accuracy, and contract compliance. Submittal of a certification will be inspected and approved by the PQCM for conformance to the project specifications or certification criteria. All items will be checked and approved by the PQCM or designated representative. Any submittals requiring modifications or changes will be returned to the originating organization for correction and then resubmitted for review and approval prior to acceptance. Approved submittals will be stamped, signed or initialed, and dated. During the preparatory phase of the QC inspections, the PQCM or designated

representative will ensure that all materials and equipment have been tested and approved. No field activities will be performed without the required approval of applicable submittals.

#### **4.2 Submittal Process**

Required submittals will be provided to project personnel as determined by the distribution schedule. Each submittal will be assigned a unique document control number.

A transmittal form will accompany each submittal. Each transmittal will be identified with:

- Contract and CTO number
- Name and address of the submitting organization
- Date of submittal
- Description of item being submitted, including reference to specification section (if applicable)
- Approval of submitting organization indicating conformance to the requirements

The PQCM will update the submittal register regularly.

#### **4.3 Review and Processing of Submittals that Do Not Require DON Approval**

Material submitted for review by the PQCM will indicate whether or not it conforms to established requirements. The PQCM will inform the submitter of the results of the review. The submittal log will be updated to indicate the status.

Conforming submittals will be transmitted to project and DON personnel as determined by the distribution schedule. A transmittal form will accompany all items sent to the DON and will list each item transmitted, the date it was reviewed by the PQCM, and its review status.

Nonconforming submittals will be returned to the submitter for correction, resolution of comments, and resubmittal.

#### **4.4 Review and Processing of Submittals that Require DON Approval**

Submittals reviewed by the PQCM will be transmitted to the DON in accordance with the project distribution schedule for further review and approval. All items sent to the DON will use a transmittal form that will indicate each item transmitted, the date reviewed by the PQCM, and its review status. Upon completion of review, the IR will either return the transmittal form to the PQCM for further action or accept the submittal as complete.

The PQCM will advise the submitter of the results of the review in writing and include any comments. The submittal log will be updated to indicate status.

Nonconforming submittals may be returned to the submitter for correction, resolution of comments, and resubmittal, if required.

## **4.5 Revised Submittals**

Revised submittals will be logged, reviewed, and processed in a manner identical to the initial submittal.

## **5.0 TESTING**

The PQCM or designated representative will verify the performance of all tests specified or required by the Work Plan to ensure that control measures are adequate to provide a product conforming to contract specifications. General requirements for testing procedures to be implemented for this project are included in the Work Plan. The type, number, and frequency of required tests are specified in the Testing Plan and Log (Appendix C). These tests include both operational and acceptance testing as appropriate.

### **5.1 Documentation**

All test results, both passing and failing, will be documented as a summary report in the Daily Contractor Quality Control (CQC) Report on the last day of each month. Paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. The test reports will be available for review by the IR and transmitted with the Project Closure Report.

### **5.2 Laboratory Services**

An independent testing laboratory will provide laboratory services, as needed. The laboratory will be selected and qualified in accordance with recognized industry and applicable project requirements.

### **5.3 Testing Plan and Log**

The Testing Plan and Log (Appendix C) lists tests required by the project specifications. Testing will be conducted to verify that control measures are adequate to provide a product conforming to contract specifications. General requirements for testing procedures to be implemented for this project are included in the Work Plan.

## **6.0 QUALITY CONTROL MEETINGS**

### **6.1 Coordination and Mutual Understanding Meeting**

Prior to the start of site work, a coordination and mutual understanding meeting will be held to discuss the QC Program requirements. DON personnel attending the meeting will include the RPM and IR. The purpose of this meeting is to develop a mutual understanding of the QC details, including forms to be used, administration of on-site and off-site work, coordination of

the field activities, production, and the PQCM duties with the IR. At a minimum, the TtEC personnel required to attend the meeting will include the PM, SS, and PQCM. Minutes of the meeting shall be prepared by the PQCM and signed by the PM and the DON's RPM and/or IR or designated representative. The meeting may be held in conjunction with the preconstruction meeting.

## **6.2 QC Meetings**

After the start of field activities, the PQCM will conduct QC meetings at a frequency of once per week or as required by the IR. The meetings will be held at the project site and will be attended by the IR, SS, SSHO, and PQCM. The PQCM will notify the IR at least 48 hours in advance of each meeting. The following will be covered at each meeting:

- Review the minutes of the previous meeting.
- Review the schedule:
  - Work or testing accomplished since last meeting
  - Rework items identified since last meeting
  - Rework items completed since last meeting
- Review the status of submittals:
  - Submittals reviewed and approved since last meeting
  - Submittals required in the near future
- Review the work to be accomplished in the following 2 weeks, documentation required, and schedule for the three phases of control and testing:
  - Establish completion date for rework items
  - Required preparatory phase inspections
  - Required initial phase inspections
  - Required follow-up phase inspections
  - Required testing
  - Status of off-site work or testing
  - Required documentation
  - Identification of deficient conditions
- Resolve QC and production problems.
- Address items that may require revisions to the PCQC Plan.

## **7.0 INSPECTIONS**

This section discusses the inspection process for the DFWs that will ensure compliance with the contract. The DFWs for this project are identified in Section 3.0 and listed in Table 3-1. The PCQC Plan includes implementing the following three control phases for all aspects of the work specified:

- Preparatory phase

- Initial phase
- Follow-up phase

## **7.1 Preparatory Phase Inspection**

The PQCM will conduct preparatory phase inspections prior to starting the DFWs listed in Table 3.1 with the exception of mobilization and demobilization. These inspections shall include the following:

- Review the Work Plan and Standard Operating Procedures.
- Ensure that all required procurement forms for supplies and services are approved.
- Ensure that provisions have been made to provide the required QC inspection.
- Ensure that all personnel have the required training and certifications needed to perform the work.
- Examine the work area to ensure that all required preliminary work has been completed and is in compliance with the approved Work Plan.
- Examine the required materials and equipment to ensure that they are properly delivered to the site, conform to specifications, and are properly stored.
- Review the appropriate AHAs to ensure that safety requirements are met.
- Discuss procedures for performing the work, including potential repetitive deficiencies.
- Document workmanship standards for the particular phase of work.
- Ensure that the PCQC Plan for the work to be performed has been accepted by the DON.

The PQCM will conduct frequent internal inspections of mobilization and demobilization, which will include the items listed on Table 3-1. The PQCM is not required to notify the DON or the PM prior to these inspections.

The PM, DON RPM, and IR will be notified at least 2 working days in advance of each preparatory phase activity. This phase will include a meeting conducted by the PQCM and attended by the SS and any personnel involved in performing the DFW.

The issues discussed during the preparatory phase meetings will be documented on the Preparatory Inspection Checklist (Appendix C). The PQCM will explain the acceptable level of workmanship required to personnel performing work activities.

## **7.2 Initial Phase Inspection**

An initial inspection will be performed at the beginning of a DFW and will include the following:

- Check preliminary work to ensure that it is in compliance with contract requirements.
- Review the Inspection Checklist documenting results of the preparatory meeting.
- Verify full contract compliance, including required control inspections.

- Establish the required level of workmanship, testing, and inspection to ensure that work meets minimum acceptable standards.
- Resolve all differences.
- Check safety requirements to include compliance with and upgrading of the APP and AHAs.

The PM, DON RPM, and IR will be notified in advance of each initial phase activity. The PQCM will document initial inspections for each item using the Initial Inspection Checklist (Appendix C) and attach it to the Daily CQC Report. The location of the initial phase inspection and documentation will be identified for future reference and comparison with follow-up inspections.

The initial phase inspection will be reviewed each time a new crew arrives on-site or when features of the work change.

### **7.3 Follow-Up Phase Inspection**

During the completion of a particular work feature, follow-up inspections will be conducted to ensure compliance with contract requirements. The frequency of the follow-up inspections will depend on the extent of the work being performed. Each follow-up inspection will be documented on the Daily CQC Report. A Follow-up Inspection Checklist (Appendix C) will be generated for any deficient conditions identified during the Initial Inspection and attached to the Daily CQC Report when all items are resolved. A final follow-up check will be conducted on any completed work phase prior to the commencement of a subsequent phase.

### **7.4 Receipt Inspections**

The PQCM will conduct inspections of materials prior to their use and installation. These inspections will be documented on a receipt inspection form and maintained on-site. Any material(s) that does not meet design specifications will be rejected and returned to the vendor. Nonconforming material will be segregated and marked accordingly, to prevent inadvertent use. The PQCM will record on the Daily CQC Report that a material inspection was performed.

### **7.5 Additional Inspections**

The PQCM may conduct additional inspections on the same DFWs under the following circumstances:

- If the quality of ongoing work is unacceptable as determined by the PQCM, PM, SS, DON RPM, or IR
- If the quality of the work is suspected of being below the established criteria of acceptance

- If work on a DFW is resumed after a substantial period of inactivity
- If other problems develop

## **7.6 Completion Inspection**

Completion inspections will be performed as summarized in this section.

### **7.6.1 Construction Quality Control Completion Inspections**

The PQCM will conduct a detailed inspection prior to the pre-final inspection, when all of the work or an increment of work is deemed to be substantially complete. The work will be inspected for conformance to plans and specifications, workmanship, and completeness. The PQCM will prepare an itemized list of work that does not conform to plans and specifications, inferior workmanship, or incomplete work. The list will also include outstanding administrative items, such as record (as-built) drawings. The list will be included in the QC documentation and submitted to the PM following the inspection and will specify an estimated date for correction of each deficiency. The completion inspection will be documented on the Completion Inspection Checklist (**Appendix C**) and attached to the Daily CQC Report.

### **7.6.2 Pre-final Inspection**

The PM or designated representative will conduct the pre-final inspection. The DON RPM, IR, PQCM, SS, and other primary management representative(s), as applicable, will attend. The PM will schedule the pre-final inspection when notified by the PQCM that the work is ready for inspection. The PQCM is required to verify at this time that all specific items previously identified as being unacceptable, along with all remaining project work, will be complete and acceptable by the date scheduled for the pre-final inspection. At this inspection, the IR will develop a list of incomplete and/or unacceptable work performed under the contract and will provide this list to TtEC.

### **7.6.3 Final Acceptance Inspection**

The PM will schedule the final acceptance inspection based on notification from the PQCM of readiness. The DON RPM, SS, IR, PQCM, and other primary management representative(s), as applicable, will attend. Notification will be provided prior to the planned final acceptance inspection date and must include verification that all specific items previously identified as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection.

## **7.7 Inspection Documentation**

The PQCM is responsible for maintaining the inspection records. Inspection records will be legible and clearly provide all information necessary to verify that the items or activities inspected conform to the specified requirements. In the case of nonconforming conditions, the PQCM will provide evidence that the conditions were brought into conformance or otherwise accepted by the IR. All inspection records will be made available to the DON.

## **8.0 DOCUMENTATION**

Preparation, review, approval, and issuance of documents affecting quality will be controlled to the extent necessary to ensure compliance to specified requirements. Project documents that will be controlled, if issued, include the following:

- Meeting minutes, conference notes, and confirmation notes
- Submittal Register
- Inspection documentation
- Contractor Production Report
- Daily CQC Report
- Material inspection and shipping logs
- NCRs
- NCR log
- FCRs
- Rework Items list
- Photograph log
- Field logbooks

### **8.1 Daily Contractor Quality Control Report**

The PQCM is responsible for maintenance of current records of QC operation, activities, inspections, and tests performed, including the work of subcontractors and suppliers. The records will include factual evidence that required QC activities and tests were performed. The Daily CQC Report will be completed to document site activities covered by the PCQC Plan and will include:

- Records of inspection and /or testing performed
- Identification and location of each DFW and its current phase (preparatory, initial, follow-up) of completion
- Results of inspections and/or testing
- Location and description of deficiencies
- Deficiencies corrected as of the date of the report
- Rework items

- Deviations from plans, difficulties, and resolution
- Test and/or control activities performed with results and references to specifications and/or plan requirements, including the control phase (preparatory, initial, and follow-up) and deficiencies (along with corrective action)
- Material received, with statement as to its acceptability and storage
- Submittals reviewed with contract reference, reviewer, and action taken
- Off-site surveillance activities, including actions taken

The records will describe both conforming and nonconforming features and include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The Daily CQC Report attached to the Contractor Production Report will be furnished to the IR by 10:00 a.m. on the first work day following the date covered by the report, or as agreed to by the IR. The report need not be submitted for days in which no work is performed. At a minimum, one report will be prepared and submitted for every 7 days of no work and on the last day of a no-work period. All calendar days will be accounted for throughout the life of the contract. The first report following a day of no work will summarize work for that day only.

The Daily CQC Report will be signed and dated by the PQCM and other appropriate personnel, including subcontractors responsible for completion of activities. The report will include copies of test reports.

## **8.2 Contractor Production Report**

The Contractor Production Report will be prepared for each day work is performed and will be attached to the Daily CQC Report prepared for the same day. The Contractor Production Report will be prepared, signed, and dated by the SS or designated representative, and will contain the following information:

- Contractor and subcontractor(s) and their area of responsibility
- Trades working on the project that day and number of personnel
- Operating equipment, with hours worked, idle, or down for repair
- Work performed that day, including location, description, weather conditions, and who did the work
- Any delays encountered
- Site visitors and the purpose of the visit
- Job safety evaluations stating what was checked, results, and instructions or corrective actions
- A list of instructions given and/or received and conflicts in plans and/or specifications
- Contractor's verification statement

### **8.3 Logbooks**

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

### **8.4 Photographs and Photo Logs**

The PQCM will maintain photographs and a photo log to document site activities. Each photograph will have a date and time stamp on it or the photograph will show a sign board documenting the date and time clearly and legibly in the photograph. The photo log will identify each photograph by date, time, location, and activity.

### **8.5 Conference Notes and Confirmation Notes**

In addition to other required documentation, the PQCM is responsible for taking notes and preparing the reports of all conferences. Conference notes will be typed and the original report furnished to the DON within 5 days of the date of the conference for concurrence and subsequent distribution to all attendees. At a minimum, this report will include the following:

- Date and place the conference was held
- List of attendees, including name, organization, and telephone number
- Comments made during the conference and decisions affecting criteria changes
- Conference notes that augment the written comments

The PM is also responsible for providing a record of all discussions, verbal directions, telephone conversations, and so forth in which TtEC personnel or their representatives participate on matters relating to this contract and work. These records, titled Confirmation Notices, will be numbered sequentially and will fully identify participating personnel, subject discussed, and any conclusions reached. The PM or designated representative will forward a reproducible copy of the confirmation notices to the DON RPM and IR within 5 working days.

## **9.0 CHANGE MANAGEMENT**

This section describes the DCN and FCR, the two main vehicles to document project changes.

### **9.1 Design Change Notices (DCN)**

The following sections detail the identification, preparation, and review and approval process for Design Change Notices.

### 9.1.1 Identification

Any member of the Project Team may identify the need for a change to the design specifications or drawings. The Project Team member will notify the PCQM, who will evaluate the request and initiate a DCN, if determined necessary.

### 9.1.2 Preparation

The PQCM will generate a DCN form (Appendix C) and submit it to the Design Engineer for review and disposition. The DCN will identify the specification requirements, the proposed change, and the reason for the change.

### 9.1.3 Review and Approval

The PM, SS, and QCPM will review and approve the DCN. It is the responsibility of the PM to notify the DON for approval of the DCN prior to making any changes identified on the DCN.

### 9.1.4 Implementation of Approved DCNs

The SS is responsible for the implementation of approved DCNs.

### 9.1.5 Records

Each approved DCN will be sequentially numbered as follows:

**DCN-CTO X-YY,**

**Where:**

**X is the task order number and YY is the DCN number, beginning with 01.**

A DCN log shall be maintained by the PQCM that provides the DCN number, date of DCN, and brief description of contents.

Each DCN will be copied to all the management signatories, the SS, PQCM, SSHO, and other personnel as deemed appropriate by the PM.

Copies of the approved DCN should be posted or otherwise included in daily site briefings as appropriate to ensure that all site personnel are aware of the changes to the task order program. Copies of DCN will be issued to all holders of controlled copies. The DCNs will be required to be maintained with the controlled copy of the document that has been changed.

## 9.2 Field Change Request

Site personnel will document changes to the approved plans (except the design specifications and drawings) in the field through the FCR form (Appendix C). At a minimum, the following information will be documented in the FCR form:

- Project name
- CTO number
- FCR number
- Documents to which a change is requested (including revision number if applicable)
- Description of the item or condition for which the change is requested
- Reason for the change
- Recommended disposition
- Cost and schedule implication of the change, if any
- Approval of disciplines
- Approval of the PM, SS, PQCM, SHM, and QCPM and concurrence from the RPM or IR

## 10.0 NONCONFORMANCE

All deficiencies or nonconforming conditions discovered during inspections or other QC functions will be noted on either a Deficiency Notice (DN) or a Nonconformance Report (NCR), as appropriate.

A DN is used to document the failure to develop, document, or implement effectively any applicable element of approved plans or to follow established procedures. A deficiency could lead to a nonconformance.

An NCR is used to document a nonconforming condition that renders the quality of an item, process, or product that has been defined in the specifications or drawings as unacceptable or indeterminate.

Copies of these forms are provided in Appendix C along with the logs used for tracking these documents. All deficiencies and nonconforming conditions will be resolved prior to completion of the project and in the timeliest manner possible. The DN will be used for all conditions that do not affect the final work product. An NCR will be used when a condition may affect the final work product and requires disposition by the Design Engineer of Record.

The PQCM will be notified of all deficiencies and nonconforming conditions identified during the course of the field activities to ensure that each of these occurrences is documented, reported, and tracked; and that corrective actions are taken and follow-up verification is conducted.

The PQCM will also document deficiencies and nonconforming conditions in the Contractor Daily Quality Control Report, noting the items found to be deficient or nonconforming; the date;

time, and location; the person who identified the deficiency or nonconformance; and the status of the item to which the deficiency or nonconformance applies.

The PQCM will update the status of the deficiency when it changes. Before the work activities of the day begin, the PQCM will note the deficiencies or nonconforming conditions that require follow-up verification that day. New or changed status will be entered into the file at the end of each day. The Contractor Daily Quality Control Report will document completion of the corrective action for each deficiency or nonconformance for that day. Nonconforming conditions or deficiencies that require rework for resolution will be noted on the Rework Items List included in Appendix C. Rework Items List will be included with the Contractor Daily Quality Control Report on the last day of the month that work is performed.

### Root Cause Analysis

The DN and the NCR forms both include space to enter information regarding the cause of the problem and the proposed resolution. The determination of the root cause of a deficiency or nonconformance is an integral part of the QC process. Root-cause analysis will be made by the PQCM in conjunction with other appropriate site personnel such as the Site Superintendent and the SSHO. Criteria considered in the analysis will include:

- staff qualifications and training
- adequacy of procedures and methods
- adequacy of equipment
- adequacy of QC measures

Input will be obtained, as necessary, from field staff and technical advisors in order to identify the factors that led to the problem.

### 10.1 Corrective Action

Following the root cause analysis, the PQCM will evaluate potential solutions (corrective actions) to determine which remedy is most effective in correcting the problem. This process will include all appropriate staff. Potential remedies considered will include:

- supplemental staff training
- changes of equipment or modification of equipment currently in use
- acquisition of supplemental equipment
- implementation of new procedures or modification of existing procedures
- changes in QC procedures

Final approval of all remedies will be the responsibility of the PM.

Successful implementation of corrective action will be documented by the PQCM in the appropriate areas of the DN or NCR. This documentation will be supported by changes to the inspection procedures or schedule as warranted (i.e., the PQCM will not certify that corrective

action has been taken until inspection of the actions and the resulting changes in the program are complete).

## **10.2 Condition Requiring Stop Work**

If corrective actions are insufficient, resolution cannot be reached, or results of prior work are indeterminate, work may be stopped. The PQCM will direct the PM to suspend work associated with the nonconformance until corrective action is complete. The PQCM will notify the QCPM immediately after stopping work. If there is a disagreement between the PQCM and the PM, the difference will be brought to the attention of the QCPM until resolution is achieved.

The conditions of the suspension of work will be described in detail on the CQC daily report and on the Rework Items List, if corrective action is not completed by the end of the working day Work will not continue until the directed by the individual who authorized it.

## **11.0 QUALITY MANAGEMENT**

In addition to the required QC field inspections, the TtEC Quality Management System requires a quality management overview of the site QA/QC Program implementation. The PQCM will perform regular internal QC checks on the site implementation of the QA/QC Program. Reports of any deficiencies will be provided to the PM for corrective action.

Inspections will be performed and checked for the following:

- Conformance with Work Plan and associated plans
- Thoroughness of performance
- Identification and completeness of documentation generated during performance

## **12.0 REFERENCES**

NAVFAC (Naval Facilities Engineering Command). 2006. Unified Facilities Guide Specifications (UFGS) 01330, Submittal Procedures. April.

USACE (United States Army Corps of Engineers). 2003. Safety – Safety and Health Requirements. EM-385-1-1. November 3.

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## **TABLES**

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**TABLE 3-1**

**DEFINABLE FEATURES OF WORK**

<b>ACTIVITY</b>	<b>PREPARATORY</b>	<b>DONE</b>	<b>INITIAL</b>	<b>DONE</b>	<b>FOLLOW-UP</b>	<b>DONE</b>
Vegetation Clearing	<ul style="list-style-type: none"> <li>• Verify that RPM, NTR, and CSO have been notified.</li> <li>• Review AHA.</li> <li>• Verify that PPE is available and meets requirements of the APP.</li> <li>• Verify that the area has been walked/visually inspected for items that could interfere with clearing (utilities, rebar, etc.).</li> </ul>		<ul style="list-style-type: none"> <li>• Verify vegetation (small trees, branches, bushes, and grass) are chipped and spread at location approved by Contracting Officer or designee</li> <li>• Verify that existing conditions photographs are taken and clearing activity is photographed.</li> </ul>		<ul style="list-style-type: none"> <li>• Continue to inspect ongoing activities.</li> <li>• Verify vegetation (small trees, branches, bushes, and grass) are chipped and spread at location approved by Contracting Officer or designee</li> <li>• Verify that site activities are being photographed.</li> </ul>	
Installation of Erosion and Sediment Controls	<ul style="list-style-type: none"> <li>• Ensure E&amp;S controls are installed, as described in the WP.</li> <li>• Review AHA.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure E&amp;S Controls are installed per MADEP guidelines.</li> </ul>		<ul style="list-style-type: none"> <li>• Inspect E&amp;S Controls and ensure they are maintained and in place until permanent vegetation is established.</li> <li>• Verify that site activities are being photographed.</li> </ul>	
Site GPS Stakeout	<ul style="list-style-type: none"> <li>• Ensure areas of excavation and wetlands areas are identified.</li> <li>• Ensure excavation within the wetlands area is coordinated with the local Conservation Commission (CONCOM).</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure areas of excavation and wetlands areas are identified.</li> <li>• Manage wetland areas as agreed upon with CONCOM.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure excavation/wetland limit markings are maintained.</li> <li>• Manage wetland areas as agreed upon with CONCOM.</li> </ul>	
Headwall and Pipe Removal	<ul style="list-style-type: none"> <li>• Verify that the RPM, NTR, and CSO have been notified.</li> <li>• Review AHA.</li> <li>• Ensure headwall and pipe removal limits are identified.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure proper PPE is worn. In particular, nitrile gloves when handling residual material in the piping and when breaking concrete.</li> <li>• Ensure there are no visible dusts generated from concrete breaking.</li> <li>• Photograph activities.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure contaminated materials are placed in contaminated staging area for load out.</li> <li>• Verify that site activities are being photographed.</li> </ul>	
Soil Excavation	<ul style="list-style-type: none"> <li>• Verify that the RPM, NTR, and CSO have been notified.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure utility markings are maintained.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure excavation is performed to the limits specified in the WP.</li> </ul>	

**TABLE 3-1**

**DEFINABLE FEATURES OF WORK**

<b>ACTIVITY</b>	<b>PREPARATORY</b>	<b>DONE</b>	<b>INITIAL</b>	<b>DONE</b>	<b>FOLLOW-UP</b>	<b>DONE</b>
	<ul style="list-style-type: none"> <li>• Verify that Massachusetts Dig Safe has been notified 72 hours prior to excavation.</li> <li>• Verify that training requirements are met for all personnel.</li> <li>• Verify locations of nearby overhead/underground utilities in the area.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure a soil containment area is constructed for stockpiling contaminated soil and sediment.</li> <li>• Ensure excavations located within wetlands area are coordinated with CONCOM.</li> <li>• Ensure excavation competent person is present during excavation activities.</li> <li>• Photograph activities.</li> </ul>		<ul style="list-style-type: none"> <li>• Verify that a spotter trained in recognizing underground utilities is present at all times.</li> <li>• Ensure soil containment area is covered when not in use.</li> <li>• Ensure excavations located within wetlands area are coordinated with CONCOM.</li> <li>• If groundwater is encountered, ensure groundwater is handled in accordance with the WP.</li> <li>• Ensure contaminated soil/sediment is stockpiled in containment area.</li> <li>• Verify that site activities are being photographed.</li> </ul>	
Groundwater Management	<ul style="list-style-type: none"> <li>• Ensure groundwater (if encountered) is handled in accordance with WP.</li> <li>• Review AHA.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure groundwater (if encountered) is handled in accordance with WP.</li> <li>• Photograph activities.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure groundwater removed is managed in accordance with the WMP.</li> <li>• Verify that site activities are being photographed.</li> </ul>	
Sample Collection and Field Screening	<ul style="list-style-type: none"> <li>• Verify that the RPM, NTR, and CSO have been notified.</li> <li>• Review Testing Plan and Log and SAP.</li> <li>• Review AHA.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure field screening is performed in accordance with the Testing Plan and Log and SAP.</li> <li>• Photograph activities.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure field screening is performed in accordance with the Testing Plan and Log.</li> <li>• Verify that site activities are being photographed.</li> <li>•</li> </ul>	
Decontamination	<ul style="list-style-type: none"> <li>• Review AHA.</li> <li>• Review dry decon procedures with crew.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure equipment is decontaminated prior to being removed from the site.</li> <li>• Establish areas for decon. Ensure contaminated material is placed on poly sheeting.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure contaminated material is disposed of with contaminated soil/sediment, in accordance with the WMP.</li> <li>• Verify that site activities are being photographed.</li> </ul>	

**TABLE 3-1  
DEFINABLE FEATURES OF WORK**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOW-UP	DONE
					•	
Transportation and Disposal	<ul style="list-style-type: none"> <li>• Verify that the RPM, NTR, and CSO have been notified.</li> <li>• Review AHA.</li> <li>• Ensure Bills of Lading, manifests, and shipping and disposal documents are submitted for approval to the CSO a minimum of 5 days prior to shipping of wastes.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure all trucks transporting contaminated waste are lined and covered, prior to departure from the site.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure weight tickets are returned and Bills of Lading/manifests are signed by the disposal facility and returned for Navy submittal within 10 days of waste delivery.</li> <li>• Verify that site activities are being photographed.</li> <li>•</li> </ul>	
Site Restoration and Demobilization	<ul style="list-style-type: none"> <li>• Verify that the RPM, NTR, and CSO have been notified.</li> <li>• Review AHA.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure all disturbed areas are returned to suitable conditions.</li> <li>• Photograph activities.</li> </ul>		<ul style="list-style-type: none"> <li>• Ensure disturbed areas are seeded with approved seed mixture(s).</li> <li>• Ensure E&amp;S controls are maintained until vegetation is sufficiently established to prevent erosion.</li> <li>• Ensure a pre-final inspection is conducted.</li> <li>• Verify that photographs are logged and stored.</li> </ul>	

**Abbreviations and Acronyms:**

AHA – Activity Hazard Analysis  
 CSO – Caretaker Site Office  
 NTR – Navy Technical Representative  
 PPE – personal protective equipment

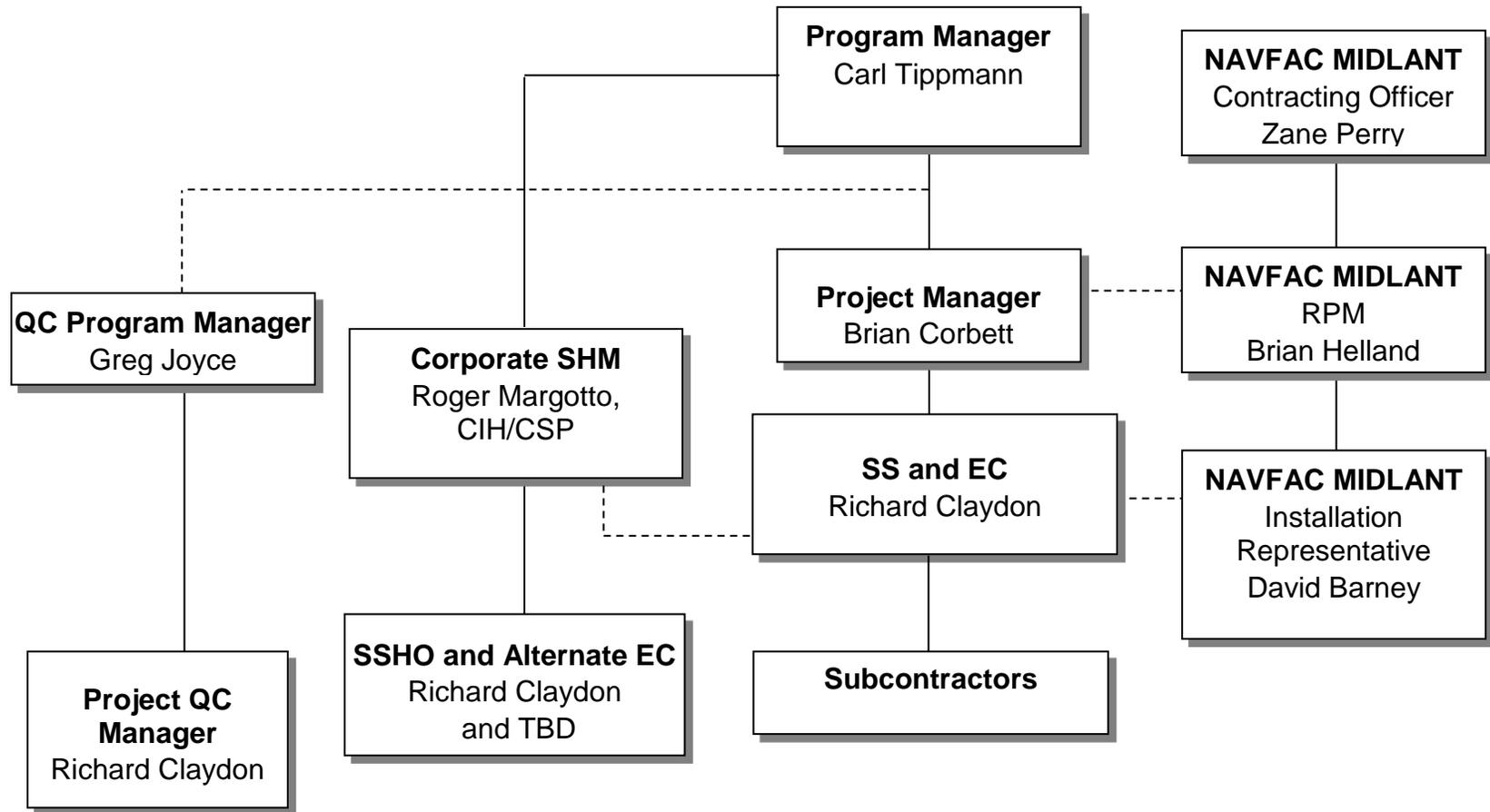
RPM – Remedial Project Manager  
 SAP – Sampling and Analysis Plan  
 SOP – Standard Operating Procedure  
 SSHO – Site Safety and Health Officer  
 WMP – Waste Management Plan

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## **FIGURES**

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Figure 2 - 1 Organizational Chart



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**APPENDIX A**  
**DELEGATION OF AUTHORITY LETTER**

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TETRA TECH EC, INC.

March 21, 2014

Mr. Richard Claydon  
Tetra Tech EC, Inc.  
133 Federal Street  
Boston, MA 02110

**Subject: Project Quality Control Manager**

Reference: NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007, CONTRACT TASK ORDER NO. WE02

Dear Mr. Claydon:

In accordance with the Lant RAC VI Program Construction Quality Control Management Plan, October 2013, this letter notifies you of your appointment as the Project Quality Control Manager for task order WE-02 for STP Site 7 at Naval Air Station, South Weymouth, MA issued under the above contract as directed by the Program QC Manager.

As the designated Project Quality Control Manager, you will be responsible for managing the site-specific quality control requirements in accordance with the approved plan. You will be responsible for conducting quality control meetings, performing the three phases of control, and performing submittal review. You will be required to be present during all field activities to ensure that any testing is conducted in accordance with approved plans. In addition, you will be required to prepare the necessary quality control certification and documentation.

You have the authority and responsibility for suspending work when conditions adverse to quality are identified and for directing the correction of all nonconforming work.

This letter is effective immediately until modified by the Quality Control Program Manager with concurrence of the TtEC Project Manager, the Lant RAC VI Remedial Project Manager, and the Resident Officer in Charge of Construction.

Sincerely,

Tetra Tech EC, Inc.

A handwritten signature in black ink that reads "Gregory D. Joyce".

Gregory D Joyce, ASQ CQM  
Quality Control Program Manager

cc: Brian Corbett

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**APPENDIX B**  
**RESUMES**  
**(to be submitted upon request)**

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**APPENDIX C**  
**QUALITY CONTROL FORMS**

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<b>TETRA TECH EC, INC</b>		<b>REPORT NO:</b>	
<b>NAVFAC MIDLANT</b>		<b>PROJECT:</b>	
<b>REMEDIAL ACTION CONTRACT (RAC VI)</b>		<b>PROJECT NO:</b>	
<b>CONTRACT NO. N62470-13-D-8007</b>		<b>SUBCONTRACTOR:</b>	
		<b>LOWER TIER SUB:</b>	
		<b>DATE:</b>	
		<b>TASK:</b>	
		<b>LOCATION:</b>	
<b>CONTRACTOR QUALITY CONTROL REPORT</b>			
<b>SEE CONTRACTOR DAILY PRODUCTION SUMMARY REPORT FOR INFORMATION ON SAFETY, WEATHER, SUBCONTRACTOR HOURS AND AREAS OF RESPONSIBILITY:</b>			
<b>SUMMARY OF CONSTRUCTION PROGRESS AND QUALITY CONTROL ACTIVITIES PERFORMED:</b>			
<p>Tests Performed and Results:</p> <p>Materials Received:</p> <p>Deficiencies Noted with Proposed or Implemented Corrective Action:</p>			
<b>JOB SAFETY: (LIST OBSERVATIONS)</b>			
<b>COMMENTS: ADDRESS ANY CHANGES (FCR/DCN), MEETING RESULTS OR OTHER INFORMATION</b>			
<p>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.</p>			
<b>NAME:</b>		<b>TITLE/COMPANY:</b>	PQCM
<b>SIGNATURE:</b>		<b>DATE:</b>	

TETRA TECH EC, INC.  
NAVY REMEDIAL ACTION CONTRACT  
CONTRACT NO. N62470-13-D-8007

**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 needed)**

<b>4. Originator (Print name and sign)</b>	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

<b>Task Order Manager (Print name and sign)</b>	<b>Date</b>

**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)**

<b>4. Originator: (print name and sign)</b>		<b>Title</b>	<b>Date</b>
<b>Reviewed by: (print name and sign)</b>		<b>Title</b>	<b>Date</b>
<b>Site Superintendent (Print name and sign)</b>	<b>Date</b>	<b>Task Order Manager (Print name and sign)</b>	<b>Date</b>
<b>TtEC Program QC Manager (Print Name and Sign)</b>	<b>Date</b>	<b>NTR Acknowledgement (Print name and sign)</b>	<b>Date</b>

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Initial Phase Inspection Checklist**

Task Order No.: \_\_\_\_\_  
Definable Feature: \_\_\_\_\_  
NAVFAC MIDLANT Notified \_\_\_\_\_

Date: \_\_\_\_\_  
Spec Section: \_\_\_\_\_  
Hours in Advance Yes \_\_\_\_\_ No \_\_\_\_\_

**I. Personnel Present:**

<u>Name</u>	<u>Position</u>	<u>Company / Government</u>
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.

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

**NONCONFORMANCE REPORT**

TASK ORDER # \_\_\_\_\_ NCR# \_\_\_\_\_ DATE \_\_\_\_\_  
LOCATION: \_\_\_\_\_ ROICC/RPM \_\_\_\_\_

1. Plan, Procedure, Specification, or Drawing (Clearly state the requirement)

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 specification

other - specify: \_\_\_\_\_

Comments:

Organization \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

TETRA TECH EC, INC.  
 NAVY REMEDIAL ACTION CONTRACT  
 CONTRACT NO. N62470-13-D-8007

**NONCONFORMANCE REPORT**

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Title

Accept	<input type="checkbox"/>
Accept with comments	<input type="checkbox"/>
Reject	<input type="checkbox"/>
Reject with comments	<input type="checkbox"/>

Comments:

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Title

Accept	<input type="checkbox"/>
Accept with comments	<input type="checkbox"/>
Reject	<input type="checkbox"/>
Reject with comments	<input type="checkbox"/>

Comments:

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

**5. Verification**

Verification required

Yes

No

Verified by:

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Title

\_\_\_\_\_  
 Date

Approved by:

\_\_\_\_\_  
 Program QC Manager

\_\_\_\_\_  
 Date

TtEC  
RAC VI

Preparatory Inspection Checklist

Task Order No.: \_\_\_\_\_

Date: \_\_\_\_\_

Definable Feature: \_\_\_\_\_

Spec Section: \_\_\_\_\_

ROICC Notified \_\_\_\_\_

I Permits

Have all necessary 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.

TtEC  
RAC VI

**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

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC 6)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

Task Order No.: \_\_\_\_\_  
Definable Feature: \_\_\_\_\_  
NAVFAC MIDLANT Notified \_\_\_\_\_

Date: \_\_\_\_\_  
Spec Section: \_\_\_\_\_  
Hours in Advance Yes \_\_\_\_\_ No \_\_\_\_\_

I. Personnel Present:

	<u>Name</u>	<u>Position</u>	<u>Company / Government</u>
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 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC 6)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

III Material Storage

Are materials stored properly?      Yes      \_\_\_\_\_      No      \_\_\_\_\_

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 plan.      \_\_\_\_\_  
\_\_\_\_\_

5. Has test facilities been approved?      \_\_\_\_\_  
\_\_\_\_\_

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC 6)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

VII Safety

1. Review applicable portion of the Task order Site Health and Safety Plan.

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2. Activity Hazard Analysis approved?

Yes \_\_\_\_\_

No \_\_\_\_\_

VIII Navy comments during meeting.

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\_\_\_\_\_  
Site CQC Representative

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

Task Order No.: \_\_\_\_\_  
Definable Feature: \_\_\_\_\_  
NAVFAC MIDLANT notification \_\_\_\_\_

Date: \_\_\_\_\_  
Spec Section: \_\_\_\_\_  
48 Hours in Advance Yes \_\_\_\_\_ No \_\_\_\_\_

**I Submittals**

1. Review submittals and/or submittal register. Have all applicable submittals been approved?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what items have not been submitted?  
Comments

2. Are all materials on hand? Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what items are missing?  
Comments

3. Check approved submittals against delivered materials. (This should be done as materials arrives.)  
Comments

**II Material Storage**

Are materials stored properly? Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what actions is taken?

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

III Specifications

1. Review each paragraph of Specification
  
  
  
  
  
  
  
  
  
  
2. Discuss procedure for accomplishing the work.
  
  
  
  
  
  
  
  
  
  
3. Clarify any differences.

IV Preliminary Work and Permits

Ensure preliminary work is correct and permits are on file.

Yes \_\_\_\_\_ No \_\_\_\_\_

If No, what action is taken?

V Testing

1. Identify test to be performed, frequency, and by whom.
  
  
  
  
  
  
  
  
  
  
2. When required?
  
  
  
  
  
  
  
  
  
  
3. Where required?
  
  
  
  
  
  
  
  
  
  
4. Review testing plan.
  
  
  
  
  
  
  
  
  
  
5. Has test facilities been approved?



**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

Task Order No.: \_\_\_\_\_  
Definable Feature: \_\_\_\_\_  
NAVFAC MIDLANT Notified \_\_\_\_\_

Date: \_\_\_\_\_  
Spec Section: \_\_\_\_\_  
Hours in Advance Yes \_\_\_\_\_ No \_\_\_\_\_

I. Personnel Present:

	<u>Name</u>	<u>Position</u>	<u>Company / Government</u>
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 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

III Material Storage

Are materials stored properly?      Yes      \_\_\_\_\_      No      \_\_\_\_\_

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 plan.      \_\_\_\_\_  
\_\_\_\_\_

5. Has test facilities been approved?      \_\_\_\_\_  
\_\_\_\_\_

**TETRA TECH EC, INC.**  
**NAVY REMEDIAL ACTION CONTRACT (RAC VI)**  
**CONTRACT NO. N62470-13-D-8007**

**Preparatory Inspection Checklist**

VII Safety

1. Review applicable portion of the Task order Site Health and Safety Plan.

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2. Activity Hazard Analysis approved?

Yes \_\_\_\_\_

No \_\_\_\_\_

VIII Navy comments during meeting.

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\_\_\_\_\_  
Site CQC Representative



**APPENDIX D**  
**ACCIDENT PREVENTION PLAN**

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**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND, MIDLANT  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62470-13-D-8007  
TASK ORDER WE02**

**FINAL  
ACCIDENT PREVENTION PLAN  
SOIL EXCAVATION AT SITE 7 FORMER STP LOCATION  
FORMER NAVAL AIR STATION  
SOUTH WEYMOUTH, MASSACHUSETTS**

**July 2014**

*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

<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	7/24/14	B. Whalen	R. Margotto	All

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## ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	micrograms per liter
AED	automatic external defibrillator
AHA	Activity Hazard Analysis
AIDS	Acquired Immune Deficiency Syndrome
APP	Accident Prevention Plan
ASTM	American Society for Testing and Materials
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CIRS	Contractor Incident Reporting System
COC	contaminant of concern
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
CRZ	contamination reduction zone
CSIR	Contractor Significant Incident Report
CSO	Caretaker Site Office
CSP	Certified Safety Professional
dba	decibels adjusted
DEET	n,n-diethyl-meta-toluamide
EC	Emergency Coordinator
EHS	Environmental Health and Safety
EM	Engineer Manual
EPA	U.S. Environmental Protection Agency
EZ	exclusion zone
FCR	Field Change Request
FEAD	Facility Engineering and Acquisition Division
HAZCOM	hazard communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HIV	human immunodeficiency virus
HTRW	hazardous, toxic, or radioactive waste
GFCI	ground-fault circuit interrupter
LO/TO	lockout/tagout
MCP	Massachusetts Contingency Plan
mg/kg	milligram per kilogram
MIDLANT	Mid-Atlantic
mph	miles per hour
MSDS	Material Safety Data Sheet
Navy	U.S. Navy
NEC	National Electric Code
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PEL	permissible exposure limit

PM	Project Manager (TtEC)
PPE	personal protective equipment
RPM	Remedial Project Manager
RQ	reportable quantity
SDS	Safety Data Sheet
SHM	Safety and Health Manager
SS	Site Superintendent
SSHO	Site Safety and Health Officer
STP	Sewage Treatment Plant
SZ	support zone
TtEC	Tetra Tech EC, Inc.
UL	Underwriters Laboratory
USACE	U.S. Army Corps of Engineers
WNV	West Nile virus
ZIP	Zero Incident Performance

## 1.0 APPROVALS

By their signatures, the undersigned hereby certify that this Accident Prevention Plan (APP) has been prepared in accordance with the requirements of EM 385 1-1 (current version including revisions) and has been reviewed and approved for use during field operations to perform removal activities at the Former Sewage Treatment Plant Site 7 at Former Naval Air Station (NAS) South Weymouth, Massachusetts.

Prepared by:



---

Becky Whalen  
Remediation Engineer II  
(757) 675-9167

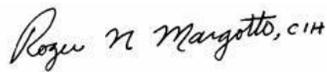
Approved by:



---

Brian Corbett  
Project Manager  
(617) 443-7517

Concurrence:



---

Roger Margotto, CIH, CSP  
TtEC, Inc. Program Health and Safety Manager  
(619) 471-3503

## **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 WE02.

### **2.3 Project Name**

Comprehensive Environmental Restoration, Conservation, and Liability Act (CERCLA) and MCP Support at Former Sewage Treatment Plant – Site 7, Former Naval Air Station (NAS) South Weymouth, Massachusetts.

### **2.4 Description**

The cleanup work performed under this task order will be performed in accordance with the CERCLA; Executive Order 12580; the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); and Massachusetts Contingency Plan (MCP).

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

- Occupational Safety and Health Administration (OSHA); 29 Code of Federal Regulations (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 (September 2008, consolidated August 2011)
- Department of Defense Guidance for the Environmental Restoration Program (ERP).

Federal OSHA maintains jurisdiction over private sector companies when working on federal properties. OSHA does not have jurisdiction over federal workers or the military.

#### **2.4.1 Former Sewage Treatment Plant (STP) Site 7**

NAS South Weymouth occupies approximately 1,442 acres. Portions of NAS South Weymouth extend into the adjacent towns of Abington and Rockland and abut the town of Hingham. NAS South Weymouth was developed during the 1940s for dirigible aircraft used to patrol the North Atlantic during World War II. The facility was closed at the end of the war and then reopened in 1953 as a Naval Air Station for aviation training. It remained a Reserve training facility until it was operationally closed on September 30, 1996, and administratively closed on September 30, 1997, as part of the Base Realignment and Closure program.

The STP site is comprised of two main areas encompassing approximately 3.3 acres: the former Tile Bed Area (0.9 acre) and the adjacent former STP area (2.3 acres). The site, currently owned by the Navy, is unpaved and relatively flat with a gentle slope to the west toward an adjacent drainage channel and wetland area. A small segment of the adjacent, downgradient/downstream wetland area (0.1 acre) is also included within Site 7. The site's ground surface is covered by grasses, shrubs, and mixed upland forest with an artificial intermittent stream located in the southern portion of the site. Several small intermittent stream channels flow through the wetland area and transport surface water for eventual discharge into French Stream to the west. French Stream flows south to off-Base properties in Rockland. Forested areas bound the site to the north, while paved roads bound the site to the east and south. Structures that remain on the site include the metal roof and frame and concrete walls of the former sludge drying bed area, an inactive transformer (polychlorinated biphenyls (PCBs)-free), clay tiles, and riser pipes of the former Tile Bed Area, and various groundwater monitoring wells installed as part of the Navy's investigations previously performed at the site.

The eastern portion of the site is located within a Massachusetts-mapped potentially productive, medium yield aquifer. In this part of the Base, groundwater flows toward the southwest in the direction of French Stream. The water table at the site is shallow, located only a few feet below ground surface (bgs) (1-3 bgs, depending on the location and proximity to the wetland area).

The Navy constructed the Tile Bed Area in the 1940s and used it for the treatment and disposal of Base sanitary wastewater until sometime prior to 1953, when the STP was constructed on the adjacent land. The STP was used until 1978, when the Base wastewater system was connected to the municipal sanitary sewer system. The Navy removed most of the STP structures by 1992. From the 1980s until 2005, the Navy stored road salt and sand under the canopy that covered the former sludge drying beds.

The Navy's investigations at Site 7 have included the sampling of surface soil, subsurface soil, groundwater, surface water, and sediment. Chemical parameters analyzed included target compound list volatile organic compounds, semivolatile organic compounds, pesticides, PCBs, and target analyte list inorganics (e.g., metals). Groundwater and surface water were not identified as a media of concern at Site 7. Cleanup concentration goals were developed for human health/ecological contaminants of concern in site soil and sediment. The risk assessment concluded potential risks to hypothetical future receptors (the recreational child and onsite residents and/or ecological receptors associated with arsenic, 4,4'-DDT, dieldrin, benz(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene in surface soil.

The remedy for the STP was initially implemented by TtEC under a previous contract. Additional surface and subsurface contamination was found that required re-evaluation of the remedial plans. Supplemental sampling has been completed by others and a new plan of action

has been developed to remove additional surface soils, discharge piping, and associated contaminated soil and sediment.

This project requires excavation of a drainage ditch within 50 feet downstream from the head wall and associated piping at 3 foot width and 1 foot depth. Soils will be staged on polyethylene sheeting. Soil removal will be performed with a track-mounted excavator. The headwall will be removed and broken up (if necessary) on site. Pipes will be removed back to the secondary tanks of the former STP. Pipe depth is estimated to be up to 12 feet bgs. Soil over pipe will be separately staged on polyethylene sheeting. Soil to the side and under the pipes will be staged on other polyethylene sheeting so that it can be sampled for contaminants. Workers will not enter any excavations to collect samples unless they are properly sloped or shored as required by regulations. Contaminated soil and piping will be loaded into lined trucks, and the trucks covered with tarp and secured prior to transportation. The uncontaminated overburden soil and additional soil will be used to fill and compact the open excavations.

## **2.5 Phases of Work Requiring Activity Hazard Analyses**

The removal elements above will consist of the following primary work tasks, each of which is addressed in an Activity Hazard Analysis (AHA) (see 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.

- AHA 1. Mobilization and Site Setup
- AHA 2. Vegetation Clearing
- AHA 3. Headwall and Pipe Removal
- AHA 4. Soil Excavation
- AHA 5. Groundwater Management
- AHA 6. Sample Collection and Field Screening
- AHA 7. Decontamination
- AHA 8. Transportation and Disposal
- AHA 9. Site Restoration and Demobilization
- AHA 10. Hoisting and Rigging by Mechanical Means

The above activities 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<sup>®</sup> (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) 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 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.

This data comparison illustrates that TtEC's performance is very good and that our rates are significantly lower than the most recent national averages for heavy construction other than highway industry.

TtEC's Experience Modification Rates are as follows:

(Policy Year October 1–September 30):

2011–2012:	0.78
2012–2013:	0.76
2013-2014:	0.80

## **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 conduct the field activities at STP Site 7.

#### **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.
- 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 – Brian Corbett

The Project Manager (PM) will be assisted as required by the Site Superintendent (SS) and Project Quality Control Manager. With respect to the EHS program, it is the responsibility of the Project Manager (PM) to:

- Ensure implementation of this APP through coordination with the 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 Site Safety and Health Officer (SSHO) 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 SHM's 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
- Approve upgrading or downgrading of personal protective equipment (PPE)
- Assist in the investigation of incidents

#### 4.2.4 Site Superintendent – Richard Claydon

For this project the SS will also be the SSHO (roles and responsibilities for this role are outlined below). Roles and responsibilities for the SS include:

- Ensure site personnel comply with the APP
- Coordinate with the 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 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 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.
- 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 APP.
- 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 Navy Technical Representative (NTR)/Facility Engineering and Acquisition Division (FEAD) and PM.

#### 4.2.5 Site Safety and Health Officer – Richard Claydon

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.
- 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.
- Perform 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 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 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.
- 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/SSHO.
- 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/SSHO, who will notify the NTR 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/SSHO 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 or SS and stated by name in the AHA or section of this APP where a competent person is specifically required by task. If the name of the competent person is not known 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 when/if specific tasks require them (e.g., excavation and trenching, fall protection, etc.). The subcontractor competent persons or TtEC competent persons, as applicable, must also be designated by name.

#### 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/SSHO will ask the subcontractor to provide an AHA for review or the SS/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.

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**

The PM, Brian Corbett, reports directly to TtEC's Program Manager, Carl Tippmann, and indirectly to the Navy's Remedial Project Manager (RPM). Brian Corbett has designated Richard Claydon as his SS to assist him in the day-to-day implementation of the site safety program. Richard Claydon is the SS and SSHO for this project. In his role of SS, he reports to the PM and in his role of SSHO, he reports to the SHM, Roger Margotto. These individuals and their aforementioned lines of authority are shown in the organization chart in Figure 4-1.

#### 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 2009), 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 any 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:

- Analytical laboratory testing - TBD
- Private utility locator – TBD
- Transportation and disposal subcontractor(s) – TBD
- Vacuum truck services – 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. Subcontractors 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 and 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. 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. 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.

### **6.2 On-the-Job Training**

In addition to the required initial training, each employee will receive 3 days of directly supervised on-the-job training (i.e., close supervision during the first 3 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 (see Section 9.8). Subcontractors must provide MSDS or SDS to the SSHO for hazardous materials they bring to the site. 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 6.4); 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.

In addition, workers who enter or attend to workers who enter any structure or opening that meets the requirements of a confined space (e.g., tanks, vaults, excavations deeper than four feet) will have received confined space training to fulfill their assigned duties (described further within section 9 plans included in this APP 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) 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 (materials in sufficient quantities), 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 training 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



## **7.0 SAFETY AND HEALTH INSPECTIONS**

Vehicle inspections will be performed daily on all site vehicles and heavy equipment by the operator. Daily inspections on the day(s) of scheduled field activities will be performed by the SS/SSHO and will be noted in the site activity logbook and TtEC Field Inspection Forms referenced above are included as Appendix D of this APP. Subcontractor personnel may be asked to participate in inspections. 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 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 and has 5 years of experience. Competent persons designated for excavation, hoisting and rigging, fall protection, and/or other areas of expertise (as applicable) will be responsible for inspections performed in their assigned roles as competent person for that task.

#### **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 the daily report to the NTR and copies will be submitted on a weekly basis 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/SSHO will orally notify the PM and NTR immediately. The PM will notify the RPM. The SS/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 spent onsite, as documented in daily production reports. 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 report that is sent to the COR.

### **8.2 Accident Investigations, Reports, and Logs**

After the oral report, the SS/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) (Appendix E), as required for any injury beyond first aid or for any government property damages \$2,000 or greater. The SS/SSHO will ensure that a report is prepared and the forms are completed as requested by the NTR 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 TtEC 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 Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT) is any injury requiring more than first aid or any government property damage in excess of \$2,000. For each reportable mishap described below, a verbal report will be made to the NTR and RPM as soon as possible. The NTR may follow-up with a request for submission of a CIRS to the NTR and RPM within 48 hours. The NTR 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 CIRS. TtEC will give the NTR 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 report 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; and
- 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.

### **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 and/or RPM. Access onto the base, where required, will be coordinated through the NTR or RPM, including any required personnel or vehicle badging or clearance.

Portable toilets and a hand washing station will be setup and serviced weekly. The existing CSO will be used as an office trailer, and will be coordinated through the NTR/FEAD.

The site will be secured using temporary fencing and signage.. The work sites, equipment, and field office will be secured appropriately to minimize potential unauthorized access and tampering or theft.

TtEC personnel and any subcontractors will become familiar with and obey base 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 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 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/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/SSHO in the site health and safety logbook. Site personnel are responsible for reporting situations they perceive as hazardous.

The above actions will provide early recognition for potential emergency situations, and allow TtEC to instigate necessary control measures. However, if the SS/SSHO determines 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/SSHO and render the appropriate level of response and support as is included in these plans.

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

TtEC personnel will provide incipient 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, or medical emergencies 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/SSHO with participation by subcontractor 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:
  - Corresponding MSDS or SDS
  - Completed medical data sheets (Appendix F) for on-site personnel. *Note: this is voluntary but encouraged.*
  - A chemical inventory of hazardous chemicals on site (Appendix G)
  - A entry/exit log identifying personnel on site each day
  - Site layout, assembly and evacuation area map (Figure 9-2)
  - Hospital route maps with directions (Figure 9-1)
  - Emergency notification – phone numbers (Table 9-2)

At the beginning of the field work, the EC (SS/SSHO) will hold an emergency evacuation drill.

The drill requires evacuations of the site to the assembly area (parking area located off Memorial Grove Avenue) and to the evacuation area if site evacuation is required (facility exit). At the evacuation area, the SSHO will brief the crew on the routes to reach the emergency hospital (South Shore Hospital). The SSHO 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/SSHO will serve as the EC until emergency response personnel arrive on site and take command. If the SS/SSHO is not present or is involved in the incident, (*TBD*) is the alternate EC and will take all necessary precautions and measures to initiate the emergency response, including notification of emergency personnel and the PM. In the event of an emergency, personnel will evacuate 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 SS/SSHO will activate an air horn (or vehicle horn if available) 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 could also occur due to activities of other contractors, NAS operations, or other 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 SZ, or other safe area as identified by the SS/SSHO where accountability of personnel will be performed. Personnel will then proceed to the designated evacuation area. The parking area located off Memorial Grove Avenue has been designated as the primary assembly area for work activities should an emergency occur; 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 SSSH 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 SSSH 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).

Based on field conditions and the daily activities, the SSSH will notate on Figure 2-2 to show the site layout and location of the assembly area and evacuation area, and to diagram egress routes from work areas to the evacuation area and to the facility exit. From this point, the map showing the route to the nearest emergency hospital (Figure 9-1), **South Shore Hospital, in**

**Weymouth, Massachusetts** 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 SS/SSHO is the designated EC and will have the authority to initiate proper action if outside services are required. If the SS/SSHO is not immediately available or is involved in the emergency, (*TBD*) is designated as the EC and will be the EC and initiate proper emergency response. 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/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 horns.
- 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 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/SSHO 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 Underwriters Laboratory (UL) approved safety cans and 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

Spill prevention and control measures will be employed during fueling activities (very limited fueling activities will be required, if any) and for emergencies such as hydraulic leaks on excavator. Absorbent materials will be staged on site in mobile equipment for responding to anticipated spills during these activities. Spill control equipment will include absorbent pads and/or kitty litter, shovels and brooms, and disposable bags. In addition to training, the following procedures are required to prevent and minimize releases of oil or 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.
- MSDSs/SDSs for hazardous materials used on-site will be kept in a binder at the field office.
- 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 /or U.S. Department of Transportation - approved, 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 operations 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.
- Fuel tanks 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.

### *9.2.2.1 Non-emergency Spills*

Non-emergency spills are defined as a discharge of a known material or non-reportable quantity (RQ) oil or hazardous substance to the land (not surface water) that can be cleaned up by TtEC and subcontractors posing an immediate threat to human health or the environment.

For a non-emergency spill, TtEC and subcontractor workers will perform the following procedures:

- Stop the source of the spill if safe to do so.
- Contain the spill by keeping it away from drains or waterways and blocking off drains located near the spill if there is a chance the spill will reach them
- Notify the SS/SSHO.
- Clean up and contain the spilled material wearing the proper PPE as designated by the SSHO (with SHM concurrence) in accordance with this APP.
- Handle the spill debris/material (PPE, sorbent materials, recovered product, etc.) in accordance with the Waste Management Plan.

Once procedures to address the immediate concerns above are underway, the supervisor will notify the NTR/FEAD, CSO, RPM and the PM (see Table 9-2). TtEC will assist the Navy in determining whether any agency notifications are required.

### *9.2.2.2 Emergency Spills*

An emergency spill is defined as any release that poses an immediate or imminent threat to human health or the environment, any release that exceeds the RQ for a hazardous substance, any release into any waterway.

For an emergency spill, TtEC and subcontractor workers will perform the following procedures:

- For an immediate or imminent threat to human health or the environment, immediately evacuate to a safe location upwind and call 911. If it is necessary to travel to a telephone to contact 911, designate a person to do so and make sure that person informs emergency response as to the nature of the emergency, the location of the emergency, and any other hazards. In this case, do not take action to mitigate the spill unless it is safe to do so, you are cleared to do so by emergency services and the SSHO, and the proper course of action has been determined. If anyone is injured, follow directions in this APP to assist injured personnel.
- If the situation is not an immediate threat to human health or the environment, and if you can safely do so, stop the source of the spill if you are able and take appropriate immediate actions to minimize potential for spill migration, then evacuate to a location upwind.
- Notify your supervisor who will notify the SSHO.
- If others are in the area, warn them and direct them to a safe location upwind.

- As soon as the immediate emergency actions are implemented, the supervisor will notify the NTR/FEAD, CSO, the RPM, the PM, and the SHM, and a course of action will be discussed (see telephone list in Table 9-1 for contacts).
- When the course of action is decided, and once personnel who will participate in the course of the action are adequately protected, cleanup actions may be taken (which may be limited) under direct supervision of the SSHO (and SHM) in accordance with the APP.
- TtEC will assist the Navy in making notifications to regulatory agencies or to request outside agency response personnel as necessary. The Navy will either notify the appropriate agency of the discharge or direct TtEC to make the initial notification if agency notification is required.

### 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, trucks, heavy equipment, and refueling areas. 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. If fire extinguishers and other hazardous materials will be sent by a carrier, TtEC will ensure that the proper hazardous material declarations are prepared by a qualified individual for ground shipment only.

In the event of a fire or explosion, contact the appropriate emergency authorities by calling 911 as specified in Table 9-2. Any fire must also be reported to the NTR and RPM and the SHM. The person reporting the fire is required to provide the following information to emergency personnel:

- His/her name
- Location of the fire (be sure to note that the fire is on base and the location on base)
- 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 posted the telephone communications points in the field office and in site vehicles.

#### 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 (SSHO plus at least one other TtEC employee or subcontractor individual, TBD) have current certifications in CPR, AED, first aid, and bloodborne pathogens. 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 TtEC or subcontractor site vehicle) to the hospital at the instruction of WorkCare© consultant. If a TtEC person is injured, 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. Subcontractor personnel will follow their corporate guidelines for case management if their personnel are injured.

##### 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, and, if an AED is on site, AED trained individuals as necessary. 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. The PM and SHM will notify the RPM and COR.

The nearest emergency hospital to the site is **South Shore Hospital**, located at 55 Fogg Road in Weymouth, Massachusetts.

The location of and directions to this hospital is included in Figure 9-1, and contact numbers for both the hospital and WorkCare® (for TtEC employees) 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 verified during mobilization.

#### *9.2.6.3 Fatal Injury*

If a fatal injury occurs, the following additional steps will be followed:

- Notify the SSHO immediately.
- Notify the PM and SHM as well as the NTR/FEAD, RPM, and COR.
- The SHM will initiate contact with OSHA and other appropriate agencies.
- The work activities on the project must be stopped for 24 hours.
- Assist the SHM and OSHA, as directed.

#### *9.2.6.4 Medical Data Sheet*

Each field team member, including visitors and subcontractors, will be asked to complete and submit a copy of the Medical Data Sheet (see Appendix F). This sheet is voluntary, but is encouraged. 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 injured person 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.

#### *9.2.6.5 Medical Surveillance*

Not required for this project.

### **9.3 Plan for Prevention of Alcohol and Drug Abuse**

TtEC has a Drug-Free Workplace Program. All TtEC and TtEC 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**

Portable toilet and hand washing facilities will be available at the project worksite in support of the field activities. These facilities will be serviced as needed, but not exceeding on a weekly basis, maintained in good condition, and located in an accessible location to work activities.

Workers will discard all food debris and other detritus in a designated refuse container. 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.

Potable water will be provided for washing hands and for any drinking water provided to employees.

### **9.5 Access and Haul Road Plan**

Not Applicable. No access or haul roads will be built during this project.

### **9.6 Respiratory Protection Plan and PPE**

This section outlines the PPE to be used on this project as well as reasons for downgrade or upgrade. There is no anticipated need for respiratory protection to be required on this project.

### 9.6.1 Respiratory Protection Plan

The need for respiratory protection for this project is not currently required based upon the scope of work activities and the concentrations of site contaminants known or anticipated to be present during the tasks being performed and because the contaminants such as PAHs, PCBs, pesticides, and metals known to be present are not particularly volatile in nature (see Section 9.7.1 for more information).

Occupational exposure to site contaminants during excavation through inhalation or ingestion or dermal contact are not anticipated to exceed the OSHA permissible exposure limit (PEL) or action levels as long as engineering controls (such as effective dust control that results in no visible dusts being generated), good decontamination practices (when required), and good hygiene practices (such as hand washing) are properly implemented and the required PPE is used as specified in this plan. If respiratory protection becomes necessary, the SHM will be contacted to modify this APP using the Field Request Change (FCR) form where the required protection and the parameters regarding use of respirators will be detailed and approved by the SHM and accepted by the RPM. Site personnel will refer to TtEC EHS 5-2, Respiratory Protection and comply with Section 5.G of the EM 385-1-1, and 29 CFR 1910.134.

### 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 and include the date the evaluation was conducted, the activity evaluated, PPE recommendations, and the name of the person(s) performing the assessment.

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 or when working around operating construction equipment, safety glasses, safety boots that comply with ASTM F2412 and ASTM F2413, leather work gloves, work clothes, ear plugs when noise exposure is a hazard, a high visibility vest when working around traffic or operating construction equipment, and weather-appropriate clothing. Refer to TtEC, EHS-5-1, Personal Protective Equipment and EM 385-1-1, Section 5 for general requirements on the use and proper wearing of PPE.

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 potentially contaminated soils or sediments where workers could come into contact with the soil or sediments, additional levels of PPE are required (as specified in the AHAs) to keep dermal contact exposures to a minimum and may include:

- Nitrile gloves will be worn under leather work gloves when there is a potential for hands to contact contaminated media (soil, sediment, water), tools, or equipment.
- Disposable boot covers (or PVC work boots [able to be decontaminated]) will be worn when walking in or on contaminated soil or sediments if this will become necessary (currently not anticipated).
- Workers working directly with contaminated sediment material must wear disposable coveralls and nitrile gloves.

In the event that groundwater handling is required and residual liquids could splash the worker:

- Workers will wear splash goggles and a 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 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 working with or around construction equipment operation (small to mid-sized excavator and/or vacuum truck, if used), including noise, slip, trip, and fall hazards, excavation hazards and working along slopes, hazards in use of small power and hand tools, and hazards from handling of debris and materials. In addition, there are some low level chemical hazards associated with COCs present in soil and sediments within STP Site 7 (see Section 9.7.1 below). 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/or bites or stings by insects.

Weather hazards may also be present including potential for high winds, lightning, heavy rains, or even snow or ice storms.

TtEC will create systems and procedures to prevent and control physical, chemical, biological, and environmental hazards identified through the risk analysis. The hierarchy of controls is engineering, administrative, work practice, and PPE. Whenever feasible, engineering, administrative, or work practice controls will be instituted even if they do not eliminate the hazard or reduce exposure. 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 9.37 of this APP identifies and describes physical hazards and mitigation measures to reduce those hazards where otherwise not already included in other sections.

Section 9.7.1 addresses chemical hazards and mitigation measures to reduce those hazards.

Section 9.7.2 addresses biological hazards and mitigation measures to reduce those hazards (e.g., bloodborne pathogens, animals, poisonous plants, and insects).

#### 9.7.1 Chemical Hazards and Mitigation

Based on 2009 sampling data, soil and sediment remaining above the remediation goals from prior remediation sites include the following:

Arsenic – ranging from 11.8 milligrams per kilogram (mg/kg) to 102 mg/kg

Benzo(a)pyrene – ranging from 2.2 mg/kg to 18 mg/kg

Benz(a)anthracene – ranging from 21.4 to 32 mg/kg

Benzo(b)fluoranthene – ranging from 23.6 mg/kg to 26 mg/kg

4-4-DDT – ranging from 20 mg/kg to 89 mg/kg

Dieldrin – at 49 mg/kg

PCBs - less than 1 mg/kg

In addition, it is believed that sediments remaining within the buried pipe that will be removed will contain higher concentrations of site contaminants than what is listed above due to

concentration over time. Workers that are working directly with contaminated material (ground workers) will be required to wear disposable coveralls and nitrile gloves.

During soil and/or sediment handling operations, including excavation and sediment removal tasks, dust may be generated. Good dust control methods will be the primary engineering control during all soil/sediment handling activities. Occupational exposure to site respirable dusts as well as COCs in sediments (PAHs, PCBs, pesticides, and metals), through inhalation or ingestion or dermal contact are not anticipated to exceed the OSHA PEL for any particular contaminant as long as engineering controls (such as effective dust control that results in no visible dusts being generated during soil handling tasks), good decontamination practices, and good hygiene practices (such as hand washing) are properly implemented and the required PPE is worn as specified in this plan.

In the event there are detectable odors during the excavation activities, a photoionization detector (PID) and/or a 4-gas meter (lower explosive limit (LEL), hydrogen sulfide (H<sub>2</sub>S), oxygen and carbon monoxide) can be used to assess the potential for an exposure hazard not related to the COCs. None of the COCs are detectable by real time air monitoring. If these meters are used, the following action levels will be used:

PID greater or equal to 10 ppm

LEL greater or equal to 10% LEL

Oxygen less than 19.5% or greater than 22%

Carbon monoxide 10 ppm or greater

The action will be to stop work and leave the area until it goes below action levels. If the levels do not change or if after resuming work, the levels again exceed action levels, Stop work and contact the SHM.

A variety of engineering controls will be implemented during the work tasks to maintain effective dust control and to minimize the potential for the spread of contaminants to adjacent areas as follows:

- During soil and sediment handling activities, including excavation, site dust control measures will be implemented to the extent required to prevent visible dust generation. Soil will be sprayed/misted with water prior to and during these tasks (as required), especially on dry days or when soil/sediment is dry.
- Whenever possible, workers will position and stage upwind of excavation and soil or sediment handling operations.
- All sediment loads will be covered/enclosed for transportation offsite.
- Contaminated soil and sediment loading or movement activities will be performed in a manner that prohibits spillage of the material onto uncontaminated areas. Means and

methods will be under the supervision of the SS. Spills of soil or sediment material, should they occur, will be cleaned up promptly.

- 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 (and will do so in designated areas).
- Workers will doff and stow any soiled PPE in a designated location under direction of the SSHO and will not wear or bring or wear any contaminated clothing or work boots beyond the contamination reduction zone unless properly decontaminated and in no instance will they bring such items into break areas, office areas, or into the cab of site vehicles. 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.

### 9.7.2 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) and other engineering controls (Section 9.7.1 above) to prevent the potential spread of contaminants into previously unaffected areas of the site and help minimize the potential for exposures. A three-zone approach will be used during work at this site when there is a potential for coming into contact with or spreading of site contaminants. This approach will be comprised of an exclusion zone (EZ), a contamination reduction zone (CRZ), and an 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 and activities being performed.

Where there is no potential for contact with contaminants, the three zone approach is not required and rather, work areas will be established around hazardous work activities (including excavations, heavy equipment operations, etc. to protect workers from physical hazards and maintain safe distances. This applies only to site inspections when there is no excavation or loading activities. In this case, direct contact with removed materials is prohibited.

Site control requires the establishment of a regulated area and designated site work zones appropriate to the work task. To minimize the transfer of potentially hazardous substances from the site, project personnel will:

- Schedule operations that use minimum numbers of personnel.
- Establish and mark site work zones around each worksite location as appropriate.
- Control who enters any exclusion zone and ensure they are trained.
- Implement appropriate decontamination procedures and other engineering controls as appropriate when workers leave the exclusion zone.

- Keep the client and other affected contractors informed of changing work zones and requirements.

#### *9.7.2.1 Exclusion Zone*

EZs will be formed around active excavation work sites, sediment removal operations, and during work tasks that require controlled work areas. Barricades or cones, along with caution tape, will delineate the EZ. Workers in this zone will be responsible for implementing proper engineering controls for the work being performed as well as wearing the prescribed PPE. Workers will place contaminated tools and equipment on plastic sheeting in the EZ to prevent contamination of the surrounding area and berms as required until the tools are appropriately decontaminated and removed from use.

#### *9.7.2.2 Contamination Reduction Zone*

Adjacent to the EZ at locations where contaminants may be present, 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 (e.g., boot wash, doffing or contaminated PPE, etc.) 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.

#### *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 SSHO is responsible for establishing and maintaining appropriate equipment and personnel decontamination areas or working with the subcontractor's Foreman to ensure adequate decontamination methods are being used where contaminants are present (anticipated being the catch basin cleanout only). The SSHO also ensures that adequate decontamination procedures are identified 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 to personnel or to non-contaminated 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.
- Set up the soil and sediment handling areas prior to placement of soils and sediments to help limit the need for workers to make contact with contaminants when possible, including having designated paths and staging areas.
- 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.

### 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.

### 9.7.3.4 *Personnel Decontamination*

It is anticipated that in most instances, PPE will not be contaminated and can be doffed and stowed for reuse or disposed of without wet decontamination. However there may be a need to use a boot wash or other minor wet decontamination if workers walk in contaminated sediments and have mud adhering to 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 that is established as 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 receptacle for used disposable PPE will be provided in the CRZ for workers to dispose of the PPE after doffing. A location will likewise be established for workers to stow re-usable PPE after decontamination for further reuse. The location will not be in any office or break room where food and/or drink are consumed.

A hand washing station will be available in or near to the SZ 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.

In general, personnel decontamination will consist of:

- Removing residual materials regardless of their source before taking breaks or engaging in hand-to-mouth activities.
- Proper physical decontamination methods will be followed when leaving an EZ.
- Employing soap and water wash and rinse for hands and face. Hygiene wipes may also be used but are 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, offices, or site or personal vehicles.

#### 9.7.3.5 *Equipment Decontamination*

It is anticipated that 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.

Wet decontamination methods are not anticipated to be required for any equipment at this time. Excavator tracks and truck tires are not anticipated to come into contact with contaminated soil or sediment. 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 will provide this information to the SSHO prior to commencing work, and will have 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).
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.

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. Humans and horses are known as dead end hosts, because once a human or horse is infected, the virus is no longer transmitted.

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, although neurological effects may be permanent.

Control measures to prevent contacting WNV include:

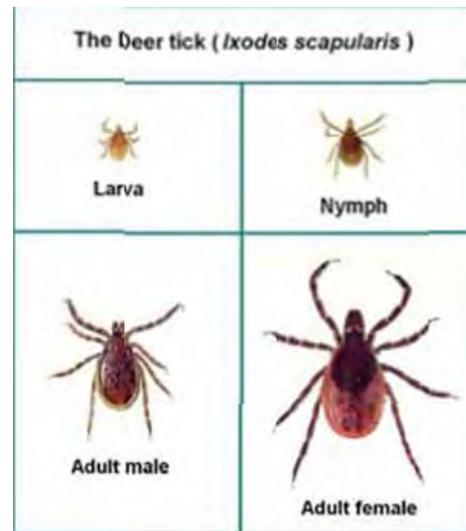
- Mosquitoes are most active at dawn and dusk. Limit outdoor activities at those times, when possible.
- Wear long-sleeved shirts and long pants.
- Spray DEET on your skin and permethrin on clothing and work boots.

#### 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 antibiotics 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 is 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/](http://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. The removed tick should be saved in small bottle and labeled with the date and location of origin. The tick can then be tested for Lyme pathogens.

#### *9.7.4.4 Poisonous Plants*

Poison ivy, oak, or sumac may be present in Massachusetts, though they are not known to be present or widespread and are not as likely in developed or maintained areas of the site. 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 poison ivy 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 Zanafel, 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 Zanafel, 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 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 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**

The hazard communication program applies to all products containing hazardous and/or toxic agents used on site during the course of the project. For all products meeting this requirement, MSDSs or SDS will be obtained and each product will be listed on a Hazardous or Toxic Agent Inventory. The MSDSs/SDSs and inventory (preliminary copy is included in Appendix G) will be maintained and updated at the site by the SSHO per the HAZCOM standard and TtEC's HAZCOM program.

The content of the MSDS or SDS will be discussed with employees using these products before they begin work. Workers using these products will be trained to recognize chemical contact and health hazards, personal protective measures to be taken to control exposures, and labeling requirements of containers used for transport. The MSDSs or SDSs will be maintained available at any time to each employee upon request.

For this project, the product inventory and MSDS/SDS file will consist primarily of very small quantities of petroleum products associated with heavy equipment operations and routine maintenance (e.g., gasoline, diesel fuel, lubricant grease). If other products are required (e.g., spray paint, pipe solvents or cement, etc.), the MSDS or SDS will be obtained, the product added to the inventory, and the product information communicated with all project personnel. The subcontractor will be required to submit their inventory of hazardous materials as well as MSDS or SDS for products they will require onsite.

MSDS or SDS for hazardous materials planned for use, and the initial Hazardous or Toxic Agent Inventory; however this list is only preliminary as all hazardous materials required for the project are not yet known.

Products and hazardous materials will be maintained in the original product manufacturer's containers with the exception of bulk purchased items such as gasoline and diesel fuel (if required). Gasoline and diesel fuel will be contained UL-listed metal safety containers. Any products transferred to an alternate container will be appropriately labeled with the product identification and hazard warnings. Workers that may be exposed to or in contact with fuels or

lubricants will wear nitrile gloves and wash hands with soap and water after the task is complete. Refueling operations (if required) will be performed in an area designated by the SSHO. Workers will position themselves upwind during fueling operations and avoid inhalation of vapors. When not in use and if stored onsite during the project, products and fuel containers will be appropriately stored in the site in a flammable material storage area. Upon completion of the project, unused products will be transferred to other project sites for reuse.

### **9.9 Process Safety Management Plan**

Not applicable.

### **9.10 Lead Abatement Plan**

Not applicable.

### **9.11 Asbestos Abatement Plan**

Not applicable. There are no components, including piping insulation at the treatment facility, that will be handled or removed during this task that contain asbestos.

### **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 planned activities at this site from exposure to ambient temperatures and season in which the work is conducted, effects of wind chill, 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.

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.
- 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 kilogram) 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 to 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 kilogram) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

Cold weather in Massachusetts 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 9-3). 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 Massachusetts 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 greater than 20 miles per hour [mph] or air temp 40°F and wind speed greater than 5 mph). Insulating dry clothes will be available.

### **9.15 Crystalline Silica Monitoring Plan (Assessment)**

Crystalline Silica exposure is possible during the removal of the existing concrete headwall. Long periods of exposure are not anticipated. Exposure to respirable dusts will be mitigated by continuous watering at the concrete breaking point, using a garden hose, or similar. If concrete activities present a potential for long periods of exposure and/or if the SSHO determines that the dewatering method is not adequate, additional measures will be taken. Additional measures may include air monitoring using a RAM (mini, Data, or equivalent) to ensure that the respirable dust levels are not greater than 0.1 mg/m<sup>3</sup>.

### **9.16 Night Operations Lighting Plan**

Night operations are not anticipated to be required for any of the project tasks. All work will be performed during daylight hours. Should this change, this section of the plan will be updated to include the requirements for performing night operations, including proper illumination.

### **9.17 Fire Prevention Plan**

Fire prevention and protection measures require preplanning. Fire extinguishers (as noted in Table 9-1) will be available at active work locations, refueling areas, and vehicles/heavy equipment.

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 SS/SSHO in accordance with base instruction.
- Hot work activities are not anticipated. If the work requires hot work procedures, this plan will be updated to include hot work requirements in accordance with TtEC's Hot Work Procedure and permit system as well as any applicable base required procedures and coordination.
- Refueling will be performed only in a designated area.
- 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.

- Any small spills will be promptly cleaned up and sorbent materials will be placed in a closed metal container for disposal.

## **9.18 Wild Land Fire Management Plan**

Not applicable.

## **9.19 Hazardous Energy Control Plan**

All applicable equipment will be covered by a safe clearance or lockout/tagout (LO/TO) procedures and all energy sources will be controlled before performing service or maintenance on equipment in which the unexpected energizing, startup, or release of stored energy could occur and cause any of the following: personal injury, property damage, loss of content, loss of protection, loss of capacity, or harm to the environment. Systems with energy isolating devices that are capable of being locked out shall be locked out. If an energy isolating device is not capable of being locked out, hazardous energy control procedures will use tagout providing full personnel protection as per EM 385 1-1 Section 12.A.11.c.

All tasks at STP Site 7 will be evaluated prior to starting work on the system to determine if hazardous energy sources are present and if so, the proper means of isolation that is appropriate to secure the source of energy for each work task. Electrical energy work is not anticipated to be required as part of the Site 7 work activities. In addition, the pipelines to be removed are not pressurized.

## **9.20 Critical Lift Plan**

Not applicable, as no cranes will be used on this project and critical lifts only apply to lifting by means of a crane.

This section; however, is being used to address hoisting operations (lifting of equipment [not personnel]) by means of mechanical equipment such as an excavator) as these type of lifts may occasionally be required for loading and unloading of equipment and materials (if required).

### **9.20.1 General Requirements**

Hoisting and rigging operations will be suspended during excessive inclement weather at the discretion of the Competent Person. A competent person will be designated (*TBD*) for hoisting and rigging tasks.

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 operations are to be performed. Inspections will include all functioning parts and systems, mechanical structures, and site conditions associated with hoisting 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 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.
- 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 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 equipment operator.
- Personnel will not be allowed to enter the swing radius of the 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 (tagline) will be attached to the load to allow positioning without requiring personnel in the vicinity of the placement location.
- 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 and Rigging 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 (in this case, the SS) 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). 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.

### **9.21 Contingency Plan for Severe Weather**

The potential for severe weather is possible at South Weymouth, Massachusetts. Seasonal storms can occasionally be severe, including high winds, rain, sleet, snow, or hail 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. 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.

The SSHO will assess what work procedures can be safely performed when wind conditions exceed 25 mph or lesser wind speeds may require consideration of work suspension if hazards are recognized. The SSHO will also give consideration to fugitive dust emissions, the safety of equipment in high winds, and protection of workers from flying debris and dust in windy conditions.

### **9.22 Float Plan**

Not applicable.

### **9.23 Site-Specific Fall Protection and Prevention Plan**

Not applicable. There is currently no work currently anticipated that will expose workers to a fall of six feet or greater on the project and the need for fall protection planning is not currently anticipated.

### **9.24 Demolition Plan**

Not applicable.

### **9.25 Excavation/Trenching Plan**

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. Excavations depths are projected to be 5 feet deep or greater in some areas. Figure 2-2 shows approximate excavation areas and nearby structures. Excavations will be performed using a small to medium sized excavator. Excavations will generally be backfilled after confirmation sample results indicate that the remedial action objectives are met; and the excavation may remain open for several days. Any open excavation will be barricaded when left unattended.

Excavations will be sloped on all sides (as is feasible) such that cave-ins will not occur (no shoring will be required) and ease of access in and out of the excavation by foot will be provided for personnel for entry and egress into shallow excavations (up to 5 feet deep) if entry is required to perform a task. If safe sloping is not feasible, the competent person must evaluate other means of shoring required if personnel are to enter the excavation if the excavation is 5 feet deep (or shallower based on actual field conditions. The competent person will evaluate soil type and other potential hazards to make this determination. Personnel will not be permitted to enter

excavations greater than 5 feet deep on this project. The management of excavations in this manner will not require the excavation to be managed as a confined space. During excavation, the competent person, identified in Section 9.25.1, will be present onsite and be responsible for conducting daily inspections of the excavation and overseeing excavation safety as contained in EHS Procedure 6-3.

Exploratory techniques, such as “pot-holing,” will be performed to ensure that any excavation near utilities can be performed safely.

Dust suppression measures during soil disturbing activities such as excavation will be performed in such a way as to minimize the generation of dust and may include light misting with water spray as necessary.

Personnel entry into excavations greater than 5 feet deep will not be allowed and entry into even a shallower excavation will only be with the permission of the excavation competent person. The following provides general requirements governing activities in and around excavations and trenches.

- Surfaces surrounding open excavations will have all surface hazards removed.
- All utilities will be located and cleared prior to initiating digging (National One Call 811). Public or facility utility groups will be used where possible for this purpose. In the absence of either, the SSHO will specify the procedures to be used to clear utilities in consultation with the SHM and PM. When the excavation is open, utilities (if present) will be supported and protected from damage. Clearance and support methods will be documented on the daily inspection checklist.
- EM 385-1-1, Section 25, requires the installation of perimeter protective systems for all open excavations. Class I perimeter protection is the most protective and requires installation of fences and barricades, which would prevent members of the public (people other than workers) from entering or falling into the excavation. Consult the EM 385-1-1 for the types of protective system required for various situations.
- When vehicles and machinery are operating adjacent to excavations, warning systems such as stop logs or barricades will be used to prevent vehicles from entering the excavation or trench. In any case, vehicles, equipment, materials, and supplies will never be placed closer than 2 feet from the edge of any excavation.
- Excavated and loose materials should be kept at least 3 feet from the edge of excavations but at a minimum of 2 feet from the edge of the excavation in accordance with OSHA requirements.
- If the need for entry into excavations greater than 5 feet in depth arises, this excavation and trenching plan will be updated to include site-specific information that will be required in addition to the basic information contained herein (e.g., protection of adjacent structures, protection of utilities, traffic control needs, diagrams or sketches of the work area, etc., anticipated soil conditions and protection methods, as necessary).

### 9.25.1 Excavation Competent Person

The SS/SSHO, Richard Claydon, has been designated by the PM as the excavation competent person to oversee proper implementation of all excavation safety. 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

Training records will be maintained in accordance with EHS 1-9, Recordkeeping. The Competent Person will provide site personnel with training on-site-specific excavation requirements as outlined in this plan and the task AHAs. The Competent Person will be on-site daily during excavations.

### 9.25.2 Daily Inspections

Inspections will be performed daily on all excavations, adjacent areas, and protective systems (if used) before personnel enter the excavation. The checklist provided in EHS Procedure 6-3 or equivalent will be used.

### 9.25.3 Soil Classification

Based on knowledge of the site from the previous removal effort, the soil and excavation is anticipated to be disturbed. The competent person will use a 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).

### 9.25.4 Sloping and Benching

All sloping and benching will be done in accordance with 29 CFR 1926.652. Selection of the sloping method and evaluation of surface surcharge loads will be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications will be listed on the daily inspection checklist.

### 9.25.5 Stability of Adjacent Structures

There are no adjacent structures that will require stability requirements to be implemented.

#### 9.25.6 Protective Systems

Not applicable, as personnel will not be permitted to enter excavations greater than 5 feet in depth.

#### **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 (SSHP) for HTRW Work**

SSHP requirements have been incorporated into 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 pits, tubes, trenches, and vessels.

In areas where deep excavation (> 5 feet) is required and confined space hazards are present, personnel will not be allowed to enter the excavation. Sampling efforts will be performed using non-entry techniques, such as collecting soil using the excavator bucket. If a water truck is used, the truck tank is a confined space and will not be entered for any reason. In addition, the tank on the vacuum truck, if used, is a confined space and will not be entered. No confined space entry is currently allowed per this plan.

Prior to the start and during the conduct of work at each site, the SSHO and the SS will identify confined spaces or confined spaces created by the nature of the work. The SSHO will not allow entry into these spaces. If a confined space requires entry, by any part of the body, after this plan has been approved but was not part of the original plan, this section will be modified and approved per the amendment procedure described in this APP and an AHA will be developed for the task. The SHM will review all confined space entry plans and completed checklists, training and qualifications of the confined space team, and/or permits prior to entry.

All 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. Confined space entry requires a specific course and compliance OSHA 29 CFR 1910.146 and EHS program for confined space entry.

### **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 (e.g., excavator, vacuum tank truck) exceeding occupational noise exposure limit action levels. Exposure to noise equal to or exceeding the OSHA 8-hour time-weighted average 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

Prior to the use of the vehicles and equipment, operators will conduct a safety inspection and record the findings in the Safety Inspection Equipment Checklist (Appendix D). Dust suppressant (water misting) will be used for controlling airborne dust generation to the fullest extent possible without causing runoff or hazardous conditions. In addition, vehicular traffic speed on non-paved roads will be restricted to 15 mph (or less). Motor vehicles and material handling equipment assigned to these sites will conform to the requirements of 29 CFR, Parts 1926.601, and 1926.602. Crews using personnel transport vehicles to and from the worksites will use the vehicle's safety belts. Drivers of vehicles will be responsible for passenger use of the safety belts. Personnel are not allowed to ride in the bed of pickup trucks, unless there is an approved restraint system installed and used. The Site Superintendent is responsible for maintaining a clean jobsite, free from hazards, and for providing safe access and egress from the site. Traffic cones and/or high-visibility barrier tape will be used, where appropriate, for traffic control into/out of restricted areas. Personnel will wear reflective, high-visibility safety vests or clothing whenever working in and around vehicles and on roads and jobsites. Other requirements include the following:

- Whenever the operator leaves the operator's position, the equipment will be turned off unless the equipment must be kept running to perform required maintenance or a safety inspection. (In this case, the operator will prevent the movement of the equipment by placing equipment in “park,” by setting the emergency brake or another type of brake, or by placing blades or pans to the ground or any other manufacturer-recommended method to keep the vehicle from moving.)
- Blades and buckets on heavy equipment will be lowered during transport. Blades and buckets will be placed on the ground whenever the operator leaves the machine.
- Construction equipment (heavy equipment) has the right-of-way in field activities.
- Heavy equipment will have a reverse signal alarm (90 dBA) that operates automatically.

- The equipment will have brakes and brake lights. Equipment operated in hours of darkness must have operating headlights.
- Personnel will not ride on, or be on, any equipment while it is in motion unless there is a seat or stand designed for a person to occupy that has restraints, such as approved seatbelts.
- Seatbelts and restraints will be used when any equipment is in motion. The project will use heavy equipment including excavator and/or backhoe, dozer, and haul trucks. This equipment poses unique and immediate hazards that, if uncontrolled, can result in severe injury or fatality. 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 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.
- During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory.
- All posted traffic signs and directions from flagmen (if used) will be observed.
- The designated haul routes will be communicated with all vehicle and haul truck operators.
- Personnel will be prohibited from placing themselves between operating equipment and immovable objects.
- Personnel will wear 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.

Personal responsibility will be invoked as a safety precaution. 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.

Heavy equipment 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 D.
- 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.

### 9.37.3 Traffic

TtEC and subcontractor personnel will follow local traffic rules. Other contractor and base operations may be ongoing simultaneously with TtEC activities in some areas, including regular traffic on roadways in and around the unrestricted areas of the site. Coordination will be maintained through the NTR or RPM as required to ensure traffic safety and the delineation of controlled work zones and traffic patterns. Site vehicles and haul trucks will yield to pedestrians, if present. Personnel working in areas subject to vehicular traffic (streets, parking lots, and so forth) will wear high-visibility safety vests. Flashing light or reflectorized barricades will be used for roads that are temporarily blocked due to equipment use. Fences and barricades, as well as appropriate signage will 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 .

#### 9.37.4 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.

Before working on systems that contain electrical or other hazardous energies, LO/TO procedures will be met to control or isolate hazardous energies.

Requirements for electrical safety include:

- Electrical wiring and equipment will be listed by an OSHA-recognized testing laboratory. The usual recognized testing laboratories are UL, Canadian Standards Association (US), and Factory Mutual.
- 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 as specified in EM 385-1-1 section 11.A.02 (c). Compliance with Section of 11 is required.
- 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 30-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. A 36-inch clearance is required for higher voltages. TtEC requires a 36-inch clearance of the breaker boxes, and so forth.
- Circuit breaker boxes that are locked, or kept in locked rooms, must have a key readily available in the event of an emergency.

Portable generators, if used, must meet the requirements for grounding as specified in the National Electric 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.

#### *9.37.4.1 Overhead Electrical Hazards*

Overhead power lines, if present, are 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; more clearance is required for higher voltage lines. If adequate clearance cannot be maintained, electrical disconnects may be required to secure against a contact hazard. The SS/SSHO will evaluate the site and work areas, including traffic routes where equipment with booms may travel for overhead lines and implement precautions to maintain sufficient clearance. No trucks or equipment will travel with booms or dump beds extended.

#### *9.37.4.2 Underground Utilities*

A high-loss-potential hazard includes excavation activities with its associated potential for contact with underground utilities. When conducting intrusive activities such as excavation and 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 in accordance with TtEC Procedure EHS 3-15.

#### 9.37.5 Slips, Trips, and Falls

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

- Uneven terrain due to excavation or cultural debris
- Workplace clutter

- Wet or slippery surfaces
- Open excavation leading edges

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.

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 and open excavations.
- Proper selection and use of portable ladders (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 the EM 385-1-1.

#### 9.37.6 Head Injuries

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

#### 9.37.7 Falling Objects

No personnel will work under equipment or suspended loads at any time. Hoisting and rigging tasks will be performed as outlined in the APP (see Section 9.20) and a specific AHA has been developed for this task. Also, the supervisor will verify that a sufficiently wide area is clear of personnel while the equipment is in operation.

#### 9.37.8 Heavy or Awkward Lifting, Ergonomic Strains, and Back Injuries

Routine activities at the project may involve tasks that, by their nature, may subject personnel to unexpected ergonomic stresses. Examples of ergonomic stresses include:

- Muscular sprains and strains
- Musculoskeletal trauma from impacts or vibrations
- Fatigue due to extended work schedules

Caution and workload awareness should be exercised by site personnel during project activities. Tasks which involve manual manipulation of tools or materials, and/or prolonged exposure to vibrating mechanical equipment should be monitored by the individuals involved with them to preclude the adverse effects of ergonomic stress.

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 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.

#### 9.37.9 Illumination

Site work, when performed outdoors, is scheduled to be performed during daylight hours only (1/2 hour after sunrise to 1/2 hour before sunset). If work must be performed during hours of darkness or inside buildings, the project will provide additional lighting is to meet the requirements of EM 385 1-1 Table 7-1.

#### 9.37.10 Portable Power Tools

Any portable power tools (e.g., drills, reciprocating saws, 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. All electrical equipment must be listed by a Nationally Recognized Testing Laboratory as required by Subpart S of 29 CFR 1910 and Section 11.A.a. in EM 385 1-1.

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 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 nationally recognized laboratory 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).
- Do not use "cheaters" to increase capacity. Get a bigger sized tool.
- Know how to shut a tool off before turning it on. No locked "on" switches on hand-held power tools.
- Eye protection is required for protection from flying particles.
- Power-activated tools will be inspected daily before use for proper operation of tool safety devices. Workers must be authorized by a foreman to operate this equipment.
- Power tools designed to accommodate guards will have guards installed and functioning prior to use.
- The power supply must be properly attached to the tool and to the source. Electric tools must be grounded (or "double insulated").
- Check the work area for other people before starting the power tool. Warn people nearby.
- Be prepared for jamming of rotating tools. Maintain good footing, good balance, and watch out for nearby obstructions. Check for loose clothing.
- Shut off and bleed down the air hose before disconnecting air tools. Never point an air hose toward another person or yourself.
- Power tools must be GFCI-protected. Electric power tools must be double-insulated or have a grounding prong on the cord.
- Avoid using power tools in wet locations (air-powered tools may be used).
- Protect cords and plugs from damage. Keep the power cord away from the operating portion of the power tool.
- Power tools must be turned off before disconnecting from the power source. If a circuit breaker is tripped or the tool stops operating, turn off the power switch before disconnecting the power source.
- Disconnect power cords from the source before coiling.
- Store tools in a safe place when not in use. Protect from weather, dirt, and water.
- All hand tools and power tools will be inspected prior to use. TtEC employs inspection checklists (see Appendix D) and colored stickers and/or tape, as previously described, to indicate that equipment has been inspected and is ready for use.

## **10.0 RISK MANAGEMENT PROCESSES**

AHAs for the planned activities are included in Appendix A of this APP and are listed in Section 2.5. 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 (Tetra Tech EC, Inc.). 2009. Project Orientation, Rules and Safety Guidelines Handbook. July.

USACE (U.S. Army Corps of Engineers). 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.

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## **TABLES**

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**Table 3-1. Comparison of TtEC and 2011 BLS Data for NAICS Code 237990 (TRIR and DART Rates)**

	<b>NAICS 237990 Heavy Construction Other than Highways 2011</b>	<b>TtEC 2010</b>	<b>TtEC 2011</b>	<b>TtEC 2012</b>
<b>Total Recordable Incident Rate (TRIR)</b>	3.5	1.32	0.92	0.30
<b>Days Away/Restricted Duty/Transfer Rate (DART)</b>	2.0	0.24	0.35	0.15

**Table 9-1. Type and Location of Emergency Equipment**

<b>Equipment</b>	<b>Location</b>
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 40:BC	Refueling areas
Portable eye wash (15-minute/0.4 gallon per minute)	Active work location
Air Horn (if not equipped with vehicle horn)	Active work location
Spill Kit (appropriately stocked with sorbent pads, gloves, and bags)	Each active work location and refueling areas.
Cellular Telephones	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)	<b>911</b>
Medical <b>Hospital: South Shore Hospital</b> <b>Weymouth, Massachusetts</b> <b>(See Figure 9-2)</b>	<b>911</b> (781) 624-8000 (Emergency Services)
WorkCare®	1-800-455-6155
Case Intervention	1-888-449-7787
Poison Control	1-800-222-1222
Navy NTR, Robert Krivinskas	(401) 841-1761
Navy FEAD/CSO, David Barney	(617) 753-4656
Navy RPM, Brian Helland	(215) 897-4912
Navy Contracting Officer, Zane Parry	(757) 322-4777
TtEC PM, Brian Corbett	(617) 443-7517 (office phone) (617) 470-8651 (cellular phone)
TtEC SHM, Roger Margotto, CIH	(619) 471-3503 (office phone) (619) 988-0520 (cellular phone)
TtEC SS, Richard Claydon	(617) 443-7516 (office phone) (857) 272-2020 (cellular phone)
TtEC SSHO, Richard Claydon	(617) 443-7516 (office phone) (857) 272-2020 (cellular phone)

*Abbreviations and Acronyms:*

- CIH – Certified Industrial Hygienist
- ET – Engineering Technician
- NTR – Navy Technical Representative
- PM – Project Manager
- 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**

<b>Core Temperature</b>	<b>Clinical</b>
95°	Maximum shivering.
87°-	Consciousness clouded; blood pressure becomes difficult to obtain;
84°-	Progressive loss of consciousness; muscular rigidity; respiratory
79°	Victim rarely conscious.
70°-	Maximum risk of ventricular fibrillation.

## **FIGURES**

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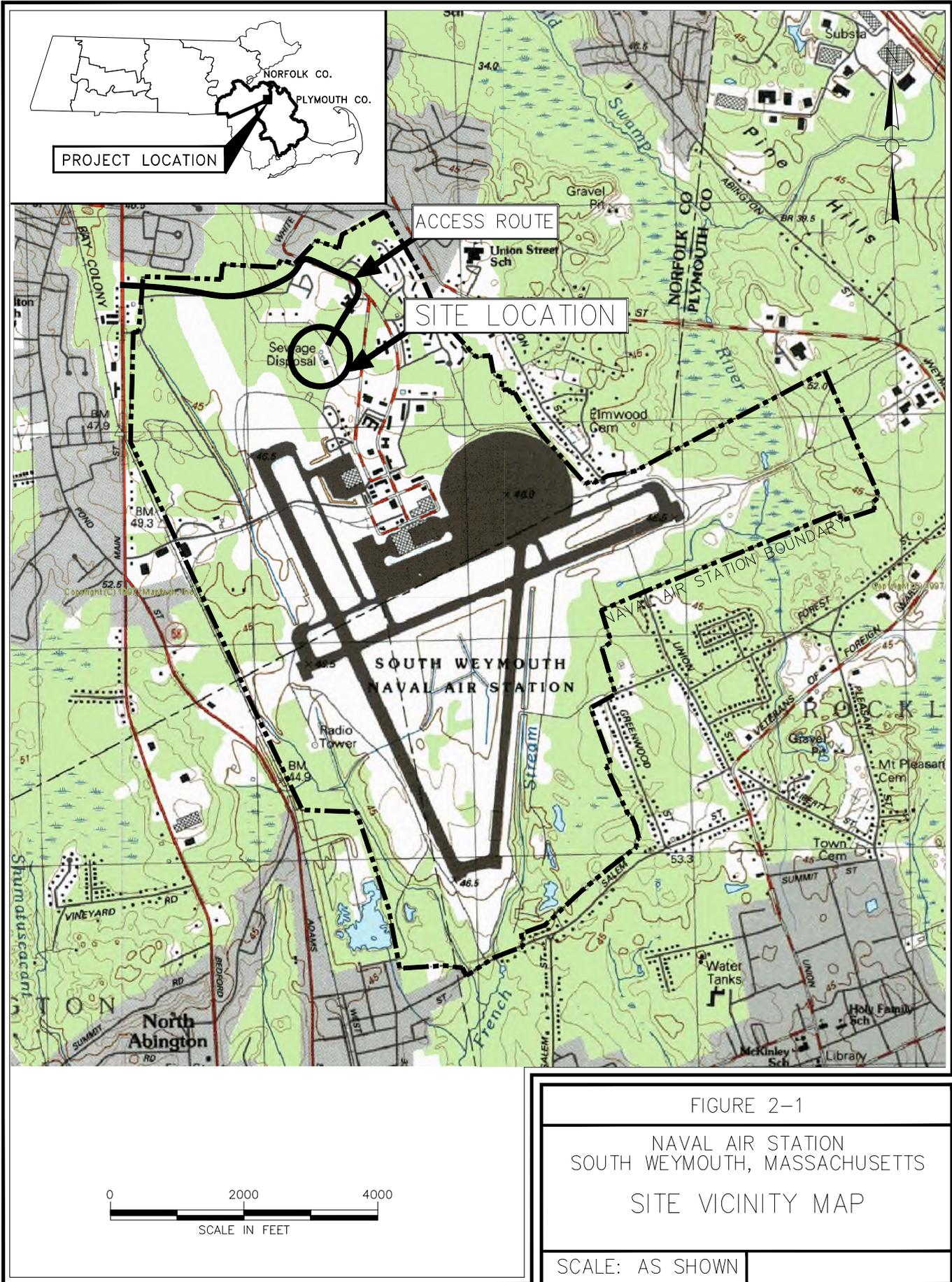


FIGURE 2-1  
 NAVAL AIR STATION  
 SOUTH WEYMOUTH, MASSACHUSETTS  
 SITE VICINITY MAP  
 SCALE: AS SHOWN

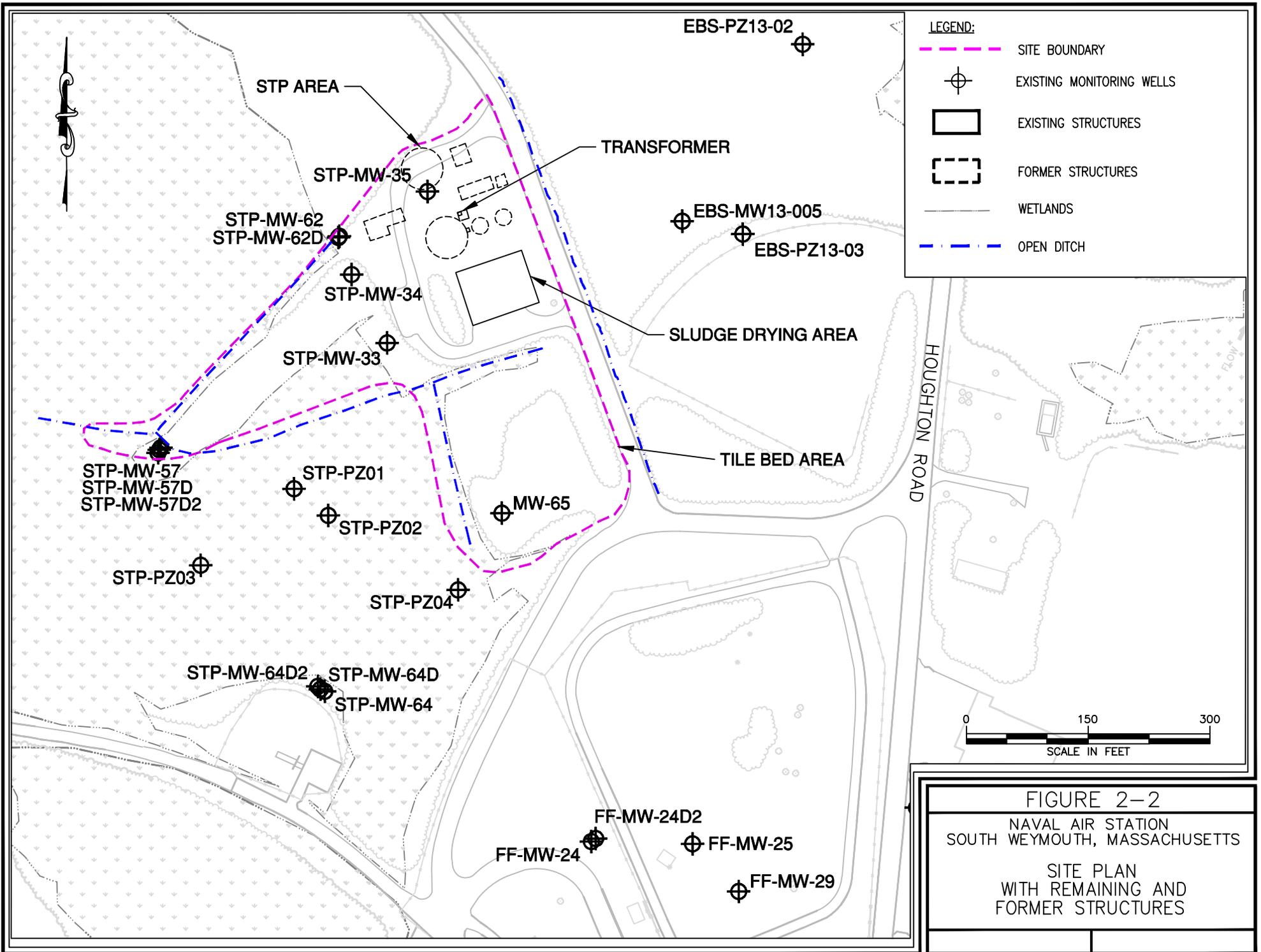
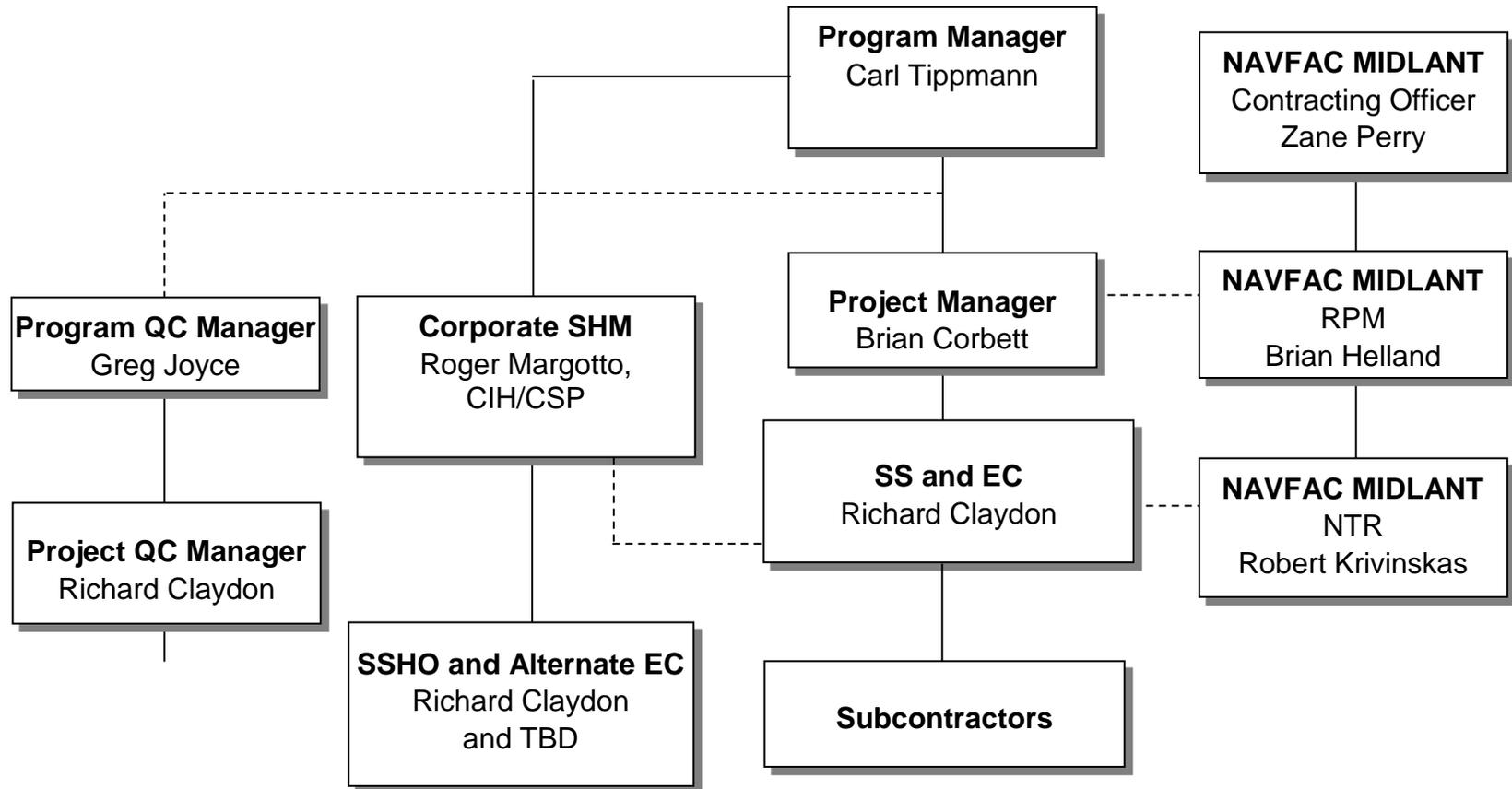


Figure 4-1. Organizational Chart



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South Shore Hospital  
55 Fogg Rd  
Weymouth, MA 02190

LEGEND:

 Hospital Route

To Hospital from NAS South Weymouth:

1. Turn right off of Shea Memorial Drive and head north on MA-18/Main St. toward Webster St. about one mile.
2. Turn right onto Fogg Rd.

Destination on left

Arrive at South Shore Hospital  
55 Fogg Rd  
Weymouth, MA 02190

IMAGE SOURCE: Creative Commons-Share Alike License (CC-BYSA)  
<http://creativecommons.org/licenses/by-sa/2.0>



Naval Air Station, South Weymouth  
Weymouth, MA

Figure 9-1  
Route and Directions to South Shore Hospital

DATE: JAN. 2014 | DWG FILENAME: APP HOSP ROUTE-REV | REV: A

 TETRA TECH



IMAGE SOURCE: Google Earth Pro.



 Naval Facilities Engineering Command		
Naval Air Station, South Weymouth Weymouth, MA		
Figure 9-2 Site Assembly Area		
DATE: JAN. 2014	DWG FILENAME: SITE ASSEMBLY ROUTE	REV: A
 TETRA TECH		

**APPENDIX A**  
**ACTIVITY HAZARD ANALYSES**

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# Activity Hazard Analysis (AHA) #1

<b>Activity/Work Task:</b> Mobilization and Site Setup	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: August, 2013		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	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.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
Job Steps	Hazards	Controls	RAC
Arrival at Location	Lack of Emergency Preparedness and Health and Safety (General) before beginning work	Get to know the location if not familiar. SSOH to locate the emergency hospital and ensure routes are correct as shown in Figure 9-1. Coordinate with FEAD and Navy personnel as required. Conduct site orientation with the personnel 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	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		work. Use buddy system. SSHO will have site workers fill out medical data sheets that are included in an appendix to the APP.	
<p>Unloading and initial staging of materials and equipment</p> <p>(general site hazards)</p> <p>Note: no site trailer will be set up onsite; office location will be existing building onsite.</p>	Vehicle operations from Tt or other tenant operations and delivery vendors could cause injury to personnel or others onsite	Workers operating company or subcontractor 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. All personnel and trucks will have Base badges following Base procedures. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear high visibility vest when working around operating vehicle traffic. Coordinate with other site tenants including the port 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 while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed.	M
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 10 – Hoisting and Rigging, which will be followed in addition to this AHA.	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 personnel) 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 marked.	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 with first aid and CPR training onsite.	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 potential overhead lines. The	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		SSHO 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 lines, if present, must be known.	
	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. SSHO to implement EHS 4-6, Temperature Extremes.	M
	Eye injuries from dust or debris	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 on roads and in laydown areas.	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.	L
	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. 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– potential underground utilities could be contacted	Implement Tt 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 National One Call, contact base for as-built diagrams and further information regarding other potential utilities.	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	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
	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	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 electrical work requires arc flash protection and a permit from the base as required by EM 385-1-1 , section 11.A.02.c. Inspect electrical service in the buildings on site for compliance with the National Electrical Code. Inspect outlets, switches, circuit breakers, etc. Circuit breakers must be labeled as to what they control, Check to ensure that all knockouts are covered per the Code.	M

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
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	Initially and at least weekly thereafter or after use

<b>AHA #1 – Activity/Work Task: Mobilization and Site Setup</b>		
	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.	for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used
Industrial hygiene monitoring equipment	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy. Refer to APP Section 9.7.1	Calibration and function checks before use. Contact SHM regarding monitoring requirements and strategies that may be necessary on this project.

**Abbreviations and Acronyms:**

- APP – Accident Prevention Plan
- DEET - N,N-diethyl-m-toluamide
- EHS – Environmental, Health, and Safety
- FEAD – Facility Engineering and Acquisition Division
- NRTL – Nationally Recognized Testing Laboratory
- OSHA – Occupational Safety and Health Administration
- 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.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

## Activity Hazard Analysis (AHA) #2

<b>Job/Task: Vegetation Clearing</b>	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by (Name/Title): Becky Whalen, Remediation Engineer	Catastrophic	E    E    H    H    M
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Critical	E    H    H    M    L
	Marginal	H    M    M    L    L
	Negligible	M    L    L    L    L
	<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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.</p>	
<p>Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (see above).</p> <p>“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.</p> <p>“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.</p>		<p><b>RAC Chart</b></p> <p style="background-color: #f08080; padding: 2px;">E = Extremely High Risk</p> <p style="background-color: #ffcc00; padding: 2px;">H = High Risk</p> <p style="background-color: #ffff00; padding: 2px;">M = Moderate Risk</p> <p style="background-color: #c0ffc0; padding: 2px;">L = Low Risk</p>
<p>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.</p>		

<b>AHA #2 – Job/Task: Vegetation Clearing</b>			
Job Steps	Hazards	Controls	RAC
Establish limits of vegetation clearing	Exposure to poison ivy or oak.	<p>As area is inspected, identify any “suspicious” vegetation that may be poison oak. Mark these areas with warning tape or spray paint in preparation for vegetation clearance. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves. Wear an “ivy blocker” and have Technu<sup>®</sup> or Zanfel post-exposure washing agent available.</p> <p>These plants need to be removed 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.</p>	M

**AHA #2 – Job/Task: Vegetation Clearing**

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 can be an inhalation hazard	Review MSDS for spray paint before use. Position upwind when spraying paint to mark limits.	L
	Failure to observe and prepare for encounter with insects, rodents, or snakes could cause injury to worker.	Observe for insects, rodents, and snakes. Use a “tapping” stick, if necessary, in any brush area to flush out or expose snakes before walking in brushy areas. Wear snake chaps (gaiters). 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
Cutting vegetation (includes grass and other vegetation cutting ) using tools such as handheld weed cutters	Noise could cause hearing loss while grass cutting equipment	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule also applies to personnel working around heavy equipment.	M
	Struck by or against heavy equipment	Wear high-visibility safety vests when working on ground in vicinity of powered or other clearing equipment. Make eye contact with operators before approaching equipment.	M
	Refueling of equipment could cause fires or spills.	Ensure equipment is turned off and allowed to cool before being refueled. Do not overfill by ensuring a small size fuel can is used which the worker can maintain good control over during refueling. Place equipment on a spill pad for refueling. Visually inspect refueling point to ensure overfill is not done. Do not fill to capacity; leave space for expansion in the tank.  Do not smoke in or near refueling areas. Do not refuel in back of a pickup truck. Have a fire extinguisher present at the refueling site and ensure workers are trained in their use.	L
	Strains to workers from use of tools, such as weed cutters.	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.	M
	Flying debris from cutting heads in motion	Ensure equipment used has guards in place. Wear long sleeved shirts and pants and lightweight coveralls. Wear leather work gloves and for face, wear safety glasses and mesh face shield.	M
	Punctures, cuts, scrapes, from vegetation debris such as sharp limbs	Remove limbs that present a puncture hazard in areas being worked in. When removing limbs using saw, watch where you are going and do not walk backwards.	M

**AHA #2 – Job/Task: Vegetation Clearing**

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.	L
	Encounters with insects, rodents, or snakes could cause injury to worker.	Observe for insects, rodents, and snakes. Use a “tapping” stick, if necessary, in any brush area to flush out or expose snakes before walking in brushy areas. 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.	L
	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. All workers will high visibility safety vests. Hard hats should be a bright color.	M
Tree cutting (includes using chainsaws)	Chainsaws can cut or strike workers causing severe injuries if used improperly	Workers will be trained and experienced in the use of chainsaws and will operate the chainsaws as per manufacturer’s recommendation. Chain saw will not be operated in a position above shoulder height. Anti-kick teeth will be in place and chain guard mechanism in place. Chainsaws will be industrial or professional grade and maintained per manufacturer’s requirements. Chain will be kept sharp. Inspect chainsaw before use. Wear steel toe leather work boots, leather work gloves and chainsaw chaps when working with chainsaws.	M
	Eye injuries with flying wood chips and debris when using chainsaws.	Workers will wear safety glasses and a face shield when using chainsaws. A portable emergency eye wash is located at the site trailer. If something enters the eye, do not rub. Use portable eyewash for flushing of eye – 0.4 gallons per minute for 15 minutes (ANSI Z-358.1) – 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
	Noise could cause hearing loss while using saws 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 chainsaws.	M

**AHA #2 – Job/Task: Vegetation Clearing**

Job Steps	Hazards	Controls	RAC
	Slips, trips, and falls during cutting activities	As trees are felled and limbed, debris will be placed into manageable piles to keep potential trip and fall hazards to a minimum.  Keep saw in off position when walking to new locations. Ensure you carry saw with chain facing out and away from body so that if you do fall, you do not fall onto chain. Lock in the chain keeper device when moving if saw is to remain in operation. Watch your steps.	L
	Workers on ground around tree felling activities could be struck by falling trees or limbs	In work areas where trees are being felled, workers doing other tasks or cutting other trees will not work within the fall radius of trees being felled by another worker plus a buffer of 25 feet. Workers will wear high-visibility vests on the ground and have a means of communication.  Workers cutting trees will be experienced in proper tree cutting techniques to direct fall direction away from them. Workers will ensure the area around the tree is clear so they can get clear of the trunk quickly when tree begins to fall. Workers must communicate carefully with each other and positively establish the proximity of other personnel prior to felling a tree and signal to others the tree falling prior to felling it.	M
	Refueling of equipment could cause fires or spills.	Ensure saws are turned off and allowed to cool before being refueled. Do not overfill saws by ensuring a small size fuel can is used which the worker can maintain good control over during refueling. Place equipment on a spill pad for refueling. Visually inspect refueling point to ensure overfill is not done. Do not fill to capacity; leave space for expansion in the tank.  Do not smoke in or near refueling areas. Do not refuel in back of a pickup truck. Have a fire extinguisher present at the refueling site and ensure workers are trained in their use.	M
	Punctures, cuts, scrapes, from vegetation debris such as sharp limbs	Remove limbs that present a puncture hazard in areas being worked in. When removing limbs using saw, watch where you are going and do not walk backwards.	L
	Lack of communication could lead to a delayed response in an emergency.	Ensure that each work team has a cellular telephone, or access to a cellular telephone, for emergency communication. A work team may substitute a 2-way radio for a cellular phone if the other radio party has access to a phone. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	L
Moving cut trees to staging area	Workers could experience strains from manually moving materials and	When possible, use heavy equipment (e.g., excavator with thumb) to move and stack log debris.	L

**AHA #2 – Job/Task: Vegetation Clearing**

Job Steps	Hazards	Controls	RAC
	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.	
	Log stacks could roll and injure personnel	Provide restraints on sides of haul vehicles and storage areas to contain logs if they shift. Keep personnel away from stacking operations and stage and load logs on level ground if possible. Do not ever walk on top of stacked logs.	L
All vegetation removing activities	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
	Lack of communication could lead to a delayed response in an emergency.	Ensure that each work team has a cellular telephone, or access to a cellular telephone, for emergency communication. A work team may substitute a 2-way radio for a cellular phone if the other radio party has access to a phone. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	M
	Cuts, scrapes, and hand injuries from handling debris	Wear leather work gloves when handling debris. Only pick up and handle as much debris as can be fed into the chipper at a time.	M

**AHA #2 – Job/Task: Vegetation Clearing**

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. Cutting tools including chainsaw	Specific training for power and hand tools will be provided. Review operators' manual for each tool and ensure that directions are followed.	Inspect before each use. Maintain as per manufacturer's recommendation. Review operators' manual for each tool and ensure that directions are followed.
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.
6. Industrial hygiene monitoring equipment	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy. Follow directions provided by industrial hygienist.	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
- DEET - N,N-diethyl-m-toluamide
- EHS – environmental health and safety
- EM – Engineer Manual
- 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

**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) #3

<b>Activity/Work Task:</b> Headwall and Pipe Removal	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager (SHM)	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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 handling any debris and when indicated, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	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.	<b>H = High Risk</b> <b>M = Moderate Risk</b> <b>L = Low Risk</b>

<b>AHA #3 – Activity/Work Task: Headwall and Pipe Removal</b>			
Job Steps	Hazards	Controls	RAC
Pipe removal	Inhalation and contact with hazardous substances while removing contaminated material from pipes	Review hazardous properties of site contaminants with workers before operations begin. Workers will be equipped with the proper skin, eye, and respiratory protection based on the exposure hazards present. Maintain dust control during excavation to prevent fugitive dust emissions. Arsenic is the only contaminant of concern. Visible dust levels have the potential to expose workers beyond the PEL for arsenic. Therefore dust control by use of light water spray mists is essential. If dust levels cannot be controlled contact SHM for discussion regarding additional PPE.	M

<b>AHA #3 – Activity/Work Task: Headwall and Pipe Removal</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Hoisting and Rigging of pipe for removal (if used during this AHA)	Refer to AHA 10 – Hoisting and Rigging, which will be followed in addition to this AHA.	M
Headwall Removal - concrete breaking (e.g., excavator with hammer attachment) and removal	Flying debris could cause injury to workers.	Ensure workers maintain safe distance during breaking of concrete. Wear face shields while on the ground in the work area.	L
	Exposure to silica dust possible during concrete breaking	If dust is generated during concrete breaking, dusts will be mitigated by continuous watering at the concrete breaking point, using a garden hose, or similar. If concrete activities present a potential for long periods of exposure and/or if the SSHO determines that the dewatering method is not adequate, additional measures will be taken. Additional measures may include air monitoring using a RAM (mini, Data, or equivalent) to ensure that the respirable dust levels are not greater than 0.1 mg/m <sup>3</sup> . Contact the SHM if this becomes necessary.	M
	Caught by rotating parts.	Ensure concrete saw, if used, is turned off prior to performing maintenance. Disconnect saw from a power source or disconnect the spark plug wire before servicing. Read and follow the operator’s manual. Avoid wearing loose clothing that may get caught in rotating parts. Ensure guards are in place.	M
	Rebar can cut or puncture or severely injure a person if they fall on it	Cut off or cap exposed rebar if workers will be working with the concrete if rebar is exposed and sharp ends protrude. Cordon off area around concrete debris piles as required.	M
	Strains and sprains caused by heavy lifting of concrete	Remove and lift concrete/asphalt debris with heavy equipment (excavator with thumb). Avoid generating dust or wet down the concrete during removal.	L
	High noise levels could cause hearing loss	Use hearing protection when exposed to excessive noise level (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that noise level may exceed 85dBA.	L
	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.	M
General activities	Struck by/against heavy equipment	Wear high visibility vest and hard hat when working in areas with operating construction equipment. Stay clear of swing radius and pinch points. Make eye contact/signal to operator when approaching equipment.	M

<b>AHA #3 – Activity/Work Task: Headwall and Pipe Removal</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	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 marked.	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 with first aid and CPR training onsite.	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
	Overhead utilities	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 and areas to be avoided will be marked and communicated or isolated through coordination with the local utility provider. The voltage of lines, if present, must be known.	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. SSHO to implement EHS 4-6, Temperature Extremes.	M
	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 on roads and in laydown areas.	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

<b>AHA #3 – Activity/Work Task: Headwall and Pipe Removal</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	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

<b>AHA #3 – Activity/Work Task: Headwall and Pipe Removal</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
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
- CPR – cardiopulmonary resuscitation
- dBA – decibels A-weighted scale
- EHS – Environmental, Health, and Safety
- NRTL – Nationally Recognized Testing Laboratory
- OSHA – Occupational Safety and Health Administration
- PEL – permissible exposure limit
- PPE – personal protective equipment
- 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.

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## Activity Hazard Analysis (AHA) #4

<b>Activity/Work Task:</b> Soil Excavation	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	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.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

<b>AHA #4 – Activity/Work Task: Soil Excavation</b>			
Job Steps	Hazards	Controls	RAC
Excavation of soil/sediment using excavator	Underground/overhead utilities	<p>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 National One Call, contact base for as-built diagrams and further information regarding other potential utilities.</p> <p>The Competent Person for excavation has been designated by the project manager. The Competent Person for excavation is Richard Claydon.</p> <p>The travel path, staging, and other locations where mobile equipment with</p>	M

<b>AHA #4 – Activity/Work Task: Soil Excavation</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		booms will be operated will be evaluated for potential overhead lines. The SSHO 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 lines, if present, must be known.	
	Excavation wall collapse	Slope/bench sidewalls of excavation to prevent wall collapse. Avoid placing material too close to excavation opening to prevent overloading of sidewalls. Personnel are not to enter if the excavation is over 5 feet in depth and not allowed to enter any excavation without the evaluation and permission of the Excavation Competent Person (Richard Claydon).	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 while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed.	M
	Struck by/against heavy equipment	Wear high visibility vest and hard hat when working in areas with operating construction equipment. Stay clear of swing radius and pinch points. Make eye contact/signal to operator when approaching equipment.	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 marked.	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 with first aid and CPR training onsite.	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
	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. SSHO to implement EHS 4-6, Temperature Extremes.	M

<b>AHA #4 – Activity/Work Task: Soil Excavation</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Eye injuries from dust or debris or struck by	<p>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.</p> <p>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 and in laydown areas.</p>	M
	Dust inhalation and contact with contaminated soil	Review hazardous properties of site contaminants with workers before operations begin. Workers will be equipped with the proper skin, eye, and respiratory protection based on the exposure hazards present. Maintain dust control during excavation to prevent fugitive dust emissions.	M
	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment or other elevated surface 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
	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

<b>AHA #4 – Activity/Work Task: Soil Excavation</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
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. The Competent Person for Excavation is Richard Claydon.	Receipt inspection by SS. Daily inspection by operator. Designation of Competent Person for Excavation signed by the Project Manager along with resume of training, experience or knowledge will be on file in site records and also provided to the RPM. A form naming the operators and the equipment they are qualified to operate signed by either the project manager or SS will be on file in site records.
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
- DEET - N,N-diethyl-m-toluamide
- EHS – Environmental, Health, and Safety
- MSDS – Material Safety Data Sheet
- NRTL – Nationally Recognized Testing Laboratory
- OSHA – Occupational Safety and Health Administration
- SHM – Safety and Health Manager
- 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.

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## Activity Hazard Analysis (AHA) #5

<b>Activity/Work Task:</b> Groundwater Management	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (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.  <b>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.</b></p>		
<p>Step 1: Review each “<b>Hazard</b>” with identified safety “<b>Controls</b>” and determine RAC (see above).</p>		
<p>“<b>Probability</b>” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.</p>		<b>RAC Chart</b>
<p>“<b>Severity</b>” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.</p>		<b>E = Extremely High Risk</b>
<p>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.</p>		<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

AHA #5 – Activity/Work Task: Groundwater Management			
Job Steps	Hazards	Controls	RAC
Dewatering of excavation(s)- Pump operations (if used)	Fire hazards during refueling and operation	Turn off pump and allow to cool prior to refueling. Do not overfill fuel tank. Never operate pumps in explosive or volatile atmospheres. Refuel only over a “protected surface” or pad to prevent spills from contacting concrete, soil and other surfaces.	M
	Pressurized hoses can cause injury to personnel	Do not operate pump against a closed valve. Drain pump completely before freezing weather. Turn off pump and bleed pressure before disconnecting hoses.	M
	Noise exposure - hearing loss or injury	All site personnel to wear ear plugs/muffs while noise is in excess of 85dBA (if you need to elevate your voice for person next to you to hear, you need hearing protection on). Vactor® trucks have high noise levels during operation and will	M

<b>AHA #5 – Activity/Work Task: Groundwater Management</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		require hearing protection for those working with the equipment or working adjacent to operating vVactor truck equipment.	
	Struck by or run over by vacuum truck during positioning	Use dedicated spotter for all backing operations. Workers on ground will wear high visibility safety vests when working around traffic and construction equipment.  Make contact with operator. Keep ground personnel away from vehicle when it is positioning.	M
	Injury and/or environmental release due to failure of vacuum truck	Only qualified operators who are trained and experienced in vacuum truck operations will operate this equipment. Complete and document thorough visible equipment inspection. If questionable items exist, remove from service until repairs/replacement can be completed.  Verify preventative maintenance has been completed.  Operate equipment in accordance with manufacturer's instructions and know limitations and operating parameters as well as how to shut down equipment.	M
	Noise exposure - hearing loss or injury	All site personnel to wear ear plugs/muffs while noise is in excess of 85dBA (if you need to elevate your voice for person next to you to hear, you need hearing protection on). Vacuum trucks have high noise levels during operation and will require hearing protection for those working with the equipment or working adjacent to operating vacuum truck equipment.	M
	Exposure to fumes from vacuum tanker (Vactor)	Fumes from the vacuum tanker can be hazardous. Place truck down wind to minimize worker exposure.	M
	Back strain or other injury from awkward body position when handling vacuum hose.	Use proper lifting techniques to move and set up equipment. Stretch arms, back and legs before beginning task. Do not lift equipment or materials over 50 pounds, use buddy to assist.  Use knee pads when kneeling for extended periods of time.  Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Injury by strike with vacuum hose under "suction" – worker could be struck or bumped	Ensure positive control is exercised on the intake hose at all times. Operator to know and have access to kill switch in the event of an emergency or loss of hose control by person operating hose. Operate equipment in accordance with manufacturer's instruction. Wear hard hat when operating hose.	M

<b>AHA #5 – Activity/Work Task: Groundwater Management</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Ergonomic strain when using the hose	Personnel will position in or around the excavation in a manner that facilitates ease of use of the hose without strain. Position body in upright position and minimize stooping. If hose worker has ability to switch positions with another worker, during cleanout task to minimize strain for long periods of time on one person.	M
	Lack of effective communication during noisy tasks or tasks out of view of operator and worker	Ensure that the buddy system is in place. Ensure that Vactor operator has visual line of sight with the operator of the hose otherwise use a spotter. Know signals that are used to indicate stop and start.	M
	Contact with contaminated media from excavation (contains PAHs, PCBs, pesticides, and metals). Potential spread of contaminants, inhalation or ingestion of contaminants.	<p>Wear nitrile gloves under leather work gloves if hand contact is possible.</p> <p>Wear PVC work boots that are able to be decontaminated after contact if it is necessary to walk in catch basin (shallow water about 1 foot, and 1 foot sediments) to position the hose.</p> <p>Wear PPE as directed by industrial hygienist and implement control zones and decontamination procedures to prevent the spread of contaminants to adjacent areas or site vehicles.</p> <p>Conduct HAZCOM training per the APP. Have a hand washing station present at the site to wash hands prior to smoking (only if allowed in designated area), eating, or drinking.</p> <p>If sediments are dry, implement dust control procedures.</p> <p>If splash hazards exist, wear splash goggles and PVC face shield.</p>	M
	Material and/or arms and legs can be inadvertently sucked into hose which can cause injury or bruising	Keep positive control of the intake hose at all times. Do not position end of hose toward body parts or place body into the intake area around the hose. Operator to know and have access to kill switch in the event of an emergency or loss of hose control by operator. Operate equipment in accordance with manufacturer's instruction.	M
	Injury from tripping over equipment and tools in work area.	<p>Keep immediate work area clear of nonessential equipment and practice good housekeeping.</p> <p>Mark and secure hoses to minimize tripping potential.</p>	M
Dewatering of excavation(s)- General	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment 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 (TBD if required). At the present time, there is no fall protection plan in place to cover this task. A fall protection	M

<b>AHA #5 – Activity/Work Task: Groundwater Management</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		plan would need to be developed and implemented prior to doing the activity.	
	Ergonomic hazards such as sprains, strains, or back injury	Use proper form when performing all tasks. Do not bend at the waist, bend at the knees. 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 marked.	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 with first aid and CPR training onsite.	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. SSHO to implement EHS 4-6, Temperature Extremes.	M
	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 on roads and in laydown areas.	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

<b>AHA #5 – Activity/Work Task: Groundwater Management</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver’s license.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Vacuum truck or pump	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
- dBA – decibels A-weighted scale
- DEET - N,N-diethyl-m-toluamide
- EHS – Environmental, Health, and Safety
- MSDS – Material Safety Data Sheet
- NRTL - Nationally Recognized Testing Laboratory
- OSHA – Occupational Safety and Health Administration
- PPE – personal protective equipment
- SHM – Safety and Health Manager
- 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.

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## Activity Hazard Analysis (AHA) #6

<b>Activity/Work Task:</b> Collection of Soil Samples and Field Screening	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	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
<b>Notes:</b> (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. <b>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.</b>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
		<b>H = High Risk</b>
	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.	<b>M = Moderate Risk</b>
<b>L = Low Risk</b>		

<b>AHA #6– Activity/Work Task: Collection of Soil Samples and Field Screening</b>			
Job Steps	Hazards	Controls	RAC
Pre-screening soil using air monitoring instrument and collection of confirmation soil samples from excavations	Handling heavy objects (coolers) could cause injury to worker	Observer proper lifting techniques. Obey sensible lifting limits (50 lb maximum per person manual lifting). Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads. A qualified person must operate air monitoring instrumentation. Refer to APP section 9.7.1 for action levels.	M
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, vegetation, excavated material, and debris. Mark, identify, or barricade other obstructions. Do not walk on slopes greater than 45 degrees.	M

<b>AHA #6– Activity/Work Task: Collection of Soil Samples and Field Screening</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Dermal contact with potentially contaminated soil, Inhalation of dust from soil samples.	Wear nitrile gloves and avoid touching soiled gloves when removing. Wear long sleeve shirt. Avoid exposure to clothing, disposable PPE may be required. If dust cannot be controlled respiratory protection and disposable PPE may be required as specified by the SHM.	L
	Excavations deeper than 5 feet present a confined space hazard	Use non-entry techniques for collection of samples and pre-screening, e.g. via an excavator bucket. If entry cannot be avoided, a new AHA must be prepared and approved by the SHM for confined space entry. In addition, the SSHO must follow TtEC EHS procedure for confined space entry.	M
	Excavation wall collapse	Store excavated material at least 2 feet from the edge of the excavation; prevent excessive loading of the excavation face. Slope or bench excavation walls. Designated competent person (refer to AHA 4) to inspect and determine soil classification and proper sloping. Competent person must be present at the excavation site at all times during an entry of any excavation 5 feet or greater in depth.	M
Collection of waste disposal samples from stockpiled soil	Slips/trips/falls	Watch footing and be alert of surroundings. Ensure work areas and pathways are cleared and free of debris.	M
Containerizing and shipping samples	Broken glass sample jars could cause cuts/lacerations	Inspect cooler contents carefully. Dispose of damaged/broken sample jars. Handle sample jars with care.	L
	Handling heavy objects (coolers) could cause injury to worker	Observe proper lifting techniques. Obey sensible lifting limits (50 lb. maximum per person manual lifting). Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads.	M
	Clean reusable sampling equipment with Alconox® or similar detergent could expose worker to contaminants.	Wear nitrile gloves while washing equipment. Dispose cleaning solution into a waste container as required.	
General	Heat stress/cold stress	Monitor for heat/cold stress in accordance with TtEC safety procedures. Provide potable water/fluids to prevent worker dehydration. Take adequate rest periods in a warm/cool shaded area.	M

<b>AHA #6 – Activity/Work Task: Collection of Soil Samples and Field Screening</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by SS.

<b>AHA #6 – Activity/Work Task: Collection of Soil Samples and Field Screening</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
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,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 monthly.
Sample supplies	Samplers must be familiar with proper sampling procedures	Receipt inspection.
PPE – nitrile gloves, disposable coveralls (dusty situations)	Personnel trained on methods for sampling to avoid exposure to eventual contaminants	SSHO will ensure that gloves and disposable coveralls are available. If respiratory protection is required due to dusty conditions the SSHO will contact the SHM.
Air Monitoring Equipment- photoionization detector (PID), 4-gas meter (primarily for LEL and hydrogen sulfide gas measurements)	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy..	Calibration and function checks before and after use.

**Abbreviations and Acronyms:**

- APP – Accident Prevention Plan
- CHMM – Certified Hazardous Materials Manager
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- EHS – Environmental, Health, and Safety
- LEL – lower explosive limit
- OSHA – Occupational Safety and Health Administration
- PID – photoionization detector
- PPE – personal protective equipment
- SHM – Safety and Health Manager
- 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.

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## Activity Hazard Analysis (AHA) #7

<b>Activity/Work Task:</b> Decontamination	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7, NAS S. Weymouth Remedial Action	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	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.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

AHA #7– Activity/Work Task: Decontamination			
Job Steps	Hazards	Controls	RAC
Dry decontamination of heavy equipment using brooms, shovels, rags.	Ergonomic hazards such as sprains, strains, or back injury from improper shovel use	Use proper form when performing all tasks. Do not bend at the waist, bend at the knees. Keep shovels lightweight – do not over-fill shovel. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M

<b>AHA #7– Activity/Work Task: Decontamination</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Dust inhalation and contact with contaminated soil	Review hazardous properties of site contaminants with workers before operations begin. Workers will be equipped with the proper skin, eye, and respiratory protection based on the exposure hazards present. Maintain dust control as necessary, to prevent fugitive dust emissions. Dust levels on the site must be controlled by use of light spray mist of water to avoid inhalation of soil dust in areas where the arsenic in the soil content is 20 mg/kg or greater. If dust levels are kept close to the ground and the amount of dust in the air is light (can be seen through) exposure levels are below PEL. If dust levels cannot be controlled, stop work and contact SHM.	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 while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed.	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 marked.	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 with first aid and CPR training onsite.	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. SSHO to implement EHS 4-6, Temperature Extremes.	M
	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 on roads and in laydown areas.	M

<b>AHA #7– Activity/Work Task: Decontamination</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment 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
	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

<b>AHA #7– Activity/Work Task: Decontamination</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
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 tools	Training in use of hand tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
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  
 DEET - N,N-diethyl-m-toluamide  
 EHS – Environmental, Health, and Safety  
 MSDS – Material Safety Data Sheet

OSHA – Occupational Safety and Health Administration  
 PEL – permissible exposure limit  
 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.

<b>NAME</b>	<b>SIGNATURE</b>	<b>TITLE</b>	<b>DATE</b>
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## Activity Hazard Analysis (AHA) #8

<b>Activity/Work Task:</b> Transportation and Disposal	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7 NAS S. Weymouth	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
Reviewed by: Roger Margotto, CIH, CSP, CHMM, Safety and Health Manager	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
	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.	<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
		<b>L = Low Risk</b>

AHA #8 – Activity/Work Task: Transportation and Disposal			
Job Steps	Hazards	Controls	RAC
Load out of soil/pipes/waste	Construction equipment could cause injury to personnel.	Wear high-visibility safety vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow standard hand. 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 acknowledgment prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment	M

<b>AHA #8 – Activity/Work Task: Transportation and Disposal</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		and must remain visible to the operator. Operator's manual required for each piece of equipment.	
	Exposure to dust while loading waste, soils and pipes could expose workers to COCs and to arsenic	Use dust control methods, such as light spraying with a fine water mist. Ensure tarps are placed to cover trucks before transporting.	
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	High noise levels	Use hearing protection when exposed to excessive noise level (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that noise level may exceed 85dBA.	L
	Defective vehicles could cause injury to personnel and/or damage equipment	Inspect all trucks before loading. Do not load soil or equipment into defective equipment. Ensure trucks are lined and covered during transport.	M
	Contact with overhead utilities could cause injury to workers and damage to property or equipment.	Ensure that the area has been surveyed and that the boom will not contact overhead lines while loading truck (minimum 15-foot clearance required).	M
	Biological hazards such as insects could cause injury or bites.	Wear protective clothing, such as work boots, socks, and pants. Use insect repellent as necessary. Use care around debris and locations where insects may be found (such as tall vegetation, out houses and so forth).	L
	Roadways may fail under excessive loads	Ensure roadways on truck routes are designed to handle the weight of the vehicles and materials. Ensure transporters follow approved traffic routes.	M
Subcontractors working onsite	Lack of subcontractor understanding of TtEC safety policies could cause injury to personnel and/or equipment damage	Ensure that subcontractors are briefed on relevant safety policies. Ensure subcontractors are following safe practices. If unsafe activities are observed, stop work and correct immediately.	M

<b>AHA #8 – Activity/Work Task: Transportation and Disposal</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
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.
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
- CHMM – Certified Hazardous Materials Manager
- CIH – Certified Industrial Hygienist
- COC – contaminant of concern
- CSP – Certified Safety Professional
- dBA – decibels, A weighted scale
- EHS – Environmental, Health, and Safety
- OSHA – Occupational Safety and Health Administration
- SHM – Safety and Health Manager
- 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) #9

<b>Activity/Work Task:</b> Site Restoration & Demobilization	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>M</b>
Project Location: STP Site 7 NAS S. Weymouth	<b>Risk Assessment Code (RAC) Matrix</b>	
Contract Number: N62470-13-D-8007	<b>Severity</b>	<b>Probability</b>
Date Prepared: January 2014		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by: Becky Whalen, Remediation Engineer	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
<p><b>Notes:</b> (Field Notes, Review Comments, etc.)</p> <p>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.</p> <p style="color: red;">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). Leather work gloves, High visibility safety vest.</p>	Step 1: Review each “ <b>Hazard</b> ” with identified safety “ <b>Controls</b> ” and determine RAC (see above).	
	“ <b>Probability</b> ” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	“ <b>Severity</b> ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	<b>E = Extremely High Risk</b>
		<b>H = High Risk</b>
		<b>M = Moderate Risk</b>
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.	<b>L = Low Risk</b>	

AHA #9 – Activity/Work Task: Site Restoration and Demobilization			
Job Steps	Hazards	Controls	RAC
Backfill of clean soil into excavation using delivery trucks hauling fill and excavator or loader to move	Hazards associated with incoming soil trucks that could cause equipment damage or personnel injury.	Ensure subcontractors abide by TtEC safety procedures. Follow posted speed limits, follow approved truck routes, use a spotter when backing, lower truck bed before moving, unload truck on level ground, and keep personnel out of the area when soil is being placed.	M

<b>AHA #9 – Activity/Work Task: Site Restoration and Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	Construction equipment could cause injury to personnel.	Wear high visibility vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow standard hand signals. 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 and ensure the truck stops a safe distance from the edge of the excavation. Construction equipment will have backup alarms installed. Workers working around construction equipment will make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
Grading using a skid steer or excavator blade	Construction equipment could cause injury to personnel.	Wear high visibility safety vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow standard hand signals. 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 make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
Applying seed, soil amendments, and straw	Heavy lifting (straw bales, seed bags)	Do not lift more than 50 lb per person. Ask for help when lifting items greater than 50 lbs or awkward items. Use material handling equipment when possible.	M
	Inhalation of dusts when spreading lime may cause irritation to the respiratory system	Use pelletized lime when possible. Stay upwind of material when applying. Wear dust mask, if necessary. Ensure MSDS is onsite and reviewed per HAZCOM requirements.	L
	Exposure to lime dust may cause irritation of the eyes /skin	Wear safety glasses or goggles and protective nitrile gloves. Stand upwind of material when placing. Avoid rubbing eyes after handling product. Stage an eyewash within an easy distance of the operations in case contact with eyes does occur and flush for 15 full minutes if contact occurs. If dust is not controlled, respirators (N-95 or better) will be worn.	L
	Biological hazards such as insects (found in straw bales)	Wear protective clothing, such as work boots, socks, and pants. Use insect repellent as necessary. Use care around debris and locations where insects may be found (such as tall vegetation, out houses and so forth).Inspect straw	L

<b>AHA #9 – Activity/Work Task: Site Restoration and Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
	could cause injury or bites.	bales for insects prior to handling. Be sure to wear protective gloves.	
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
Removal of erosion controls (silt fence)	Manual removal may cause injury to workers	Remove using heavy equipment in lieu of manual removal to avoid unnecessary strain.	M
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	Construction equipment could cause injury to personnel.	Wear high visibility vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow standard hand signals. 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 make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's manual required for each piece of equipment.	M
	Slips/trips/falls	Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	Contact with overhead utilities could cause injury to workers and damage to property or equipment.	Ensure that the area has been surveyed and that the boom will not contact overhead lines while loading truck (minimum 15-foot clearance required).	M
	Biological hazards such as insects could cause injury or bites.	Wear protective clothing, such as work boots, socks, and pants. Use insect repellent as necessary. Be sure to wear protective gloves. Use insect repellent as necessary.	L
Removal of materials and equipment from work areas and consolidate for offsite removal and demobilization	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	M

<b>AHA #9 – Activity/Work Task: Site Restoration and Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		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.	
	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 10 – 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 at the waist, 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 silt fence and other materials	Wear leather work gloves when handling cutting tools and removing 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.	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 <sup>®</sup> or Zanfel <sup>®</sup> post-exposure washing agent available.	M

<b>AHA #9 – Activity/Work Task: Site Restoration and Demobilization</b>			
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
		Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	
	Failure to observe and prepare for encounter with insects could cause injury to worker.	Wear protective clothing, such as work boots, socks, and pants. Use insect repellent as necessary. Be sure to wear protective gloves. Use insect repellent as necessary.	M
	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	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

<b>AHA #9 – Activity/Work Task: Site Restoration and Demobilization</b>		
<b>Equipment to be Used</b>	<b>Training Requirements/Competent or Qualified Personnel Name(s)</b>	<b>Inspection Requirements</b>
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 tools		
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.

<b>AHA #9 – Activity/Work Task: Site Restoration and Demobilization</b>		
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
- CHMM – Certified Hazardous Materials Manager
- CIH – Certified Industrial Hygienist
- CRL – Corporate Reference Library
- CSP – Certified Safety Professional
- dBA – decibels, A weighted scale
- EHS – Environmental, Health, and Safety
- HAZCOM – hazard communication
- HSG – Health and Safety Guideline
- mph – miles per hour
- MSDS – Material Safety Data Sheet
- OSHA – Occupational Safety and Health Administration
- SHM – Safety and Health Manager
- SPF – sun protection factor
- 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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**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<sup>®</sup>, Do It Right<sup>®</sup>, and Shared Vision<sup>®</sup>, Zero Incident Performance<sup>®</sup> operating philosophies.

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**APPENDIX C**  
**EHS PROGRAMS AND PROCEDURES**

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**Purpose:** The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
		<b>Title:</b>	EHS Inspections
<b>Version Date - Type:</b>	11/09/2010 - Revised	<b>Original Issue</b>	02/01/95
		<b>Date:</b>	
<b>Category:</b>	Company Procedures	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
<b>Sub-Category:</b>	Departmental/Discipline	<b>Document</b>	Procedure
		<b>Type:</b>	
<b>Keyword Index:</b>	EHS Compliance/Waste Management, Field Activities/Environmental H&S, Training, Monitoring, Nonconformance and Corrective and Preventive Action	<b>Document</b>	Skip Parry
		<b>Owner</b>	

See Below

The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

This procedure applies to all Tetra Tech EC, Inc. (TtEC) ("the Company") project sites, offices, and warehouses, including subcontractor activities.

The Project Manager (PM) is responsible for:

- a. Planning and budgeting for inspections as part of the project planning process in accordance with Task Initiation Procedure, PO-2 and the Project's Risk Management Plan.
- b. Ensuring that inspections are conducted in accordance with this procedure.
- c. Reviewing Environmental Health and Safety (EHS) inspection reports with on-site management.

The Site Manager (SM) or PM is responsible for:

- a. Participating in weekly EHS inspections as practicable.

- b. Ensuring that action items are developed, documented, and implemented and tracked to closure.

Site Supervisors are responsible for:

Conducting weekly EHS inspections for their area(s) of responsibility.

Ensuring that weekly inspection action items are implemented and documented in the project files.

The Operations Manager for each office and warehouse is responsible for ensuring that:

- a. Inspections of the office and, if applicable, warehouse are conducted on a quarterly basis.
- b. Action items are implemented and documented in a timely manner.

The Director, EHS Services, is responsible for:

- a. Reviewing and updating the inspection checklists as necessary.
- b. Monitoring conformance with the Project Environmental and Safety Manager (PESM) inspection requirements.
- c. Developing Lessons Learned Reports, Event Reports, or ZIP Bulletins for selected inspection findings

The PESH is responsible for:

- a. Approving and documenting PESH inspection frequency.
- b. Performing the PESH inspections and/or designating the appropriate technical specialist, as necessary, per the project schedule and budget.
- c. Immediately communicating significant violations or potential violations to the Project Manager and the Director, EHS Services.
- d. Preparing PESH inspection reports, issuing the report, and posting to the Company PESH inspection Database located on Lotus Notes within 10 days of the inspection.
- e. Tracking closure of each PESH inspection.
- f. Providing training in proper inspection techniques and as required to address action items.
- g. Reviewing EHS inspection reports.

The ESS is responsible for:

- a. Performing informal daily inspections of the worksite and documenting observations in the safety logbook.
- b. Assisting the PM or SM with weekly inspections.
- c. Reviewing the weekly and monthly inspection checklists for completeness, thoroughness, and trends. [Trends of action items in weekly and monthly EHS inspection results should be reviewed for similar](#)

[situations in other areas.](#)

The Office Environmental and Safety Coordinator (ESC) is responsible for:

- a. Assisting with quarterly inspections of the office and, if applicable, the warehouse.
- b. Training alternate office personnel on how to conduct office inspections.

For projects encompassing 1-week duration or more of consecutive workdays, the Site Supervisor shall conduct a weekly inspection of his/her area(s) of responsibility at the project site. The inspection shall:

- a. Include site conditions, employee and Subcontractor behaviors and work practices, pollution prevention and waste management practices, wastewater and other environmental conditions, or any other applicable requirements specified in the project EHS Plan(s).
- b. Be documented in an inspection report identifying the date, time, site conditions/operations, activities observed, personnel conducting the inspection, findings, recommended action items, individual responsible for implementation of each action item, and schedule for implementation. Attachment B may be used to document the inspection.

PESM inspections are budgeted inspections of remediation, clean construction, and consulting and engineering (C&E) projects. The PESH will either perform the inspection and/or designate an appropriate technical specialist. The PESH shall utilize a hierarchical risk based approach to determine inspection frequency at remediation, C&E, and clean construction projects.

- a. Specific checklist to be used for a given inspection will be determined by the PESH, based on the scope and risks of the project. The pertinent portions of each applicable checklist should be covered during at least one inspection annually.
- b. For programs with multiple task orders, the PESH will identify the task orders which should be inspected. Inspection frequency will be risk based to include an assessment of project scope, complexity, staffing, potential environmental, health, and safety standards.
- c. Inspections should occur soon after site mobilization and initiation of site activities. Subsequent PESH inspections shall be based upon the results of previous inspections; greater risk = increased inspection frequency. The PESH shall coordinate the date and time of the inspection with the PM and the SM.

For C&E field projects the PESH shall evaluate the need for field inspections. The determination of whether an inspection(s) is required should consider the factors described in paragraph b. above

Inspection frequency should be identified in the project EHS Plan.

The PESH shall **immediately** call the Director, EHS Services to report significant inspection findings including those that might require agency reporting. The Director, EHS Services, in conjunction with the legal department, will help the Project Manager and PESH determine if the finding requires agency reporting. If a determination is made that a finding must be reported, the client and agency will be notified

in accordance with EHS 1-7, Event Reporting and Investigation.

The PESM shall post inspection reports, including checklists (Attachment C) and action items (Attachment E or equivalent), to the PESM Inspection Database within 10 days of the inspection.

All Action Items should be classified by the PESM as either Major or Minor, or recommendation. Major findings shall receive first priority schedule for addressing action items.

Action items should be addressed as described in the Action Item Report by the Project Manager and forward the completed Action Item Report to the PESM.

The PESM shall review the completed Action Item Report to ensure completeness and appropriate closure of all Action Items. The PESM shall post completed Action Item Reports to the PESM Inspection Database and close the inspection.

The Operations Manager shall ensure that EHS inspections are conducted at least quarterly at each office and warehouse, except for fire extinguishers and first aid kits which shall be inspected monthly. Attachment F, or an equivalent, shall be used to conduct and document the inspection. The Operations Manager shall send a copy of the completed Inspection Checklist to the Director EHS Services.

The Operations Manager shall ensure implementation and documented closure of all action items using the Action Item Report (Attachment E) or equivalent. The Operations Manager shall send the completed Action Item Report to the Director, EHS Services, within 30 days of conducting the inspection.

Inspection results should be analyzed for root causes. At least annually, the Director, EHS Services OR Director, Quality Programs, or his/her designee, shall review PESM inspection findings to identify trends.

This review should be documented and forwarded to the ESQ Program Directors, and to the Chief Executive Officer.

The ESQ Program Directors and the Chief Executive Officer will utilize the analysis to develop program and environmental objectives and targets, as appropriate.

The Director, EHS Services, shall ensure that individuals responsible for conducting inspections understand the Company's program requirements; applicable federal, state and local laws and regulations; and proper inspection techniques.

Records of all inspections and closure of identified Action Items related to EHS inspections shall be documented and maintained by the office or project as follows:

- a. Informal Inspections - Project Files
- b. Weekly Inspections - Project Files
- c. PESM Inspection Report - PESM Inspection Database
- d. Completed PESM Inspections Action Item Report - PESM Inspection Database
- e. Completed Office/Warehouse Inspections and Action Item Reports - Operations Manager

## 4.1 Definitions

A finding that indicates the real-time presence of a potential or imminent hazard, significant regulatory violation, or may result in imminent harm to people, property or the environment. Major findings are typically observed in the field at the time of inspection, and require immediate corrective action to reduce the risk of loss. Major findings must receive top priority for correction.

An observed finding which by itself is not a direct hazard, or potential harm to human health or the environment. Minor findings are usually associated with documentation, programmatic deficiencies, recordkeeping, reporting, or management/organizational practices.

### **Example #1: Findings associated with Stormwater Control Systems**

- a. **Major** - A significant breach in erosion control feature (e.g., missing or deteriorated hay bales).
- b. **Minor** - Failure to maintain documentation of required periodic inspections of erosion control features.

### **Example #2: Compliance with OSHA Ladder Standards**

- a. **Major** - Defective extension ladder observed.
- b. **Minor** - Failure to ensure all ladders are routinely inspected.

The ESS and all Company employees and Company subcontractor employees should be continuously aware of workplace and environmental conditions and the work practices of their fellow workers. If a substandard condition of work practice is identified, it shall be brought to the attention of the individual or supervisor, and corrected. Hazard Report and Suggestion Form (Attachment A) can be used to report substandard conditions or work practices. ZIP Slip (Attachment G) can be used to report exceptional practices or substandard conditions. ZIP Slips may be completed electronically using the Company Zip Slip Database. The Compliance Hot Line can also be utilized for anonymous reporting (See PP-18, Employee Reporting, Hotline and Non Retaliation).

The inspector should review project documents (Contract, TIP, Work Plans, EHS Plan(s), any pertinent decision documents, subcontractor approvals, permits, etc.) before the inspection.

The PESM should utilize the appropriate PESM Inspection Checklists (Attachment C) to perform the site inspection. Only the portions of the checklist applicable to the project being inspected will be utilized. The PESM should modify the inspection checklist as necessary for major projects.

Detailed environmental compliance checklists are very useful for the first PESM inspection of a site to ensure nothing is overlooked. (This is especially helpful if you are not the Project Regulatory Compliance Specialist and are not familiar with site activities). For subsequent PESM inspections, the Project's Regulatory Compliance and Waste Management Plans (or relative sections of the EHS Plan or Work Plans) may be used as the basis for the inspection to ensure site is implementing the Plan/s.

The PESM Inspection shall include:

- a. High risk activities (HIPO) and a visual inspection of the site. Areas of the project site that may be accessed and inspected include but are not limited to, exclusion zones, buildings, and waste storage areas.
- b. Completion of applicable and selected portions of the PESM Inspection Checklists or equivalent documentation (Attachment C).
- c. A review of on-site records (e.g., permits, agency approvals, waste analyses, waste profiles, waste manifests, discharge monitoring reports, training records, etc.).
- d. Positive recognition of conformance.
- e. Non-conformance noted by the PESM that can be remedied during the conduct of the inspection will be corrected. Conformance and non-conformance shall be documented on the PESM Inspection Checklists.
- f. Training of project and subcontract personnel, when possible, to address non-conformances.
- g. Identification of any observed positive practices.

The PESM will stop work if any conditions or work practices are identified which pose imminent danger to the environment or to the safety and health of personnel.

**Please Describe Your Reference Here**

**Place Your Link in this Column**

1. Environmental Health & Safety Programs, Procedure EHS 1-7, Event Reporting and Investigation
2. Personnel Practices Procedure PP-18, Employee Reporting, Hotline, and Non-Retaliation
3. Project Initiation and Operations Procedure PO-2, Task Initiation (TIP)
- 4.
- 5.
- 6.

**Please Provide a Description of the Attachment**

- A. Hazard Report and Suggestion Form
  
- B. EHS Weekly Checklists and Action Item Report
  
- C. PESH Inspection Checklist(s)

**Place Your Attachments Here**



ehs 1-7 Attachment B040301.doc



EHS 3-3 Attachment B, 3-24-2011.doc



EHS3-3 Attachment C Air, 8-10-09.doc



EHS 3-3 Attachment C Asbestos 5-24-11.doc



EHS 3-3 Attachment C Conservation, 6-21-06.doc



EHS 3-3 Attachment C Drinking, 6-21-06.doc



EHS 3-3, Attachment C EHS Programs, 6-5-06.doc



EHS 3-3 Attachment C Field Construction 5-24-11.doc



EHS 3-3 Attachment C HazWaste, 5-25-11.doc



EHS 3-3 Attachment C Lead, 6-30-09.doc



EHS 3-3 Attachment C Oil and Haz Subst, 7-6-09.doc



EHS 3-3 Attachment C PCB, 6-27-06.doc



EHS 3-3 Attachment C Solid, 6-27-06.doc



EHS3-3 Attachment C UST AST 5-24-11.doc



EHS 3-3 Attachment C Wetlands, 8-1-09.doc



EHS 3-3 Attachment C Wastewater, 6-30-09.doc



EHS 3-3 Attachment C Hazwaste Perm, 5-25-11.doc



EHS 3-3 Attachment C, Radioactive Mat DOE, 7-25-2005.doc



EHS 3-3 Attachment C, Radioactive Mat NRC, 7-25-2005.doc



EHS 3-3 Attachment C, Radioactive Mat, 7-2005.doc



EHS 3-3 Attachment E.doc



EHS 3-3 Attachment Fgc122809.doc

E. Action Item Report

F. EHS Office/Warehouse Inspection Checklist

G. ZIP Slip

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**EHS 1-7 ATTACHMENT B**



	<b>HAZARD REPORT AND SUGGESTION FORM</b>	<b>Hazard Type:</b> Condition <input type="checkbox"/> Practice <input type="checkbox"/>	
<i>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!</i>			
<b>DESCRIBE CONDITION OR PRACTICE:</b>			
<b>SUBMITTED BY (OPTIONAL):</b>		<b>DATE:</b>	
<b>IMMEDIATE CORRECTIVE ACTION COMPLETED:</b>		<b>COMPLETED BY</b>	<b>COMPLETION DATE</b>
<b>RECOMMENDATIONS FOR FURTHER CORRECTIVE ACTION</b>	<b>RESPONSIBLE PERSON</b>	<b>TARGET DATE</b>	<b>COMPLETION DATE</b>
<b>FOR OFFICE USE ONLY</b>			
<b>POTENTIAL INCIDENT TYPE:</b>			
Slip/Trip/Fall		Strain/Overexertion	
Struck by or against		Chemical Exposure	Fire
Caught in, between or under		Property damage	Environmental Release
		Other (Explain)	
Project/Office/Location: _____			
Report Given To: _____		Date: _____	
Tracking Number: _____			



**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)
<b>Weather Conditions at time of Inspection</b> _____.		
<b>Work Conditions</b>		
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		
<b>Equipment</b>		
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		
<b>Material Handling Equipment</b>		
17. Hoisting and Rigging		
18. Lifting Aids Used When Possible		
19. Proper Lifting Techniques Used		
<b>Electrical Safety</b>		
20. Power Cords		
21. GFCI		
22. Generators		
23. Breaker Box Access/Clearance		
<b>Hazardous Materials</b>		
24. Hazardous Chemical List Current		
25. MSDS		



**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		
<b>Emergency Systems</b>		
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		
<b>Protective Equipment</b>		
36. PPE used, stored, and maintained in accordance with EHS plan		
37. Respirator use, storage, and maintenance		
<b>Hazardous Waste Storage Area (HWSA)/Satellite Accumulation Area (SAA)</b>		
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:		



**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.		
<b>Hazardous Waste Tank Storage Area</b>		
49. Daily written inspection is being conducted and is maintained on site. The inspection requirements in the plan are being documented as required.		
<b>Waste/Stockpiles</b>		
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		
<b>TSCA PCB Wastes</b>		
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		



EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type:  Weekly  Monthly

Project/Location:	Inspector/s:	Time/Date:
TOPIC	OBSERVATIONS	FINDING (Y/N)
<b>Spill Prevention and Preparedness</b>		
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?		
<b>Stormwater Pollution Prevention and Erosion Controls</b>		
59. Are site activities causing land disturbance being performed (grading, excavating, clearing and grubbing, demolition and foundation removal, etc?)		



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.		
<b>Other Conditions or Work Practices</b>		
65.		
66.		
67.		
68.		



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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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes</b>	<b>No</b>	<b>N/A</b>
<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>

*This checklist applies to projects where asbestos materials or waste are present.*

<b>Surveying/Sampling Non-School Buildings</b>		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>1. Licensing/Certification/Accreditation.</b> 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.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>2. Handling/Disposal of Sampling Wastes/PPE.</b> Sampling wastes/PPE are being handled and disposed of in accordance with state/local requirements. (State/local air and safety regulations)	
<b>Demolition/Renovation</b> ( <i>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.</i> ) <i>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).</i>		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>3. Written Notification.</b> 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. <i>Note: State/local (e.g., air agencies) regulations may establish different size/time periods for notification so be sure to check local requirements.</i> a. Demolition/renovation of at least 260 linear ft (160 ft <sup>2</sup> ) or 35 ft <sup>3</sup> of 1% Regulated Asbestos-Containing Material (RACM) -- 10 day notice provided. b. Demolition of less than 260 linear ft (160 ft <sup>2</sup> ) or 35 ft <sup>3</sup> of 1% RACM - 10 day notice provided. c. Renovation of less than 260 linear ft (160 ft <sup>2</sup> ) or 35 ft <sup>3</sup> 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 <sup>2</sup> is removed. (40 CFR 761, Appendix A provides EPA interpretive ruling)	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>4. Removal.</b> 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))	

 **TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>5. Non-Component Removal/Emissions Controls.</b> RACM is adequately wetted unless:</p> <ul style="list-style-type: none"> <li>a. Agency has indicated that wetting would unavoidably damage equipment/pose safety hazard,</li> <li>b. Exhaust ventilation and collection system designed and operated to capture asbestos emissions is in use and no visible emissions to outside air,</li> <li>c. Glove bag system is being used which is operating to contain particulate asbestos, or</li> <li>d. Leak-tight wrapping is being used to contain all ACM. (40 CFR 61.145(c))</li> </ul>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>6. Component Removal/Emissions Controls.</b> 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))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>7. RACM Handling.</b> 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))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>8. Training.</b> 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)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>9. Posting Area.</b> Removal/storage area is demarcated and access is restricted. (29 CFR 1929 and 1915; state air regulations)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>10. Health and Safety Requirements.</b> 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.</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>11. Minimizing Emissions.</b> 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)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>12. Vehicle Placarding.</b> All vehicles are marked with visible asbestos hazard warning signs. (40 CFR 61.150 and 61.149)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>13. Disposal.</b> Disposal facility has been prequalified under TTEC procedures for disposal of ACM.</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>14. Labeling.</b> 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))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>15. Shipping papers.</b> Shipment papers are prepared and signed by generator. (40 CFR 61.150(d))</p>	

 **TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>16. Transportation.</b> 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. <i>Complete the “Oil and Hazardous Substances Management” checklist.</i>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>17. Reports.</b> 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.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>18. Recordkeeping.</b> Waste shipment records, exception reports and notifications are retained in project files.. (40 CFR 61.150(d), GMP)	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>19. Deconwater/Treatment Filters/PPE.</b> 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.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>20. State Hazardous Waste.</b> 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.	
<b>School Building</b> ( <i>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.</i> )		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>21. Training.</b> 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.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>22. Surveys/Written Assessment.</b> 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.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>23. Sampling.</b> 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.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>24. Asbestos Management Plan.</b> Each facility with ACM has an asbestos management plan. (40 CFR 763.93)	

 **TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST— ASBESTOS**

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>25. Response.</b> Response action is being conducted in accordance with written assessment developed under 40 CFR 763.88. The response action includes:</p> <ul style="list-style-type: none"> <li>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.</li> <li>b. Damaged friable surfacing ACM which is either being encapsulated, enclosed, removed or repaired.</li> <li>c. Significantly damaged friable ACM which is being isolated, access is restricted, and ACM is enclosed/encapsulated or removed. (40 CFR 763.90)</li> </ul>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>26. Operations and Maintenance Plan.</b> An O&amp;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&amp;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)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>27. Air Sampling.</b> 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.</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>28. Notification.</b> Local education agency is providing annual written notification to parents, teachers and employee organization of availability of asbestos management plan. (40 CFR 763.93)</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>29. Minimizing Exposure.</b> 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))</p>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p><b>30. Record Keeping.</b> The following records, as applicable, are being maintained in the project files:</p> <ul style="list-style-type: none"> <li>a. Air sampling information.</li> <li>b. Cleaning records for activities described in 40 CFR 763.91(c).</li> <li>c. Other records, as required by client under contract, training records, description of response actions, surveillance activities, O&amp;M activities, etc.</li> </ul>	

-- End of Checklist --



PESM INSPECTION CHECKLIST— CONSERVATION RESOURCES AND ENVIRONMENTAL REVIEWS

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

**Location-Dependent Programs**

		<p><b>1. River.</b> 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)</p>	
		<p><b>2. Coastal Zone Management Act.</b> 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)</p>	
		<p><b>3. Shoreline Protection.</b> 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)</p>	
		<p><b>4. Public Lands.</b> 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 &amp; documented. (Federal/State/local regulations)</p>	

**Environmental Review**

		<p><b>5. National Environmental Policy Act.</b> If applicable, project activities are in compliance with any mitigation measures specified in the final documentation (e.g., FONSI). (40 CFR 1500-1508)</p>	
		<p><b>6. State Environmental Policy Act.</b> 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)</p>	
		<p><b>7. CERCLA/State Mini-CERCLA Cleanup.</b> Project is not required to undergo environmental review because it is being conducted under CERCLA or State cleanup law.</p>	
		<p><b>8. Exempt.</b> 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)</p>	



PESM INSPECTION CHECKLIST— CONSERVATION RESOURCES AND ENVIRONMENTAL REVIEWS

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

**Location or Activity-Dependent Programs**

		<p><b>9. Archaeological/Cultural/Historic Resources.</b> 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)</p>	
		<p><b>10. Threatened/Endangered Species.</b> 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)</p>	
		<p><b>11. Fish and Wildlife Collection.</b> 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)</p>	

--End of Checklist--



PESM INSPECTION CHECKLIST— DRINKING WATER, SOLE SOURCE AQUIFER, WELLHEAD PROTECTION AND WATER WITHDRAWAL

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A	<b>REQUIREMENTS</b>
			<b>COMMENTS/NOTES</b>

*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.)

			<b>1. Design.</b> System design has been approved by regulatory agency and is being constructed in accordance with design plans.	
			<b>2. PE Certification/Stamping.</b> If applicable, drawings are properly stamped/certified.	
			<b>3. Water System Permits.</b> If required, permit is maintained in files and activities are in compliance with permit terms/conditions.	
			<b>4. Water System Connection Approvals/Plumbing Code.</b> If applicable, the connection design has been approved by the local authority and conforms to the local plumbing code.	
			<b>5. Other Permits/Certifications.</b> 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. <i>Complete the "Field/Construction/Road Activities" Checklist to demonstrate compliance.</i>	
			<b>6. Waste Management.</b> Construction debris and other wastes, if any, are being properly managed, transported, and disposed of. <i>Complete applicable waste checklists.</i>	
			<b>7. Easements/Right-of-Ways.</b> 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.)

			<b>8. Well Construction and Abandonment Approval/Notice.</b> Notice or approval was obtained prior to commencing well construction or abandonment activities. Documentation is in project files. (State regulations)	
			<b>9. Well Decommissioning Forms.</b> Notice was submitted to agency after well was decommissioned. (State regulations)	
			<b>10. Well Construction Standards.</b> Well construction standards have been met. (State regulations)	
			<b>11. Well Contractor Licensing.</b> Contractor performing well construction/abandonment is properly licensed. Documentation of licensing is contained in project files. (State regulations)	



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.)*

			<p><b>12. Wellhead Protection Program.</b> 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)</p>	
			<p><b>13. Wellhead Restrictions.</b> If the impacted area is within a wellhead protection area, all restrictions are being complied with. (State regulations)</p>	

**Water Withdrawal.** *(Applies if groundwater is being withdrawn.)*

			<p><b>14. Groundwater Withdrawal Permit.</b> 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)</p>	
			<p><b>15. Sole Source Aquifer Protection Standards.</b> 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)</p>	

--End of Checklist--

**PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*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.)

		<p><b>1. Utilities.</b> Project involves the construction, hook-up or shut-off and extension of the following utilities. <i>Circle all that apply.</i></p> <ul style="list-style-type: none"> <li>a. Electric</li> <li>b. Phone</li> <li>c. Water</li> <li>d. Sewer</li> <li>e. Gas</li> <li>f. Other: _____</li> </ul>	
		<p><b>2. Permit/Approval.</b> 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)</p>	
		<p><b>3. Inspection.</b> Regulatory agency has conducted an inspection of the activities. <i>In the adjacent column note the date of the inspection(s) and the results.</i></p>	

**Zoning/Land Use**

		<p><b>4. Zoning.</b> 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) <i>Note: This issue normally will apply to larger project in which landfills are being constructed, or other larger facilities are being developed.</i></p>	
		<p><b>5. Building Code.</b> 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) <i>If an inspection was conducted note the date and results.</i></p>	
		<p><b>6. UFC.</b> 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) <i>If an inspection was conducted note the date and results.</i></p>	



PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>7. Airport/FAA Approval.</b> 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).</p>	
		<p><b>8. Noise.</b> 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).</p>	
		<p><b>9. Certification of Drawings.</b> As-builts, specifications, or drawings have been stamp/sealed by PE or certified by other professional, as applicable, in accordance with state/local regulation.</p>	
		<p><b>10. Demolition Activities.</b> Project involves the demolition of structures or equipment.</p>	
		<p>a. <b>Pre-demolition Notice/License.</b> Notice is maintained in project files or posted conspicuously, if required.</p>	
		<p>b. <b>Hazardous substances.</b> 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.</p>	
		<p>c. <b>Asbestos Determination.</b> A determination regarding the presence of asbestos has been made. Proper notifications have been made (40 CFR 61, State/Local agencies)</p>	
		<p>d. <b>Waste Characterization.</b> Debris and other wastes have been characterized and are being properly managed and disposed of.</p>	

**Miscellaneous**

		<p><b>11. Excavation Activities.</b> Dig-safe/ "hot dig" permits/approvals have been obtained. Permits are maintained in the project files. (State/Local regulations)</p>	
		<p><b>12. Well Drilling/Construction/Maintenance/Abandonment.</b> Project involves the drilling/abandonment of wells.</p>	



PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A	<b>REQUIREMENTS</b>
			<b>COMMENTS/NOTES</b>

			<p>a. <b>Drilling Permit/Pre-Drill Notification/Start Card.</b> Permit/approval/notification was obtained in a timely manner and is maintained in the project files. (State/Local regulations).</p>	
			<p>b. <b>Licensed Operator.</b> Documentation of Driller or Professional Geologist licensing/certification is maintained in project files. (State/Local regulations)</p>	
			<p>c. <b>Well Construction/Abandonment Standards.</b> Well was constructed/abandoned in accordance with regulatory standards/guidance. (State/Local regulations)</p>	
			<p>d. <b>Post-Abandonment Notification.</b> Notification was submitted in a timely manner and a copy is maintained in the project files. (State/Local regulations)</p>	
			<p><b>13. Clean Fill Certification/Testing.</b> 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)</p>	
			<p><b>14. Soil Erosion Control.</b> Project involves excavation, grading or other land disturbing activities associated with construction projects.</p>	
			<p>a. Stormwater Permit. Project is complying with General or Individual Permit for Stormwater Discharges from Construction Projects as required by State/Local regulations. <i>Complete "Wastewater/Stormwater Discharge/UIC" checklist</i></p>	
			<p>b. Soil Erosion and Sediment Control Plan. Project prepared Plan and effectively implements erosion controls, inspections and maintenance requirements.</p>	
			<p>c. Grading Permit/Plan. Activities are being conducted in compliance with the permit. Permit is maintained in the project files.</p>	
			<p><b>15. Stormwater Pollution Prevention (SWPP).</b> 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.</p>	
			<p><b>16. Spill Prevention Control and Countermeasures Plan (SPCC).</b> 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). <i>Complete oil and hazardous substances checklist.</i></p>	



PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

			<b>17. Dust Control.</b> 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).	
			<b>18. Stream Crossing.</b> If applicable, the USACE § 9 permit has been obtained. State may also require permit. <i>Complete "Wetlands/Streams/Floodplains" checklist.</i>	
			<b>19. Land Surveying.</b> 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.*)

			<b>20. Road Alteration/Curb Cuts.</b> Opening/access permit or approval has been obtained from the local or state agency prior to commencing construction. (State/local regulations)	
			<b>21. Heavy/Large Loads.</b> 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)	
			<b>22. Traffic Impact Analysis.</b> If required, the analysis was conducted and approved by the local regulatory agency. (Local regulations)	
			<b>23. Road Crossing/Easements.</b> 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)	



PESM INSPECTION CHECKLIST— FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A	<b>REQUIREMENTS</b>
			<b>COMMENTS/NOTES</b>

			<p><b>24. Traffic Control.</b> 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)</p>	
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**Materials Transportation** (Includes the activities such as classification, packaging and shipment of DOT-regulated Hazardous Materials. See 49 CFR 172.101 Hazardous Materials Table)

			<p><b>25. Hazardous Materials (HM) Transportation.</b> Project plans identify hazardous materials transported over public roadways by the project and address DOT requirements. <i>Complete oil/hazardous substances and hazardous waste (as applicable) checklists.</i></p>	
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			<p>a. <b>Fuel Transport.</b> If Project uses “fuel trucks” (i.e., tanks on back of a pickup truck) for diesel fuel transport along <u>roads that are accessible by the public and</u> the tanks have a capacity of &gt; 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 &amp; it must display the appropriate 4-digit DOT Identification Number (49 CFR 172.101).</p>	
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			<p><b>--End of Checklist--</b></p>	
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**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

*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.)*

<b>General Requirements (Please complete each line in this section.)</b>		
	<p><b>1. ESS or Designated Waste Management Role. Discuss Role of ESS or designated individual with regards to waste management at the Site.</b></p> <p>a. How is waste management handled. Is it working effectively?</p> <p>b. What types of problems have been encountered?</p> <p>c. Is ESS or designated individual receiving regulatory support/oversight from ESQ Specialists, as needed?</p> <p>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.</p>	
	<p><b>2. Permit Applications/Interim Status and Final Part B Permits.</b> Copies of Part A and B permit applications and final Part B permits are located on-site. Verify the following: (40 CFR 270)</p> <p>a. Permit is current.</p> <p>b. Existing physical facilities are consistent with contents in permit and application.</p> <p>c. Part A and B application and permit, as applicable, accurately reflect existing TSD project activities.</p> <p>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</p>	
	<p><b>3. EPA Identification Number.</b> Facility has an EPA Identification number to store/treat/dispose/transport/offer waste for transport. (40 CFR 264.11 and 265.11)</p>	
	<p><b>4. Waste Determination.</b> 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)</p>	
	<p><b>5. Waste Analysis Plan.</b> Written waste analysis plan has been developed.</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p>a. Contents. The waste analysis plan includes:</p> <ul style="list-style-type: none"> <li>• All wastes generated and received at the project.</li> <li>• Parameters for which each waste will be analyzed.</li> <li>• Test methods used to test for these parameters.</li> <li>• Sampling method used to obtain representative samples.</li> <li>• Frequency with which initial analysis will be reviewed or repeated.</li> <li>• Provisions for retesting waste when the process or operation generating the waste changes.</li> <li>• Procedures used to inspect and analyze each hazardous waste shipment received. (40 CFR 264.13 and 265.13)</li> </ul>	
	<p>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.</p> <p>c. Updates. WAP is updated to reflect requirements applicable to restricted wastes. (40 CFR 265.13(b)(6) and 268.7(c) and (d))</p>	
	<p><b>6. Waste Minimization.</b> Waste minimization practices are being implemented in accordance with a written plan. (40 CFR 262.41(a)(6)-(8); 58 Fed. Reg. 31114)</p>	
	<p><b>7. Inspection.</b> A written schedule has been developed and is being complied with to inspect monitoring equipment, safety equipment, security devices, and operating and structure equipment.</p> <p>a. A copy of the plan is kept at the project site.</p> <p>b. Areas subject to spills are inspected daily.</p> <p>c. Deterioration/malfunctions are remedied in a timely manner.</p> <p>d. All inspections are documented in a log.</p> <p>All inspections must show deficiencies, responsibility for correcting deficiencies, and dates on which those deficiencies were corrected.</p>	
	<p><b>8. Location Requirements.</b> Project involves the construction of a TSD unit. Location standards specified in 40 CFR 264.18 and 265.18 are being complied with.</p>	
	<p><b>9. Construction Quality Assurance Program.</b> 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.</p>	
<p><b>Closure/Post-Closure</b> (<i>Applies if the project involves closure or post-closure care for any hazardous waste management unit.</i>)</p>		
	<p><b>10. Closure Plan.</b> 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)</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>11. Amendment to Plan.</b> 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.	
	<b>12. Notification.</b> 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)	
	<b>13. Time Allocation.</b> 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)	
	<b>14. Disposal.</b> 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)	
	<b>15. Certification.</b> 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)	
	<b>16. Survey Plat.</b> 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)	
	<b>17. Post-Closure Care/Plans/Notices and Certifications.</b> 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)	
	<b>18. State-Specific Requirements.</b> Closure meets state-specific requirements. (State Hazardous Waste Regulations) See Work Plan/WMP for details on requirements.	
<b>Container Storage</b> ( <i>Applies to storage of containers for greater than 90 days.</i> )		
	<b>19. Marking.</b> Containers are clearly marked with the words "Hazardous Waste".	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>20. Condition.</b> Containers are in good condition (e.g., no severe rusting, apparent structural defects). (40 CFR 264.171 and 265.171)	
	<b>21. Compatibility.</b> Waste is compatible with container. (40 CFR 264.172 and 265.172)	
	<b>22. Management.</b> 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)	
	<b>23. Stacking Drums.</b> Containers stored on top of each other have pallets between them and are not stored more than 2 high. (GMP)	
	<b>24. Drum Log.</b> A log is kept of all drums contained in the storage area. (GMP)	
	<b>25. Location.</b> Containers holding ignitable/reactive waste are stored at least 50 feet from property boundary. (40 CFR 264.177 and 265.176)	
	<b>26. Secondary Containment--Final Status.</b> Storage area has a secondary containment system which: <ul style="list-style-type: none"> <li>a. Is impervious: free from cracks or gaps and impervious enough to contain leaks, spills, and precipitation.</li> <li>b. Base is sloped (or otherwise designed) to drain and remove liquids resulting from leaks, spills, or precipitation.</li> <li>c. Containers are elevated or protected from contact with accumulated liquids.</li> <li>d. Has adequate capacity to contain 10% of volume of containers or the volume of the largest container, whichever is greater.</li> <li>e. Run-on into the containment system is prevented or system has sufficient capacity to contain any runoff that might enter system.</li> <li>f. Liquids within containment system are removed as soon as practicable. (40 CFR 264.175)</li> </ul>	
	<b>27. Inspections.</b> Containers and storage area are inspected at least weekly and logs are kept of these inspections. (40 CFR 264.174 and 265.174)	
	<b>28. Incompatibility.</b> 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)	
	<b>29. Separation.</b> 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)	
	<b>30. Closure.</b> 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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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>31. Air Emissions.</b> Containers comply with management standards specified in 40 CFR Part 265.1030, -.1050, and -.1080.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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)</li> </ul>	
	<p><b>32. State-Specific Requirements.</b> Storage area meets state-specific requirements. (State Hazardous Waste Regulations) See WMP for additional state requirements.</p>	
<b>Satellite Accumulation</b>		
	<p><b>33. Satellite Accumulation Area.</b> 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 <i>Hazardous Waste: Storage Treatment Disposal in Less than 90 Days Checklist</i></p>	
<b>Tanks</b>		
	<p><b>34. Existing Tanks.</b> 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))</p>	
	<p><b>35. New Tanks Installed as Part of Project.</b> Project involves the installation of a tank that stores/treats hazardous waste, and the following has been performed:</p> <ul style="list-style-type: none"> <li>a. <b>Integrity Assessment.</b> 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))</li> <li>b. <b>Installation Inspection.</b> 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))</li> </ul>	
	<p><b>36. Marking.</b> Tanks are clearly marked with "Hazardous Waste".</p>	

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	<p><b>37. Containment System.</b> Applies to a new tank, existing tank storing F020-F023, F026/F027, or other specified existing tanks, unless variance obtained.</p> <ul style="list-style-type: none"> <li>a. <b>General Requirement.</b> 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))</li> <li>b. <b>Leak Detection.</b> 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))</li> <li>c. <b>Removal of Releases.</b> All spills, leaks, precipitation are removed from containment system within 24 hours. (40 CFR 264.193(c) and 265.193(c))</li> <li>d. <b>Specific Design.</b> 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))</li> <li>e. <b>Ancillary Equipment.</b> <i>Ancillary equipment is provided with secondary containment. (40 CFR 264.193(f) and 265.193(f))</i> 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.</li> <li>f. <b>Existing tanks not yet subject to containment requirement.</b> 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))</li> </ul>	
	<p><b>38. Overfill/Spill Control.</b> 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)</p>	
	<p><b>39. Inspection.</b> 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)</p>	

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>40. Spills/Releases.</b> If a spill has occurred from tank/containment system, the following must be performed: (40 CFR 264.196 and 265.196)</p> <ul style="list-style-type: none"> <li>a. <b>Waste/Released Material.</b> 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))</li> <li>b. <b>Release to Environment.</b> 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))</li> <li>c. <b>Notification.</b> If release to environment occurred, proper verbal and written notification was conducted. (40 CFR 264.196(d) and 265.196(d))</li> <li>d. <b>Repair.</b> 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)) <i>Note: Major repair includes installation of internal liner, repair of ruptured containment system, etc.</i></li> </ul>	
	<p><b>41. Closure.</b> 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)</p>	
	<p><b>42. Ignitable/Reactive.</b> 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) <b>OR</b> 2) waste is stored/treated so that it is protected from material/conditions that may cause ignition/reaction <b>OR</b> 3) tank system is used solely for emergencies <b>AND</b> NFPA requirements for storage of such wastes are met. (40 CFR 264.198 and 265.198)</p>	
	<p><b>43. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in same tank system. (40 CFR 264.199 and 265.199)</p>	
	<p><b>44. Air Emissions.</b> 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)</p>	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>45. Waste Analysis and Treatment -- Interim Status.</b> 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:</p> <ul style="list-style-type: none"> <li>a. Waste analyses and trial treatment or storage tests (e.g., bench-scale or pilot-plant scale tests); OR</li> <li>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)</li> </ul>	
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	<p><b>46. State-Specific Requirements.</b> Tank system meets state-specific requirements (State Hazardous Waste Regulations). See WMP for requirements.</p>	
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**Containment Buildings**

	<p><b>47. Enclosed.</b> 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))</p>	
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	<p><b>48. Barrier.</b> 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))</p>	
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	<p><b>49. Compatibility.</b> Surfaces are chemically compatible with wastes that come into contact with them. (40 CFR 264.1101(a)(2) and 265.1101(a)(2))</p>	
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	<p><b>50. Amount of Waste.</b> Level of waste within containment walls does not exceed height of wall. (40 CFR 264.1101(c) and 265.1101(c))</p>	
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	<p><b>51. Decontamination.</b> Building has decontamination area and procedures to prevent tracking waste out of building. (40 CFR 264.1101(c) and 265.1101(c))</p>	
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	<p><b>52. Fugitive Dust Control.</b> 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))</p>	
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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>53. Liquids Management.</b> 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))</p> <ul style="list-style-type: none"> <li>a. <b>Primary Barrier</b> is designed to prevent the migration of hazardous constituents into the barrier.</li> <li>b. <b>Liquid Collection/Removal.</b> 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.</li> <li>c. <b>Secondary Containment.</b> 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. <i>(Note: Leak detection system requirement is met if bottom slope is 1% or more and constructed of granular drainage material with hydraulic conductivity of <math>1 \times 10^{-2}</math> or more and 12 inches thick or constructed of synthetic/geonet drainage materials with transmissivity of <math>3 \times 10^{-5}</math> m<sup>2</sup>/sec or more)</i></li> <li>d. <b>Treatment.</b> If treating in building, treatment area must be designed to prevent release of liquids, wet materials, or liquid aerosols to other portions of building.</li> <li>e. <b>Chemically Resistant.</b> Secondary containment system is constructed of materials that are chemically resistant to waste and liquids managed and of sufficient strength and thickness.</li> </ul>	
	<p><b>54. PE Certification.</b> 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)).</p>	
	<p><b>55. Release.</b> 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))</p> <ul style="list-style-type: none"> <li>a. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted.</li> <li>b. <b>Recordkeeping.</b> Condition/release was recorded in operating record.</li> <li>c. <b>Notification.</b> Within 7 days EPA was notified and within 14 working days written plan of steps taken to repair/cleanup was submitted.</li> <li>d. <b>PE Certification.</b> After repairs were performed, EPA was provided with PE certification that repairs/cleanup were conducted in accordance with written plan.</li> </ul>	

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>56. Inspection.</b> 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))</p>	
	<p><b>57. Areas With and Without Secondary Containment.</b> 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)).</p>	
	<p><b>58. Closure.</b> 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)</p>	
	<p><b>59. Recordkeeping.</b> The following records are kept:</p> <ul style="list-style-type: none"> <li>a. Certification by PE that building meets design requirements.</li> <li>b. Operating log which includes containment building operations and reported leaks or spills.</li> <li>c. Regulatory agency correspondence.</li> <li>d. Operating procedures to maintain integrity of areas without secondary containment. (40 CFR 264.1101 and 265.1101)</li> </ul>	
	<p><b>60. State-Specific Requirements.</b> Containment building meets state-specific requirements. (State Hazardous Waste Regulations) See WMP for requirements.</p>	

**Surface Impoundments**

	<p><b>61. Permit.</b> Surface impoundment is operating in accordance with conditions of permit. (40 CFR 270)</p>	
	<p><b>62. Construction or Expansion.</b> 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)) <i>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.</i></p>	

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>63. Existing Units.</b> Project involves non-construction activities at an existing surface impoundment. The unit :</p> <ul style="list-style-type: none"> <li>a. Contains a liner which is designed, constructed and installed to prevent the migration of waste out of the unit. <i>Applies to final status.</i> (40 CFR 264.221(a))</li> <li>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. <i>Applies to interim status.</i> (40 CFR 265.221(f) and (g))</li> <li>c. Designed, constructed, maintained and operated to prevent overtopping by overfilling due to normal or abnormal activities, wind and wave action, rainfall, runoff, malfunctions of level controllers, alarms and other equipment and human error. <i>Applies to final status.</i> (40 CFR 264.221(g))</li> <li>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)</li> <li>e. Has additional design requirements as specified in the Part B permit. <i>Applies to final status.</i> (40 CFR 264.221(i))</li> </ul>	
	<p><b>64. Inspections.</b> The following inspections are conducted. Records are maintained at the project site.</p> <ul style="list-style-type: none"> <li>a. During and after installation and construction, liners and cover systems are inspected. <i>Applies to final status only.</i></li> <li>b. Freeboard level is checked daily for interim status facilities and weekly for final status facilities.</li> <li>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.</li> <li>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)</li> </ul>	
	<p><b>65. Response Action.</b> 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)</p>	
	<p><b>66. Certification -- Final Status.</b> 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))</p>	

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>67. Removal from Service -- Final Status.</b> 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)</p>	
	<p><b>68. Closure/Post-Closure.</b> 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)</p>	
	<p><b>69. Ignitable/Reactive Wastes.</b> Ignitable/reactive wastes are not placed in the surface impoundment unless:</p> <ul style="list-style-type: none"> <li>a. Waste and impoundment satisfy 40 CFR 268 requirements; AND</li> <li>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</li> <li>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</li> <li>d. Surface impoundment is used solely for emergencies. (40 CFR 264.229 and 265.229)</li> </ul>	
	<p><b>70. Incompatible Wastes.</b> 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)</p>	
	<p><b>71. Dioxin-containing Wastes -- Final Status.</b> 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)</p>	
	<p><b>72. Waste Analysis and Trial Tests -- Interim Status.</b> 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)</p>	

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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>
	<b>73. Air Emissions Standards.</b> 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)	
	<b>74. State-Specific Requirements.</b> Surface impoundment meets state-specific requirements. (State Hazardous Waste Regulations)	
<b>Waste Piles</b>		
	<b>75. Permit.</b> Waste pile is operating in accordance with conditions of permit. (40 CFR 270)	
	<b>76. Protection From Wind.</b> Pile containing hazardous waste is protected from the wind. Are appropriate BMPs in place? (40 CFR 264.251(j) and 265.251)	
	<b>77. Waste Analysis.</b> 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)	
	<p><b>78. Construction or Expansion.</b> Project involves the construction or replacement of portions of a waste pile. Waste pile has:</p> <ul style="list-style-type: none"> <li>a. Double liner that meets the requirements of 40 CFR 264.251(c);</li> <li>b. Leachate collection and removal system;</li> <li>c. Run-on control system capable of preventing flow onto active portion of pile from at least 25-year storm;</li> <li>d. Run-off system to collect/control water volume from 24-hour, 25-year storm;</li> <li>e. Collection/holding systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity;</li> <li>f. Additional requirements specified in permit. (40 CFR 264.251 and 265.254)</li> </ul> <p><i>Note: This requirement applies to construction, lateral expansions or replacement of existing units which commenced after January 29, 1992.</i></p>	

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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<p><b>79. Existing Waste Pile.</b> Unless an alternative design has been approved by EPA/state, waste pile has:</p> <ul style="list-style-type: none"> <li>a. Liner designed, constructed, and installed to prevent migration of wastes out of the pile. <i>Applies to final status.</i> (40 CFR 264.251(a))</li> <li>b. Impermeable base compatible with the waste which supports liner. (40 CFR 264.251 and 265.253(a)(1))</li> <li>c. Run-on diversion and control systems. (40 CFR 264.251(g) and 265.253(a))</li> <li>d. Leachate and runoff collection. (40 CFR 264.251 and 265.253) and</li> <li>e. Collection/holding systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity.</li> </ul> <p><i>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 runoff by other means, and no liquids or waste containing free liquids are placed on pile, then these conditions do not apply.</i></p>		
	<p><b>80. Exemptions -- Final Status.</b> 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:</p> <ul style="list-style-type: none"> <li>a. Liquids are not placed in the waste pile (40 CFR 264.250(c)(1));</li> <li>b. The unit is protected from surface water runoff (40 CFR 264.250(c)(2));</li> <li>c. Wind dispersal is controlled by a means other than wetting; (40 CFR 264.250(c)(3)); and</li> <li>d. Pile does not generate leachate through decomposition or reactions (40 CFR 264.250(c)(4)).</li> </ul>		
	<p><b>81. Inspections.</b> The following inspections are conducted. Records are maintained at the project site.</p> <ul style="list-style-type: none"> <li>a. During and after installation and construction, liners and cover systems are inspected. <i>Applies to final status only.</i></li> <li>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. <i>Applies to final status only.</i></li> <li>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)</li> </ul>		

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Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>82. Response Action.</b> 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)</p>	
	<p><b>83. Closure/Post-Closure.</b> 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)</p>	
	<p><b>84. Ignitable/Reactive Wastes.</b> Ignitable/reactive wastes are not placed in a waste pile unless:</p> <ul style="list-style-type: none"> <li>a. Waste and impoundment satisfy 40 CFR 268 requirements; AND</li> <li>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</li> <li>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)</li> </ul>	
	<p><b>85. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in the same waste pile unless 40 CFR 264.17(b) or 265.17(b) requirements are met.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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)</li> </ul>	
	<p><b>86. Dioxin-Containing Wastes -- Final Status.</b> 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)</p>	
	<p><b>87. State-Specific Requirements.</b> Waste pile complies with state-specific requirements. (State Hazardous Waste Regulations)</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Drip Pads</b>		
	<p><b>88. Design and Operation.</b> Drip pads are designed and operated as follows:</p> <ul style="list-style-type: none"> <li>a. Constructed solely of nonearthen materials (40 CFR 264.573(a)(1) and 265.443(a)(1));</li> <li>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));</li> <li>c. Pad is either covered or capable of preventing runoff and runoff from a 24-hour, 25-year storm (40 CFR 264.573(e) and (f) and 265.443(e) and (f)).</li> <li>d. Collecting/holding units are emptied as soon as possible after storms. (40 CFR 264.573(h) and CFR 265.443(h));</li> <li>e. Pad has hydraulic conductivity of <math>1 \times 10^{-7}</math> 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))</li> <li>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))</li> <li>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))</li> </ul>	
	<p><b>89. Construction of New Units.</b> Project activities involve the construction of a new drip pad. All of the requirements specified in #1 are complied with EXCEPT:</p> <ul style="list-style-type: none"> <li>a. Pad has hydraulic conductivity of <math>1 \times 10^{-7}</math> 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</li> <li>b. Pad has a synthetic liner and leakage detection system constructed in accordance with 40 CFR 264.573(b) or 265.442(b).</li> </ul> <p><i>Note: New units are those which commenced construction after December 24, 1992.</i></p>	
	<p><b>90. Assessment and Certification.</b> 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))</p>	
	<p><b>91. Operating Record.</b> Past operating and waste handling practices are document in the facility records. (40 CFR 264.573(o) and 265.443(n).</p>	

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>92. Closure.</b> 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).</p>	
	<p><b>93. Inspection.</b> The following inspections have or are being conducted. Documentation is placed in on-site files.</p> <ul style="list-style-type: none"> <li>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))</li> <li>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)).</li> <li>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))</li> </ul>	
	<p><b>94. Release.</b> If leak detected, the following has been conducted: (40 CFR 264.573(m) and 265.443(m))</p> <ul style="list-style-type: none"> <li>a. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted.</li> <li>b. <b>Recordkeeping.</b> Condition/release was recorded in operating record.</li> <li>c. <b>Notification.</b> Within 24 hours EPA was notified and within 10 days a written report of steps taken to repair/cleanup was submitted.</li> <li>d. <b>Certification.</b> Independent engineering certification was submitted upon completion of repairs and cleanup.</li> </ul>	
	<p><b>95. State-Specific Requirements.</b> Drip pads comply with state-specific requirements. (State Hazardous Waste Regulations)</p>	
<b>Landfills</b>		
	<p><b>96. Design and Operation.</b> 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</p> <ul style="list-style-type: none"> <li>a. Double liners;</li> <li>b. Leak detection; and</li> <li>c. Groundwater monitoring. (40 CFR 264.301, 264.90 - 100 and 265.301)</li> </ul>	
	<p><b>97. Written Procedures.</b> 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)</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>98. Runoff Collection/Control System.</b> Landfill has a runoff diversion and control system which is capable of managing a 24-hour, 25-year storm.</p> <ul style="list-style-type: none"> <li>a. The system is emptied as soon as practicable to maintain the required holding capacity.</li> <li>b. Collected runoff is analyzed to determine if it is hazardous waste.</li> <li>c. Collected runoff is properly managed according to characterization. (40 CFR 264.301(g), (h), and (j) and 265.301(b) - (c)).</li> </ul>	
	<p><b>99. Waste Location Documentation.</b> 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)</p>	
	<p><b>100. Inspection.</b> The following inspections have or are being conducted. Documentation is contained in project files.</p> <ul style="list-style-type: none"> <li>a. Liners and cover systems were inspected during and after installation (examine construction records to determine).</li> <li>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.</li> <li>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)</li> </ul>	
	<p><b>101. Response Action.</b> 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)</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>102. Closure/Post-Closure.</b> 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)</p>	
	<p><b>103. Reactive/Ignitable Wastes.</b> Reactive or ignitable waste are placed in landfill only if:</p> <ul style="list-style-type: none"> <li>a. It is treated, rendered, or mixed before or immediate after placement in the landfill so it is no longer reactive/ignitable; OR</li> <li>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))</li> </ul>	
	<p><b>104. Incompatible Wastes.</b> Incompatible wastes are placed in the same landfill cell only if wastes are managed to prevent:</p> <ul style="list-style-type: none"> <li>a. Extreme heat, fire or explosion;</li> <li>b. Uncontrolled toxic mists, dusts, fumes, or gases;</li> <li>c. Uncontrolled flammable vapors or gases;</li> <li>d. Damage to structural integrity of landfill; and</li> <li>e. Threat to human health and the environment. (40 CFR 264.17(b) and 265.17(b))</li> </ul>	
	<p><b>105. Bulk Liquids -- Final Status.</b> 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)</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>106. Containerized Liquids.</b> Containerized liquids are only placed in the landfill under the following conditions:</p> <ul style="list-style-type: none"> <li>a. Free-standing liquid has been removed;</li> <li>b. Waste has been mixed with absorbents or solidified so that free-standing liquid is no longer observed;</li> <li>c. Container is very small, such as an ampule;</li> <li>d. Container is designed to hold free liquids for use other than storage, such as a battery or capacitor; OR</li> <li>e. Container is a lab pack. (40 CFR 264.314(d) and 265.314(d))</li> <li>f. Absorbents used to treat free liquids are non-biodegradable. (40 CFR 264.314(e) and 265.314(f))</li> </ul>	
	<p><b>107. Empty Containers.</b> 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).</p>	
	<p><b>108. Dioxin-Containing Wastes – Final Status.</b> 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)</p>	
	<p><b>109. State-Specific Requirements.</b> Landfill complies with state-specific requirements. (State Hazardous Waste Regulations)</p>	

**Incinerators**

	<p><b>110. Exemption.</b> 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).</p>	
	<p><b>111. Waste Analysis.</b> 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)</p>	
	<p><b>112. Principal Organic Hazardous Constituents (POHCs) -- Final Status.</b> POHCs in the waste feed are being treated to meet performance standard of 40 CFR 264.343. During trial burn, POHCs are meeting trial burn requirements specified in 40 CFR 270.62. (40 CFR 264.342)</p>	
	<p><b>113. Performance Standards -- Final Status.</b> 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.</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

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Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>114. Permit -- Final Status.</b> 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)	
	<b>115. Operating Conditions -- Final Status.</b> 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).	
	<b>116. Operating Conditions -- Interim Status.</b> 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)	
	<b>117. Monitoring and Inspections -- Interim Status.</b> 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)	
	<b>118. Monitoring and Inspections -- Final Status.</b> 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)	
	<b>119. Closure.</b> 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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Project:	Inspector:	Date:		
Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			<b>120. Dioxin Containing Wastes -- Interim Status.</b> 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)	
			<b>121. Waste Residues and Treated Wastes.</b> 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.	
			<b>122. State-Specific Requirements.</b> Incinerator complies with state-specific requirements. (State Hazardous Waste Regulations)	
<b>Thermal Treatment Units.</b> <i>(This section applies to interim status facilities only.)</i>				
			<b>123. Operation.</b> 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)	
			<b>124. Waste Analysis Plan.</b> 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)	
			<b>125. Monitoring and Inspections.</b> 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 <sub>2</sub> and CO meters, process levels, etc.). Stack plume emissions are monitored at least hourly (for color and opacity). Daily inspection is conducted of: <ul style="list-style-type: none"> <li>a. Pumps, valves, conveyors, and pipes for leaks, spills, and fugitive emissions;</li> <li>b. Emergency shutdown controls; and</li> <li>c. System alarms.</li> </ul> Inspections logs are kept in the project files. (40 CFR 265.377 and 265.15)	
			<b>126. Contingency Planning.</b> 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)	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<b>127. Detonation of Explosives.</b> 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).		
	<b>128. Closure.</b> 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)		
	<b>129. Dioxin Containing Wastes -- Interim Status.</b> 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)		
	<b>130. Waste Residues and Treated Wastes.</b> 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.		
	<b>131. State-Specific Requirements.</b> Unit complies with state-specific requirements. (State Hazardous Waste Regulations). Refer to WMP for requirements.		
<b>Chemical, Physical, and Biological Treatments.</b> ( <i>Applies to interim status facilities only.</i> )			
	<b>132. Operating Procedure.</b> 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)		
	<b>133. Waste Analysis Plan.</b> 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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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>134. Inspections.</b> Daily inspections are being conducted of</p> <ul style="list-style-type: none"> <li>a. Discharge control and safety equipment; and</li> <li>b. Data gathered from monitoring equipment.</li> </ul> <p>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)</p>	
	<p><b>135. Incompatible Wastes.</b> Incompatible wastes are placed in the same treatment process only if wastes are managed to prevent:</p> <ul style="list-style-type: none"> <li>a. Extreme heat, fire or explosion;</li> <li>b. Uncontrolled toxic mists, dusts, fumes, or gases;</li> <li>c. Uncontrolled flammable vapors or gases;</li> <li>d. Damage to structural integrity of landfill; and</li> <li>e. Threat to human health and the environment. (40 CFR 265.17(b))</li> </ul> <p>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))</p>	
	<p><b>136. Reactive/Ignitable Wastes.</b> Reactive or ignitable waste are treated to prevent ignition or reaction.</p> <ul style="list-style-type: none"> <li>a. It is treated, rendered, or mixed before or immediately after placement in the treatment process so it is no longer reactive/ignitable;</li> <li>b. Treated in a manner that does not threaten human health or the environment; OR</li> <li>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))</li> </ul>	
	<p><b>137. Closure.</b> 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)</p>	
	<p><b>138. Waste Residues and Treated Wastes.</b> 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)</p>	
	<p><b>139. State-Specific Requirements.</b> Unit meets state-specific requirements. (State Hazardous Waste Regulations)</p>	

**Land Treatment Units**

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>140. Design and Operation.</b> 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))</p>	
	<p><b>141. Treatment Demonstration. -- Final Status.</b> Treatment demonstration has been conducted for each waste that will be applied to the treatment zone in accordance with 40 CFR 264.272.</p>	
	<p><b>142. Waste Analysis -- Interim Status.</b> Before hazardous waste was placed in or on a land treatment facility, waste analysis was conducted in accordance with 40 CFR 265.273.</p>	
	<p><b>143. Run-on/Runoff Control.</b> 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)</p>	
	<p><b>144. Wind Dispersal Control.</b> Treatment zone contains particulate matter and wind dispersal is being controlled. (40 CFR 264.273(f) and 265.272(e))</p>	
	<p><b>145. Inspections – Final Status.</b> 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))</p>	
	<p><b>146. Monitoring.</b> 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)</p>	
	<p><b>147. Significant Increase of Hazardous Constituents -- Final Status.</b> 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))</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>148. Reactive/Ignitable Wastes.</b> Reactive or ignitable waste are treated to prevent ignition or reaction.</p> <ul style="list-style-type: none"> <li>a. It is immediately incorporated into the soil so that they no longer meet the definition of ignitability or reactivity; OR</li> <li>b. It is managed to prevent ignition or reaction. (40 CFR 264.281 and 265.281)</li> </ul>	
	<p><b>149. Incompatible Wastes.</b> 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)</p>	
	<p><b>150. Treatment of Dioxins -- Final Status.</b> 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)</p>	
	<p><b>151. Recordkeeping.</b> 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)</p>	
	<p><b>152. Closure.</b> Land treatment unit is being properly closed.</p> <ul style="list-style-type: none"> <li>a. Operations necessary to maximize degradation, transformation, or immobilization of waste and minimize run-on/runoff and wind dispersal will continue through closure.</li> <li>b. Vegetative cover is being established and maintained.</li> <li>c. Unsaturated zone monitoring is being continued.</li> <li>d. Soil pore monitoring is continued for 90 days after last waste application</li> <li>e. Closure has been certified by independent qualified soil scientist or independent registered professional engineer. (40 CFR 264.280 and 265.280)</li> </ul>	
	<p><b>153. State-Specific Requirements.</b> Land treatment unit complies with state-specific requirements. (State Hazardous Waste Regulations)</p>	
<b>Miscellaneous Units (Applies to final status units only.)</b>		
	<p><b>154. Design and Operation.</b> Unit is designed and operated in accordance with permit conditions, including but not limited to:</p> <ul style="list-style-type: none"> <li>a. Prevention of migration of waste constituents in groundwater or subsurface environment;</li> <li>b. Prevention of migration of waste constituents in surface water, wetlands, or soil surface;</li> <li>c. Prevention of migration of waste constituents to air; and</li> <li>d. Procedures regarding monitoring and analysis, inspection, emergency response, spill reporting, and corrective action. (40 CFR 264.600 - 603)</li> </ul>	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<b>155. Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action.</b> 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)		
	<b>156. Closure.</b> Plan is in place for closure and if all contamination cannot be completely removed, post closure plan is in place. (40 CFR 264.603)		
	<b>157. State-Specific Requirements.</b> Miscellaneous unit complies with state-specific requirements. (State Hazardous Waste Regulations)		
<b>Boilers And Industrial Furnaces</b>			
	<b>158. Interim Status.</b> 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.		
	<b>159. Final Status.</b> 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.		
<b>Groundwater Monitoring</b>			
	<b>160. Solid Waste Management Unit – Final Status.</b> 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)		
	<b>161. Monitoring At Interim Status Facilities.</b> 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. <i>Note: Facility may have obtained a waiver from these requirements if the criteria specified in 40 CFR 265.90(c) - (e) were met.</i>		
<b>Corrective Action Management Units Facilities (Applies to final status facilities only.)</b>			

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<p><b>162. Designated Area.</b> 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)</p>	
	<p><b>163. Closure.</b> 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))</p>	
	<p><b>164. Documentation.</b> EPA has documented the rationale for designating the CAMU. (40 CFR 264.552(g))</p>	
	<p><b>165. Incorporation Into Permit.</b> 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))</p>	
	<p><b>166. Temporary Unit.</b> 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)</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Training</b>		
	<p><b>167. General.</b> 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))</p>	
	<p><b>168. Annual Refresher.</b> Personnel have undergone annual refresher training. (40 CFR 264.16(c) and 265.16(c))</p>	
	<p><b>169. Personnel Records.</b> 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))</p>	
	<p><b>170. Training Records.</b> 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))</p>	
<b>Preparedness and Prevention</b>		
	<p><b>171. Controlled Entry/Security.</b> The following security measures are installed at the hazardous waste portion of the project site. (40 CFR 264.14 and 265.14)</p> <ul style="list-style-type: none"> <li>a. Area is surrounded by a fence or natural barrier.</li> <li>b. Entrances are locked or monitored on a 24-hour basis.</li> <li>c. Signs with "Danger-Unauthorized Personnel Keep Out" are posted at each entrance and other locations as appropriate.</li> <li>d. Signs are legible from at least 25 feet and are written in English or other language predominant in the area.</li> </ul>	
	<p><b>172. Management of Project.</b> Project is managed to minimize the possibility of fire, explosion, or any sudden releases to the environment. (40 CFR 264.31 and 265.31)</p>	
	<p><b>173. Equipment.</b> Project site is equipped with:</p> <ul style="list-style-type: none"> <li>a. Internal communication or alarm system.</li> <li>b. Telephone or hand-held two-way radio capable of summoning help.</li> <li>c. Spill control, and decontamination equipment, and</li> <li>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)</li> </ul>	
	<p><b>174. Testing.</b> Equipment is tested/maintained to assure proper operation and records are kept of testing. (40 CFR 264.33 and 265.33)</p>	
	<p><b>175. Waste Handling Procedure.</b> 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)</p>	

PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	
	<b>176. Aisle space.</b> 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)		
	<b>177. Local Arrangements.</b> Arrangements have been made with emergency response agencies. (40 CFR 264.37 and 265.37)		
	<b>178. Ignitable/Reactive/Incompatible Wastes.</b> 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)		
	<b>179. Contingency Planning</b>		
	<b>180. Hazardous Waste Contingency Plan.</b> 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)		
	<b>181. Copies.</b> HWCP is maintained at the project site and submitted to local emergency response agencies, as appropriate. (40 CFR 264.53 and 265.53)		
	<b>182. Revision of HWCP.</b> 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.		
	<b>183. Emergency Coordinator Responsibilities.</b> 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)		
	<b>184. Implementation of Plan.</b> During emergency, requirements/responsibilities of emergency coordinator, implementation of plan, and notification were properly conducted. (40 CFR 264.56 and 265.56)		

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**Off-site Transportation/Disposal**

	<p><b>185. Transporter.</b> Hazardous wastes are offered only to transporters with proper EPA Identification Numbers. (40 CFR 262.12(c))</p>	
	<p><b>186. Prequalification.</b> Hazardous wastes are transported by and disposed only by prequalified transporters and disposal, treatment, or recycling facilities (EHS 1-4).</p>	
	<p><b>187. Manifesting.</b> 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.</p>	
	<p><b>188. Packaging/Labeling/Placarding.</b> Prior to off-site transport each hazardous waste is:</p> <ul style="list-style-type: none"> <li>a. Packaged and labeled in accordance with DOT requirements.</li> <li>b. If 110 gallons or less, marked with commercial label designated "Hazardous Waste" and contact information.</li> <li>c. Marked with generator's name, address, and manifest document number.</li> <li>d. Placarded in accordance with DOT requirements. (40 CFR 262.30 - .32)</li> </ul>	

**Receiving Offsite Waste**

	<p><b>189. Manifest/Shipping Paper Review.</b> 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)</p>	
	<p><b>190. Discrepancies.</b> 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)</p>	
	<p><b>191. Unmanifested Waste Reports.</b> 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 form 8700-13B) was submitted to EPA within fifteen days after receiving the waste.</p>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>192. Restricted Waste Disposal.</b> 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))</p> <p>a. <b>Recordkeeping.</b> Records are maintained of all notices and certifications pertaining to land disposal. (40 CFR 268.7(c)(1))</p> <p>b. <b>Sampling and Analysis.</b> Waste or extract of waste must be tested to ensure waste is in compliance with treatment standards. Verify:</p> <ul style="list-style-type: none"> <li>• Waste analysis plan contains frequency and analytical methods.</li> <li>• Operating record demonstrates waste analysis plan is being implemented.</li> <li>• Laboratory analysis demonstrates waste disposed of meets LDRs.</li> </ul>	
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	<p><b>193. Receiving Off-site Waste.</b> 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)</p> <p>a. Written notice is maintained in project's operating record.</p> <p>b. Project is approved to handle specified waste type.</p>	
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**Import/Export**

	<p><b>194. Export.</b> 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)</p>	
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	<p><b>195. Import.</b> 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)</p>	
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**Onsite Transportation**

	<p><b>196. Management Practices.</b> 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.</p>	
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	<p><b>197. Crossing Public Roads.</b> 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)</p>	
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**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**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.*

	<p><b>198. Operating Record.</b> Operating record contains the following:</p> <ul style="list-style-type: none"> <li>a. Description, quantity and date of placement of each shipment of waste received. This information should cross-reference the manifest number.</li> <li>b. Location of waste at the facility.</li> <li>c. Records and results of waste analysis and trial tests.</li> <li>d. Report on incidents.</li> <li>e. Records/results of inspections in accordance with 40 CFR 264.17 and 265.17.</li> <li>f. Monitoring, testing, and analytical data.</li> <li>g. Copies of LDR notices and certifications.</li> <li>h. Records of quantities of waste placed in land disposal under extension of effective date of any LDR.</li> <li>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.</li> <li>j. Annual waste minimization program certifications. (40 CFR 264.73, 265.74, 268.7 and 268.8)</li> </ul>	
	<p><b>199. Generator Records If Waste Shipped Off-site.</b> Records are kept on-site for at least 3 years (or in project files if project ends earlier) of the following:</p> <ul style="list-style-type: none"> <li>a. Copy of signed manifests from TSDF which received waste.</li> <li>b. Copy of exception reports.</li> <li>c. Records to characterize wastes. (40 CFR 262.40)</li> </ul>	
	<p><b>200. Biennial/State Report.</b> 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)</p>	
	<p><b>201. Facility Reports.</b> The following reports, if applicable, have been prepared, signed, and submitted:</p> <ul style="list-style-type: none"> <li>a. Any release from solid waste management unit.</li> <li>b. Fires and explosions.</li> <li>c. Groundwater detection monitoring program.</li> <li>d. Compliance monitoring program.</li> <li>e. Corrective action program.</li> <li>f. Surface impoundment, waste pile, land treatment, and land disposal unit monitoring.</li> <li>g. Certification of closure for hazardous waste surface impoundment, waste pile, land treatment, and landfill units. (40 CFR 264.77 and 265.77)</li> </ul>	

**PESM INSPECTION CHECKLIST— HAZARDOUS WASTE: PERMITTED FACILITIES**

**CONFIDENTIAL**

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	<b>202. Exception Reports.</b> 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)	
	<b>203. LDR Certification/Notices/Waste Analysis.</b> 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))	
<b>Land Disposal Restrictions</b>		
	<b>204. Notice/Certification.</b> 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))	
	<b>205. Variance/Extension/Exemption.</b> 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))	
	<b>206. Exemption.</b> 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))	
	<b>207. Compliance with LDRs.</b> 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)	
	<b>208. Debris.</b> Debris which contains a listed waste or is characteristically hazardous has: <ul style="list-style-type: none"> <li>a. Obtained a contained-in determination by EPA under 40 CFR 261</li> <li>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.</li> <li>c. Meets the land disposal restrictions in 40 CFR 268.40 and applicable Universal Treatment Standards of 40 CFR 268.48.</li> <li>d. Residues from treatment of hazardous debris must be managed as a hazardous waste and meet 40 CFR 268 standards prior to land disposal.</li> </ul>	

--End Checklist--



**PESM INSPECTION CHECKLIST - HAZARDOUS WASTE: STORAGE/TREATMENT/DISPOSAL  
IN LESS THAN 90 DAYS**

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

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.

**General Requirements**

	<p><b>1. ESS or Designated Waste Management Role.</b> Discuss Role of ESS or designated individual with regards to waste management at the site.</p> <ul style="list-style-type: none"> <li>a. How is waste management handled &amp; is it working effectively?</li> <li>b. What types of problems have been encountered?</li> <li>c. Is ESS or designated individual receiving regulatory support from ESQ Env. Compliance/Regulatory Specialists as needed?</li> <li>d. Does ESS or designated individual have the required training and knowledge?</li> </ul>	
	<p><b>2. Waste Classification.</b> Waste is characterized as hazardous or state-regulated hazardous waste.</p> <p>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.</p>	
	<p><b>3. EPA Identification Number.</b> Generator has obtained EPA Identification number to store &amp; offer waste for transport. (40 CFR 262.12)</p>	

**Container Storage**

	<p><b>4. Storage Requirements.</b> Review weekly inspection forms for container &amp; 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)</p>	
	<p><b>5. Inspections.</b> Containers &amp; storage area are inspected at least weekly &amp; written records are kept of these inspections as well as corrective actions documentation. (40 CFR 265.174; GMP)</p>	
	<p><b>6. Incompatibility.</b> Check to see if incompatible wastes are stored without adequate separation or berms, as applicable. (40 CFR 265.177; GMP)</p>	



PESM INSPECTION CHECKLIST - HAZARDOUS WASTE: STORAGE/TREATMENT/DISPOSAL  
IN LESS THAN 90 DAYS

**CONFIDENTIAL**

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

	<p><b>7. Air Emissions.</b> Containers comply with management standards specified in 40 CFR Part 265.1030, -.1050, and -.1080 (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p> <p>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 &amp; operate equipment within those specified emissions (40 CFR 265 Subpart AA).</p> <p>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).</p> <p>c. If there are tanks that contain hazardous waste, the tanks must meet specific design criteria in Subpart CC (<i>Note: Superfund sites &amp; RCRA Corrective Actions are exempt</i>). If haz. waste is stored in surface impoundments, there must be emissions controls per Subpart CC. (40 CFR 265 Subpart CC).</p>	
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	<p><b>8. State-Specific Requirements.</b> Storage area meets state-specific requirements, which may include secondary containment. <b>See the Site Health &amp; Safety Plan (or Project Waste Management Plan) for additional requirements.</b></p>	
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**Satellite Accumulation**

	<p><b>9. Designated Area and Marking.</b> A designated area has been established to accumulate waste (posted as such) &amp; area is marked with caution signage or tape on the floor.</p>	
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	<p><b>10. Quantity and Location.</b> 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))</p> <p>Ex.: NAPL removed from a monitoring well is accumulated in a 55-gal. drum &amp; stored next to the well, and drum contains less than 55 gallons.</p> <p>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.</p>	
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PESM INSPECTION CHECKLIST - HAZARDOUS WASTE: STORAGE/TREATMENT/DISPOSAL  
IN LESS THAN 90 DAYS

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	<p><b>11. Marking.</b> Containers are marked with the words "Hazardous Waste".</p> <p>NOTE: An <b>Accumulation Start Date</b> is <b>not</b> 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).</p>	
	<p><b>12. Timing.</b> 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.</p> <p>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 <b>shipped off-site</b> within 3 days.</p>	
	<p><b>13. State-Specific Requirements.</b> Satellite accumulation area meets state-specific requirements. <b>See Site H&amp;S Plan</b> (or Waste Mgmt. Plan) for additional requirements.</p>	
	<p><b>14. Container Management.</b> Containers meet the same condition, compatibility, and requirements for handling as less than 90-day storage areas (<b>see #4 through #8 above</b>).</p>	

**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.

	<p><b>15.</b> Is the remediation waste stockpile located within the AOC (contiguous contaminated area)?</p>	
	<p><b>16.</b> Stockpiles of haz. waste are tracked in a waste log to include at a minimum:</p> <ul style="list-style-type: none"> <li>a. Date of generation (accumulation start date)</li> <li>b. Dates sampled (if applicable)</li> <li>c. Characterization of waste</li> <li>d. Off-site shipment dates.</li> </ul>	
	<p><b>17.</b> Stockpiles of hazardous waste are shipped off-site within 90 days of the accumulation start date.</p>	



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		18. Stockpiles are designed & maintained appropriately (e.g. placed on poly sheeting, bermed, and <b>covered when not in use or at the end of each day. Covers should be anchored appropriately to avoid wind lifting cover &amp; exposing waste or rain to enter into the bermed area.</b>	
		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. <b>New Tanks Installed as Part of Project.</b> Project involves the installation of a tank that stores/treats hazardous waste, and the following has been performed:	
		a. <b>Integrity Assessment.</b> 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. <b>Installation Inspection.</b> 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. <b>Marking.</b> Tanks are clearly marked with the words "Hazardous Waste" and accumulation start date is clearly visible. (40 CFR 262.34(a))	
		22. <b>Accumulation Time.</b> 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. <b>Containment System.</b> Applies to a new tank, existing tank storing F020-F023, F026/F027, or other specified existing tanks, unless a variance was obtained.	
		a. <b>General Requirement.</b> Containment system is capable of detecting/collecting releases & accumulated liquids until collected material is removed. (40 CFR 265.193(b)(2))	
		b. <b>Leak Detection.</b> 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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			<p>c. <b>Removal of Releases.</b> All spills, leaks, precipitation are removed from containment system within 24 hours. (40 CFR 265.193(c))</p>	
			<p>d. <b>Specific Design.</b> 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))</p>	
			<p>e. <b>Ancillary Equipment.</b> Ancillary equipment is provided with secondary containment. (40 CFR 265.193(f))</p> <p>Note: Not applicable to above ground piping/welded flanges, joints &amp; connections/seamless or magnetic coupling pumps and valves/pressurized aboveground piping with automatic shut-off devices that are visually inspected daily.</p>	
			<p>f. <b>Existing Tanks not yet Subject to Containment Requirement.</b> 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 &amp; document is kept on-site. (40 CFR 265.193(i))</p>	
			<p><b>24. Overfill/Spill Control.</b> Tank system includes spill prevention controls, overfill prevention controls and maintenance of freeboard in uncovered tanks to prevent overtopping. (40 CFR 265.194)</p>	
			<p><b>25. Inspection.</b> 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)</p>	
			<p><b>26. Spills/Releases.</b> If a spill has occurred from tank/containment system, the following must have been performed: (40 CFR 265.196)</p>	
			<p>a. <b>Waste/Released Material.</b> 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))</p>	
			<p>b. <b>Release to Environment.</b> 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)</p>	
			<p>c. <b>Notification.</b> 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))</p>	



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		<p>d. <b>Repair.</b> If after the release the tank system required major repair, the PE certification was sent to EPA/state. (40 CFR 265.198(e))</p> <p>Note: "Major repair" includes installation of internal liner, repair of ruptured containment system, etc.</p>	
		<p><b>27. Closure.</b> 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) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>28. Ignitable/Reactive.</b> 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) <b>OR</b> 2) waste is stored/treated so that it is protected from material/conditions that may cause ignition/reaction <b>OR</b> 3) tank system is used solely for emergencies <b>AND</b> NFPA requirements for storage of such wastes are met. (40 CFR 265.198) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>29. Incompatible Wastes.</b> Incompatible wastes/materials are not placed in same tank system. (40 CFR 265.199)</p>	
		<p><b>30. Air Emissions.</b> If 40 CFR Part 265, Subpart AA, BB, or CC standards are applicable, tank system complies with these management standards. (40 CFR 265.202) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>31. Treatment in 90-Day or Less Tanks.</b> 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)) (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p>	
		<p><b>32. State-Specific Requirements.</b> Tank system meets state-specific requirements. <b>See Project Waste Mgmt. Plan for requirements.</b></p>	
<p><b>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.</b></p>			
		<p><b>33. Enclosed.</b> Building is completely enclosed (floor/walls and roof), self-supported and can support the waste and daily operating activities. (40 CFR 265.1100(a))</p>	



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		<p><b>34. Barrier.</b> 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))</p>	
		<p><b>35. Compatibility.</b> Surfaces are chemically compatible with wastes that come into contact with them. (40 CFR 265.1101(a)(2))</p>	
		<p><b>36. Amount of Waste.</b> Level of waste within containment walls does not exceed height of wall. (40 CFR 265.1101(c))</p>	
		<p><b>37. Decontamination.</b> Building has decontamination area and procedures to prevent tracking waste out of building. (40 CFR 265.1101(c))</p>	
		<p><b>38. Fugitive Dust Control.</b> 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.</p> <p>If particulate collection devices are used (fabric filter, electrostatic precipitator) these devices are operated and maintained.</p> <p>(40 CFR 262.1101(c))</p>	
		<p><b>39. Liquids Management.</b> If containment building is used to store/treat wastes with free liquids, the following requirements are met: (40 CFR 265.1101(b))</p>	
		<p>a. <b>Primary Barrier.</b> The primary barrier is designed to prevent the migration of hazardous constituents into the barrier</p>	
		<p>b. <b>Liquid Collection/Removal.</b> 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.</p>	
		<p>c. <b>Secondary Containment.</b> 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. (<b>Contact ESQ Env. Compliance Specialist for assistance</b>).</p> <p>(Note: Leak detection system requirement is met if bottom slope is 1% or more and constructed of granular drainage material with hydraulic conductivity of <math>1 \times 10^{-2}</math> or more and 12 inches thick or constructed of synthetic/geonet drainage materials with transmissivity of <math>3 \times 10^{-5} \text{ m}^2/\text{sec}</math> or more)</p>	



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			d. <b>Treatment.</b> 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. <b>Chemically Resistant.</b> Secondary containment system is constructed of materials that are chemically resistant to waste and liquids managed and of sufficient strength and thickness.	
			<b>40. PE Certification.</b> 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)).	
			<b>41. Release.</b> 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. <b>Repair.</b> Condition was promptly repaired and any cleanup was conducted.	
			b. <b>Recordkeeping.</b> Condition/release is recorded in operating record.	
			c. <b>Notification.</b> Within 7 days notify EPA and within 14 working days provide written plan of steps taken to repair/cleanup.	
			d. <b>PE Certification.</b> After repairs performed, provide EPA with PE certification that repairs/cleanup conducted in accordance with written plan.	
			<b>42. Inspection.</b> 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).	
			<b>43. Areas With and Without Secondary Containment.</b> If building contains areas with and without secondary containment: <ul style="list-style-type: none"> <li>• Each area is designed and operated to meet specified requirements,</li> <li>• Measures are taken to prevent release of liquids/wet materials into areas without secondary containment; and</li> <li>• Operating log provides written description of procedures used to maintain integrity of areas without secondary containment.</li> </ul> (40 CFR 265.1101(d)).	
			<b>44. Closure.</b> 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) <b>(Contact ESQ Env. Compliance Specialist for assistance).</b>	



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Yes	No	N/A	<b>REQUIREMENTS</b>
			<b>COMMENTS/NOTES</b>

			<b>45. Accumulation Time.</b> 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))	
			<b>46. Recordkeeping.</b> The following records are kept:	
			a. Procedure to ensure that each waste volume remains in the unit for no more than 90 days, <b>OR</b>	
			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)).	
			<b>47. State-Specific Requirements.</b> Containment building meets state-specific requirements. ( <i>See Project Waste Mgmt. Plan for requirements</i> ).	

**Training**

			<b>48. General.</b> 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.	
			<b>49. Annual Refresher.</b> Personnel have undergone annual waste management refresher training. (40 CFR 265.16(c)). DOT/HM Security is every 2 years ( <i>Tt policy because our training includes air shipment module which is more stringent than DOT rail, highway, vessel modes</i> ).	
			<b>50. Personnel Records.</b> 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))	
			<b>51. Training Records.</b> 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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		<p><b>52. Management.</b> Project is managed to minimize the possibility of fire, explosion, or any sudden releases to the environment. (40 CFR 265.31)</p>	
		<p><b>53. Testing.</b> Emergency equipment is tested/maintained to assure proper operation and records are kept of testing. (GMP; 40 CFR 265.33)</p>	
		<p><b>54. Waste Handling Procedure.</b> Whenever waste is being poured, mixed, spread, or handled, all personnel have immediate access to internal alarm or emergency communication device.</p> <p>When only one employee is on-site, he/she has immediate access to communication device.</p> <p>(40 CFR 265.34)</p>	
		<p><b>55. Local Arrangements.</b> Arrangements have been made with emergency response agencies. (40 CFR 265.37)</p>	
<p><b>Contingency Planning (NOTE: THESE REQUIREMENTS MAY BE COVERED IN THE SITE-SPECIFIC HEALTH &amp; SAFETY PLAN)</b></p>			
		<p><b>56. Hazardous Waste Contingency Plan.</b> 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) <b>(Contact ESQ Env. Compliance Specialist for assistance).</b></p>	
		<p><b>57. Copies.</b> HWCP is maintained at the project site and was submitted to local emergency response agencies, as appropriate. (40 CFR 265.53)</p>	
		<p><b>58. Revision of HWCP.</b> HWCP is reviewed and amended immediately when:</p> <ul style="list-style-type: none"> <li>a. regulations change,</li> <li>b. plan failed in an emergency,</li> <li>c. increased potential for emergency from changes in project/facility,</li> <li>d. list of emergency coordinators changes, and</li> <li>e. list of emergency equipment changes.</li> </ul> <p>(40 CFR 265.54)</p>	



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		<p><b>59. Emergency Coordinator Responsibilities.</b> 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)</p>	
		<p><b>60. Implementation of Plan.</b> During emergency, requirements/responsibilities of emergency coordinator, implementation of plan, and notification were properly conducted. (40 CFR 265.56)</p>	

**Offsite Transportation/Disposal**

		<p><b>61. Transporter.</b> Hazardous wastes are offered only to transporters with proper EPA Identification Numbers. (40 CFR 262.12(c))</p>	
		<p><b>62. Prequalification.</b> 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.</p>	
		<p><b>63. Manifesting.</b> 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 &amp; transporter. (40 CFR 262.20-.23; 49 CFR 172.604)</p> <p><b>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.</b></p>	
		<p><b>64. Packaging/Labeling/Placarding.</b> Prior to off-site transport each hazardous waste is:</p> <ul style="list-style-type: none"> <li>a. Packaged &amp; labeled in accordance with DOT requirements.</li> <li>b. If 110 gallons or less, marked with commercial label designated "Hazardous Waste" and contact information</li> <li>c. Marked with generator's name, address, and manifest document number</li> <li>d. Placarded in accordance with DOT requirements.</li> </ul> <p>(40 CFR 262.30 - .32)</p>	

**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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**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.*

	<p><b>65. Records.</b> Records are kept on-site for at least 3 years (or in project files if project ends earlier) of the following:</p> <ul style="list-style-type: none"> <li>a. copy of generator-signed manifest</li> <li>b. copy of exception reports</li> <li>c. copy of Biennial Hazardous Waste Report (or state equivalent)</li> <li>d. records to characterize wastes.</li> </ul> <p>(40 CFR 262.40)</p>	
	<p><b>66. Biennial/State Report.</b> 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)</p> <p><i>Note: Determine what Tetra Tech scope of work is. At a minimum, Tetra Tech should provide client with notice that Biennial Report is required.</i></p>	
	<p><b>67. Exception Reports.</b> 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)</p>	
	<p><b>68. LDR Certification/Notices/Waste Analysis.</b> 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))</p>	

**Land Disposal Restrictions**

	<p><b>69. Notice/Certification.</b> LDR Notification forms are submitted with the first off-site shipment of each particular RCRA hazardous waste to a TSDf, <b>OR</b> generator has provided Certification form that waste is not prohibited from land disposal and waste meets LDR treatment standards. (40 CFR 268.7(a))</p>	
	<p><b>70. Exemption.</b> 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))</p>	



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			<p><b>71. Debris. (Note: Contact Project Env. Compliance Specialist for assistance). (40 CFR 268)</b></p> <p>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:</p> <ul style="list-style-type: none"> <li>a. Obtained a "contained-in" determination by EPA;</li> <li>b. Has been treated and meets the LDR Debris performance standards and therefore is no longer regulated as hazardous; OR</li> <li>c. Meets the LDR standards and applicable Universal Treatment Standards.</li> </ul> <p>(Residues from treatment of hazardous debris must be managed as a hazardous waste and meet 40 CFR 268 standards prior to land disposal.)</p>	
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--End of Checklist--

EHS 3-3 ATTACHMENT C



PESM INSPECTION CHECKLIST— LEAD-BASED PAINT ABATEMENT/ASSESSMENT/SAMPLING

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

This checklist applies to projects where lead-based paint abatement, assessment, or sampling is being conducted

General Requirements			
		<p><b>1. Scope of Activities.</b> Project involves the following activities. Please circle those that are applicable.</p> <ul style="list-style-type: none"> <li>a. Assessment</li> <li>b. Sampling</li> <li>c. Abatement</li> <li>d. Other: _____</li> </ul>	
		<p><b>2. Certifications.</b> Check on that the following certifications are in order:</p> <p><b>Training Programs:</b> 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.</p> <p><b>Firms:</b> 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.]</p> <p><b>Individuals:</b> 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.</p> <p><b>Note:</b> There are some exceptions to the above. Check with ESQ if any of the certifications are lacking.</p>	
		<p><b>3. Permits.</b> 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)</p> <p><b>Note:</b> 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.</p>	

EHS 3-3 ATTACHMENT C



PESM INSPECTION CHECKLIST— LEAD-BASED PAINT ABATEMENT/ASSESSMENT/SAMPLING

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	<p><b>4. Cleanup Standards.</b> Ensure that project is complying with federal/state cleanup requirements. (Federal/State/local regulations)</p> <p><b>Note:</b> Federal clearance levels are found in §745.227.</p>	
	<p><b>5. Record-keeping.</b> 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</p>	
	<p><b>6. OSHA.</b> OSHA specifies requirements for workers conducting lead-abatement activities. Review SHSP implementation requirements. Discuss with ESS how requirements are being met at the Site.</p>	

<p><b>Waste Generation/Management/Disposal</b> <i>(If hazardous wastes are being generated, also refer to Hazardous Waste: Storage Treatment Disposal in Less than 90 days Checklist)</i></p>		
	<p><b>7. Recognized Test Kits.</b> Ensure that only EPA recognized test kits for lead are being used at the project site.</p> <p><b>Note:</b> This regulation took effective June 23, 2008.</p>	

EHS 3-3 ATTACHMENT C



PESM INSPECTION CHECKLIST— LEAD-BASED PAINT ABATEMENT/ASSESSMENT/SAMPLING

**CONFIDENTIAL**

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p><b>8. Waste Characterization.</b> 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.</p> <ul style="list-style-type: none"> <li>a. <b>Bulk Items (Wood, Plaster, Doors, etc.).</b> Generally hazardous when the lead level in the paint exceeded 4 mg/cm<sup>2</sup>. This threshold is not EPA policy.</li> <li>b. <b>Paint Chips/Dust/Debris.</b> May be hazardous or non-hazardous.</li> <li>c. <b>HEPA Filters/ HEPA Vacuum Debris.</b> May be hazardous or non-hazardous.</li> <li>d. <b>Stripping Sludge/Unfiltered Liquid Waste.</b> May be hazardous or non-hazardous.</li> <li>e. <b>Disposable Work Clothes.</b> Generally considered non-hazardous.</li> <li>f. <b>Respirator Filters.</b> Generally considered non-hazardous.</li> <li>g. <b>Filtered Wash-water.</b> Generally considered non-hazardous.</li> <li>h. <b>Plastic Sheeting and Tape.</b> Generally considered non-hazardous, unless a heat gun is used for paint removal or if enclosure or encapsulation abatement methods are used.</li> </ul>	
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--End of Checklist--



PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT

**CONFIDENTIAL**

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			
		<p><b>1. Oil/Water Separators.</b> 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. <i>Complete applicable EHS 3-3 Solid or Hazardous Waste Checklists.</i></p>	
		<p><b>2. State Regulations.</b> State/local regulations specify requirements for oil storage, handling or disposal which are more stringent than requirements specified in this checklist. <i>Check the Site Health and Safety Plan to determine if State/local regulations are applicable.</i></p>	
		<p><b>3. Fire Marshall Approval.</b> 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.</p>	
		<p><b>4. Uniform Fire Code Requirements.</b> 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.</p>	
		<p><b>5. Oil Product Handling/Disposition.</b> Project involves the storage/disposition of oil product. The method by which the oil will be dispositioned will dictate the management/disposal requirements. <i>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."</i></p>	

**PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

**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.)*

		<p><b>6. Development.</b> SPCC plan has been developed and project was constructed and is operating in compliance with its requirements. (40 CFR 112)</p>	
		<p><b>7. Contents.</b> SPCC plan states that it meets all plan requirements as stated in 40 CFR 112.</p>	
		<p><b>8. Certification.</b> 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</p>	
		<p><b>9. Project Drainage.</b> Facility drainage meets the following standards:</p> <ul style="list-style-type: none"> <li>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.</li> <li>b. Undiked areas drain into ponds, lagoons or catchments basins which are designed not to flood.</li> <li>c. If treatment units are used, drainage is designed to gravity flow or flow into back-up pumping systems.</li> <li>d. Drainage is engineered to prevent oil from reaching navigable waters.</li> </ul> <p>(40 CFR 112.7(e)(1))</p>	
		<p><b>10. Containment/Diversionary Structures.</b> 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)).</p>	
		<p><b>11. Spill Control/Cleanup Equipment.</b> 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))</p>	
		<p><b>12. Drainage Water Quality.</b> 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.</p>	

**PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT**

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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>13. On-shore Bulk Storage.</b> 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)) <i>Note: Check regional EPA definition of "bulk" storage which normally includes any aboveground storage greater than 12,000 gallons.</i></p>	
	<p><b>14. Testing.</b> 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))</p>	

	<p><b>15. Loading/Unloading.</b> 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))</p>	
	<p><b>16. Security.</b> Appropriate security is maintained at project site. (40 CFR 112.7(e)(9))</p>	
	<p><b>17. Recordkeeping.</b> The following records are maintained:</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul> <p>(GMP; 40 CFR 112.7(e)(8))</p>	
	<p><b>18. Amendments.</b> 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)</p>	
	<p><b>19. Review.</b> 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).</p>	
	<p><b>20. Designated Project Staff.</b> A designated person is responsible for overall spill prevention. This person conducts workplace safety evaluations and inspections. (40 CFR 112.7(e)(10))</p>	



PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>21. Release.</b> 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) <i>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.</i></p>	
		<p><b>22. Training.</b> Project staff involved with management/handling of oil take part in periodic training in spill prevention/response. (40 CFR 112.7(e)(10))</p>	
		<p><b>23. Inspections.</b> Inspections are conducted daily in accordance with SPCC plan.</p>	
		<p><b>24. Release of Accumulated Containment Liquids.</b> Confirm with ESS procedures for releasing accumulated storm water from secondary containment surrounding tank. Is it documented on daily inspection documentation?</p> <ul style="list-style-type: none"> <li>a. Water is inspected for visible signs of contamination prior to release</li> <li>b. Water is removed daily, or as necessary to prevent excessive accumulation</li> </ul>	
<p><b>Facility Response Plan</b> (<i>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.</i>) For example, oil refineries and terminals.</p>			
		<p><b>25. Develop/Submit Facility Response Plan.</b> Facility response plan was developed in accordance with 40 CFR 112.20 and <b>submitted</b> to EPA in a timely manner for the project activities. (40 CFR 112.20)</p>	
		<p><b>26. No Substantial Harm.</b> 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))</p>	



PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

**Hazardous Materials Storage** *(Applies to storage of virgin hazardous materials, not hazardous and non-hazardous wastes)*

		<p><b>27. OSHA Hazardous Communication.</b> Health and Safety Inspection has been conducted which addressed OSHA Hazardous Communication requirements. (29 CFR 1910.1200)</p>	
		<p><b>28. Hazardous Chemical Inventory Reporting.</b> (EPCRA Section 312) Project site handles/stores:</p> <ul style="list-style-type: none"> <li>a. 10,000 pounds or more of a hazardous chemical; OR</li> <li>b. 500 pounds or the threshold planning quantity (TPQ) (whichever is less) of an extremely hazardous substance (EHS);</li> <li>c. Then project must submit a list of hazardous substances/copies of MSDS to state commission, local committee, and local fire department.</li> </ul> <p>(40 CFR 370)</p>	
		<p><b>29. Toxic Chemical Release Reporting.</b> (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) <i>Note: Site often only provides information to client for their reporting purposes. If Section 313 reporting is applicable, ensure project files reflect actions taken.</i></p>	
		<p><b>30. Emergency Planning and Response.</b> (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) <i>Note: OSHA also has emergency planning requirements which should have been addressed in H&amp;S inspection.</i></p>	
		<p><b>31. Release.</b> (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)</p>	



PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

**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.)

	<b>32. Shipping Papers/Manifests.</b> 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	
	<b>33. Packaging/Labeling/Marking.</b> Based upon the classification of the hazardous material, the proper DOT packaging/labeling/markings is being chosen and the materials are being packaged by an employee/subcontractor who has been properly DOT trained. (40 CFR 172)	
	<b>34. Training.</b> 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)	
	<b>35. Placarding.</b> Placards are being offered to transporter prior to shipment offsite. (40 CFR 172.500)	
	<b>36. Transportation in Tetra Tech EC Vehicle.</b> 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. <i>Note: Materials of Trade Exemption may apply.</i>	
	<b>37. International Shipments.</b> 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.	
	<b>38. Prequalification.</b> Review transporters used at project site and ensure all were pre-qualified prior to use. (See EHS 1-4)	



PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	<p><b>39. DOT HM Security Plan.</b> 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 <u>capacities</u>:</p> <ul style="list-style-type: none"> <li>• 17.3 cubic yards for solids (Ex.: 20 cubic yard capacity roll-off container, end dump, dump truck, etc.); or</li> <li>• 3,500 gallons for liquids (Ex.: 5,000 gallon capacity tanker truck); or</li> <li>• Shipment is required by DOT regulations to be placarded (Ex.: More than 1,000 pounds of HM, except for Class 9).</li> </ul> <p>(49 CFR 172 Subpart 800)</p>	
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--End of Checklist--



PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

CONFIDENTIAL

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.*

General Requirements			
			1. <b>PCBs 50 ppm or greater.</b> 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. <b>PCBs Resulting from Spill/Concentration Less than 50 ppm.</b> 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. <b>PCBs Resulting from Spill/CERCLA Activity.</b> 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. <b>Awaiting Analytical.</b> PCB wastes are being stored awaiting analytical regarding PCB concentration.
<b>Storage 30 Days or Less</b> (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. <b>Designated Area.</b> A designated area has been established for accumulation of PCB wastes. (GMP)
			6. <b>Accumulation Time.</b> Waste tracking log shows PCB wastes are stored in designated area for 30 days or less. (40 CFR 761.65(c)(1))
			7. <b>PCB Article/Type of Wastes.</b> 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))



PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

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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))	
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**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.*

			<b>8. Accumulation Time.</b> Waste tracking log indicates PCB wastes are disposed of within 1 year of being placed into storage.	
			<b>9. Roof and Walls.</b> Storage facility has adequate roof and walls to prevent rain water from reaching PCBs and PCB Items. (40 CFR 761.65(b))	
			<b>10. Curbing.</b> Floor has continuous curbing with minimum six inch high curb.	
			<b>11. Containment.</b> 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.	
			<b>12. Impervious Material.</b> Floor/curbing are constructed of continuous smooth and impervious materials to prevent/minimize penetration of PCBs.	
			<b>13. Floodplain.</b> 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*)

			<b>14. Marking Storage Area.</b> Storage area is clearly marked with "Caution-PCB" sign. (40 CFR 761.40(a)(10))	
			<b>15. Marking Containers.</b> 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))	
			<b>16. Management.</b> Storage area is managed so that PCB Articles/Containers can be located by date they entered storage.	



PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		17. <b>Decontamination of Equipment.</b> 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. <b>Inspection.</b> 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. <b>Leaking Articles/Containers.</b> 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. <b>Container Requirements.</b> PCBs are contained in DOT Specification Containers. (49 CFR 172.101, GMP)	
		21. <b>One-Year Disposal Requirement.</b> 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. <b>Accumulation Time.</b> Waste tracking log indicates PCB waste stockpiles are stored less than 180 days.	
		23. <b>Type of Wastes.</b> Only solid, non-flowing PCB solids may be stored in stockpiles.	
		24. <b>Containment.</b> The stockpile is covered when not in use to control dispersal by wind or water. Water is not used to prevent wind dispersal.	
		25. <b>Leachate.</b> No leachate is generated as a result of storage in the stockpile	
		26. <b>Liner.</b> Stockpiled waste is placed on a liner that prevents PCBs from migrating into soil or groundwater.	
		27. <b>Storm Water Protection.</b> Adequate run-on controls are present to withstand a 25 year storm event. Water ??	

**Decontamination**

		28. <b>Container Decontamination.</b> 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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PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		29. <b>Staging Area.</b> Decontamination is conducted in engineered staging area where all rinsates/solvents/residues are collected in a sump or other containment system.	
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**Disposal**

		30. <b>All PCBs.</b> 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.	
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**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. <b>Historical Spills.</b> 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))	
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		32. <b>Current Spills.</b> 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))	
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		33. <b>Notification/Recordkeeping.</b> 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)	
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		34. <b>Recordkeeping.</b> 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))	
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**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. <b>Records. Project files contain the following records:</b> <ul style="list-style-type: none"> <li>a. Written annual document log regarding disposition of each PCB item prepared by July 1 for the previous year;</li> <li>b. Signed manifests; and</li> <li>c. Certificates of Disposal (40 CFR 761.180(a)).</li> </ul> <p>These records are kept for at least 3 years after project stops storing PCBs.</p>	
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PESM INSPECTION CHECKLIST— POLYCHLORINATED BIPHENYLS

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p><b>36. Exception Reports.</b> 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)</p>	
		<p><b>37. One-Year Exception Report.</b> 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)</p>	
		<p><b>38. Cleanup/Decontamination Report.</b> 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))</p>	

**Off-Site Transportation/Disposal**

		<p><b>39. EPA Notification Number.</b> 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) <i>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".</i></p>	
		<p><b>40. Transporter/Disposer.</b> Transporters and disposers used for the project PCB wastes have EPA Notification numbers. (40 CFR 761.202(b))</p>	
		<p><b>41. Manifesting.</b> 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)</p> <ul style="list-style-type: none"> <li>a. Bulk PCBs: identify waste, date of removal from service (Out of Service Date), and weight of PCBs.</li> <li>b. PCB Article Container/Container: unique identifying number; type of waste, date of removal from service, and weight.</li> <li>c. PCB Article not in Container: serial number/identification; date of removal from service, and weight of PCB waste in the article.</li> </ul>	
		<p><b>42. Certificate of Disposal.</b> Certificate of Disposal was received by generator within 30 days of the date that PCB waste was disposed of.</p>	

--End of Checklist--



PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

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. <b>Waste Determination.</b> Waste has been characterized. (State/local regulations, TTEC Environmental Field Procedures)										
		2. <b>Waiting Analytical.</b> Wastes being stored awaiting waste determination.										
Investigation Derived Waste												
		<p>3. <b>WMP Plan.</b> 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.</p> <table border="0"> <tr> <td>Soil cuttings</td> <td>Treatment residues</td> <td>Disposable Sampling Equipment</td> </tr> <tr> <td>Purge water</td> <td>Deconwater</td> <td>PPE</td> </tr> <tr> <td colspan="3">Other: _____</td> </tr> </table>	Soil cuttings	Treatment residues	Disposable Sampling Equipment	Purge water	Deconwater	PPE	Other: _____			
Soil cuttings	Treatment residues	Disposable Sampling Equipment										
Purge water	Deconwater	PPE										
Other: _____												
		4. <b>Suspected Hazardous Waste.</b> 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. <b>Container/Stockpile Labeling.</b> 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. <b>Containers are being managed in accordance with BMPs. (containers closed, inspected, tracked)</b>										
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. <b>Stockpiles.</b> Waste is being stored in stockpiles in compliance with liner, size, covering, etc. requirements. (State/local regulations)										



PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p><b>8. Container Management.</b> 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.</p>	
		<p><b>9. Labeling.</b> Waste is labeled in accordance with the WMP. ESS understands WMP requirements for labeling.</p>	
		<p><b>10. Inspections.</b> 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:</p> <ul style="list-style-type: none"> <li>a. containers kept closed, except when adding/removing wastes,</li> <li>b. containers handled/stored to prevent leaking/rupturing and allow for inspection,</li> <li>c. accumulation/storage areas are kept free of precipitation, debris, etc.</li> </ul>	
		<p><b>11. Drum/Waste Logs.</b> Drum/Waste logs are reviewed and were noted to be up-to-date.</p>	
		<p><b>12. Treatment.</b> 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. <i>Note: Complete "Air Quality" and "Wastewater/Stormwater Discharges/UIC" checklists, if applicable. (State/local regulations)</i></p>	
		<p><b>13. Accumulation Time.</b> 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)</p>	
		<p><b>14. On-Site Disposal.</b> 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)</p>	
		<p><b>15. Transportation.</b> Transportation of waste complies with state/local solid waste and transportation requirements. Transportation vehicles are inspected in accordance with regulatory requirements. <i>Note: If hazardous materials being transported off-site, complete "Oil and Hazardous Substance Management" checklist.</i></p>	
		<p><b>16. Off-Site Disposal.</b> Off-site landfills which receives waste is pre-qualified under TTEC procedures. (State/local regulations)</p>	



PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		17. <b>Recordkeeping.</b> 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. <b>State-Specific Requirements.</b> 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. <b>WMP.</b> WMP addresses medical/infectious waste management. ESS understands medical waste management requirements including transportation requirements.	
		20. <b>Segregation.</b> Medical/infectious wastes are segregated.	
		21. <b>Packaging.</b> 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. <b>Storage.</b> 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. <b>Labeling.</b> Untreated medical waste is affixed with label "Medical Waste" or "Infectious Waste" or "Biohazard symbol." Treated medical waste need not be labeled.	
		24. <b>Disposal/Transportation.</b> ESS follows and understands labeling, marking, packaging, manifesting requirements for shipping medical /infectious waste.	
		25. <b>Disposal.</b> Disposal facility was prequalified under TTEC procedures to dispose of medical/infectious waste.	

**USDA Soil Permits**

		26. <b>Quarantine State/Area.</b> 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. <b>Certificate/Permit.</b> Certificate or permit has been obtained for the interstate shipment unless specific conditions are met allowing transport without a permit/certificate.	



PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<b>28. Attachment of Certificate/Permit To Container/Shipping Paper.</b> Certificate/permit is attached to outside of container holding soils or attached to bill of lading/shipping paper.	
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**On-Site Landfill**

		<b>29. Design.</b> 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)	
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		<b>30. Permitting/Licensing.</b> Permit/license has been obtained to construct/operate landfill. Construction/operation complies with conditions of permit. (State/local regulations)	
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		<b>31. Operation.</b> 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)	
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		<b>32. Stormwater.</b> individual NPDES Stormwater permit has been obtained or coverage under a multi-sector/general permit has been obtained. <i>Complete "Wastewater/Stormwater Discharges/UIC" checklist to evaluate compliance.</i>	
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**Unexploded Ordnance/Ordnance Explosive Waste/Chemical Warfare Material**

		<b>33. Site-Specific UXO Work Plan.</b> A site-specific workplan has been developed for the project.	
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		<b>34. UXO Team On-site.</b> UXO team is on-site to oversee all operations which have potential for UXO/OEW.	
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		<b>35. Management.</b> OEW and CWM may be RCRA regulated material. <i>Complete "Hazardous Waste" checklists, as appropriate.</i>	
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**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.*

		<b>36. Testing.</b> Used oil has been tested and determined: <ul style="list-style-type: none"> <li>a. Not to be mixed with a listed hazardous waste.</li> <li>b. If mixed with a characteristically hazardous waste, it does not exhibit a characteristic of hazardous waste.</li> <li>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)</li> </ul>	
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PESM INSPECTION CHECKLIST— NON-HAZARDOUS IDW/SOLID WASTE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

	<p><b>37. Prohibitions.</b> Used oil is:</p> <ul style="list-style-type: none"> <li>a. Not managed in a surface impoundment or waste pile.</li> <li>b. Used as dust suppressant without state/EPA approval.</li> <li>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)</li> </ul>	
	<p><b>38. Storage.</b> Used oil is stored as follows:</p> <ul style="list-style-type: none"> <li>a. In tank/container/unit subject to regulation under 40 CFR 264/265.</li> <li>b. Container/tank is in good condition.</li> <li>c. Labeled with words "Used Oil."</li> <li>d. Fill pipe connecting to UST is labeled with "Used Oil". (40 CFR 279.22, State regulations)</li> </ul> <p><i>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.</i></p>	
	<p><b>39. Oil-Fired Space Heaters.</b> 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)</p>	
	<p><b>40. Off-Site Shipment.</b> 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)</p>	
	<p><b>41. Off-Site Disposal.</b> Used oil is transported to a facility that has been approved for used oil recycling/disposal and prequalified under TTEC procedures.</p>	
	<p><b>42. DOT Compliance.</b> Used oil is transported in accordance with DOT requirements including shipping papers, packaging, marking, labeling, and placarding. <i>Complete "Oil and Hazardous Substances Management" Checklist to evaluate compliance.</i> (49 CFR 171-178)</p>	

--End of Checklist--

**PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A
<b>REQUIREMENTS</b>		
<b>COMMENTS/NOTES</b>		

*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.*

<b>Surface Wastewater Discharges</b>			
			<p><b>1. Point Source Discharge.</b> 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)) <i>Note: Reference to NPDES permit in this section includes state-authorized NPDES permit.</i></p>
			<p><b>2. Exemption.</b> 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.</p>
			<p><b>3. § 401 Water Quality Certification.</b> 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)</p>
			<p><b>4. Permit Conditions.</b> 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. <i>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.</i></p>
			<p>a. <b>Effluent Limits.</b> Based upon review of discharge monitoring reports (DMR) and permit conditions, verify that permit discharge limits are being met.</p>
			<p>b. <b>Bypass/No Effluent Exceedance.</b> 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)]</p>



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p>c. <b>Bypass/Effluent Exceedance.</b> Bypass has occurred and effluent limitations were exceeded. Notification was provided to regulatory agency.</p> <ul style="list-style-type: none"> <li>- If planned bypass, 10-day prior notice and approval was obtained.</li> <li>- If unanticipated bypass occurred, 24-hour notice was provided. [40 CFR 122.41(m)(3) and (4)]</li> </ul>	
		<p>d. <b>Upset.</b> 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)]</p>	
		<p>e. <b>Maintenance/Operation.</b> Project site and treatment/control systems are being properly operated and maintained Project files contain documentation demonstrating compliance. [40 CFR 122.41(e)]</p>	
		<p><b>5. Treatment Unit.</b> Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable).</p>	
		<p>a. <b>Training.</b> Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) <i>Note: This requirement usually applies to large treatment plants.</i></p>	
		<p>b. <b>Operation/Maintenance Log.</b> 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.</p>	
		<p>c. <b>Sludge/Treatment Residue/Filters.</b> Management and disposal of sludge, treatment residue, and filters are complying with federal/ state solid, hazardous or special waste regulations.</p>	
		<p>d. <b>Operating/Startup/Shutdown Procedures.</b> Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)</p>	
		<p><b>6. Notification/Discharge Limit Exceedances.</b> 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)]</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>7. Monitoring.</b> 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.</p>	
		<p>a. <b>Recordkeeping.</b> Adequate documentation is being maintained of sampling date/time/location; analyses dates; individuals performing sampling/analysis; analytical methods/techniques used; and analytical results.</p>	
		<p>b. <b>DMR.</b> Monitoring results are reported and submitted on a DMR, and signed by responsible party. [40 CFR 122.41 and 122.22(b)]</p>	
		<p>a. <b>Notification.</b> Regulatory agency was notified as soon as project personnel knew or had reason to believe that:</p> <p>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).</p> <p>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).</p>	
		<p><b>8. Best Management Plan.</b> If permit requires a BMP, project site has the plan &amp; implements the requirements. This may be applicable if the project site uses, manufactures, stores, handles, or discharges any toxic pollutant listed in CWA §307(a)(1) or pollutant listed in CWA §311.</p>	
		<p><b>9. Discharge of Toxic Pollutants.</b> 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).</p> <p>a. Specified toxic pollutant effluent limits are being met.</p> <p>b. Regulatory agency has been notified within 60 days from date of promulgation of toxic pollutant standard.</p> <p>c. Reporting is being conducted in compliance with 40 CFR 129.5(d)(2).</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>10. Permit Modification.</b> Regulatory agency has been notified as soon as practicable of any of the following events and the permit has been modified.</p> <ul style="list-style-type: none"> <li>a. Any significant changes in operation.</li> <li>b. Planned physical alterations/additions to project if it constitutes a “new source” under 40 CFR 122.29(b).</li> <li>c. Alteration/addition could significantly change the nature or increase quantity of pollutants discharged.</li> <li>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)]</li> </ul>	
		<p><b>11. Permit Transfer.</b> 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)</p>	
		<p><b>12. Permit Renewal.</b> 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))</p>	
		<p><b>13. Recordkeeping.</b> The following records are being kept for at least 3 years:</p> <ul style="list-style-type: none"> <li>a. All data used to complete permit applications and any supplemental information. [40 CFR 122.21(p)]</li> <li>b. Discharge monitoring reports.</li> <li>c. Notification required for routine/non-routine discharge of toxic pollutants not specified in permit under 40 CFR 122.44(f).</li> <li>d. Reports required by the permit. [40 CFR 122.44(i)(2)]</li> <li>e. Equipment calibration/maintenance records/original strip chart recordings for continuous monitoring instrumentation.</li> <li>f. Quality assurance records.</li> </ul>	
		<p><b>14. State-Specific Requirements.</b> Discharge is in compliance with state-specific permit/regulatory requirements. (State regulations)</p>	
<p><b>Discharge To Publicly Owned Treatment Works/Federally Owned Treatment Works</b> (<i>Applies when project discharges to POTW/FOTW.</i>)</p>			
		<p><b>15. Permit/Approval.</b> Pre-discharge permit/approval has been obtained authorizing the discharge of wastewater to the POTW/FOTW. <i>Note in adjacent column, if the discharge permit/approval is batch, one-time approval or is sufficient for life of the project.</i> (40 CFR 403.5)</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>16. Waste Acceptance Criteria.</b> 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. <i>Note: This may be part of permit/approval described above. (40 CFR 403.5)</i></p>	
		<p><b>17. Treatment Unit.</b> 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)]</p>	
		<p>a. <b>Training.</b> Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) <i>Note: This requirement usually applies to large treatment plants. (USC 33:26:1341)</i></p>	
		<p>b. <b>Operation/Maintenance Log.</b> 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)</p>	
		<p>c. <b>Sludge/Treatment Residue/Filters.</b> Management and disposal of sludge, treatment residue, and filters are complying with federal/state solid or hazardous or special waste regulations.</p>	
		<p>d. <b>Operating/Startup/Shutdown Procedures.</b> Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

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Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

	<p><b>18. General Pretreatment Standards.</b> Discharge to POTW complies with general pretreatment standards. [40 CFR 403.5(b)]</p> <p>The following is prohibited from discharge:</p> <ul style="list-style-type: none"> <li>a. Fire/explosion hazards or waste streams with flashpoint below 140°F.</li> <li>b. Pollutants that will result in toxic gases/vapors/fumes in POTW in quantity to cause acute worker health/safety problems.</li> <li>c. Trucked/hailed pollutants except at discharge points designated by POTW.</li> <li>d. Pollutants that will cause corrosive damage to POTW or pH less than 5.0 unless POTW is designed to handle such discharges.</li> <li>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.</li> <li>f. Heat in amounts that will inhibit biological activity or in such quantities that temperature at POTW influent exceeds 104°F unless POTW approves.</li> <li>g. Any pollutant, including oxygen-demanding pollutants, at flow rate or concentration that will cause interference with POTW.</li> </ul>	
	<p><b>19. Categorical Pretreatment Standards.</b> 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)</p>	
	<p><b>20. No dilution.</b> 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)]</p>	
	<p><b>21. No Hazardous Waste.</b> No hazardous waste is discharged to POTW. [Good Management Practice (GMP)]</p>	
	<p><b>22. Reports/Recordkeeping.</b> 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)</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<b>23. State/Local-Specific Requirements.</b> Discharge complies with state/local agency permit and regulatory requirements. (State regulations)	
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**Discharge to Private Treatment Works** (*Applies if wastewater is discharged to treatment system owned by a private party.*)

		<b>24. Contract.</b> A contract has been signed by our client and owner of treatment system allowing discharge of wastewater to private treatment works.	
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		<b>25. State Permit.</b> 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)	
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**Discharge to Ground/Groundwater**

		<b>26. Permit.</b> 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) <i>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.</i>	
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		a. <b>Effluent Limits.</b> Based upon review of monitoring reports and permit conditions verify that permit discharge limits are being met.	
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		b. <b>Maintenance/Operation.</b> 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.	
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		c. <b>Other Plans.</b> 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.	
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		<b>27. Treatment Unit.</b> Wastewater is treated at the project site prior to discharge. The following requirements are being complied with (if applicable):	
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PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

Project:		Inspector:	Date:	
Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			a. <b>Training.</b> Personnel who maintain/operate water pollution control unit are trained. (State/local regulations) <i>Note: This requirement usually applies to large treatment plants.</i>	
			b. <b>Operation/Maintenance Log.</b> Operation/maintenance logs comply with requirements in state/local regulations and/or permit.	
			c. <b>Sludge/Treatment Residue/Filters.</b> Management and disposal of sludge, treatment residue, and filters comply with federal/state solid, hazardous, or special waste regulations.	
			d. <b>Operating/Startup/Shutdown Procedures.</b> Operating and start-up/shutdown procedures required under permit are being complied with including requirements for maintenance, inspections, alarm response, etc. (Permit conditions)	
			<b>28. Monitoring.</b> Monitoring requirements specified in permit and regulations are being met. (State/local regulations/permit)	
			a. <b>Recordkeeping.</b> Adequate documentation is being maintained of sampling date/time/location; analyses dates; individuals performing sampling/analysis; analytical methods/techniques used; and analytical results.	
			b. <b>Monitoring Reports.</b> Monitoring results are reported and submitted in a timely fashion.	
			c. <b>Notification.</b> Regulatory agency was notified as soon as project personnel knew or had reason to believe exceedance occurred or other permit condition was violated.	
			<b>29. Permit Renewal.</b> Permit will expire within 6 months, and an application for permit has been submitted in a timely fashion. (State/local regulations)	
			<b>30. Reports/Recordkeeping.</b> 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**

	<p><b>31. Applicability.</b> Project activities involve discharge of stormwater and</p> <ul style="list-style-type: none"> <li>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) &amp; (b)(15)], OR</li> <li>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) &amp; (B)), OR</li> <li>c. Constitute an “industrial activity” (common types of remediation projects that are “industrial” are: landfill closures/construction; RCRA TSD facilities, etc.). [40 CFR 122.26(b)], OR</li> <li>d. Involve construction activities impacting less than 5 acres at a client’s facility which has an existing NPDES stormwater permit.</li> <li>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)].</li> </ul>	
	<p><b>32. Permit.</b> 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. <i>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)</i></p> <p><i>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.</i></p>	
	<p><b>33. Permit Conditions.</b></p> <ul style="list-style-type: none"> <li>a. <b>Discharge of Non-Stormwater.</b> Non-stormwater is not combined with stormwater.</li> </ul>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

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Project:		Inspector:	Date:	
Yes	No	N/A	REQUIREMENTS	COMMENTS/NOTES
			<p>b. <b>Release of Reportable Quantity of a Hazardous Substance.</b> 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)]</p>	
			<p>c. <b>SWPPP Development.</b> 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) &amp; (d)(2)]</p>	
			<p>d. <b>EPCRA § 313 Sources.</b> 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.]</p>	
			<p><b>34. Stormwater Pollution Prevention Plan.</b> 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)]</p> <ul style="list-style-type: none"> <li>a. Pollution prevention team,</li> <li>b. Describes potential pollutant sources,</li> <li>c. Identifies Best Management Practices,</li> <li>d. Housekeeping/preventative maintenance,</li> <li>e. Spill prevention/response procedures,</li> <li>f. Inspections,</li> <li>g. Employee training,</li> <li>h. Recordkeeping/reporting,</li> <li>i. Sediment/erosion control,</li> <li>j. Management of runoff, and</li> <li>k. Comprehensive site evaluation, including schedule.</li> </ul>	
			<p><b>35. Amendment of SWPPP.</b> 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.</p>	
			<p><b>36. Monitoring.</b> Monitoring is being conducted in compliance with permit and SWPPP. (Permit condition/SWPPP)</p>	
			<p><b>37. Reporting.</b> Reporting to regulatory agency is being conducted in accordance with permit conditions. This may include monitoring results/DMRs, certifications, notifications, etc. (Permit conditions)</p>	
			<p><b>38. Recordkeeping.</b> 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)</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

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<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>39. State-Specific Requirements.</b> 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)</p>	
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**Discharge to Underground Injection Wells** (*Applies if project discharges wastewater to UIC or injection gallery.*)

		<p><b>40. Permit/Authorization by Rule.</b> 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) <i>Note: Injection well is any dug hole which is deeper than it is wide into which fluids (may include oxygen) are emplaced.</i></p>	
		<p><b>41. Inventory Information.</b> UIC is authorized by rule and an inventory form has been submitted to EPA/state delegated agency. (40 CFR 144.26, State/local regulations)</p>	
		<p><b>42. Closure Notification.</b> 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)</p>	
		<p><b>43. Authorized by Rule -- Existing Class I, II, or III Wells.</b> 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. <i>See definitions for Well Classification in 40 CFR 144.6.</i></p>	
		<p><b>44. Authorized by Rule -- Class IV Well.</b> 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). <i>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.</i></p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

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<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>45. Authorized by Rule -- Class V Well.</b> 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) <i>Note: To date, EPA has not issued requirements to permit Class V wells.</i></p>	
		<p><b>46. Permitting.</b> Project site discharges to a permitted well.</p>	
		<p>a. <b>Permit Acquisition.</b> Permit has been obtained by the "operator" prior to construction. (40 CFR 144.31)</p>	
		<p>b. <b>General Permitting Requirements.</b> 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)</p>	
		<p>c. <b>Class I, II or III Wells.</b> Mechanical integrity of well has been established and is being maintained. (40 CFR 144.51(q) and 146.8)</p>	
		<p>d. <b>Well-specific Requirements.</b> Operation/maintenance, effluent limits, monitoring, and recordkeeping/reporting are in compliance with permit terms and conditions. (40 CFR 144.55)</p>	
		<p>e. <b>Corrective Action.</b> If permit contains corrective action requirements, project is in compliance with those conditions. (40 CFR 144.55)</p>	
		<p><b>47. Class I Nonhazardous Well.</b> Project discharges to a Class I nonhazardous well that meets:</p> <p>a. Criteria and standards for construction specified in 40 CFR 146.12.</p> <p>b. Operating, monitoring, and reporting specified in 40 CFR 146.13.</p>	
		<p><b>48. Class II Wells.</b> Project discharges to a Class II well that meets:</p> <p>a. Criteria and standards for construction specified in 40 CFR 146.22.</p> <p>b. Operating, monitoring, and reporting specified in 40 CFR 146.23.</p>	
		<p><b>49. Class III Wells.</b> Project discharges to a Class III well that meets:</p> <p>a. Criteria and standards for construction specified in 40 CFR 146.32.</p> <p>b. Operating, monitoring, and reporting specified in 40 CFR 146.33.</p>	



PESM INSPECTION CHECKLIST— WASTEWATER/STORMWATER DISCHARGES/UIC

CONFIDENTIAL

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:

- Waste is not prohibited from discharge or a waiver has been obtained under 40 CFR 148.1 and 148.10-.17.
- Siting under 40 CFR 146.61.
- Manifesting, notification, identification, maintenance of operating records, reporting, personnel training, certification of closure in accordance with 40 CFR 264 requirements.
- Corrective action requirements, if applicable, under 40 CFR 146.64.
- Construction requirements under 40 CFR 146.65 and .66.
- Operating requirements under 40 CFR 146.67.
- Continuous recording devices for monitoring compliance in accordance with 40 CFR 146.67.
- Testing and monitoring requirements under 40 CFR 146.68.
- Reporting requirements under 40 CFR 146.69.
- Well closure plan/post-well closure plan in accordance with 40 CFR 146.71 and .72.
- Land disposal restrictions in accordance with 40 CFR 148 and 268.

-- End of Checklist--

**PESM INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies to all projects that could potentially impact wetlands, streams, and floodplains.*

<b>Wetlands</b> (This section applies if wetlands are <b>suspected to be</b> located adjacent to or within the project site.)		
		<p><b>1. Delineation.</b> 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)</p>
		<p>a. <b>Non-Jurisdictional Wetlands.</b> Jurisdictional status of wetlands has been determined and supporting documentation is in file. <i>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.</i></p>
		<p><b>2. Buffer.</b> Protective buffers have been identified and area staked so that project mitigation measures are effective. Regulatory agency approved buffers &amp; documentation in file. (State/local regulations)</p>
		<p><b>3. CWA § 404 Permit.</b> 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) <i>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.</i></p>
		<p>a. <b>Mitigation.</b> If mitigation was required, a plan was developed and approved by the regulatory agency. Project activities are being conducted in compliance with the plan.</p>
		<p>b. <b>Notification to USFWS, NMFS, State Fish and Game, SHPO, Local Agency.</b> 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.</p>
		<p>c. <b>Specific Conditions/Terms.</b> Terms and conditions of the individual or Nationwide Permit were reviewed and project is in compliance with all terms/conditions.</p>

**PESM INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS**

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>		<b>Date:</b>	
<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>REQUIREMENTS</b>		<b>COMMENTS/NOTES</b>
			<p><b>4. Exemption.</b> 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.</p>		
			<p><b>5. CWA § 401 Water Quality Certification.</b> § 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)</p>		
			<p><b>6. Temporary Water Quality Modification.</b> 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)</p>		
			<p><b>7. Coastal Zone Management (CZM) Certification.</b> 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)</p>		
<p><b>Stream Bed/Bank Disturbance</b> (<i>Applies if project activities involve filling, dredging, altering, or otherwise impacting water quality in or near stream or river.</i>)</p>					
			<p><b>8. USACE § 10 or CWA § 404 permit.</b> 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)</p>		
			<p><b>9. State Fisheries.</b> 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)</p>		
			<p><b>10. Shoreline Protection.</b> 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) <i>Note: If project is located within shoreline but does not constitute a “regulated activity,” explain in adjacent column.</i></p>		

**PESM INSPECTION CHECKLIST— WETLANDS/STREAMS/FLOODPLAINS**

**CONFIDENTIAL**

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A	<b>REQUIREMENTS</b>
			<b>COMMENTS/NOTES</b>

		<p><b>11. Temporary Water Quality Modification.</b> 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)</p>	
		<p><b>12. CWA § 401 Water Quality Certification.</b> 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)</p>	
		<p><b>13. Coastal Zone Management Certification.</b> 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)</p>	
		<p><b>14. Riparian Zones.</b> If project activities will cause the removal of near-stream vegetation, activities may require authorization or compliance with State regulations or local ordinances. 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)</p>	

**Floodplain/Flood Control** (*Applies when project will potentially impact floodplains or is located in a flood control area*)

		<p><b>15. Floodplain.</b> 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)</p>	
		<p><b>16. Flood Control.</b> 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.</p>	

**--End of Checklist--**

**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION  
FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

*This checklist applies to projects where radioactive material and/or types of radiation are present.*

<b>Determination of License Type</b>			
		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 submitted to DOE? (835.101(g))	
<b>Internal Audits</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. Are the audits of the Radiation Protection Program every 36 months? (835.102)	
<b>Radiation Protection Program Management Qualifications</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. Do the individuals responsible for developing, implementing, and compliance with the requirements have the appropriate education, training, and skills? (835.103)	
<b>Procedures</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. Are there written procedures developed that are consistent with the ability of the individuals exposed to the hazards? (835.104)	
<b>Occupational Dose Limits</b> ( <i>Applies if a radioactive material license exists.</i> )			
		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)	

**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION  
FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		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)	
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**Surveys and Monitoring** (*Applies if a radioactive material license exists.*)

		1. Is monitoring performed to demonstrate: <ul style="list-style-type: none"> <li>a. Detection of buildup of radioactive material (835.401(a)(4))</li> <li>b. Verify effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure (835.401(a)(5))</li> <li>c. Identify and control potential sources of individual exposure to radiation and/or radioactive material? (835.401(a)(6))</li> </ul>	
		2. Are the instruments and equipment used for monitoring: <ul style="list-style-type: none"> <li>a. Periodically maintained and calibrated on an established frequency (835.401(b)(1))</li> <li>b. Appropriate for the types(s), levels, and energies of the radiation(s) encountered (835.401(b)(2))</li> <li>c. Appropriate for existing environmental conditions (835.401(b)(3))</li> <li>d. Routinely tested for operability? (835.401(b)(4))</li> </ul>	
		3. Is monitoring of individual exposures to external radiation when radiological workers who, under typical conditions, are likely to receive: <ul style="list-style-type: none"> <li>a. An effective dose equivalent to the whole body of 0.1 rem or more in a year, or (835.402(a)(1)(i))</li> <li>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))</li> <li>c. A lens of the eye dose equivalent of 1.5 rem or more in a year? (835.402(a)(1)(iii))</li> </ul>	
		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: <ul style="list-style-type: none"> <li>a. An individual is likely to receive an exposure of 10 or DAC-hrs in a year (835.403(a)(1))</li> <li>b. As necessary to characterize the airborne radioactivity hazard where respiratory protective devices have been prescribed? (835.403(a)(2))</li> </ul>	

**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION  
FOR DEPARTMENT OF ENERGY PROJECTS**

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		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))	
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**Access Control to Radiological Areas** (*Applies if a radioactive material license exists.*)

		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))	
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		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 means capable of providing an immediate estimate of the individual's integrated deep dose? (835.502(a)(2))	
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		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 in 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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			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))	
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**Posting and Labeling** (*Applies if a radioactive material license exists.*)

			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 than 8 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 exists.*)

			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))	
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**Radiological Records** (*Applies if a radioactive material license exists.*)

			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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		<p>3. Are the following results of monitoring for radiation and radioactive material documented:</p> <ul style="list-style-type: none"> <li>a. Results from monitoring entries into high and very high radiation areas and contamination and high contamination areas; (835.703(a))</li> <li>b. Results of monitoring used to determine individual occupational dose from external and internal sources; (835.703(b))</li> <li>c. Results of monitoring for the release and control of material and equipment; and (835.703(c))</li> <li>d. Results of maintenance and calibration performed on survey and monitoring instruments and equipment? (835.703(d))</li> </ul>	
		<p>4. Are training records maintained to show:</p> <ul style="list-style-type: none"> <li>a. Radiation safety training (835.704(a))</li> <li>b. Actions taken to maintain occupational exposure ALARA (835.704(b))</li> <li>c. Documentation of the results of internal audits and other reviews of program content and implementation (835.704(c))</li> <li>d. Written declarations of pregnancy (835.704(d))</li> <li>e. Changes in equipment, techniques, and procedure used for monitoring (835.704(e))</li> <li>f. As necessary to demonstrate compliance with the requirements for sealed radioactive source control, inventory, and source leak tests? (835.704(f))</li> </ul>	

**Reports to Individuals and Licensor** (*Applies if a radioactive material license exists.*)

		<p>1. Is a report to individuals concerning their radiation exposure being reported when:</p> <ul style="list-style-type: none"> <li>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))</li> <li>b. Upon request of the individual terminating employment (835.801(b))</li> <li>c. Annually (835.801(c))</li> <li>d. Upon request (835.801(d))</li> <li>e. When a DOE contractor is required to report to the DOE for occurrence reporting and processing? (835.801(e))</li> </ul>	
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**Sealed Radioactive Source Control** (*Applies if a radioactive material license exists.*)

		<p>1. Is there a program for control of sealed radioactive sources that are used, handled, and stored? (835.1201)</p>	
		<p>2. Is each accountable sealed source inventoried at intervals not to exceed six months and the inventory contains:</p> <ul style="list-style-type: none"> <li>a. Physical location of each accountable sealed radioactive source (835.1302(a)(1))</li> <li>b. Verify the presence and adequacy of associated postings and labels(835.1302(a)(2))</li> <li>c. Establish the adequacy of storage locations, containers, and devices? (835.1302(a)(3))</li> </ul>	

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**Radiological Criteria for License Termination** *(Applies if a radioactive material license exists.)*

**Radiation Safety Training or Instruction to Workers** *(Applies if a radioactive material license exists.)*

		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: <ul style="list-style-type: none"> <li>a. Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure; (835.901(c)(1))</li> <li>b. Basic radiological fundamentals and radiation protection concepts; (835.901(c)(2))</li> <li>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))</li> <li>d. Individual rights and responsibilities as related to implementation of the facility radiation protection program; (835.901(c)(4))</li> <li>e. Individual responsibilities for implementing ALARA measures required by 835.101, and; (835.901(c)(5))</li> <li>f. Individual exposure reports that may be requested? (835.901(c)(6))</li> </ul>	

**Design and Control** *(Applies if a radioactive material license exists.)*

		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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		<p>2. During the design of new facilities or modification of existing facilities, are the following objectives adopted:</p> <ul style="list-style-type: none"> <li>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))</li> <li>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))</li> <li>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))</li> <li>d. The design or modification and the selection of materials includes features that facilitate operations, maintenance, decontamination, and decommissioning? (835.1002(d))</li> </ul>	
		<p>3. Does the licensee, during routine operations, use the combination of physical design features and administrative control provided that:</p> <ul style="list-style-type: none"> <li>a. The anticipated occupational dose to general employees does not exceed 835.202 limits, and (835.1003(a))</li> <li>b. The ALARA process is utilized for personnel exposure to ionizing radiation? (835.1003(b))</li> </ul>	

**Radioactive Contamination Control** (*Applies if a radioactive material license exists.*)

		<p>1. Are there means to release material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas to a controlled area, if:</p> <ul style="list-style-type: none"> <li>a. Removable surface contamination levels on accessible surfaces exceed the removable surface contamination levels specified; (835.1101(a)(1))</li> <li>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))</li> </ul>	
		<p>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))</p>	

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		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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*This checklist applies to projects where radioactive material and/or types of radiation are present.*

<b>Determination of License Type</b>			
		1. NRC/Agreement State requires that persons/company conducting work with radioactive material be licensed for specific amounts and types of radioactive material. Is there a license? (NRC/Agreement State)	
		2. Is there a documented Radiation Protection Program? (10 CFR 20.1101(a))	
		3. Does the licensee use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA? (20.1101(b))	
<b>Internal Audits</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. Is an audit of the radiation protection program occurring at least annually and reviewing the content and implementation? (20.101(c))	
<b>Procedures</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. Does the licensee use, to the extent practical, procedures based upon sound radiation protection principles to minimize exposure to radiation and radioactive material? (19.12(a)(3))	
<b>Occupational Dose Limits</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. Are the annual limits to the occupational workers: <ul style="list-style-type: none"> <li>a. 5 rem TEDE/yr (20.1201(a)(1)(i))</li> <li>b. 50 rem/yr to internal organs except the eye (20.1201(a)(1)(ii))</li> <li>c. 15 rem/yr to the eye (20.1201(a)(2)(i))</li> <li>d. Shallow dose to the skin of 50 rem/yr? (20.1201(a)(2)(ii))</li> </ul>	
		2. Is there a means to authorize a Special Planned Exposure? (20.1206)	
		3. Is the dose limit to the fetus/embryo 0.1 rem/9 months? (20.1208)	
		4. Is the dose limit to minors 0.5 rem/yr? (20.1207)	
		5. Is the ALI used to calculate internal dose from the inhalation of radioactive material and is this the primary means of determining dose? (20.1203, 1204)	
<b>Surveys and Monitoring</b> ( <i>Applies if a radioactive material license exists.</i> )			

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	<p>1. Is monitoring performed to demonstrate:</p> <ul style="list-style-type: none"> <li>a. Compliance with the regulations of the part (20.1501(a)(1))</li> <li>b. Evaluate the magnitude and extent of radiation levels (20.1501(a)(2)(i))</li> <li>c. Concentrations or quantities of radioactive material (20.1501(a)(2)(ii))</li> <li>d. The potential radiological hazards? (20.1501(a)(2)(iii))</li> </ul>	
	<p>2. Does the licensee ensure that the instruments and equipment used for quantitative radiation measurements are calibrated periodically for the radiation measured? (20.1501(b))</p>	
	<p>3. Does the licensee ensure that all personnel dosimeters that require processing to determine the radiation dose must be processed and evaluated by a dosimetry processor that:</p> <ul style="list-style-type: none"> <li>a. Holds a current personnel dosimetry accreditation from the National voluntary Laboratory Accreditation Program (20.1501(c)(1))</li> <li>b. Is approved in the accreditation process for the type of radiations included in the NVLAP program and closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored? (20.1501(c)(2))</li> </ul>	
	<p>4. Is monitoring of individual exposures to external radiation when radiological workers who, under typical conditions, are likely to receive:</p> <ul style="list-style-type: none"> <li>a. In 1 year, in excess of 10% of the annual limit of 5 rem (20.1502(a)(1))</li> <li>b. Minors in 1 year, in excess of 0.1 rem, 0.15 rem to the lens of the eye, or a shallow dose to the skin in excess of 0.5 rem (20.1502(a)(2))</li> <li>c. Declared pregnant women during the entire pregnancy in excess of 0.1 rem (20.1502(a)(3))</li> <li>d. Individuals entering a high or very high radiation area? (20.1502(a)(4))</li> </ul>	
	<p>5. Is monitoring the occupational intake of radioactive material occurring by and assess the committed effective dose equivalent to:</p> <ul style="list-style-type: none"> <li>a. Adults likely to receive, in 1 year, a committed effective dose equivalent in excess of 10% of Appendix B (20.1502(b)(1))</li> <li>b. Minors likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.1rem (20.1502(b)(2))</li> <li>c. Declared pregnant women likely to receive, during e entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem? (20.1502(b)(3))</li> </ul>	

**Access Control to Radiological Areas** (*Applies if a radioactive material license exists.*)

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		1. Is there a means for personnel entry control to a high radiation area using one or more of the following features <ul style="list-style-type: none"> <li>a. A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which and individual might receive a deep-dose equivalent of 0.1 rem in 1 hour at 30 cm. from the radiation source or from any surface that the radiation penetrates (20.1601(a)(1))</li> <li>b. 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 (20.1601(a)(2))</li> <li>c. Entry ways that are locked, except during periods when access to the areas is required, with positive control over each individual entry (20.1601(a)(3))</li> <li>d. In place of the controls required by paragraph (a) of this section for a high radiation area, the licensee may substitute continuous direct electronic surveillance that is capable of preventing unauthorized entry? (20.1601(b))</li> </ul>	
		2. Does the licensee establish controls in a way that do not prevent individuals from leaving a high radiation area? (20.1601(d))	
		3. In addition to the above requirements, is the licensee instituting additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates? (20.1602)	

**Posting and Labeling** (*Applies if a radioactive material license exists.*)

		a. Is there the standard radiation symbol (trefoil) with the colors magenta, purple, or black on yellow background? (20.1902(a)(1-2))	
		b. Is each of the following areas posted with signs bearing the following wording: <ul style="list-style-type: none"> <li>a. Caution, Radiation area (20.1902(a))</li> <li>b. Caution, High radiation area (20.1902(b))</li> <li>c. Grave Danger, Very high radiation area (20.1902(c))</li> <li>d. Caution, Airborne radioactivity area (20.1902(d))</li> <li>e. Caution, Radioactive material(s)? (20.1902(e))</li> </ul>	

**Respiratory Protection and Controls to Restrict Internal Exposures** (*Applies if a radioactive material license exists.*)

		1. Has the licensee used to the extent practical process or other engineering controls to control the concentration of radioactive material in air? (20.1701)	
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		<p>2. Does the licensee increase monitoring and limit intakes by one or more of the following means if engineering and process controls are not practical to control the concentrations of radioactive material in the air to values below those that define an airborne radioactivity area:</p> <ul style="list-style-type: none"> <li>a. Control of access; (20.1702(a)(1))</li> <li>b. Limitation of exposure times; (20.1702(a)(2))</li> <li>c. Use of respiratory protection equipment; or (20.1702(a)(3))</li> <li>d. Other controls? (20.1702(a)(4))</li> </ul>	
		<p>3. If the licensee performs an ALARA analysis to determine whether or not respirators should be used, does the licensee consider safety factors other than radiological factors? Does the licensee also consider the impact of respirator use on workers' industrial health and safety? (20.1702(b))</p>	
		<p>4. If the licensee assigns or permits the use of respiratory protection equipment to limit the intake of radioactive materials, does the licensee use only respiratory protection equipment that is tested and certified by the National Institute for Occupational Safety and Health (NIOSH) or has the licensee submitted an application to the NRC for authorized use of this equipment except as provided in this part? (20.1703(a-b))</p>	



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	<p>8. Does the licensee implement and maintain a respiratory protection program that includes:</p> <ul style="list-style-type: none"> <li>a. The licensee shall advise each respirator user that the user may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief. (20.1703(d))</li> <li>b. The licensee shall also consider limitations appropriate to the type and mode of use. (20.1703(e))</li> <li>c. Standby rescue persons are required under prescribed situations. (20.1703(f))</li> <li>d. Atmosphere-supplying respirators must be supplied with respirable air of grade D quality or better air. (20.1703(g))</li> <li>e. The licensee shall ensure that no objects, materials or substances, such as facial hair, or any conditions that interfere with the face-facepiece seal or valve function, and that are under the control of the respirator wearer, are present between the skin of the wearer's face and the sealing surface of a tight-fitting respirator facepiece. (20.1703(h))</li> <li>f. In estimating the dose to individuals from intake of airborne radioactive materials, the concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the ambient concentration in air without respiratory protection, divided by the assigned protection factor? (20.1703(i))</li> </ul>	
	<p>9. Does the licensee have additional restrictions such as:</p> <ul style="list-style-type: none"> <li>a. Ensuring that the respiratory protection program is adequate to limit doses to individuals from airborne radioactive materials consistent with ALARA, (20.1704(a))</li> <li>b. Limiting the extent to which the use of respiratory protection equipment instead of process or other engineering controls? (20.1704(a))</li> </ul>	

**Radiological Records** (*Applies if a radioactive material license exists.*)

	<p>1. Has the licensee maintained records of the radiation protection program including;</p> <ul style="list-style-type: none"> <li>a. Provisions of the program (20.2102(a)(1))</li> <li>b. Audits and other reviews of program content and implementation? (20.2102(a)(2))</li> </ul>	
	<p>2. Is the licensee maintaining records showing the results of surveys and calibrations? (20.2103(a))</p>	

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		<p>3. Is the licensee retaining the following records until the Commission terminates the license:</p> <ul style="list-style-type: none"> <li>a. Results of surveys to determine the dose from external sources and used, in the absence of combination with individual monitoring data, in the assessment of individual dose equivalents. (20.2103(b)(1))</li> <li>b. Results of measurements and calculations used to determine individual intakes of radioactive material and used in the assessment of internal dose. (20.2103(b)(2))</li> <li>c. Results of air sampling, surveys, and bioassays. This includes those records showing the results of air sampling, surveys, and bioassays; and (20.2103(b)(3))</li> <li>d. The results of measurements and calculations used to evaluate the release of radioactive effluents to the environment? (20.2103(b)(4))</li> </ul>	
		<p>4. Is the licensee for each individual who is likely to receive in a year, an occupational dose requiring monitoring:</p> <ul style="list-style-type: none"> <li>a. Determining the occupational radiation dose received during the current year, (20.2104(a)(1))</li> <li>b. Attempting to obtain the records of cumulative occupational radiation dose? (20.2104(a)(2))</li> </ul>	
		<p>5. Does the licensee maintain records that describe special planned exposure use;</p> <ul style="list-style-type: none"> <li>a. The exceptional circumstances requiring the use of a planned special exposure, (20.2105(a)(1))</li> <li>b. The name of the management official who authorized the planned special exposure and a copy of the signed authorization, and when necessary (20.2105(a)(2))</li> <li>c. What action were necessary (20.2105(a)(3))</li> <li>d. Why the actions were necessary (20.2105(a)(4))</li> <li>e. How doses were maintained ALARA, and (20.2105(a)(5))</li> <li>f. What individual and collective doses were expected to result and actual doses received? (20.2105(a)(6))</li> </ul>	
		<p>6. Does the licensee maintain records of individual monitoring results? (20.2106(a))</p>	
		<p>7. Does the licensee maintain records of dose to individual members of the public? (20.2107)</p>	
		<p>8. Does the licensee maintain records of disposal of licensed materials? (20.2108)</p>	

**Reports to Individuals and Licensor** (*Applies if a radioactive material license exists.*)

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		9. Does the licensee report the following to the licensor: a. Reports of theft or loss of licensed material (20.2201) b. Notification of incidents (20.2202) c. Reports of exposure, radiation levels, and concentrations of radioactive material exceeding the limits (20.2203) d. Reports of special planned exposures (20.2204) e. Reports to individuals of exceeding dose limits, and (20.2205) f. An annual report of the individual monitoring results? (20.2206)	
		10. Is a written report, include appropriate identifying data, name of the individual, the individual's SS number, the exposure information, and a statement to individuals concerning their radiation exposure being reported when: a. Annually (19.13(b)) b. Upon request of a worker formally employed (19.13(c)) c. Upon request of the individual terminating employment? (19.13(e))	

**Sealed Radioactive Source Control** (*Applies if a radioactive material license exists.*)

		1. Does the licensee label and post the licensed material and the rooms that the material is used or stored? (20.1902, Appendix C)	
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**Radiological Criteria for License Termination** (*Applies if a radioactive material license exists.*)

		1. If the licensee wants to terminate the license, has the licensee decontaminated the site, calculated the peak annual TEDE to an average member of the critical group by using 1000 years after decontamination? (20.1401(d))	
		2. In order to allow unrestricted use, has the licensee calculated that the highest annual TEDE is 25 mrem per year or less to the average member of the critical group? (20.1402)	



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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	<p>1. Are all individuals who in the course of employment that are likely to receive in a year an occupational dose in excess of 100 mrem the following information:</p> <ul style="list-style-type: none"> <li>a. Kept informed of the storage, transfer, or use of radiation and/or radioactive material; (19.12(a)(1))</li> <li>b. Instructed in the health protection problems associated with exposure to radiation and/or radioactive material, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed; (19.12(a)(2))</li> <li>c. Instructed in, and required to observe, to the extent within the workers control, the applicable provisions of Commission regulations and licenses for the protection of personnel from exposure to radiation and/or radioactive material; (19.12(a)(3))</li> <li>d. Instructed of their responsibility to report promptly to the licensee any condition which may lead to or cause a violation of Commission regulations and licenses or unnecessary exposure to radiation and/or radioactive material; (19.12(a)(4))</li> <li>e. Instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation and/or radioactive material; and (19.12(a)(5))</li> <li>f. Advised as to the radiation exposure reports which workers may request pursuant to § 19.13. (19.12(a)(6))</li> </ul>	
	<p>2. Does the licensee, in determining those individuals subject to the requirements of paragraph (a) of this section take into consideration assigned activities during normal and abnormal situations involving exposure to radiation and/or radioactive material which can reasonably be expected to occur during the life of a licensed facility? Is the extent of these instructions must be commensurate with potential radiological health protection problems present in the work place? (19.12(b))</p>	

**Design and Control** (*Applies if a radioactive material license exists.*)

	<p>1. Does the licensee describe in the application (or radiation protection program) how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste? (20.1406)</p>	
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**-- End of Checklist --**

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*This checklist applies to projects where radioactive material and/or types of radiation are present.*

<b>Determination of License Type</b>			
		1. <b>License.</b> DOE/NRC/Agreement State requires that persons/company conducting work with radioactive material be licensed for specific amounts and types of radioactive material. Is there a license? (DOE/NRC/Agreement State regulations)	
		2. Is there a documented Radiation Protection Program (RPP)? (10 CFR 835.101(a))	
		3. Is there a documented Radiation Protection Program? (10 CFR 20.1101(a))	
		4. 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))	
		5. Does the NRC/Agreement State licensee use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA? (20.1101(b))	
		6. 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))	
		7. If the RPP was updated, was a revision submitted to DOE? (835.101(g))	
<b>Internal Audits</b> ( <i>Applies if a radioactive material license exists.</i> )			
		8. <b>1.</b> If a DOE licensee, are the audits of the Radiation Protection Program every 36 months? (835.102)	
		9. <b>2.</b> If a NRC/Agreement State licensee, is an audit of the radiation protection program occurring at least annually and reviewing the content and implementation? (20.101(c))	
<b>Radiation Protection Program Management Qualifications</b> ( <i>Applies if a radioactive material license exists.</i> )			
		10. If a DOE licensee, do the individuals responsible for developing, implementing, and compliance with the requirements have the appropriate education, training, and skills? (835.103)	
<b>Procedures</b> ( <i>Applies if a radioactive material license exists.</i> )			
		1. If a DOE licensee, are there written procedures developed that are consistent with the ability of the individuals exposed to the hazards? (835.104)	

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		2. Does the NRC/Agreement State licensee use, to the extent practical, procedures based upon sound radiation protection principles to minimize exposure to radiation and radioactive material? (19.12(a)(3))	
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**Occupational Dose Limits** (*Applies if a radioactive material license exists.*)

		11. If a DOE licensee, 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))	
		12. If a NRC/Agreement State licensee, are the annual limits to the occupational workers: a. 5 rem TEDE/yr (20.1201(a)(1)(i)) b. 50 rem/yr to internal organs except the eye (20.1201(a)(1)(ii)) c. 15 rem/yr to the eye (20.1201(a)(2)(i)) d. Shallow dose to the skin of 50 rem/yr? (20.1201(a)(2)(ii))	
		13. Is there a means to authorize a Special Planned Exposure? (835.204) or (20.1206)	
		14. Is the dose limit to the fetus/embryo 0.1 rem/9 months? (835.206) or (20.1208)	
		15. If a DOE licensee, is the dose limit to minors 0.1 rem/yr? (835.207)	
		16. If a NRC/Agreement State licensee, is the dose limit to minors 0.5 rem/yr? (20.1207)	
		17. If a DOE licensee, 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)	
		18. If a NRC/Agreement State licensee, is the ALI used to calculate internal dose from the inhalation of radioactive material and is this the primary means of determining dose? (20.1203, 1204)	

**Surveys and Monitoring** (*Applies if a radioactive material license exists.*)

		19. If a DOE licensee, 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))	
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	<p>20. Are the instruments and equipment used for monitoring:</p> <ul style="list-style-type: none"> <li>a. Periodically maintained and calibrated on an established frequency (835.401(b)(1))</li> <li>b. Appropriate for the types(s), levels, and energies of the radiation(s) encountered (835.401(b)(2))</li> <li>c. Appropriate for existing environmental conditions (835.401(b)(3))</li> <li>d. Routinely tested for operability? (835.401(b)(4))</li> </ul>	
	<p>21. If a NRC/Agreement State licensee, is monitoring performed to demonstrate:</p> <ul style="list-style-type: none"> <li>a. Compliance with the regulations of the part (20.1501(a)(1))</li> <li>b. Evaluate the magnitude and extent of radiation levels (20.1501(a)(2)(i))</li> <li>c. Concentrations or quantities of radioactive material (20.1501(a)(2)(ii))</li> <li>d. The potential radiological hazards? (20.1501(a)(2)(iii))</li> </ul>	
	<p>22. Does the licensee ensure that the instruments and equipment used for quantitative radiation measurements are calibrated periodically for the radiation measured? (20.1501(b))</p>	
	<p>23. Does the licensee ensure that all personnel dosimeters that require processing to determine the radiation dose must be processed and evaluated by a dosimetry processor that:</p> <ul style="list-style-type: none"> <li>a. Holds a current personnel dosimetry accreditation from the National voluntary Laboratory Accreditation Program (20.1501(c)(1))</li> <li>b. Is approved in the accreditation process for the type of radiations included in the NVLAP program and closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored? (20.1501(c)(2))</li> </ul>	
	<p>24. If a DOE licensee, is monitoring of individual exposures to external radiation when radiological workers who, under typical conditions, are likely to receive:</p> <ul style="list-style-type: none"> <li>a. An effective dose equivalent to the whole body of 0.1 rem or more in a year, or (835.402(a)(1)(i))</li> <li>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))</li> <li>c. A lens of the eye dose equivalent of 1.5 rem or more in a year? (835.402(a)(1)(iii))</li> </ul>	
	<p>25. 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))</p>	
	<p>26. 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))</p>	

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		27. Are there individuals entering a high or very high radiation area? (835.402(1)(5))	
		28. Is monitoring of airborne radioactivity performed when: <ul style="list-style-type: none"> <li>a. An individual is likely to receive an exposure of 10 or DAC-hrs in a year (835.403(a)(1))</li> <li>b. As necessary to characterize the airborne radioactivity hazard where respiratory protective devices have been prescribed? (835.403(a)(2))</li> </ul>	
		29. 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))	
		30. If a NRC/Agreement State licensee, is monitoring of individual exposures to external radiation when radiological workers who, under typical conditions, are likely to receive: <ul style="list-style-type: none"> <li>a. In 1 year, in excess of 10% of the annual limit of 5 rem (20.1502(a)(1))</li> <li>b. Minors in 1 year, in excess of 0.1 rem, 0.15 rem to the lens of the eye, or a shallow dose to the skin in excess of 0.5 rem (20.1502(a)(2))</li> <li>c. Declared pregnant women during the entire pregnancy in excess of 0.1 rem (20.1502(a)(3))</li> <li>d. Individuals entering a high or very high radiation area? (20.1502(a)(4))</li> </ul>	
		31. Is monitoring the occupational intake of radioactive material occurring by and assess the committed effective dose equivalent to: <ul style="list-style-type: none"> <li>a. Adults likely to receive, in 1 year, a committed effective dose equivalent in excess of 10% of Appendix B (20.1502(b)(1))</li> <li>b. Minors likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.1rem (20.1502(b)(2))</li> <li>c. Declared pregnant women likely to receive, during e entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem? (20.1502(b)(3))</li> </ul>	

**Access Control to Radiological Areas** (*Applies if a radioactive material license exists.*)

		32. If a DOE licensee, is there a means for personnel entry control using one or more of the following: <ul style="list-style-type: none"> <li>a. Signs and barricades (835.501(c)(1))</li> <li>b. Control devices on entrances (835.501(c)(2))</li> <li>c. Conspicuous visual and/or audible alarms (835.501(c)(3))</li> <li>d. Locked entrance ways; or (835.501(c)(4))</li> <li>e. Administrative controls (835.501(c)(5))</li> <li>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))</li> </ul>	
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	<p>33. If a DOE licensee, are the following measures implemented for each entry in to a high or very high radiation area?</p> <ul style="list-style-type: none"> <li>a. The area is monitored as necessary during access to determine the exposure rates to which the individuals are exposed (835.502(a)(1))</li> <li>b. Each individual is monitored by a supplemental dosimetry device or other means capable of providing an immediate estimate of the individual's integrated deep dose? (835.502(a)(2))</li> </ul>	
	<p>34. Are one or more of the following features used for each entrance or access point to a high radiation area:</p> <ul style="list-style-type: none"> <li>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))</li> <li>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))</li> <li>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))</li> <li>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))</li> <li>e. Continuous direct or electronic surveillance that is capable of preventing unauthorized entry (835.502(b)(5))</li> <li>f. A control device that will automatically generate audible and visual alarm signals to alert personnel in 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))</li> </ul>	
	<p>35. 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))</p>	

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		36. If a NRC/Agreement State licensee, is there a means for personnel entry control to a high radiation area using one or more of the following features a. A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which and individual might receive a deep-dose equivalent of 0.1 rem in 1 hour at 30 cm. from the radiation source or from any surface that the radiation penetrates (20.1601(a)(1)) b. 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 (20.1601(a)(2)) c. Entry ways that are locked, except during periods when access to the areas is required, with positive control over each individual entry (20.1601(a)(3)) d. In place of the controls required my paragraph (a) of this section for a high radiation area, the licensee may substitute continuous director electronic surveillance that is capable of preventing unauthorized entry? (20.1601(b))	
		37. Does the licensee establish controls in a way that do not prevent individuals from leaving a high radiation area? (20.1601(d))	
		38. In addition to the above requirements, is the licensee instituting additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates? (20.1602)	

**Posting and Labeling** (*Applies if a radioactive material license exists.*)

		39. If a DOE licensee, are the postings and labels include the standard radiation warning trefoil in black or magenta imposed upon a yellow background? (835.601(a))	
		40. 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))	
		41. 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))	
		42. Are areas excepted from the posting requirements for periods of less than 8 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))	

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		43. If a NRC/Agreement State licensee, is there the standard radiation symbol (trefoil) with the colors magenta, purple, or black on yellow background? (20.1902(a)(1-2))	
		44. Is each of the following areas posted with signs bearing the following wording: a. Caution, Radiation area (20.1902(a)) b. Caution, High radiation area (20.1902(b)) c. Grave Danger, Very high radiation area (20.1902(c)) d. Caution, Airborne radioactivity area (20.1902(d)) e. Caution, Radioactive material(s)? (20.1902(e))	

**Respiratory Protection and Controls to Restrict Internal Exposures** (*Applies if a radioactive material license exists.*)

		45. If a DOE licensee, 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))	
		46. If a NRC/Agreement State licensee, has the licensee used to the extent practical process or other engineering controls to control the concentration of radioactive material in air? (20.1701)	
		47. Does the NRC/Agreement State licensee if engineering and process controls are not practical to control the concentrations of radioactive material in the air to values below those that define an airborne radioactivity area, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means; a. Control of access; (20.1702(a)(1)) b. Limitation of exposure times; (20.1702(a)(2)) c. Use of respiratory protection equipment; or (20.1702(a)(3)) d. Other controls? (20.1702(a)(4))	
		48. If the licensee performs an ALARA analysis to determine whether or not respirators should be used, does the licensee consider safety factors other than radiological factors? Does the licensee also consider the impact of respirator use on workers' industrial health and safety? (20.1702(b))	
		49. If the licensee assigns or permits the use of respiratory protection equipment to limit the intake of radioactive materials, does the licensee use only respiratory protection equipment that is tested and certified by the National Institute for Occupational Safety and Health (NIOSH) or has the licensee submitted an application to the NRC for authorized use of this equipment except as provided in this part? (20.1703(a-b))	

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		<p>50. Does the licensee implement and maintain a respiratory protection program that includes:</p> <ul style="list-style-type: none"> <li>a. Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate doses; (20.1703(c)(1))</li> <li>b. Surveys and bioassays, as necessary, to evaluate actual intakes; (20.1703(c)(2))</li> <li>c. Testing of respirators for operability (user seal check for face sealing devices and functional check for others) immediately prior to each use; (20.1703(c)(3))</li> <li>d. Testing of respirators for operability (user seal check for face sealing devices and functional check for others) immediately prior to each use; (20.1703(c)(3))</li> <li>e. Written procedures regarding:             <ul style="list-style-type: none"> <li>(i) Monitoring, including air sampling and bioassays;</li> <li>(ii) Supervision and training of respirator users;</li> <li>(iii) Fit testing;</li> <li>(iv) Respirator selection;</li> <li>(v) Breathing air quality;</li> <li>(vi) Inventory and control;</li> <li>(vii) Storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment;</li> <li>(viii) Recordkeeping; and</li> <li>(ix) Limitations on periods of respirator use and relief from respirator use; (20.1703(c)(4))</li> </ul> </li> <li>f. Determination by a physician that the individual user is medically fit to use respiratory protection equipment:             <ul style="list-style-type: none"> <li>(i) Before the initial fitting of a face sealing respirator;</li> <li>(ii) Before the first field use of non-face sealing respirators, and</li> <li>(iii) Either every 12 months thereafter, or periodically at a frequency determined by a physician. (20.1703(c)(5))</li> </ul> </li> <li>g. Fit testing, with fit factor <math>\geq 10</math> times the APF for negative pressure devices, and a fit factor <math>\geq 500</math> for any positive pressure, continuous flow, and pressure-demand devices, before the first field use of tight fitting, face-sealing respirators and periodically thereafter at a frequency not to exceed 1 year. (20.1703(c)(6))</li> </ul>	
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		<p>51. Does the licensee implement and maintain a respiratory protection program that includes:</p> <ul style="list-style-type: none"> <li>a. The licensee shall advise each respirator user that the user may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief. (20.1703(d))</li> <li>b. The licensee shall also consider limitations appropriate to the type and mode of use. (20.1703(e))</li> <li>c. Standby rescue persons are required under prescribed situations. (20.1703(f))</li> <li>d. Atmosphere-supplying respirators must be supplied with respirable air of grade D quality or better air. (20.1703(g))</li> <li>e. The licensee shall ensure that no objects, materials or substances, such as facial hair, or any conditions that interfere with the face-facepiece seal or valve function, and that are under the control of the respirator wearer, are present between the skin of the wearer's face and the sealing surface of a tight-fitting respirator facepiece. (20.1703(h))</li> <li>f. In estimating the dose to individuals from intake of airborne radioactive materials, the concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the ambient concentration in air without respiratory protection, divided by the assigned protection factor? (20.1703(i))</li> </ul>	
		<p>52. Does the licensee have additional restrictions such as:</p> <ul style="list-style-type: none"> <li>a. Ensuring that the respiratory protection program is adequate to limit doses to individuals from airborne radioactive materials consistent with ALARA, (20.1704(a))</li> <li>b. Limiting the extent to which the use of respiratory protection equipment instead of process or other engineering controls? (20.1704(a))</li> </ul>	
<b>Radiological Records</b> ( <i>Applies if a radioactive material license exists.</i> )			
		53. If a DOE licensee, are there records documenting doses received by all individuals for whom monitoring was required? (835.702(a))	
		54. Are the results of individual external and internal dose monitoring that is performed, but not required, recorded? (835.702(b))	

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	<p>55. Are the following results of monitoring for radiation and radioactive material documented:</p> <ul style="list-style-type: none"> <li>a. Results from monitoring entries into high and very high radiation areas and contamination and high contamination areas; (835.703(a))</li> <li>b. Results of monitoring used to determine individual occupational dose from external and internal sources; (835.703(b))</li> <li>c. Results of monitoring for the release and control of material and equipment; and (835.703(c))</li> <li>d. Results of maintenance and calibration performed on survey and monitoring instruments and equipment? (835.703(d))</li> </ul>	
	<p>56. Are training records maintained to show:</p> <ul style="list-style-type: none"> <li>a. Radiation safety training (835.704(a))</li> <li>b. Actions taken to maintain occupational exposure ALARA (835.704(b))</li> <li>c. Documentation of the results of internal audits and other reviews of program content and implementation (835.704(c))</li> <li>d. Written declarations of pregnancy (835.704(d))</li> <li>e. Changes in equipment, techniques, and procedure used for monitoring (835.704(e))</li> <li>f. As necessary to demonstrate compliance with the requirements for sealed radioactive source control, inventory, and source leak tests? (835.704(f))</li> </ul>	
	<p>57. If a NRC/Agreement State licensee, has the licensee maintained records of the radiation protection program including:</p> <ul style="list-style-type: none"> <li>a. Provisions of the program (20.2102(a)(1))</li> <li>b. Audits and other reviews of program content and implementation? (20.2102(a)(2))</li> </ul>	
	<p>58. Is the licensee maintaining records showing the results of surveys and calibrations? (20.2103(a))</p>	
	<p>59. Is the licensee retaining the following records until the Commission terminates the license:</p> <ul style="list-style-type: none"> <li>a. Results of surveys to determine the dose from external sources and used, in the absence of combination with individual monitoring data, in the assessment of individual dose equivalents. (20.2103(b)(1))</li> <li>b. Results of measurements and calculations used to determine individual intakes of radioactive material and used in the assessment of internal dose. (20.2103(b)(2))</li> <li>c. Results of air sampling, surveys, and bioassays. This includes those records showing the results of air sampling, surveys, and bioassays; and (20.2103(b)(3))</li> <li>d. The results of measurements and calculations used to evaluate the release of radioactive effluents to the environment? (20.2103(b)(4))</li> </ul>	

**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION**

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	60. Is the licensee for each individual who is likely to receive in a year, an occupational dose requiring monitoring: <ul style="list-style-type: none"> <li>a. Determining the occupational radiation dose received during the current year, (20.2104(a)(1))</li> <li>b. Attempting to obtain the records of cumulative occupational radiation dose? (20.2104(a)(2))</li> </ul>	
	61. Does the licensee maintain records that describe special planned exposure use; <ul style="list-style-type: none"> <li>a. The exceptional circumstances requiring the use of a planned special exposure, (20.2105(a)(1))</li> <li>b. The name of the management official who authorized the planned special exposure and a copy of the signed authorization, and when necessary (20.2105(a)(2))</li> <li>c. What action were necessary (20.2105(a)(3))</li> <li>d. Why the actions were necessary (20.2105(a)(4))</li> <li>e. How doses were maintained ALARA, and (20.2105(a)(5))</li> <li>f. What individual and collective doses were expected to result and actual doses received? (20.2105(a)(6))</li> <li>g.</li> </ul>	
	62. Does the licensee maintain records of individual monitoring results? (20.2106(a))	
	63. Does the licensee maintain records of dose to individual members of the public? (20.2107)	
	64. Does the licensee maintain records of disposal of licensed materials? (20.2108)	

**Reports to Individuals and Licensor** (*Applies if a radioactive material license exists.*)

	65. If a DOE licensee, is a report to individuals concerning their radiation exposure being reported when: <ul style="list-style-type: none"> <li>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))</li> <li>b. Upon request of the individual terminating employment (835.801(b))</li> <li>c. Annually (835.801(c))</li> <li>d. Upon request (835.801(d))</li> <li>e. When a DOE contractor is required to report to the DOE for occurrence reporting and processing? (835.801(e))</li> </ul>	
	66. If a NRC/Agreement State licensee, does the licensee report the following to the licensor: <ul style="list-style-type: none"> <li>a. Reports of theft or loss of licensed material (20.2201)</li> <li>b. Notification of incidents (20.2202)</li> <li>c. Reports of exposure, radiation levels, and concentrations of radioactive material exceeding the limits (20.2203)</li> <li>d. Reports of special planned exposures (20.2204)</li> <li>e. Reports to individuals of exceeding dose limits, and (20.2205)</li> <li>f. An annual report of the individual monitoring results? (20.2206)</li> </ul>	

PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		67. If a NRC/Agreement State licensee, is a written report, include appropriate identifying data, name of the individual, the individual's SS number, the exposure information, and a statement to individuals concerning their radiation exposure being reported when: <ul style="list-style-type: none"> <li>a. Annually (19.13(b))</li> <li>b. Upon request of a worker formally employed (19.13(c))</li> <li>c. Upon request of the individual terminating employment? (19.13(e))</li> <li>d.</li> </ul>	
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**Sealed Radioactive Source Control** (*Applies if a radioactive material license exists.*)

		68. If a DOE licensee, is there a program for control of sealed radioactive sources that are used, handled, and stored? (835.1201)	
		69. Is each accountable sealed source inventoried at intervals not to exceed six months and the inventory contains: <ul style="list-style-type: none"> <li>a. Physical location of each accountable sealed radioactive source (835.1302(a)(1))</li> <li>b. Verify the presence and adequacy of associated postings and labels(835.1302(a)(2))</li> <li>c. Establish the adequacy of storage locations, containers, and devices? (835.1302(a)(3))</li> </ul>	
		70. If a NRC/Agreement State licensee, does the licensee label and post the licensed material and the rooms that the material is used or stored? (20.1902, Appendix C)	

**Radiological Criteria for License Termination** (*Applies if a radioactive material license exists.*)

		71. If a NRC/Agreement State licensee and the licensee wants to terminate the license, has the licensee decontaminated the site, calculated the peak annual TEDE to an average member of the critical group by using 1000 years after decontamination? (20.1401(d))	
		72. In order to allow unrestricted use, has the licensee calculated that the highest annual TEDE is 25 mrem per year or less to the average member of the critical group? (20.1402)	

PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

	<p>73. In order to allow restricted use, has the licensee:</p> <ul style="list-style-type: none"> <li>a. Demonstrated that further reduction s in residual radioactivity necessary to meet the &lt;25 mrem/yr would result in net public or environmental harm and the residual levels with restricted conditions are ALARA; (20.1403(a))</li> <li>b. The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem per year; (20.1403(b))</li> <li>c. The licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site; (20.1403(c))</li> <li>d. The licensee has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission and specifying that the licensee intends to decommission by restricting use of the site; (20.1403(d))</li> <li>e. Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either— <ul style="list-style-type: none"> <li>(1) 100 mrem per year; or</li> <li>(2) 500 mrem per year (20.1403(e))</li> </ul> </li> </ul>	
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**Radiation Safety Training or Instruction to Workers** (*Applies if a radioactive material license exists.*)

	<p>74. If a DOE licensee, 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))</p>	
	<p>75. Is this training completed before being permitted unescorted access and before receiving occupational dose? (835.901(b)(1-2))</p>	
	<p>76. 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))</p>	

PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	<p>77. 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:</p> <ul style="list-style-type: none"> <li>a. Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure; (835.901(c)(1))</li> <li>b. Basic radiological fundamentals and radiation protection concepts; (835.901(c)(2))</li> <li>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))</li> <li>d. Individual rights and responsibilities as related to implementation of the facility radiation protection program; (835.901(c)(4))</li> <li>e. Individual responsibilities for implementing ALARA measures required by 835.101, and; (835.901(c)(5))</li> <li>f. Individual exposure reports that may be requested? (835.901(c)(6))</li> </ul>	
	<p>78. If a NRC/Agreement State licensee, are all individuals who in the course of employment that are likely to receive in a year an occupational dose in excess of 100 mrem the following information:</p> <ul style="list-style-type: none"> <li>a. Kept informed of the storage, transfer, or use of radiation and/or radioactive material; (19.12(a)(1))</li> <li>b. Instructed in the health protection problems associated with exposure to radiation and/or radioactive material, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed; (19.12(a)(2))</li> <li>c. Instructed in, and required to observe, to the extent within the workers control, the applicable provisions of Commission regulations and licenses for the protection of personnel from exposure to radiation and/or radioactive material; (19.12(a)(3))</li> <li>d. Instructed of their responsibility to report promptly to the licensee any condition which may lead to or cause a violation of Commission regulations and licenses or unnecessary exposure to radiation and/or radioactive material; (19.12(a)(4))</li> <li>e. Instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation and/or radioactive material; and (19.12(a)(5))</li> <li>f. Advised as to the radiation exposure reports which workers may request pursuant to § 19.13. (19.12(a)(6))</li> </ul>	

PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		79. Does the licensee, in determining those individuals subject to the requirements of paragraph (a) of this section take into consideration assigned activities during normal and abnormal situations involving exposure to radiation and/or radioactive material which can reasonably be expected to occur during the life of a licensed facility? Is the extent of these instructions must be commensurate with potential radiological health protection problems present in the work place? (19.12(b))	
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**Design and Control** (*Applies if a radioactive material license exists.*)

		80. If a DOE licensee, 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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		81. During the design of new facilities or modification of existing facilities, are the following objectives adopted: <ul style="list-style-type: none"> <li>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))</li> <li>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))</li> <li>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))</li> <li>d. The design or modification and the selection of materials includes features that facilitate operations, maintenance, decontamination, and decommissioning? (835.1002(d))</li> </ul>	
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		82. Does the licensee, during routine operations, use the combination of physical design features and administrative control provided that: <ul style="list-style-type: none"> <li>a. The anticipated occupational dose to general employees does not exceed 835.202 limits, and (835.1003(a))</li> <li>b. The ALARA process is utilized for personnel exposure to ionizing radiation? (835.1003(b))</li> </ul>	
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		83. If a NRC/Agreement licensee, does the licensee describe in the application (or radiation protection program) how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste? (20.1406)	
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**Radioactive Contamination Control** (*Applies if a radioactive material license exists.*)

**PESM INSPECTION CHECKLIST— RADIOACTIVE MATERIAL/RADIATION**

*CONFIDENTIAL*

<b>Project:</b>		<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		84. If a DOE licensee, are there means to release material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas to a controlled area, if: <ul style="list-style-type: none"> <li>a. Removable surface contamination levels on accessible surfaces exceed the removable surface contamination levels specified; (835.1101(a)(1))</li> <li>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))</li> </ul>	
		85. 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))	
		86. 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: <ul style="list-style-type: none"> <li>a. Removable surface contamination levels are below the removable surface contamination values specified; and (835.11019(c)(1))</li> <li>b. The material or equipment is routinely monitored and clearly marked or labeled to alert personnel of the contamination status? (835.1101(c)(2))</li> </ul>	
		87. 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))	
		88. If the licensee has 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: <ul style="list-style-type: none"> <li>a. The area is routinely monitored; (835.1102(c)(1))</li> <li>b. The area is conspicuously marked to warn individuals of the contaminated status? (835.1102(c)(2))</li> </ul>	
		89. Does the licensee require individuals exiting contamination, high contamination, or airborne radioactivity areas be monitored, as appropriate, for surface contamination? (835.1102(d))	
		90. Does the licensee require individuals entering areas in which removable contamination exists at levels exceeding the removable surface contamination values specified, wear protective clothing? (835.1102(e))	
<b>-- End of Checklist --</b>			

**EHS 3-3 ATTACHMENT E**



**TETRA TECH EC, INC.**

**ACTION ITEM REPORT**

**CONFIDENTIAL**

**Project Name:**

**Location:**

**Delivery Order No.:**

**Date of Inspection:**

<b>ACTION ITEM</b>	<b>CLASS* MA/MI/R<sup>1</sup></b>	<b>RESPONSIBLE PARTY</b>	<b>SCHEDULE</b>	<b>DATE COMPLETED</b>
1.				
2.				
3.				
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11.				
12.				
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14.				
15.				
16.				

Reviewed by: \_\_\_\_\_  
Project Manager/ Operations Manager

\_\_\_\_\_ Date

**PESM Inspections:**

*Return original, completed Action Item Report to PESM within 60 days of Inspection date. PESM to forward original to Director, Quality Programs and copy to Regional ESQ Manager.*

**Office/Warehouse Inspections:**

*Send copies of completed Action Item Report to ESC and Regional ESQ Manager.*

\* Recommendations shall be entered as observations in the EtQ Solutions database

\_\_\_\_\_  
<sup>1</sup> Ma – Major, Mi - Minor, R - Recommendation  
Revision Date 04/03/03



EHS OFFICE/WAREHOUSE INSPECTION CHECKLIST

CONFIDENTIAL

Office/Warehouse:	Inspector:	Date:
REQUIREMENTS	COMMENTS/NOTES	

<b>Walking Surfaces, Housekeeping</b>		
1. Aisles are proper width and are clear of storage.		
2. No tripping hazards are evident.		
3. Floors are even (no holes or cracks).		
4. Wires not stretched across aisles. Extension cords are covered to reduce trip hazard		
5. Floors dry - not slippery.		
6. Carpets and rugs secure.		
7. No samples or hazardous materials present in offices or office storage areas.		
8. Storage areas kept free of tripping and fire hazards.		
9. Outside walkways and parking areas are in good repair.		
<b>Stairways, Halls, Ramps</b>		
1. Adequate lighting.		
2. Ramps have non-slip surface.		
3. Stairways clear - not cluttered.		
4. Stair treads in good condition.		
5. Handrails installed and in good condition.		
6. Guardrails installed and in good condition.		
7. Halls kept clear of equipment and supplies.		
8. Shelves not overloaded.		
9. Storage shelf files and bookcases secured to wall when necessary.		



## EHS OFFICE/WAREHOUSE INSPECTION CHECKLIST

**CONFIDENTIAL**

Office/Warehouse:	Inspector:	Date:
REQUIREMENTS	COMMENTS/NOTES	

**Office Equipment, Duplicating Machines, Tools**

1. File drawers closed when not in use.		
2. Chairs (springs, casters) in good mechanical condition, free of splinters and rough edges.		
3. Fans guarded and secure from falling or tipping.		
4. Paper cutter is equipped with guard and blade spring on guard functions.		
5. Paper shredder guarded and functions.		
6. Safe (non-rolling type) step stools used when needed.		
7. No complaints of ventilation problems.		
8. Ozone filters are replaced as required on laser printers and other office equipment.		
9. Duplicating chemicals properly stored.		
10. Paper, supplies, and material safely stacked.		
11. Knives, scissors, and other sharp tools used/ stored correctly.		
12. Emptied containers of duplicating chemicals properly disposed. MSDS obtained for duplicating chemicals		
13. Tops of file cabinets clean of excess boxes, papers, binders, etc.		

**Ergonomics (EHS 3-1)**

1. New Employees received training.		
2. Workstation evaluations completed as scheduled and action items are closed out.		
3. Workstations meet corporate standards per ehs 3-1.		

**Electric Hazards**

1. Machines and equipment appropriately grounded.		
2. Electrical outlets not overloaded.		
3. Extension cords are UL approved or 3 wire type.		
4. Condition of power cords (not patched or spliced).		



EHS OFFICE/WAREHOUSE INSPECTION CHECKLIST

CONFIDENTIAL

Office/Warehouse:	Inspector:	Date:
REQUIREMENTS	COMMENTS/NOTES	

5. Floor electrical outlets are protected with cover plates.		
6. Safe condition of plugs and wall outlets maintained.		
7. Electric switch panels clear for access (at least 30" side, 3' front).		
8. Combustible materials not stored within 5 ft of switch panels.		
9. No wires under carpets.		
10. Electric heaters safety are UL rated/approved and use is allowed by landlord.		
<b>Emergency Preparedness/ Fire Protection</b>		
1. Emergency exit routes prominently posted, fire exits marked, and access not blocked or obstructed.		
2. Aisles used as primary emergency exits have minimum clearance of 36".		
3. Fire extinguishers accessible, not blocked, or obstructed, and monthly inspections conducted.		
4. Fire doors not locked, closed, or blocked open.		
5. Sprinkler heads not blocked.		
6. Excess paper trash removed.		
7. Emergency lights are available.		
8. Emergency phone numbers posted.		
9. First aid kits fully stocked.		
10. Field/ Vehicles first aid kits fully stocked.		
11. Bloodborne pathogen kits available, and fully stocked and readily accessible.		
12. List of first aid trained persons posted.		
13. Maps to medical facility available.		
14. Required notices: OSHA or State OSHA, State Right-to-Know, Workers' Compensation posted.		
15. Office Evacuation Plan is up-to-date and current version is located on Lotus Notes.		



EHS OFFICE/WAREHOUSE INSPECTION CHECKLIST

**CONFIDENTIAL**

Office/Warehouse:	Inspector:	Date:		
REQUIREMENTS	COMMENTS/NOTES			

16. Is automatic external defibrillator (AED) presently installed in a permanent location and clearly labeled? Is the maintenance current on the AED?		
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EHS OFFICE/WAREHOUSE INSPECTION CHECKLIST

**CONFIDENTIAL**

Office/Warehouse:	Inspector:	Date:
REQUIREMENTS	COMMENTS/NOTES	

<b>Materials and Waste Storage and Disposal</b>		
1. Expiration date of chemicals/ hazardous materials have been checked.		
2. Expired chemicals are in the process of being properly disposed. ESQ personnel are involved in waste characterization, management and disposal.		
3. If hazardous wastes (e.g., samples or excess chemicals brought back to office/warehouse) are generated and disposed manifests must be properly maintained and tracked.		
<b>Warehouse Storage</b>		
1. If vehicles or equipment are stored in warehouse, is there an emergency spill kit available in the event that fuel, oil, or other fluids are released?		
<b>Environmental Management System</b>		
1. ESQ Policy Posting. Current Environmental policy is posted at appropriate locations throughout the office.		
2. Awareness. TtEC employees are aware of the ESQ policy and commitments it contains. Have new employees received EMS awareness training?		
3. <b>Company-wide Significant Environmental Risks (Aspects), Objectives and Targets.</b> The company-wide significant risks (aspects), objectives and targets are being incorporated into the office activities. Where appropriate, ensure proper documentation exists to demonstrate conformance.		
4. <b>Waste Management</b> See Materials and Waste Storage and Disposal above		
a. <b>Worker Health &amp; Safety</b> Have ergonomic surveys been completed per EHS 3-1, Ergonomics?		



## EHS OFFICE/WAREHOUSE INSPECTION CHECKLIST

**CONFIDENTIAL**

Office/Warehouse:	Inspector:	Date:
REQUIREMENTS	COMMENTS/NOTES	

<b>b. Pollution Prevention Practices.</b> <b>1) Paper.</b> What percentage of recycled content paper is being used?		
<b>2) Employee Participation.</b> How many employees surveyed/observed are using double-sided copying, double-sided printing and/or implementing other pollution prevention practices (electronic editing, minimal printing, etc.)?		
<b>3) Posters.</b> Are double-sided copying posters posted?		
<b>5. Recycling.</b> <b>a. Justification.</b> Is recycling program commensurate with waste generated and cost?		
<b>b. Employee Participation.</b> Are employees recycling these materials? Check employee waste baskets and recycling bins.		
<b>6. Monitoring and Measuring and Corrective Measures</b>		
<b>a. Monitoring and Measuring.</b> When was the last EHS Office/Warehouse inspection conducted and documented?		
<b>b. Corrective Action.</b> Are corrective action to address any deficiencies implemented and closure is documented in the office files.		
<b>-End of Checklist-</b>		

cc: ESC  
 Manager, EHS Services



**ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies to all projects*

<b>Program Administration and Documentation</b>		
		<b>1. EHS Procedures.</b> Site has access to current, relevant EHS Program requirements through CRL or other communication source.
		<b>2. Awareness Recognition Programs (EHS 1-2).</b> EHS awareness being implemented (e.g., postings, posters, etc.). EHS recognition program instituted.
		<b>3. Employee Participation Program (EHS 1-3).</b> "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).
		<b>4. Subcontractors (EHS 1-4).</b>
		<b>a) HIPO Field Contractors</b> have been approved and proper documentation is maintained.
		<b>b) Waste Management Subs</b> have been approved (including lower tier subcontractors) and proper documentation is maintained.
		<b>5. Visitor Safety (EHS 1-5).</b> Visitors entering site have complied with procedural requirements.
		<b>6. EHS Meetings (EHS 1-3)</b>
		<b>a)</b> EHS Daily Briefings conducted – contents properly documented, EMS issues discussed (ESQ Policy, worker impacts to environment, pollution prevention).
		<b>b)</b> "Major Projects" conduct weekly meetings. Documentation is maintained.
		<b>7. Incident/Regulatory Reporting (EHS 1-7)</b>
		<b>a)</b> Incident reports submitted for all incidents in a timely fashion.
		<b>b)</b> Investigation report submitted for all incidents in a timely fashion.
		<b>c)</b> Corrective actions identified in the investigation report have been completed and closure has been documented.
		<b>d)</b> Employer's first report of injury prepared and submitted on time.
		<b>e)</b> Permit exceedences/spills/releases have been reported to regulatory agencies as required by law or regulation.
		<b>8. Manifests/TtEC Permits (EHS 1-8).</b>
		<b>a)</b> Manifests are not signed by TtEC personnel except as allowed by EHS 1-8.
		<b>b)</b> No environmental permits in TtEC's name or TtEC as operator except as allowed by EHS 1-8.



PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

		<p><b>9. Recordkeeping (EHS 1-9).</b> All EHS records maintained per procedure          Personnel medical clearance          EHS Correspondence          H&amp;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.)</p>	
		<p><b>10. External Regulatory Inspections/Notices (EHS 1-10).</b>          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?</p>	
		<p><b>11. EHS/EMS Training (EHS 1-11).</b></p>	
		<p>a) All staff (including subcontractors) have required EHS and TtEC training. Documentation is maintained on-site as required by EHS 1-11.</p>	
		<p>b) Training on EHS, WM, and DOT Plans have occurred and is documented (EHS 3-2).</p>	
		<p>c) Are personnel trained in the environmental aspects of their activities?</p>	
		<p><b>12. Ergonomics (EHS 3-1).</b> Field and Office Ergonomic evaluations have been conducted as suggested in EHS 3-1</p>	
		<p><b>13. EHS Plans (EHS 3-2).</b></p>	
		<p>a) Meets requirements of EHS 3-2, including requirements under 29 CFR 1910.120 and any other safety or environmental statute or regulation.</p>	
		<p>b) Are TIP/RMP risks incorporated into EHS plan?</p>	
		<p>c) Completed, approved, and signed copy is on-site.</p>	
		<p>d) Has been modified to reflect changing site condition/activities.</p>	
		<p>e) Is being implemented as written.</p>	
		<p>f) Identifies activity hazard analyses, which adequately address site hazards (EHS 3-5).</p>	
		<p>g) Identifies PPE, which is appropriate for site contaminants, actual, and potential exposure levels, and site activities.</p>	
		<p>h) Identifies Air/Noise monitoring strategy (s), which is appropriate for contaminants and activities.</p>	
		<p>i) Lists action levels which are appropriate and action levels are being implemented.</p>	
		<p>j) Identifies exclusion, CRZ, and support zones, site is clearly demarcating these zones per EHS plan (EHS 3-4).</p>	



**PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<b>k)</b> Discusses appropriate personnel and equipment decontamination procedures. Procedures are being implemented (EHS 5-1).	
	<b>l)</b> Includes Emergency Response Plan, which addresses potential site emergencies (EHS 2-1).	
	<b>m)</b> 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.	
	<b>n)</b> Addresses respiratory protection program (EHS 5-2) requirements. Program being implemented.	
	<b>o)</b> Addresses environmental conditions and regulatory requirements.	
	<b>p)</b> Identifies all waste streams, management requirements (including client requirements), and transport/disposal plans. These requirements are being implemented.	
	<b>q)</b> Identifies all required environmental permits – permits are current and all applicable conditions are implemented. <i>(Refer to specific checklists if necessary).</i>	
	<b>14. Inspections (EHS 3-3).</b>	
	<b>a)</b> Weekly/monthly inspections conducted. Closure of action items are documented.	
	<b>b)</b> Closures of previous PESM inspection action items are documented. <i>(Those action items not closed must be forwarded to action item matrix for this inspection).</i>	

**Postings/ Signs/ Labeling/ Markings**

	<b>15.</b> OSHA Job Safety & Health Poster.	
	<b>16.</b> OSHA 300 Log (February) posted.	
	<b>17.</b> OSHA Noise Regulation posted.	
	<b>18.</b> Department of Labor Postings.	
	<b>19.</b> Emergency phone numbers posted.	
	<b>20.</b> Other suggested postings: <b>a)</b> Evacuation routes posted. <b>b)</b> All hazard warning signs. <b>c)</b> Noise hazard warning signs. <b>d)</b> Control zones clearly identified. <b>e)</b> Site perimeter posted and controlled. <b>f)</b> Emergency exits clearly marked. <b>g)</b> Fire extinguishers clearly marked. <b>h)</b> Safety showers/ eyewashes clearly marked. <b>i)</b> Circuit breakers labeled. <b>j)</b> Low overhead hazards clearly marked.	
	<b>21.</b> Copy of TtEC Work Rules Posted (EHS 3-6).	



**ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	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	
	<ul style="list-style-type: none"> <li>a) Do Site Personnel: <ul style="list-style-type: none"> <li>Where appropriate PPE</li> <li>Understand risks</li> <li>Implement appropriate controls</li> <li>Implement permit systems</li> <li>Comply with EHS Plan requirements</li> </ul> </li> <li>b) Do Supervisors: <ul style="list-style-type: none"> <li>Provide appropriate tasking</li> <li>Identify competent persons as necessary</li> <li>Provide sufficient oversight</li> </ul> </li> </ul>	
	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.	



**ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS**

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<b>Project:</b>		<b>Inspector:</b>		<b>Date:</b>	
Yes No N/A	<b>REQUIREMENTS</b>			<b>COMMENTS/NOTES</b>	

		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. <b>Project-Specific Significant Environmental Risks (Aspects).</b> Project-specific significant environmental risks (aspects) have been identified in TIP.	
		50. <b>Significant EHS Risks</b> The Project/Site Manager should be able to describe project environmental and H&S risks and their mitigations.	
		<p><b>a) Pollution Prevention.</b> Does project have a recycling program for paper, bottle, cans, construction debris, trees/shrubs, other: _____ (specify). (Please circle all that apply). <i>If not, why not?</i></p>	
		51. <b>Document Control.</b> 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. <b>Operational Controls.</b> 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. <i>Operational controls are described as mitigation measures in TIP.</i>	
		53. <b>Monitoring and Measuring and Corrective Measures.</b> 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--

 **EHS 3-3 ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—AIR QUALITY**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Permitting Applicability/Exemption</b> <i>(Please complete each line in this section)</i>		
		<p><b>1. State/Local Pre-Construction Permit.</b> 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) <i>Note: regulated sources may include passive emission sources such as landfills, bioremediation piles, etc.</i></p>
		<p><b>2. PSD Permit.</b> 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<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, VOC, CO, lead). Project meets PSD permit conditions (40 CFR 52.21, State/local air regulations)</p>
		<p><b>3. Non-attainment Area.</b> 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 &amp; meets conditions in the pre-construction permit (40 CFR 52, State/local regulations) <i>Note: definitions for major source and significant amounts of pollutants will vary depending upon the classification of the nonattainment area.</i></p>
		<p><b>4. NSPS Sources.</b> Project involves modification of a source that is subject to NSPS standards. Project obtained permit mod &amp; meets permit conditions. (40 CFR 60)</p>
		<p><b>5. Hazardous Air Pollutant Sources.</b> 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)</p>
		<p><b>6. Title V Permit.</b> 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)</p>
		<p><b>7. State Toxic Air Pollutants.</b> 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)</p>


**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

			<p><b>8. Permit Exclusion/Exemption.</b> 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)</p>	
			<p><b>9. Permit Equivalency.</b> 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.</p>	

**Equipment/Pollution Control Devices** (*Applies if project has equipment that generates or controls air pollution.*)

			<p><b>10. Equipment, Process, Materials, Process Rates.</b> Permit terms/conditions reflect current equipment, process, materials, and process rates. If not, note differences and determine if permit modification is required.</p>	
			<p><b>11. Pollution Control Devices.</b> Air emissions source includes control technology. Evaluation of the following was conducted and determined to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Verification was made that control technology as specified in permit/regulations is in place and operating properly.</li> <li>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.</li> </ul>	
			<p><b>12. Treatment Residues.</b> Control equipment generates treatment residues which have been properly characterized, managed, and/or disposed of. <i>Complete applicable waste checklists.</i></p>	

**Emissions Monitoring and Testing** (*Applies if project must conduct air emissions monitoring or testing.*)

			<p><b>13. Continuous or Periodic Emissions Measurement.</b> Emissions from project sources are subject to continuous/periodic emissions measurements. Evaluation of the following was conducted and determined to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Verification was made that emissions measurements comply with regulatory requirements.</li> <li>b. Monitoring data was reviewed and meets emissions limits specified in regulations/permit conditions.</li> <li>c. Recordkeeping to regulatory agency, if required, is being conducted. Documentation exists in project files.</li> </ul>	
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**ATTACHMENT C**  
**TETRA TECH EC, INC.**  
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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<p><b>14. Stack Testing.</b> 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)</p> <ul style="list-style-type: none"> <li>a. Testing was conducted as specified in regulations/permit.</li> <li>b. Notification to regulatory agency, if required, was performed/documented.</li> <li>c. Reporting of testing results was performed, if required.</li> <li>d. Testing verified that source was in compliance with regulatory/permit requirements.</li> </ul>	
		<p><b>15. NSPS Sources.</b> Sources subject to NSPS have specific Continuous Emission Monitoring (CEM) &amp; performance testing requirements. An evaluation of the following was conducted and found to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Source-specific CEM performance testing specified in applicable Subpart.</li> <li>b. Notification prior to startup of CEM/opacity demonstration was provided to agency. (40 CFR 60.7)</li> <li>c. If excess emissions occurred, quarterly reports were submitted to agency. (40 CFR 60.7)</li> <li>d. CEM requirements in 40 CFR 60.13 are being met.</li> <li>e. General performance testing requirements specified in 40 CFR 60.8 has been met.</li> </ul>	
		<p><b>16. HAPs/NESHAP Sources.</b> Sources subject to HAPs/NESHAPs have specific Continuous Monitoring System (CMS) &amp; performance testing requirements. (40 CFR 61 and 63) An evaluation of the following was conducted and found to be in compliance:</p> <ul style="list-style-type: none"> <li>a. Source-specific CEM/performance testing specified in applicable Subpart.</li> <li>b. Notification prior to performance test/startup of CEM was provided to agency. (40 CFR 63.7/63.8)</li> <li>c. CMS requirements in 40 CFR 63.8 are being met, including CMS quality control program.</li> </ul>	
<b>Emissions Limits</b> <i>(Please complete each line in this section)</i>			
		<p><b>17. General Regulatory Emissions Limits.</b> 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)</p>	
		<p><b>18. Permit-specific Emissions Limits.</b> Emissions from project sources comply with permit-specific emissions limits.</p>	
		<p><b>19. NSPS Source-Specific Emissions Limits.</b> Project is in compliance with NSPS emissions limits. (40 CFR 60, Subparts)</p>	


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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<b>20. HAPs/NESHAPs Source-Specific Emissions Limits.</b> Project is in compliance with HAPs/NESHAPs emissions limits. (40 CFR 61/63, Subparts)	
<b>Reporting/Recordkeeping</b> <i>(Please complete each line in this section)</i>			
		<b>21. Registration.</b> Emissions source is required to register with state/local agency. Project files document that registration has been performed. (State/local air regulations)	
		<b>22. Emissions Inventory.</b> Emissions inventory must be submitted to state/local agency and project files document that emissions inventory has been submitted. (State/local air regulations)	
		<b>23. Permit Posting.</b> Permit is posted conspicuously, if required. (State/ local air regulations)	
		<b>24. Reporting of Startup/Shutdown/Malfunctions/Emissions Excesses/Other.</b> 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)	
		<b>25. Recordkeeping.</b> 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)	
		<b>26. NSPS Reporting/Recordkeeping.</b> Project is in compliance with the following requirements: <ul style="list-style-type: none"> <li>a. Documentation exists in project files demonstrating that project has complied with applicable notification requirements. (40 CFR 60.7)</li> <li>b. Records of startup/shutdown, malfunctions of NSPS process, control and monitoring equipment are in project files. (40 CFR 60.7)</li> <li>c. Source-specific recordkeeping requirements have been evaluated and project files contain all proper records. (40 CFR 60 Subparts)</li> <li>d. Reporting to regulatory agencies of source-specific requirements. (40 CFR 60 Subparts)</li> </ul>	


**ATTACHMENT C**  
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<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

			<p><b>27. HAPs/NESHAPs Reporting/Recordkeeping.</b> Project is in compliance with the following requirements:</p> <ul style="list-style-type: none"> <li>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)</li> <li>b. Records of startup/shutdown, malfunctions, control and monitoring equipment are in project files. (40 CFR 63.6(e))</li> <li>c. Source-specific recordkeeping requirements have been evaluated and project files contain all proper records. (40 CFR 63, Subparts)</li> <li>d. Records of performance tests are maintained for 5 years.</li> <li>e. Startup/shutdown/malfunction plan has been developed &amp; 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 &amp; written report was submitted within 7 days. (40 CFR 63.6(e)(3))</li> <li>f. Records required in 40 CFR 63.10 are being kept for 5 years.</li> </ul>	
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**CFCs** *(This section applies to projects which involve the handling of CFCs.)*

			<p><b>28. Export/Import/Production Destruction/Transformation of Ozone-Depleting Controlled Substances.</b> If project involves any of these activities, 40 CFR 82 must be consulted for specific reporting, recordkeeping, labeling, and training requirements.</p>	
			<p><b>29. Disposal of Appliances/Motor Vehicle Air Conditioners.</b> 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))</p>	
			<p><b>30. Recordkeeping/Reporting.</b> If appliances/MVACs are disposed of, reporting and recordkeeping requirements are being met. (40 CFR 82.166)</p>	

**Miscellaneous** *(Please complete each line in this section)*

			<p><b>31. Fugitive Dust.</b> 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)</p>	
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**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST—AIR QUALITY**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

		<b>32. Odor.</b> Odors from project are minimized. (State/local regulations)	
		<b>33. Complaints by Adjacent Landowners.</b> Complaints from adjacent landowners have been filed.	
		<b>34. Inspections by Air Quality Regulatory Agencies.</b> Project has been inspected by air quality regulatory agency. <i>Please note the purpose (e.g., permit compliance), and results of the inspection.</i>	
		<b>35. Accidental Release Emergency Planning.</b> 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. <i>Note: Federal § 112(r) program has not been finalized to date.</i> (State regulations).	
		<b>36. Open Burning.</b> 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 <u>not</u> 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--**

**PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE TANK  
 INSTALLATION AND CLOSURE**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
Yes	No	N/A
<b>REQUIREMENTS</b>		
<b>COMMENTS/NOTES</b>		

*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/overflow 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.*

<b>General Information</b>			
			<p><b>1. Activity.</b> Project involves the following activity at an UST/AST:            (Please circle applicable activity):</p> <ul style="list-style-type: none"> <li>a. Installation</li> <li>b. Upgrading</li> <li>c. Closure: Demolition/In-place</li> <li>d. Investigation</li> <li>e. Corrective Action</li> <li>f. Other: _____</li> </ul>
			<p><b>2. Type of Substance.</b> 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.</p>
<p><b>USTs Installed AFTER December 22, 1988</b> (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.</p>			
			<p><b>3. Corrosion Protection.</b> USTs meet one of following standards:</p> <ul style="list-style-type: none"> <li>a. Constructed of fiberglass-reinforced plastic (FRP);</li> <li>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;</li> <li>c. Constructed of steel/FRP composite;</li> <li>d. Constructed of steel with no corrosion protection if site determined by corrosion expert to not be corrosive enough to cause release; or</li> <li>e. Alternative design approved by regulatory agency. (40 CFR 280.20(a) and (b))</li> </ul>



PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE  
TANK INSTALLATION AND CLOSURE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

	<p><b>4. Spill and Overfill Prevention.</b> If tank system is filled by transfer of more than 25 gallons, it has spill/overfill protection which include:</p> <ul style="list-style-type: none"> <li>a. Equipment that will prevent release of product when transfer hose is detached from fill pipe (e.g., catchment basin);</li> <li>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 &gt; 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</li> <li>c. Alternative equipment approved by regulatory agency. (40 CFR 280.20(c))</li> </ul>	
	<p><b>5. Proper Installation/Certified Installer.</b> Regulatory agency was notified of installation by ONE of the following certifications:</p> <ul style="list-style-type: none"> <li>a. Checklist showing that all work in manufacturer’s checklist is completed;</li> <li>b. Installer is certified by tank/piping manufacturers or regulatory agency;</li> <li>c. Installation has been inspected and certified by registered PE with experience in UST installation;</li> <li>d. Installation has been approved by regulatory agency; or</li> <li>e. Another method approved by regulatory agency. (40 CFR 280.20(d) and (e))</li> </ul> <p><i>Note: State regulations may specifically require one type of certification. Check state regulations.</i></p>	
	<p><b>6. Release Detection.</b> ONE of the following release detections is being used:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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</li> <li>c. Weekly manual tank gauging is conducted if tank is 550 gallons or less. (40 CFR 280.41(a))</li> </ul> <p>Records are kept documenting compliance with inspection/monitoring/ testing requirements.</p>	



PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE  
TANK INSTALLATION AND CLOSURE

CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES	

	<p><b>7. Petroleum UST Release Detection for Piping.</b> If project involves installation of an UST which stores petroleum, the UST has release detection in piping which consists of:</p> <ul style="list-style-type: none"> <li>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</li> <li>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.</li> <li>c. No release detection is required if meet suction piping requirements.</li> <li>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))</li> </ul> <p>Records are kept documenting compliance with inspection/monitoring/ testing requirements.</p>	
	<p><b>8. Hazardous Substances USTs/Secondary Containment.</b> Secondary containment is designed/constructed/installed to:</p> <ul style="list-style-type: none"> <li>a. Contain substances released from tank system until they are detected and removed and prevent release to environment during operational life.</li> <li>b. Containment is checked for releases every 30 days. Records are kept of these inspections.</li> <li>c. Tank and piping designed with double-wall or external liners, including vaults to contain 100% capacity of largest tank.</li> <li>d. Pressurized piping is equipped with automatic line leak detector. (40 CFR 280.42)</li> </ul>	
<b>USTs Installed BEFORE December 22, 1988</b>		
	<p><b>9. Criteria.</b> 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)</p>	



**ATTACHMENT C  
TETRA TECH EC, INC.**

**PESM INSPECTION CHECKLIST— UNDERGROUND/ABOVEGROUND STORAGE  
TANK INSTALLATION AND CLOSURE**

**CONFIDENTIAL**

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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

	<p><b>10. Release Prevention Upgrades.</b> If the UST is a steel tank it has:</p> <ul style="list-style-type: none"> <li>a. Internal lining which is inspected annually for 10 years/every 5 years thereafter;</li> <li>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</li> <li>c. Alternative approved by regulatory agency. (40 CFR 280.21(b) and (c)).</li> <li>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.</li> <li>e. Spill/overflow prevention equipment described for new tanks (above in question 2) has been installed.</li> </ul>	
	<p><b>11. Release Detection.</b> Depending upon when tank was installed, release detection/pressurized piping was installed according to timetable in regulations. Release detection includes ONE of the following.</p> <ul style="list-style-type: none"> <li>a. Every 30 days monitor release through automatic tank gauging/inventory control, vapor /groundwater /interstitial/ alternative approved monitoring;</li> <li>b. Weekly manual tank gauging (if tank is 550 gallons or less);</li> <li>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</li> <li>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.</li> <li>e. If tank contains hazardous substances, secondary containment specified above for new tanks was installed. (40 CFR 280.40).</li> </ul> <p>Records of monitoring/inspections/tests are maintained in project files.</p>	



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		<p><b>12. Piping Release Detection.</b> Depending upon when tank was installed, release detection for piping has been installed according to timetable in regulations.</p> <p>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</p> <p>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.</p> <p>c. No release detection is required if meet suction piping requirements.</p> <p>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.</p> <p>e. Hazardous substance tanks must have secondary containment as described for new tanks. (40 CFR 280.40).</p> <p>Records of monitoring/inspections/tests are kept in files.</p>	
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**All UST Systems** (Applies to installation, operation, repair, maintenance, etc. of all UST tanks.)

		<p><b>13. Cathodic Protection System Operation/Maintenance.</b> 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)</p>	
		<p><b>14. Repairs.</b> 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)</p>	
		<p><b>15. Compatibility.</b> UST system is compatible with substance stored. (40 CFR 280.32)</p>	
		<p><b>16. Filling.</b> 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))</p>	



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		<p><b>17. Reporting.</b> 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 (<i>note that states may have more stringent requirements for spill reporting for their UST programs – check state reporting requirements</i>):</p> <ul style="list-style-type: none"> <li>a. Spills/overfill of 25 gallons of petroleum if released to environment.</li> <li>b. Spill of petroleum which causes sheen on surface water.</li> <li>c. Spills of more than RQ of hazardous substance.</li> </ul> <p>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)</p>	
		<p><b>18. Temporarily Out of Service.</b> Maintenance requirements specified in 40 CFR 280.70 must be met for USTs temporarily taken out of service. (40 CFR 280.70)</p>	
		<p><b>19. Conversion.</b> UST system is being converted to store nonregulated substances.</p> <ul style="list-style-type: none"> <li>a. The regulatory agency has been/will be notified 30 days prior to conversion.</li> <li>b. Tank is being emptied and cleaned by removing all liquids/accumulated sludges.</li> <li>c. Assessment is being performed to measure for contamination unless other monitoring indicates no release present.</li> <li>d. If release confirmed, notification has been made. (40 CFR 280.71 and .72)</li> </ul>	



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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

		<p><b>20. Records.</b> Project files contain the following applicable records <i>(Mark each applicable record contained in the file.):</i></p> <ul style="list-style-type: none"> <li>a. Corrosion expert’s analysis of site’s corrosion potential if corrosion protection is not used on steel tank.</li> <li>b. Proper operation of cathodic protection system -- last 2 inspections for operation of system; last 3 inspections if an impressed current CPS is used.</li> <li>c. Repairs made in compliance with 40 CFR 280.33.</li> <li>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).</li> <li>e. Schedules of required calibration/maintenance provided by manufacturer of release detection equipment (5 years from installation).</li> <li>f. Results of tank tightness test (until next test conducted).</li> <li>g. Calibration, maintenance, repairs of release detection equipment (1 year).</li> <li>h. Results of site investigation if permanent closure conducted.</li> <li>i. Copies of permits, notification forms, release reports, corrective action reports, other information submitted to regulatory agency. (40 CFR 280.34(b))</li> </ul>	
		<p><b>21. Reporting.</b> Project files contain the following applicable records <i>(Mark each applicable record contained in the file.):</i></p> <ul style="list-style-type: none"> <li>a. Notification for all UST systems (certification of installation).</li> <li>b. Reports of releases, suspected releases, spills/overfills and confirmed releases described in this checklist.</li> <li>c. Corrective action planned or taken -- initial abatement measure, initial site characterization, free product removal, investigation of soil/groundwater cleanup, corrective action plan.</li> <li>d. Notification prior to permanent closure or change in service. (40 CFR 280.34(a))</li> </ul>	



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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

<b>Investigation of Release/Corrective Action/Closure</b>			
		<p><b>22. Suspected Release Reporting.</b> The following was reported to regulatory agency within 24 hours:</p> <ul style="list-style-type: none"> <li>a. Discovery of released regulated substances at UST site.</li> <li>b. Unusual operating conditions unless equipment is found to be defective but not leaking and is repaired/replaced immediately.</li> <li>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)</li> </ul>	
		<p><b>23. Investigation.</b> 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)</p>	
		<p><b>24. Confirmed Release Reporting.</b> 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)</p>	
		<p><b>25. Corrective Action.</b> Corrective action is being taken to cleanup spill. <i>Circle which of the following is included in Tetra Tech EC scope of work.</i></p> <ul style="list-style-type: none"> <li>a. Identification/mitigation of fire/explosion/vapor hazards,</li> <li>b. Removal of regulated substance from UST,</li> <li>c. Prevention of further migration of released substance,</li> <li>d. Investigation to determine presence of free product,</li> <li>e. Initial site characterization,</li> <li>f. Free product removal,</li> <li>g. Investigation for soil/groundwater cleanup,</li> <li>h. Development of corrective action plan. (40 CFR 280.60 - .66)</li> </ul>	
		<p><b>26. Closure.</b> The following steps were completed for closure of the UST. (40 CFR 280.71 and .72)</p> <ul style="list-style-type: none"> <li>a. <b>Notification.</b> Regulatory agency was notified 30 days prior to conducting closure. Notice is maintained in files.</li> </ul>	



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Yes No N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

			<p>b. <b>Emptying.</b> UST was emptied of all product and sludges and cleaned. <i>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.</i></p>	
			<p>c. <b>Type of Closure.</b> UST was closed EITHER through permanent removal of all liquids and accumulated sludges OR by filling with inert material. <i>Please circle applicable activity.</i></p>	
			<p>d. <b>Site Assessment.</b> Site assessment was performed to measure for contamination unless vapor or groundwater monitoring detected no release.</p>	
			<p>e. <b>Notification if Contamination Found.</b> If contamination was found during assessment, was notification provided to regulatory agency within 24 hours?</p>	
			<p><b>27. Records.</b> 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))</p>	
			<p><b>28. Reporting.</b> The following reports have been submitted to regulatory agencies:</p> <p>a. Reports of releases, suspected releases, spills/overfills and confirmed releases described in this checklist.</p> <p>b. Corrective action planned or taken -- initial abatement measure, initial site characterization, free product removal, investigation of soil/groundwater cleanup, corrective action plan.</p> <p>c. Notification prior to permanent closure or change in service. (40 CFR 280.34(a))</p>	

**Aboveground Storage Tanks** (*Applies if project involves the design/construction/repair/cleanup/closure of aboveground storage tanks that store hazardous substance/oil.*)

			<p><b>29. Installation/Repair.</b> 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) <i>Please also complete the “Oil and Hazardous Substances Management” Checklist.</i></p>	
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Yes	No	N/A	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>	

			<p><b>30. Cleanup/Closure.</b> 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)</p>	
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*Federal USTs ( This section applies to USTs owned by Federal Agencies and are a result of the Federal Policy Act of 2005)*

			<p><b>31. Inspection Requirements.</b> 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.</p>	
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			<p><b>32. Delivery Prohibition.</b> 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.)</p>	
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			<p><b>33. Operator Training.</b> 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:</p> <p><b>Class A:</b> Personnel having primary responsibility to operate and maintain UST tank systems.</p> <p><b>Class B:</b> Personnel who are responsible for implementing UST state/federal regulatory requirements in the field.</p> <p><b>Class C:</b> Personnel who are responsible for the first line of response events indicating emergency conditions.</p>	
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			<p><b>34. Groundwater Protection.</b> 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. (<b>Note:</b> Does not apply to repairs needed to maintain existing UST system.)</p>	
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**--End of Checklist--**

**EHS 3-3 ATTACHMENT C  
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<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

*This checklist applies when petroleum, oil, or hazardous substances are stored, used, or handled on the project site or transported on- or off-site.*

<b>General Requirements</b>		
		<p><b>1. Oil/Water Separators.</b> 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. <i>Complete applicable EHS 3-3 Solid or Hazardous Waste Checklists.</i></p>
		<p><b>2. State Regulations.</b> State/local regulations specify requirements for oil storage, handling or disposal which are more stringent than requirements specified in this checklist. <i>Check the Site Health and Safety Plan to determine if State/local regulations are applicable.</i></p>
		<p><b>3. Fire Marshall Approval.</b> 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.</p>
		<p><b>4. Uniform Fire Code Requirements.</b> 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.</p>
		<p><b>5. Oil Product Handling/Disposition.</b> Project involves the storage/disposition of oil product. The method by which the oil will be dispositioned will dictate the management/disposal requirements. <i>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."</i></p>

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**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.)*

			<p><b>6. Development.</b> SPCC plan has been developed and project was constructed and is operating in compliance with its requirements. (40 CFR 112)</p>	
			<p><b>7. Contents.</b> SPCC plan states that it meets all plan requirements as stated in 40 CFR 112.</p>	
			<p><b>8. Certification.</b> Plan has been certified by a PE and contains appropriate management approvals, unless it meets the conditions for "self certification." (40 CFR 112.7); <i>See ZIP Bulletin 260</i></p>	
			<p><b>9. Project Drainage.</b> Facility drainage meets the following standards:</p> <ul style="list-style-type: none"> <li>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.</li> <li>b. Undiked areas drain into ponds, lagoons or catchments basins which are designed not to flood.</li> <li>c. If treatment units are used, drainage is designed to gravity flow or flow into back-up pumping systems.</li> <li>d. Drainage is engineered to prevent oil from reaching navigable waters.</li> </ul> <p>(40 CFR 112.7(e)(1))</p>	
			<p><b>10. Containment/Diversionary Structures.</b> 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)).</p>	
			<p><b>11. Spill Control/Cleanup Equipment.</b> 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))</p>	
			<p><b>12. Drainage Water Quality.</b> 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.</p>	

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			<p><b>13. On-shore Bulk Storage.</b> 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)) <i>Note: Check regional EPA definition of "bulk" storage which normally includes any aboveground storage greater than 12,000 gallons.</i></p>	
			<p><b>14. Testing.</b> 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))</p>	
			<p><b>15. Loading/Unloading.</b> 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))</p>	
			<p><b>16. Security.</b> Appropriate security is maintained at project site. (40 CFR 112.7(e)(9))</p>	
			<p><b>17. Recordkeeping.</b> The following records are maintained:</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul> <p>(GMP; 40 CFR 112.7(e)(8))</p>	
			<p><b>18. Amendments.</b> 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)</p>	
			<p><b>19. Review.</b> 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).</p>	
			<p><b>20. Designated Project Staff.</b> A designated person is responsible for overall spill prevention. This person conducts workplace safety evaluations and inspections. (40 CFR 112.7(e)(10))</p>	

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		<p><b>21. Release.</b> 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) <i>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.</i></p>	
		<p><b>22. Training.</b> Project staff involved with management/handling of oil take part in periodic training in spill prevention/response. (40 CFR 112.7(e)(10))</p>	
		<p><b>23. Inspections.</b> Inspections are conducted daily in accordance with SPCC plan.</p>	
		<p><b>24. Release of Accumulated Containment Liquids.</b> Confirm with ESS procedures for releasing accumulated storm water from secondary containment surrounding tank. Is it documented on daily inspection documentation?</p> <ul style="list-style-type: none"> <li>a. Water is inspected for visible signs of contamination prior to release</li> <li>b. Water is removed daily, or as necessary to prevent excessive accumulation</li> </ul>	
<p><b>Facility Response Plan</b> (<i>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.</i>) For example, oil refineries and terminals.</p>			
		<p><b>25. Develop/Submit Facility Response Plan.</b> Facility response plan was developed in accordance with 40 CFR 112.20 and <b>submitted</b> to EPA in a timely manner for the project activities. (40 CFR 112.20)</p>	
		<p><b>26. No Substantial Harm.</b> 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))</p>	

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<b>Hazardous Materials Storage</b> <i>(Applies to storage of virgin hazardous materials, not hazardous and non-hazardous wastes)</i>		
		<p><b>27. OSHA Hazardous Communication.</b> Health and Safety Inspection has been conducted which addressed OSHA Hazardous Communication requirements. (29 CFR 1910.1200)</p>
		<p><b>28. Hazardous Chemical Inventory Reporting.</b> (EPCRA Section 312) Project site handles/stores:</p> <ul style="list-style-type: none"> <li>a. 10,000 pounds or more of a hazardous chemical; OR</li> <li>b. 500 pounds or the threshold planning quantity (TPQ) (whichever is less) of an extremely hazardous substance (EHS);</li> <li>c. Then project must submit a list of hazardous substances/copies of MSDS to state commission, local committee, and local fire department.</li> </ul> <p>(40 CFR 370)</p>
		<p><b>29. Toxic Chemical Release Reporting.</b> (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) <i>Note: Site often only provides information to client for their reporting purposes. If Section 313 reporting is applicable, ensure project files reflect actions taken.</i></p>
		<p><b>30. Emergency Planning and Response.</b> (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) <i>Note: OSHA also has emergency planning requirements which should have been addressed in H&amp;S inspection.</i></p>
		<p><b>31. Release.</b> (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)</p>

**EHS 3-3 ATTACHMENT C  
TETRA TECH EC, INC.  
PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

<b>Hazardous Materials Transportation</b> <i>(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.)</i>		
	<b>32. Shipping Papers/Manifests.</b> 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	
	<b>33. Packaging/Labeling/Marking.</b> Based upon the classification of the hazardous material, the proper DOT packaging/labeling/markings is being chosen and the materials are being packaged by an employee/subcontractor who has been properly DOT trained. (40 CFR 172)	
	<b>34. Training.</b> 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)	
	<b>35. Placarding.</b> Placards are being offered to transporter prior to shipment offsite. (40 CFR 172.500)	
	<b>36. Transportation in Tetra Tech EC Vehicle.</b> 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. <i>Note: Materials of Trade Exemption may apply.</i>	
	<b>37. International Shipments.</b> 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.	
	<b>38. Prequalification.</b> Review transporters used at project site and ensure all were pre-qualified prior to use. <i>(See EHS 1-4)</i>	

**EHS 3-3 ATTACHMENT C**  
**TETRA TECH EC, INC.**  
**PESM INSPECTION CHECKLIST - OIL AND HAZARDOUS SUBSTANCES MANAGEMENT**

**CONFIDENTIAL**

<b>Project:</b>	<b>Inspector:</b>	<b>Date:</b>
<b>Yes No N/A</b>	<b>REQUIREMENTS</b>	<b>COMMENTS/NOTES</b>

	<p><b>39. DOT HM Security Plan.</b> 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 <u>capacities</u>:</p> <ul style="list-style-type: none"> <li>• 17.3 cubic yards for solids (Ex.: 20 cubic yard capacity roll-off container, end dump, dump truck, etc.); or</li> <li>• 3,500 gallons for liquids (Ex.: 5,000 gallon capacity tanker truck); or</li> <li>• Shipment is required by DOT regulations to be placarded (Ex.: More than 1,000 pounds of HM, except for Class 9).</li> </ul> <p>(49 CFR 172 Subpart 800)</p>	
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--End of Checklist--

Draft Only

**Purpose:** This program provides requirements and recommendations relative to identification, location, avoidance, and management of underground utilities, appurtenances, and structures during intrusive activities.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
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## 1.0 PURPOSE

This program provides requirements for identification, location, and avoidance of underground utilities, appurtenances, and structures during intrusive activities, as defined in Section 4.0. The program also addresses actions to be taken in response to encountering or contacting underground utilities.

## 2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations. The procedures address the requirements and recommendations for identifying and locating, working around, and encountering or contacting underground utilities.

## 3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs, is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

## 4.0 DEFINITIONS

### 4.1 Aggressive Methods

The use of mechanized equipment such as excavators, backhoes, drill rigs, directional drilling, road saws, etc. Non-Aggressive methods involve the use of manual or non-mechanized methods such as hand-digging with shovels and air/hydro/vacuum methods.

## 4.2 Buffer Zone

As defined in this procedure, the area around a utility where only non-aggressive excavation methods may be utilized, unless specific conditions are met.

The definition cited above, and the excavation requirements and restrictions associated with it, will vary depending on the particular state regulations. TtEC requires the imposition of a four-foot Buffer Zone on all sides of the utility as measured from the outside edges of the utility, both horizontally and vertically. Since most jurisdictions recognize Buffer Zones which vary somewhere in the range of 18 to 36 inches, this distance must be verified by consulting the applicable state regulations before excavating so that adjustments to surface markings can be made to achieve the TtEC-required four-foot buffer zone.

Referred to as the "Tolerance Zone", "Safety Zone", or "Approximate Location of Underground Utilities" in some jurisdictions.

Information relative to excavation within the buffer zone is contained in Section 5.2.2.4.

## 4.3 Competent Person

A Competent Person has the ability to recognize hazards associated with underground utilities and the authority to stop or direct operations to ensure the safety of personnel and conformance with this procedure. The Competent Person has an understanding of this procedure, and the "One-Call" system requirements for the jurisdiction where excavation is occurring. The Competent Person must be capable of notifying One-Call agencies and maintaining and tracking One-Call Locate Numbers. Additionally, they must have knowledge of methods and work practices for utility identification, avoidance, and protection.

## 4.4 De-Energize

As applicable to a utility, to physically eliminate and/or prevent the presence, transmission, flow, or release of energy or materials which may cause harm to personnel or property.

## 4.5 Excavation

An operation for the purpose of movement or removal of earth, rock, or the materials in the ground, including but not limited to; digging, blasting, augering, backfilling, test boring, drilling, pile driving, directional drilling, grading, plowing-in, hammering, pulling-in, jacking-in, trenching, tunneling, structural demolition, milling, scraping, tree and root removal (grubbing), fence or sign post installation. TtEC requires that the designated One-Call agency for the applicable jurisdiction be contacted any time an intrusive activity is planned.

## 4.6 Jurisdiction

The authority having legal jurisdiction relative to regulations and requirements for notification of excavation activities and associated identification and marking. In the United States, the states have jurisdiction, and most consider the regulations applicable when excavation is to be performed in any location, including any

public or private way, any company right-of-way or easement, or any public or privately owned land or way.

#### **4.7 Locate**

To indicate the existence of a utility by establishing a mark through the use of flags, pins, stakes, paint, or some other customary manner, that approximately determines the location of a line or facility.

#### **4.8 Locate Request**

A communication between an entity performing intrusive activities and a utility marking agency (One-Call, etc).

#### **4.9 Observer**

The person assigned to visually monitor and, as needed, signal the operator during mechanized intrusive activity when the activity is occurring within four feet of the outside edge of the buffer zone. This person remains in close communication with the equipment operator(s) and will stop the activity if needed.

#### **4.10 One-Call Agency**

An entity that administers a system through which a person can notify owners/operators of underground lines or utilities of the intent to perform intrusive activities in proposed public areas.

#### **4.11 Positive Response**

Communication with the entity performing intrusive activities, prior to the activity, to ensure that all contacted (typically via the One-Call agency) owner/operators have located and marked the underground utilities.

#### **4.12 Potholing**

The practice of exposing an underground facility by safe, non-aggressive excavation methods in order to ascertain the precise horizontal and vertical position and orientation of underground lines or utilities.

#### **4.13 Underground Utility**

An underground or submerged conductor, pipe, or structure used in providing electric or communications

service (including but not limited to, traffic control loops and similar underground or submerged devices), or an underground or submerged pipe used in carrying, providing, or gathering gas, oil or oil product, sewage, storm drainage, water or other liquid service (including, but not limited to, irrigation systems), and appurtenances thereto. As used in this procedure, utility includes all underground appurtenances and structures.

The following are examples of the types of underground utilities that may be present in a given location:

- Natural gas pipelines
- High voltage electric cables
- Water pipelines
- Fiber optic telecommunications lines
- Steam pipelines
- Gasoline, oil, or other fuels
- Sewer pipelines
- Hazardous Materials
- Underground Storage Tanks (USTs)
- Abandoned underground structures containing hazardous materials, hazardous wastes, and radioactive materials

Note: Electrical and pressurized mechanical underground utilities that are not energized shall be considered as applicable to the requirements of this procedure until they are disconnected and removed or protected by a lockout/tagout system approved by TtEC (see Section 5.2.2.6)

#### **4.14 Underground Utility Owner**

Any person, utility, municipality, authority, political subdivision or other person or entity who owns, operates, or controls the operation of an underground line/facility.

#### **4.15 White Lining**

The practice whereby the entity which intends to perform intrusive activities pre-marks the site with an outline of the area where intrusive activities will occur. This involves the use of white paint, flags, stakes, or a combination thereof to mark the extent of where work is to be performed. The marking may vary depending on what intrusive activities are to be conducted. For example, for general excavation, an areal outline of the excavation shall be marked, while for drilling, the individual boreholes shall be marked. Studies have shown that pre-marking is a practice that does prevent utility contact incidents.

### **5.0 DISCUSSION**

#### **5.1 Responsibilities**

##### **5.1.1 Competent Person**

The Competent Person shall be responsible for:

- Obtaining a copy of, and understanding the applicable regulations for the state of jurisdiction where the excavation activities are to be performed.
- Contacting the appropriate One-Call agency or private locating service, as applicable.
- Recording One-Call locate numbers.
- If necessary, renewing One-Call locate numbers before expiration.
- Ensuring that white-lining of the area to be excavated is performed.
- Ensuring that a “positive response” has been received from every utility owner/operator identified by the One-Call agency and that they have located their underground utilities and have appropriately marked any potential conflicts with the areas of planned intrusive activities.
- Completion of the *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B ).
- Reviewing applicable AHAs with all project members before work begins.
- Conducting training on communication protocols to be used by the excavation observer and equipment operator.
- Ensuring Implementation of appropriate work practices during intrusive activities (including maintaining the prescribed buffer zone for use of aggressive methods).
- Conducting daily inspections of the excavation area to make sure that all markings are intact.
- Maintaining required records.
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.

### **5.1.2 Observer**

Whenever intrusive operations with mechanized equipment are being conducted within four feet of the outside edge of the buffer zone, horizontally and vertically, an observer must be assigned to monitor the activities. The observer is responsible for:

- Observing the operation to ensure that the operator stops operations if utilities are observed.
- Reviewing hand signals and other forms of communication with the operator.
- Properly signaling the operator.
- Stopping the operation immediately if the observer’s attention must be diverted even momentarily.
- Stopping the operation immediately if a hand signal or other directive is not followed. Operations will not resume until the observer and operator mutually agree that the reason(s) for not complying with the directive(s) are/is identified and fully corrected.
- Maintaining required records, such as logbook entries, or other, as requested by line management.

### **5.1.3 Line Management**

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure.
- Providing the necessary resources for compliance with this procedure.
- Designating Competent Personnel in consultation with the Project Environmental, Health and Safety Manager (PESM) prior to the start of work.

### **5.1.4 Environmental, Health and Safety Personnel**

The Environmental and Safety Supervisor (ESS) shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure.
- Consulting with the PM and Competent Person on underground utility issues.

## **5.2 Procedure**

The following sections provide the requirements and recommendations of this procedure, which are intended

to prevent injury to personnel, damage to infrastructure, and associated indirect effects associated with encountering or contacting underground utilities during the execution of intrusive work. Underground utilities present multiple potential hazards that must be recognized before and during work which occurs near them, therefore, this procedure is divided into sections addressing underground utility identification and location, working around or near underground utilities, and actions to be taken in the event that underground utilities are encountered or contacted. Hazards that may be presented by underground utilities include explosion and fire, electrocution, toxic exposures, pathogens, and drowning.

### 5.2.1 Identifying and Locating Underground Utilities

The possibility of the existence of underground utilities must be evaluated as early as possible in the planning phase for any project which involves intrusive activities, as defined in Section 4.2. The Task Initiation Procedure (TIP) form should be used for documentation of the identification of this potential hazard and the procedures to be followed to address them. The following sections describe various methods for identifying and locating utilities on a site. Plans should be verified during the readiness review. The *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B) must be completed before any activities meeting the definition of excavation in Section 4.2 are conducted. Attachment A is intended to be used as a guide during the process of locating and marking utilities in the area to be excavated. Attachment B is intended to be used as a guide in the overall process of underground utilities management during the course of the project.

All underground utilities on a site involving excavation as defined in Section 4.4, must be located and identified before intrusive activities commence, by one or more of the following entities:

- The Utility Owner
- A Private or Public Utility Locating Service
- An Approved TtEC Competent Person

These options are described in greater detail in the following Sub-Sections:

#### 5.2.1.1 Pre-Planning and the Site EHSP

- The Site-Specific Environmental Health and Safety Plan (EHSP) developed for the project must:
- Identify the location and types of underground utilities that are believed to be present on the site.
- Reference this procedure (EHS 3-15), and describe how it will be implemented on the project.
- Contain an Activity Hazard Analysis in which the hazards associated with underground utilities are identified, as well as the measures used to control them.
- Contain, as an appendix, a copy of the applicable regulations from the state of jurisdiction where excavation activities are to be performed. These can usually be obtained via the Internet.
- Contain clear and concise procedures to be followed in the event that contact with underground utilities occurs.
- Address underground utilities and potential associated scenarios in the emergency response section of the EHSP.

#### 5.2.1.2 “One-Call” Locating and Marking Services

Every state has utility marking service programs having various names such as “One-Call”, “Dig-Safe”, “Call-Before-You-Dig”, “Dig-Safely”, and many others. These services will identify the types and locations of any utility that may exist in an area to be excavated, as long as the property is in the public domain.

- The appropriate One-Call service for the jurisdiction where the project is located must be contacted prior to beginning excavation work. The One-Call agency should be given as detailed a description of the property as possible; address, cross street, utility pole numbers, physical description, etc.

- Notification to the One-Call service shall allow sufficient lead time for the agency to mark the utilities before excavation begins. The lead times vary, but range from two to ten days, depending on the state of jurisdiction.
- A complete listing of One-Call agencies and telephone numbers for all states is available in the “Call-Before-You-Dig Call Center Directory”, which can be accessed on the Internet at the WebPage (<http://www.agc.org/galleries/default-file/State%20One%20call%20Centers%20Laws.doc>) sponsored by “Underground Focus” magazine.
- Once notified, the One-Call agency will provide the contractor with a unique “locate number” or “reference number”. This reference number must be kept in the project files by the Competent Person or designee. Additionally, the reference numbers have expiration dates, which may vary depending on the particular One-Call agency. The valid period of the locate number and required renew notification date shall be requested from the One-Call agency.
- On a project with multiple contractors, each contractor must request a separate locate number. Under no circumstances will any other contractor or entity be allowed to “work under our locate number”. Subcontractors to TtEC may excavate under the locate number secured by TtEC, provided that they are excavating within the area which was previously white-lined by TtEC and subsequently marked. **However, the One-Call agency must be contacted and notified of this arrangement so that the subcontractor can be recorded as working under the existing locate number.** If a TtEC subcontractor will be excavating in an area not white-lined by TtEC, then the TtEC subcontractor must request a new locate.
- The area where work is to be performed shall be white-lined by TtEC personnel before the locating service goes to the site.
- It is good practice to arrange a pre-excavation meeting at the project site with the personnel performing the utility location and marking. This meeting will facilitate communications, coordinate the marking with actual excavation, and assure identification of high-priority utilities.
- The One-Call agency should provide the identities of the utility owners that will be notified of the locate request. This information shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and maintained in the project files. The contact person and phone number for each utility owner shall also be recorded.
- The utility owners should provide a “positive response” relative to the locate request, which can consist of two types of action by the utility owner. The facility owner or operator is required to 1) mark it’s underground utilities with stakes, paint, or flags, or 2) notify the excavator that the utility owner/operator has no underground utilities in the area of the excavation.
- The positive responses shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and cross-checked with the list of utility owners that the One-Call agency stated that they would notify. If it is discovered that a utility owner has not provided a positive response, then the One-Call agency must be notified.
- Excavation shall not be conducted until positive responses have been received from all utility owners identified by the One-Call agency as having underground utilities on the property.
- Before beginning excavation, the excavator must verify that the location marked was correct, and the distinct, color-coded markings of all utility owners are present.
- Examine the site to check for any visible signs of underground utilities that have not been located and marked such as pedestals, risers, meters, warning signs, manholes, pull boxes, valve boxes, patched asphalt or concrete pavement, areas of subsidence, fresh sod or grass, lack of grass or vegetation, and new trench lines.
- The markings placed by the utility owners must be documented by TtEC using a still, digital, or video camera. The photo-documentation shall be maintained with the project files indefinitely.
- The markings placed by the utility owners or marking services shall follow the American Public Works Association Uniform Color Code as described in ANSI Standard Z 535.1. This code appears below.

#### **American Public Works Association Uniform Color Code**

Red	Electric Power Lines, Cables, Conduit
Orange	Communications, Telephone, Cable TV
Yellow	Gas, Oil, Steam, Petroleum or Gaseous Materials

Green  
Blue  
Purple  
Pink  
White

Sewers and Drains  
Potable Water Systems  
Reclaimed Water, Irrigation, Slurry Lines  
Temporary Survey Markings  
Proposed Excavation

### 5.2.1.3 Private Utility Locating and Marking Services

- As discussed in Section 5.2.1.1, One-Call agencies arrange for the identification and marking of underground utilities only on public property, up to the point of contact with private property. In the event that excavation activities are to be conducted on non-public properties, the presence, location, depth, and orientation of all underground utilities within the white-lined area shall be ascertained through records review, including any site plot plans, utility layout plans, and as-built drawings available from the property owner, as well as through interviews with knowledgeable personnel associated with the property. Additionally, the information gathered from these sources shall be verified by physical detection methods (non-aggressive), performance of a geophysical survey, or by procuring the services of a private utility locating and marking service. If any detection methods are to be self-performed, the requirements of 5.2.1.4. must be followed.

The above requirements are also intended to address the potential presence of unknown or undocumented underground utilities, therefore, the area to be excavated must also be evaluated by the PM to determine if the potential for unknown or undocumented underground utilities exist. If the determination is made that the presence of these unknown or undocumented underground utilities is unlikely, then a variance should be requested to eliminate the requirement to identify them.

A list of vendors providing locating and marking services can be found in the “*Network of Underground Damage Prevention Professionals*” which can be accessed on the Internet at the “*Underspace*” WebPage (<http://underspace.com/index.htm>).

- Variance to this requirement above must be approved by the PM and PESM.

### 5.2.1.4 Self-Performance of Utility Locating and Marking

The techniques and instruments used to locate and characterize underground utilities can be extremely complicated and difficult to use effectively. Additionally, interpretation of the data generated by this instrumentation can be difficult. The utility marking services described in 5.2.1.1 and 5.2.1.2 are staffed by well-trained, experienced professionals who perform locating activities on a regular basis. For these reasons, it is most desirable that these professional services are used for utility location and marking on projects.

- In some instances, such as long-term projects where excavation is a primary task, and the presence of underground utilities is extensive, it may be prudent to self-perform locating and marking activities.
- If locating and marking is to be self-performed, all personnel using instrumentation will be trained on the use of the equipment that will be used, and the interpretation of the data.
- There are variety of locating methods which may be utilized for self-performance of utility locating as categorized below:
  - Magnetic field-based locators or path tracers
  - Buried electronic marker systems (EMS)
  - Ground penetration radar-based buried –structure detectors
  - Acoustics-based plastic pipe locators
  - Active probes, beacons, or sondes for non-metallic pipes
  - Magnetic polyethylene pipe
- Before self-performing any underground utility locating on a project, approval must be obtained from

the TtEC Director, EHS Services.

## **5.2.2 Working Near or Around Underground Utilities**

After the site has been properly evaluated for the presence of underground utilities, intrusive activities may begin. Since there is no perfect way of eliminating the hazards presented by underground utilities, an effort must be made to perform the tasks following the direction and guidance as described by the following best practices that should be implemented during the execution of the project.

### **5.2.2.1 Work Site Review**

Before beginning intrusive activities, a meeting shall be held between all members of the project team. This shall consist of a review of the marked utility locations with the equipment operators, observers, laborers, etc.

### **5.2.2.2 Preservation of Marks**

During excavation, efforts must be made to preserve the markings placed by the utility owners until they are no longer required. If any markings are obliterated, the One-Call agency must be contacted for re-marking. No intrusive activities are to take place if markings are not visible.

### **5.2.2.3 Excavation Observer**

Whenever intrusive operations are being conducted within four feet of the edge of the buffer zone, an observer must be assigned to monitor the activities. The observer will be designated each day, and a review of hand signals and other forms of communication between the observer and operator will be conducted. The directives of the observer will be followed precisely and immediately by those operating equipment.

### **5.2.2.4 Excavation Within The Buffer Zone**

Performing intrusive activities within the buffer zone requires careful adherence to proper guidelines and procedures to minimize the risk of contact with underground utilities.

The purpose of the buffer zone is to designate and define an area where careful, prudent, and reasonable excavation practices are to be used to prevent contact with underground utilities. However, there may be occasions where it is necessary to perform aggressive excavation methods in this designated area.

The boundaries of the buffer zone as defined in Section 4.1 will be observed at all times during intrusive activities. Aggressive excavation methods (excavators, backhoes, drill rigs) must be restricted to areas outside of the 4-foot buffer zone unless a special exemption to this requirement is obtained.

Consider whether the objective of the project can be completed without performing intrusive activities in the buffer zone at all. This will greatly reduce the risks presented by performing work in close proximity to underground utilities. If after consideration, the determination is made that intrusive activities in the buffer zone are necessary, then a formal exemption request shall be made to the PESH according to the guidelines

below.

A request to utilize aggressive excavation methods in the buffer zone may be made if:

- There is no other appropriate and reasonable alternative to using aggressive methods in the buffer zone; and
- The utility has been de-energized (and purged if necessary), verified as de-energized, and locked-out (per Section 5.2.2.6); or
- the depth and orientation of the utility has been adequately and visually determined through the use of non-aggressive methods such as air/hydro/vacuum excavation, potholing, probing, hand-digging, or a combination thereof; and
- for utilities containing electrical energy, the depth of the existing water table is below the location of the utility; and
- application for the exemption has been submitted to the PESM via a Field Change Notification (FCN); and
- the exemption has been granted and approved in writing by the PESM on the FCN form.

The following conditions will apply to this request:

- Aggressive methods may be used in the buffer zone only to the extent allowed by the applicable state or other jurisdictional regulations.
- Appropriate physical protection measures for exposed utilities as described in Section 5.2.2.5 shall be implemented to eliminate the potential for equipment contact with utilities.
- The extent of the project excavation area to be covered by the exemption request must be specified in the FCN.
- When evaluating the use of aggressive excavation methods in the buffer zone, the PESM will consider the type of utility involved and the associated risk potential.

Based on this evaluation, the PESM may impose further conditions and requirements, which will be detailed in the FCN.

Even if the above exemption conditions are met, the PESM has authority to deny the request, the reasons for which will be described in the FCN.

Unless exempted according to the above provisions of this procedure, only non-aggressive methods may be used within the buffer zone. Non-aggressive, or non-mechanized equipment is used in order to prevent mechanical contact with underground utilities which could result in damage to the utility and create the potential for personal injury and property damage. Following are examples of non-aggressive excavation methods:

- Hand-digging
- Non-conductive hand tools must be used when digging within the buffer zone surrounding underground electrical utilities.
- If conductive hand tools must be used near electrical lines, then the PESM shall be consulted to determine additional requirements relative to safe electrical practices, procedures, and equipment.
- Hydro-excavation (water pressure).
- Air excavation (air pressure).
- Vacuum extraction (soil excavation/removal).
- Air excavation/vacuum extraction combination.
- Aggressive methods may be used for the removal of pavement over a utility, if allowed by the state regulations.

#### **5.2.2.5 Protection of Underground Utilities**

It is very important that consideration be given to the protection of underground utilities when performing adjacent intrusive activities. This is necessary not only to prevent physical damage and associated indirect effects, but also to prevent the potential for injury to employees and the public.

- When using aggressive excavation methods within the buffer zone around exposed underground utilities, physical protection may be appropriate. Basically, this involves creation of a physical barrier between the mechanized operation and the utility. The following are some possible types of physical protective measures:
  - Heavy timbers, similar to swamp mats.
  - Sheets of plywood.
  - Blasting mats.
- Once exposed, underground utilities no longer have the support provided by surrounding soil and may need to be physically supported to prevent shifting, bending, separation, or collapse, which could result in damage to the utility, and possibly personnel. Following are suggested support methods:
  - Timber shoring underneath the utility.
  - Timbers or girders over the top of the excavation fitted with hangers that support the utility.
  - Design by a PE for complicated or large applications.
- Utilities must also be protected from objects that may fall into the excavation such as rocks and equipment. This can be accomplished by following these guidelines:
  - Cast spoils as far away from the excavation as possible. Excavated and loose materials shall be kept two feet from the edge of excavations, as required by OSHA.
  - Relocate large rocks, cobbles, and boulders away from the excavation and sloped spoils piles.
  - When vehicles and machinery are operating adjacent to excavations, warning systems such as soil berms, stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
  - Scaling or barricades shall be used to prevent rock and soils from falling into the excavation.
  - Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

#### 5.2.2.6 De-Energizing Utilities

Utilities can carry many types of potential energy, including electricity, flowing liquids, liquids under pressure, gasses under pressure, etc. A release, such as may happen if a utility conveyance is compromised, could result in personal injury, property damage, and other indirect effects. If the white lines of the proposed excavation area overlaps or extends into the buffer zone of a known underground utility, then if at all possible, that utility shall be de-energized to physically prevent the transmission, flow, or release of energy. Conversely, if the buffer zone of the known utility lies outside of the white-lined, proposed excavation area, then de-energization is not required.

- The owner of the utility shall be contacted to determine the feasibility and methodology of de-energizing the utility. Plenty of lead-time should be provided for this since it may take utility companies weeks to de-energize some utilities.
- Depending on the utility and the material being conveyed, isolation points which may be suitable for de-energizing include but are not limited to the following:
  - Electrical circuit breakers
  - Slide gate
  - Disconnect switches
  - Piping flanges
  - Other similar devices
- When utilities are de-energized, it must be verified by demonstration. This can be accomplished by testing equipment, switching on a machine or lighting, opening a valve, etc. For any current-carrying electrical equipment, such as cables, electrical panels, etc., successful de-energization must be certified through the use of appropriate electrical testing equipment.
- Whenever a utility is de-energized, a means of ensuring that the energy isolation device and equipment cannot be operated until the device is removed must be provided. Typically, this is achieved by utilizing a lockout device, accompanied by a written tag, that physically controls the configuration of the energy isolation point. Lockout devices include but are not limited to the

following:

- Locks
- Chains
- Valve covers
- Circuit breaker hasps
- Blind flanges
- Slip blinds, and
- Multiple lock hasps
- When de-energizing and locking out of utilities is practiced, the provisions of EHS 6-4 Lockout/Tagout, shall be followed, as applicable.
- In the event that a utility is de-energized, but there is no means of adequately providing a physical locking-out of the utility, then a spotter must be posted at the point of isolation to ensure that the utility is not re-energized. The spotter must be supplied with a communication device such as a site radio.

#### **5.2.2.7 Damage Discovery**

During excavation, utility damage may be discovered which is pre-existing or otherwise not related to a known contact. Disclosure to the utility owner is very important because the possibility of utility failure or endangerment of the surrounding population increases when damage has occurred. The utility may not immediately fail as a result of damage, but the utility owner or operator must be afforded the opportunity to inspect the utility and make a damage assessment and effect repairs if necessary. The following guidance applies:

- Observe and photograph the utility from a safe distance and determine if there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, or other damages to utility lines, conduits, coatings, or cathodic protection systems.
- The One-Call agency or private location service must be contacted immediately.

#### **5.2.3 Encountering or Contacting Underground Utilities**

In the event that encountering or contacting an underground utility occurs, it is imperative that the appropriate actions are taken to minimize damage to the utility, prevent personal injury, and minimize indirect effects.

##### **5.2.3.1 Encountering Underground Utilities**

It is possible that underground utilities will be encountered in locations that have previously been “cleared” of having underground utilities by the locating service, or are found outside of the area which has been marked as having underground utilities. In either case, if this occurs, the following applies:

- Intrusive activities must be curtailed
- The One-Call agency or private location service must be contacted immediately
- The PM and PESM must be notified
- No further intrusive activities may be conducted until:
- The One-Call agency/private location service and/or the subject utility owner visit the site;
- Identification of the utility owner and the type of material/energy being conveyed by the utility has been made; and
- The orientation and depth of the subject utility has been determined and suitably marked.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.

##### **5.2.3.2 Contacting Underground Utilities**

If excavation or other equipment being used for intrusive activities makes contact with an underground utility,

the following guidelines apply:

- Intrusive activities must be stopped immediately.
- Observe the utility from a safe distance and determine if there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, scratched coatings, cathodic protection compromise, material leakage, obvious electrical energy.
- Move all personnel to the evacuation meeting point as described in the SSHP.

EXCEPTION: If an electrical line has been contacted and it is your belief that equipment (such as an excavator) is electrically energized, do not approach the equipment. Order the operator to remain in the equipment until emergency personnel can de-energize the source (unless the equipment is on fire, at which time the operator should jump off of the vehicle and shuffle along the ground to a safe area). Shuffling is required because current flows outward through the soil in a ripple pattern called a power gradient, creating a pattern of high and low potential, Shuffling decreases the chance that these gradients could be bridged, causing current to flow through the body, resulting in electrocution.

- Secure the area to prevent the public from entering.
- Contact emergency responders as specified in the SSHP.
- The One-Call agency or if known, the utility owner must be contacted immediately.
- The PM and PESM must be notified.
- No further intrusive activities may be conducted until:
  - The utility owner inspects the scene and after repairs, verifies that all danger has passed.
  - The orientation and depth of the subject utility has been determined and suitably marked.
  - Permission from the emergency responders to resume work has been given.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.
- State and Local regulations must be reviewed to determine if reporting to any additional agencies is required.

### 5.3 Training

Competent Persons shall have adequate experience and/or training to carry out the requirements of this procedure.

## 6.0 SOURCES OF INFORMATION

### 6.1 Organizations

- Common Ground Alliance  
—
- Center for Subsurface Strategic Action (CSSA)  
—
- DigSafely  
—
- National Utility Contractors Association (NUCA)  
—
- National Utility Locating Contractors Association (NULCA)

- 
- Underground Focus Magazine

- 
- NUCA State Listing of One-Call centers

- 
- Utility Safety Magazine
- 

## **6.2 Vendors and Commercial Sites**

- RadioDetection, Inc. (Detection Instruments)

- 
- Heath Consultants (Detection Instruments)

- 
- Ben Meadows Company (Detection Instruments)

- 
- So-Deep, Inc. (Complete Utilities Services)

- 
- Concept Engineering Group, Inc. (Air Excavation Equipment)

- 
- Rycom Instruments, Inc. (Detection Instruments)

- 
- Schonstedt Instrument Company (Detection Instruments)

- 
- Forestry Suppliers, Inc. (Fiberglass Probe – “Fiberglass Tile Probe”, Part #77543, Approx. \$20.00, Telephone 800-647-5368)
- 

## **7.0 REFERENCES**

- Common Ground Study of One-Call Systems and Damage Prevention Best Practices, August, 1999, Sponsored by US DOT.

## **8.0 ATTACHMENTS**

Attachment A – Underground Utilities Locating and Marking Checklist

Attachment B – Underground Utilities Management Checklist

**ATTACHMENT 1  
Tetra Tech EC, Inc.  
EHS 3-15 - ATTACHMENT A  
UNDERGROUND UTILITIES LOCATING AND MARKING CHECKLIST**

**Click the icon below to launch or download.**



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**ATTACHMENT 2**  
**Tetra Tech EC, Inc.**  
**EHS 3-15 - ATTACHMENT B**  
**UNDERGROUND UTILITIES MANAGEMENT CHECKLIST**

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**EHS 3-15 - ATTACHMENT A  
UNDERGROUND UTILITY LOCATING AND MARKING CHECKLIST**



**TETRA TECH EC, INC.**

**To be Completed by PM and/or "Competent Person"  
Complete Form as Location/Marking Progresses and Maintain in Site Files**

<b>PROJECT INFORMATION:</b>	Location:
Project Name:	Task/Activity:
Tetra Tech EC Competent Person:	Start Date of Work:
Tetra Tech EC Subcontractor: <input type="checkbox"/> No <input type="checkbox"/> Yes:	Private Locating Service Required: <input type="checkbox"/> Yes <input type="checkbox"/> No
Property Owner:	If Not, Explain:
<b>NOTIFICATION:</b>	
Locating Service Name:	Locating Service Tel. Number:
Date Locating Service Notified:	Locate Ticket Number:
Address of Property to be Marked:	Locate Ticket Expiration Date:
Nearest Intersecting Street:	
Are There Any Utilities on the Properties That the Locating Service Will Not Contact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Specify:	
<i>Enter Utility Information in Table 1 Below. In Addition to Utility Locating Services, Consult Client, Utility Owners, Drawings, Facility Personnel, Maintenance Personnel, Municipalities, etc.</i>	

**TABLE 1  
ON-SITE UTILITY INFORMATION**

NAME OF UTILITY COMPANY	TYPE OF UTILITY	COLOR CODE	UTILITY PRESENT ON-SITE?	EMERGENCY PHONE NUMBER	DATE MARKS COMPLETED
	Electric	RED			
	Communications, Phone, CATV	ORANGE			
	Gas, Oil, Steam, Petroleum	YELLOW			
	Sewers, Drains	GREEN			
	Potable Water	BLUE			
	Reclaimed Water, Irrigation	PURPLE			
	Temporary Survey Markings	PINK			
To be performed by excavator prior to utility mark-out.	Proposed Excavation	WHITE			

White-Lining Completed?  No Explain: \_\_\_\_\_  Yes: Date: \_\_\_\_\_ By Whom? \_\_\_\_\_

**LOCATING AND MARKING:**

Have All Utilities Identified in Table 1 Been Marked?  Yes  No (If Not, Contact Locating Service for Resolution)  
Problem(s) With Markings?

Yes  No  No Marks  Incorrect Location  Too Wide  
 Other: \_\_\_\_\_  Not All Utilities Marked Per Table 1 (notify marking service)

Measurements Taken:  Yes  No

Documentation of Marks:  Photos  Video  Other: \_\_\_\_\_

**EXCAVATION:**

Utilities Accurately Marked?  Yes  No

If no, describe: \_\_\_\_\_

Were Unmarked or Mis-Marked Utilities Encountered?  Yes  No

If Yes, Specify: \_\_\_\_\_

Locating Service Notified?  Yes  No

Will Excavation Continue Past Locate Number Expiration?  Yes  No

If Yes, Locate Number Renewed?  Yes  No New Expiration Date: \_\_\_\_\_

Any Other Problems/Concerns? Specify: \_\_\_\_\_

Form Completed By:	Signature:	Date:
--------------------	------------	-------

## EHS 3-15 - ATTACHMENT B

### UNDERGROUND UTILITIES MANAGEMENT CHECKLIST



**TETRA TECH EC, INC.**

**To be Completed by PM and/or “Competent Person”  
Complete Form as Project Progresses and Maintain in Site Files.**

PHASE	TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
<b>Pre-Planning</b>	1. Excavation in Work Scope? (As defined in EHS 3-15, Section 4.4)				
	2. Underground Utilities Identified in TIP?				
	3. Competent Person Assigned?				
	4. Has a Copy of the Applicable State Regulations Been Obtained, Read, Understood?				
	5. EHS Plan Addresses Underground Utilities? (AHAs, Contingency Plan, State Regulations Appendix)				
<b>Identifying, Locating and Marking</b>	6. Locating and Marking Checklist Initiated? (Attachment A)				
	7. Identification and Address of Property Determined, Including Nearest Intersection?				
	8. One-Call Agency Contacted?				
	9. Additional Locating and Marking Required on Property? (One-Call agency marks to public property line only)				
	10. Additional Marker/Locator Identified?				
	11. Additional Marker/Locator Qualified?				
	12. TtEC Self-Performing Location and Marking?				
	13. If Yes to 12 Above, Approval From TtEC Director EHS Services?				
	14. Area of Excavation “White-Lined” by TtEC?				
	15. TtEC Present When Markings Completed?				
	16. All Utilities Marked? (Refer to Attachment A, Table 1)				
	17. All Markings Photo/Video Documented?				
	18. Area Checked for Signs of Previous Excavation? (subsidence, new grass, patching, etc)				
	19. All Applicable Information Recorded on Attachment A?				
	20. Multiple Contractors Excavating On-Site?				
	21. Separate Locate Requests for All Contractors?				
	22. TtEC Subcontractors Excavating in TtEC White-Lined Area(s)?				
	23. If Yes to 22 Above, One-Call Agency Contacted to Determine if TtEC Subcontractor Can be Added to Existing Locate Ticket?				
<b>Excavation Activities</b>	24. Meeting and Site Walk-Over Conducted with Project Personnel? (Managers, Equipment Operators, Laborers, Competent Person, Excavation Observer, etc)				
	25. AHA and EHSP Review Conducted With Personnel?				
	26. Do Site Activities Have Potential to Obliterate Utility Markings?				
<b>Excavation Activities – Cont’d</b>	27. If Yes to 26 Above, Have Provisions Been Made to Preserve Markings?				

## EHS 3-15 - ATTACHMENT B

### UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE	TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
	28. Has an Excavation Observer Been Designated to Monitor Excavation When Occurring within 4 Feet of the Buffer Zone?				
	29. Have Operator and Observer Reviewed Commands and Signals?				
	30. Has TtEC-Required 4-Foot Buffer Zone Been Marked on Either Side of Markings Placed by Locator?				
<b>Excavation Within Buffer Zone</b>	31. Is Excavation Within The Buffer Zone Absolutely Necessary?				
	32. If Yes to 31 Above, Can Non-Aggressive Methods Be Used For Excavation In The Buffer Zone? If Yes, Identify Appropriate Non-Aggressive Methods.				
	33. If No to 32 Above, Has a Buffer Zone Exemption Request (FCN) Been Approved by The PESM? If No, then Aggressive Methods May Not Be Used in The Buffer Zone.				
	34. If Yes to 33 Above, Has the Utility Been De-Energized, Purged, Verified/Tested, and Locked-Out? Or,  Has The Depth and Orientation of the Utility Been Adequately and Visually Determined Through The Use of Non-Aggressive Methods?				
	35. If Yes to 34 Above, Have All of The Following Conditions Been Met?  For Utilities Containing Electrical Energy, Is The Depth of The Water Table Below The Depth of The Utility?  Have Regulations Been Consulted to Determine Specific State Requirements Relative to Excavating in The Buffer Zone?  Have Appropriate Physical Protection Measures Been Implemented to Prevent Equipment Contact With Utilities and to Prevent Damage to Utilities?  Has The FCN Requesting The Buffer Zone Exemption Been Signed by The PESM?  If No to Any of The Above Conditions, Then Only Non-Aggressive Excavation Methods May Conducted in The Buffer Zone, Since The Conditions of The Exemption Have Not Been Satisfied.				
<b>Working Around Exposed Utilities</b>	36. If Necessary, Have Provisions Been Made to Support the Utility During Work Activities?				
	37. Have Spoils Been Placed as far Away From the Excavation as Feasible?				
	38. Has the Utility Been De-Energized? (If Any Portion of the 4-Foot Buffer Zone around a Utility is Inside of the White-Lined Area)				
	39. Has the Isolation Point for the De-Energized Utility Been Physically Locked-Out?				
<b>Working Around Exposed Utilities -Cont'd</b>	40. If No to 39 Above, Has a Spotter Been Assigned to Monitor Isolation Point?				
	41. If Yes to 40 Above, Does the Spotter Have Adequate Communications? (Radio, Telephone, etc)				
	42. Has the Isolation Point Been Tagged?				
<b>Damage Discovery</b>	43. Has Pre-Existing Damage to a Utility Been Discovered During Excavation?				
	44. If Yes to 43 Above, Has the One-Call Agency and/or Utility Owner Been Notified?				
	45. If Yes to 43 Above, Have Photographs Been taken?				

## EHS 3-15 - ATTACHMENT B

### UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE	TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
<b>Encountering or Contacting Underground Utilities</b>	46. Have Utilities Been Encountered in Locations That Have Not Been Marked?				
	47. If Yes to 46 Above, Has the One-Call Agency or Other Locating Service Been Contacted?				
	48. If Yes to 46 Above, Has the PM and PESM Been Notified?				
	49. If Yes to 46 Above, Has a TtEC Incident Report per EHS 1-7 Been Completed? (Include Photographs)				
	50. Has Excavation Equipment Come In Contact With Underground utilities?				
	51. If Yes to 50 Above, Were Intrusive Activities Immediately Curtailed?				
	52. If Yes to 50 Above, Has a Damage Determination Been Made From a Safe Distance?				
	53. If Yes to 50 Above, Has the Area Been Secured?				
	54. If Yes to 50 Above, Have Emergency Responders Been Notified?				
	55. If Yes to 50 Above, Has the Locating Agency and/or Utility Owner Been Notified?				
	56. If Yes to 50 Above, Have State and Local Reporting Requirements Been Met?				
	57. If Yes to 50 Above, Were Intrusive Activities Curtailed Until; Inspection From Utility Owner, Orientation and Depth of Utility Was Determined and Marked, Permission From Emergency Responders Given?				
58. If Yes to 50 Above, Has a TtFW Incident Report per EHS 1-7 Been Completed? (Include Photographs)					

CHECKLIST COMPLETED BY:

NAME	SIGNATURE	DATE
NAME	SIGNATURE	DATE

**Purpose:** The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
<b>Version Date - Type:</b>	01/28/2011 - Revised	<b>Title:</b>	Temperature Extremes
<b>Category:</b>	Company Procedures	<b>Original Issue</b>	02/01/95
<b>Sub-Category:</b>	Departmental/Discipline	<b>Date:</b>	
<b>Keyword Index:</b>	EHS Compliance/Waste Management, Monitoring, Operational Control, Training	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
		<b>Document</b>	Procedure
		<b>Type:</b>	
		<b>Document</b>	Skip Parry
		<b>Owner</b>	

See Below

## 1.0 PURPOSE

The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

## 2.0 SCOPE

This procedure applies to all Tetra Tech EC, Inc. ("the Company") and subcontractor field personnel that may be exposed to heat or cold stress during the performance of their field work assignments.

## 3.0 MINIMUM REQUIREMENTS

### 3.1 Responsibilities

#### 3.1.1 Line Management

General responsibilities are found in EHS 1-1, Responsibilities for Program Implementation. Procedure specific responsibilities are:

Site Supervisors have the responsibility to:

- a. Evaluate the work activities and anticipated temperatures that may affect worker productivity or harm workers.
- b. Provide resources and facilities necessary to prevent health effects from temperature extremes.
- c. Enforce work rules related to such prevention.

### **3.1.2 Environmental, Health and Safety Personnel**

The Project Environmental and Safety Manager (PESM) will make the initial determination of heat and cold stress prevention requirements as part of the site EHS Plan (see EHS 3-2, EHS Plans) and oversee the implementation of this program on a project basis for all Company field programs.

The Environmental Safety Supervisor (ESS) will assist with implementation of heat and cold stress prevention programs. The ESS will, in most cases, be the person responsible for monitoring heat and cold stress on the job, determining work/rest and work/warm-up schedules where used, and will implement emergency response or corrective action, if needed. The ESS will train site personnel on the effects of temperature extremes and the site prevention program, and will maintain records related to this program.

The ESS will implement the appropriate heat stress or cold stress requirements when temperatures indicate a potential heat or cold stress condition. The ESS will work with the line management to implement work rest regimens or other administrative controls such as ceasing certain activities, changing PPE, or engineering controls such as warming areas, cooling areas or shifting work schedules.

### **3.2 General Program Requirements**

Adverse temperature conditions must be considered when planning site operations. Heat and cold stress injuries are completely avoidable with the proper education and work monitoring.

Implementing organizations will determine if contractual or regulatory requirements apply. Numerous Federal Agencies (e.g. USCOE, DOE) will contractually impose requirements related to temperature extremes. Also several states have passed regulations with requirements that will be applicable when working in those areas. In these cases, the information in the Guidance section and the attachments may become requirements.

## **4.0 GUIDANCE**

This section contains [s](#) optional guidance information to successfully execute the procedure.

### **4.1 Definitions**

#### **4.1.1 Body Core Temperature**

The temperature of the organs within the trunk of the body.

#### **4.1.2 Deep Frostbite**

The tissue beneath the skin is solid to the touch; it may involve a full thickness freeze to the bone. This is an extreme emergency and can result in permanent tissue loss.

#### **4.1.3 Frostbite**

Freezing of body tissue.

#### **4.1.4 Frostnip or Incipient Frostbite**

A cold related injury that progresses slowly and is painless while developing. The victim is usually unaware that he/she has frost nip. The skin first becomes reddened, then changes to white; no freezing of tissue occurs.

#### **4.1.5 Heat Cramp**

Painful muscle spasms usually occurring on the arms, legs, and abdomen; caused by excessive loss of body electrolytes from profuse sweating.

#### **4.1.6 Heat Exhaustion/Fatigue**

Heat Exhaustion is a form of shock that occurs when the body loses large amounts of water and electrolytes from excessive perspiration after exposure to heat and physical activity; also called heat prostration. Symptoms include profuse sweating, pale, cool, sweaty skin and other symptoms identified in Attachment 1, Section 1.3.

Heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Works unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance.

#### **4.1.7 Heat Rash**

Profuse tiny raised red vesicles (blister-like) on affected areas of the skin which cause a prickling sensation during heat exposure.

#### **4.1.8 Heat Stroke**

A life-threatening condition caused by rapidly rising body core temperature that occurs when the body's temperature regulating mechanisms are overwhelmed. Sweating stops and the skin is dry and hot.

#### **4.1.9 Hyperthermia**

A rise in body core temperature above 99.6<sup>o</sup> F.

#### **4.1.10 Hypothermia**

Decreased body core temperature from prolonged exposure to freezing or near-freezing temperatures. This is the most life-threatening cold injury and affects the entire body with possible localized severe cooling. Hypothermia is defined as the deep body temperature dropping below 96.8<sup>o</sup>F (36<sup>o</sup>C).

#### **4.1.11 Superficial Frostbite**

Frostbite which affects the skin and tissue just beneath the skin. The skin is firm and waxy, tissue beneath is soft and numb. The skin turns purple and may tingle and burn during warming.

#### **4.1.12 Wet-Bulb Globe Temperature (WBGT) Index**

Method used to measure the environmental factors (e.g., temperature, relative humidity) which impact the body's physiological responses to heat.

#### **4.1.13 Wind-Chill Factor or Equivalent Chill Temperature (ECT)**

An index describing the effect of the cooling power of moving air on exposed flesh. The effect of wind velocity at a certain temperature is expressed as the equivalent cooling effect of a lower temperature with still air.

#### **4.1.14 Work/Recovery Regimen**

The ratio of time spent working to time spent resting in an area designed to relieve heat related conditions. This ratio is expressed in one hour periods. Example: A work/recovery regimen of 75% work, 25% rest corresponds to 45 minutes work, 15 minutes rest each hour.

### **4.2 General Program Guidance**

Excessively hot or cold working environments can produce a number of different injuries. Critical to the ability to care for those injuries is a basic understanding of the way in which the body maintains its temperature and how it physiologically adjusts to extremes of heat and cold.

Preventing Heat and Cold Stress is prevented by planning in advance, and by training affected personnel in the symptoms of temperature extremes. OSHA has not established a temperature extremes standard, instead relying on the general duty clause.

The US Army Corps of Engineers has established requirements for work under its control in "EM-385-1-1, [most current edition and ACGIH TLV/BEI Guide, most current edition.](#)"

The ACGIH Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices has updated its recommendations "[in the ACGIH TLV/BEI Guide, most current edition.](#)" These recommendations are incorporated in the appropriate sections.

Several states have also passed regulations or temperature extremes (e.g. Washington, California).

Three attachments are attached to provide information related to temperature extremes:

Attachment 1 provides information on the body's physiological responses to heat and cold stress.

Attachment 2 provides information on Heat Stress Monitoring and Work/Rest Regimens.

Attachment 3 provides information on Cold Stress Monitoring and Work Recovery Regimens.

Proper care of victims who are suffering from the effects of heat or cold exposure will help to minimize injuries and speed recovery. On the other hand, improper treatment of these emergencies can result in serious injury, disability, or death.

The most effective first aid for any injury is prevention. When acceptable monitoring and prevention programs are followed, there should be no victims.

### **4.3 Heat Stress**

A heat stress prevention program will be implemented when ambient temperatures exceed

70°F (21° C) for personnel wearing **permeable** clothing. Wet Bulb Globe Temperature Index (WBGT) or physiological monitoring will be conducted. When a WBGT Index is not available, or workers are wearing impermeable clothing, or the WBGT is not representative to the actual work area (enclosed work areas, work over asphalt or reflective materials etc.) **physiological** (pulse, temperature) **monitoring** may be used in its place.

WBGT devices located away from the project (up to several miles) maybe used for monitoring the project if the general weather and measured work surfaces are similar.

#### **4.3.1 Selection of Chemical Protective Clothing**

The PESM will review site data and working conditions and select the personal protective equipment ensemble that best protects the employees from site hazards. The risk of heat related illness will be fully considered in balancing the risks and benefits of the PPE.

#### **4.3.2 Hydration**

The Company will supply cool potable water or other suitable drinks (e.g., sport electrolyte replacements) for fluid replacement. Employees involved in the heat stress prevention program will be trained and encouraged to drink at a rate of approximately 8 oz. every 20 minutes. Individual disposable cups will be used and kept in closed containers or dispensers. Alternately, cool bottled water or sports drinks in individual sealed bottles may be provided.

#### **4.3.3 Cool Rest Areas**

Shaded rest areas will be provided. On large remediation projects, air conditioned rest areas should be provided for workers exposed to heat stress conditions. In low humidity locations, evaporative coolers or misting devices and fans can be used to provide cool down locations. On smaller projects, personnel can use air-conditioned vehicles as cool down areas.

#### **4.3.4 Other Prevention Elements**

The PESM, ESS and the Project Manager will incorporate other elements into the heat stress prevention program as necessary. The selected elements will be described in the EHS plans. Engineering controls are preferred. Where their use is not feasible, the program must incorporate administrative/work practice controls, personal protective equipment, or a combination. Examples of prevention program elements include:

##### Engineering Controls

Air conditioned cabs for heavy equipment and vehicles (such controls may eliminate the need for other program elements).

Fans, blowers, or misters

Cool water for drenching personnel in impermeable clothing. This can be provided through a garden hose, a garden sprayer filled with ice water, a clean drum full of water for "hard hat dipping" for containers of ice water and clean towels in the rest area to hasten cool down.

##### b. Administrative and Work Practice Controls

Adjusting work schedules to do the bulk of the work during the cooler parts of the day.

Acclimating workers.

Implementing work/rest regimens (See Attachment 2 for Work/Rest Regimen Procedures)

c. Personal Protective Equipment

Ice Vests

Circulating water vests

Vortex tubes and air circulating vests

Where ice vests and circulating water vests are used, rest periods of approximately 15 minutes should be taken when ice packs or batteries need to be changed. Continuous work over long periods of time with these devices may present an increased musculoskeletal injury risk due to the extra weight. Since the duration of the cooling effectiveness of these devices will vary with heat and work loads, users must be instructed to leave the area to replenish ice or batteries at the first sign of loss of cooling.

d. Monitoring

A program of environmental and physiological monitoring must be established in order to use work/rest regimens to verify the effectiveness of the regimens. The monitoring procedures are described in Attachment 2.

#### **4.3.5 Training**

All site personnel must receive training on the following topics:

- a. Health effects of hot environments and symptoms of heat related illness.
- b. Personal risk factors; including use of some medications (e.g. blood pressure, allergy, renal or sweat gland functions), physical condition, insufficient sleep; attempting full work loads when not fully acclimatized and dehydration due to consumption of alcohol, consumption of caffeine or other diuretics.
- c. Effect of personal protective equipment on heat stress conditions.
- d. Preventive measures
  - Physiological monitoring methods and thresholds
  - Acclimatization
- e. Fluid replacement; including taking frequent breaks for fluid replacement on an as-needed basis, maintaining hydration and electrolyte balances.
- f. Elements of the site Heat Stress Prevention Program.
- g. First aid and emergency response

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

#### **4.4 Cold Stress**

At certain times of the year, workers may be exposed to the hazards of working in cold

environments. Potential hazards in cold environments include frostbite, trenchfoot or immersion foot, and hypothermia as well as slippery surfaces, brittle equipment, poor judgment and taking short cuts. ACGIH guidelines are provided in Attachment 3. The Company will implement the following cold stress prevention program elements when there is a potential for cold related injuries. Workers should be protected from exposure to cold so the core body temperature does not fall below the Threshold Limit Value of 96.8°F (36°C).

#### **4.4.1 Personnel Protective Equipment**

The following personal protective equipment will be provided as necessary to Company employees when conditions indicate a potential for cold-related injury. Subcontractors will be expected to supply appropriate equipment to their employees.

- a. Hard hat liners, face covers
- b. Gloves or glove liners, chemical sock and glove warmers
- c. Rain gear or water impermeable coveralls and gloves for potentially wet operations
- d. Fleeced boot liners where rubber steel-toe boots are used
- e. Winter coveralls

#### **4.4.2 Engineering Controls**

A variety of engineering controls shall be evaluated to minimize cold stress. These include:

- a. General or spot heating should be used to increase temperature at the workplace.
- b. If fine work is to be performed with bare hands in a cold environment, special provisions should be made to keep the workers' hands warm. Warm air jets, radiant heaters, or contact warm plates can be used.
- c. The work area should be shielded from winds and drafts that may affect the wind chill factor.
- d. The air velocity in refrigerated rooms should be minimized as much as possible, and should not exceed 2.2 mile/hour (1m/sec) in the work zone.
- e. At temperatures below freezing, metal handles of tools and control bars should be covered with thermal insulating material.
- f. Unprotected metal chair sets should not be used as they conduct heat away from the body.
- g. When necessary, equipment and processes should be substituted, isolated, relocated, or redesigned to reduce cold stress at the worksite.
- h. Power tools, hoists, cranes, or lifting aids should be used to reduce metabolic workload.
- i. Heated warming shelters such as tents and cabins should be made available if work is performed continuously in an equivalent chill temperature of 20°F or below.
- j. The ESS may implement a work-rest schedule to reduce exposure to cold stress.
- k. Scheduled rest breaks should be enforced.

- l. Personnel exposed to the cold should be provided the opportunity for frequent intake of warm, sweet, caffeine-free, nonalcoholic liquids or soup.
- m. Work should be moved to warmer areas whenever possible.
- n. Extra workers should be assigned to highly demanding tasks.
- o. Workers should be allowed to pace themselves, taking breaks when needed.
- p. Workers shall be trained in the prevention, symptoms, and emergency response to cold stress.
- q. Utilize the "buddy system" to monitor cold stress symptoms among the workers.
- r. Allow new employees time to adjust or "acclimate" to cold conditions.
- s. Minimize the need to sit or stand in one place for long periods of time.
- t. Minimize the amount of work time spent in a cold environment.
- u. Allow for the weight and bulkiness of protective clothing when estimating work performance goals and tasks.

#### **4.4.3 Warm Rest Areas**

The Company will make warm rest areas, e.g., heated trailers, available for rest breaks in cold weather. Employees will be permitted and encouraged to use the heated trailers whenever they experience symptoms of cold stress.

#### **4.4.4 Work/Warm-Up Schedules**

The work/warm-up schedule found in the ACGIH for cold stress will be followed as a guideline unless a government project, where they are required by ACOE or DOE regulation (Attachment 3). In addition, the Company will make warm-up periods available to employees who need to change into dry clothing to prevent immersion foot or hypothermia.

#### **4.4.5 Training**

All Company employees and subcontractors will be trained in:

- a. The effects of cold stress, including frostbite, immersion foot and hypothermia.
- b. Conditions that can lead to hypothermia, including work practices, clothing, activity levels, wind chill.
- c. Personal risk factors, including use of some medications, physical condition, insufficient sleep, dehydration due to consumption of caffeine, alcohol or other diuretics.
- d. Recognition of the symptoms.
- e. Methods employees can use to protect themselves.
- f. First aid procedures and recognition of medical emergencies.

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

## 5.0 REFERENCES

Please Describe Your Reference Here

Place Your Link in this Column

1. ACGIH (American Conference of Government Industrial Hygienists) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2007
2. Fundamentals of Industrial Hygiene. Third Edition, 1988
3. National Safety Council
4. NIOSH (National Institute for Occupational Safety and Health)
5. NIOSH/OSHA/EPA/USCG/EPA
6. Occupational Exposure to Hot Environments, Revised Criteria 1986
7. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - October 1985
8. EHS 1-1, Responsibilities for Program Implementation
8. EHS 1-9, Recordkeeping
9. EHS 3-2, Environmental, Health & Safety Plan(s)
10. US Army Corps of Engineers, Safety & Health Manual (EM 385-1-1) Nov 2003, Section 06.J.04

## 6.0 ATTACHMENTS

### Please Provide a Description of the Attachment

1. Heat and Cold Stress Information
2. Heat Stress Monitoring and Work/Rest Regimens
3. Cold Stress Monitoring and Work/Recovery Regimens
4. Example - WBGT Monitoring Form
- 5.

### Place Your Attachments Here



EHS 4-6, Attachment 1 final 11-8-08



EHS 4-6, Attachment 2 Final 11-11-



EHS 4-6, Attachment 3 final 11-8-08



Attachment 4 Example WBGT Monit

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## ATTACHMENT 1

### HEAT AND COLD STRESS INFORMATION

#### 1.0 HEAT STRESS

Hot weather can cause physical discomfort, loss of efficiency, and personal injury. The human body strives to maintain a constant core temperature of 98.6° F (37° C). If this temperature is to be maintained, heat loss must equal heat production. This balance is maintained by variations in the blood flow to the outer part of the body. When the core temperature rises, blood vessels beneath the skin dilate, and the blood brings increased heat to the skin, where it is dissipated by radiation and convection. This works only as long as the skin temperature is higher than the temperature of the outside environment. Heat loss by radiation convection is impossible when the temperature of the outside air approaches or exceeds the temperature of the skin. The body will now rely on dissipation through evaporation of sweat. But the sweat mechanism also has limits. The normal adult can sweat only about one liter per hour and can sweat at that rate for only a few hours at a time. In addition, sweating is effective only if the relative air humidity is low. Sweat evaporation ceases entirely when the relative humidity reaches 75 percent.

Of particular concern in heat stress monitoring is the use of personal protective clothing which decreases natural body ventilation and greatly increases the temperature and humidity to the skin. If precautions are not taken, heat stress will progress into a heat-related injury. Heat-related injuries fall into three major categories: heat cramps/fatigue, heat exhaustion, and heat stroke.

#### 1.1 Heat Cramps

Heat cramps are the least common and least severe of heat injuries. Heat cramps are thought to occur when the electrolytic balance in the blood between water, calcium, and sodium (salt) is altered. Low blood salt level, from profuse sweating and inadequate salt consumption, is the usual cause, as well as poor conditioning..

##### 1.1.1 Symptoms

- a. Severe muscle cramps and pain, especially of the upper legs, calves, and abdomen, and occasionally in the arms
- b. Faintness and dizziness
- c. Possible nausea and vomiting

##### 1.1.2 Treatment

Emergency care will include:

- a. Remove victim from the hot environment and allow victim to rest and cool down
- b. Provide small amounts of cool water or use a commercial sport drink and allow victim to sip this solution to hydrate. Avoid drinks with caffeine or alcohol.

- c. To relieve pain, gently stretch the involved muscle group; gently message cramps as long as it does not increase the pain or discomfort.

The victim should avoid exertion of any kind for 12 hours. A victim of heat cramps is prone to recurrence.

## **1.2 Heat Fatigue**

Heat Fatigue is most likely to affect new or un-acclimatized workers.

### **1.2.1 Symptoms**

- a. Loss of energy, extreme tiredness
- b. Stumbling, staggering, or loss of balance. The loss of balance is a particular risk to workers on elevated surfaces or climbing.
- c. Excessive skin redness as body moves blood to surface
- d. Lack of judgment recognizing the onset of heat fatigue and taking action to remove themselves from the environment for cool down and hydration

### **1.2.2 Treatment**

- a. Remove from the hot work environment for cool down
- b. Provide fluids (cool water or sport drinks to re-hydrate the victim)
- c. Extend cool-down period or cessation of work for the day with extra hydration and rest
- d. Enhance observations by other workers and physiological monitoring
- e. Provide individual work/rest regimens until acclimatized

## **1.3 Heat Exhaustion**

### **1.3.1 Symptoms**

Heat exhaustion is the most common heat injury and usually occurs in an individual who is involved with heavy physical exertion in a hot, humid environment, and is wearing protective clothing. Heat exhaustion is a mild state of physical shock caused by the pooling of blood in the vessels just below the skin, causing blood to flow away from the major organs of the body. Due to prolonged and profuse sweating, the body also loses large amounts of salt and water.

The symptoms of heat exhaustion include:

- a. Profuse sweating
- b. Pale, cool, sweaty skin
- c. Headache and extreme weakness, fatigue
- d. Nausea and possible vomiting

- e. Dizziness and faintness
- f. Collapse and possible brief unconsciousness
- g. Body core temperature from 100.4° F (38° C) to 104° F (40° C), although skin temperature may even be slightly below normal.

### 1.3.2 Treatment

Emergency care will include:

- a. Remove victim from the hot environment and out of the exclusion zone
- b. Lie victim down with feet slightly raised
- c. Remove as much clothing as reasonable (especially personal protective clothing); loosen what cannot be removed
- d. Apply cold, wet compresses to the skin; fanning will also aid in cooling
- e. If the victim is fully alert, allow him/her to drink water at the same rate, that was used for the emergency care of heat cramps
- f. If the victim vomits, do not give fluids by mouth, transport him/her to a hospital immediately (dehydration is the most critical problem in heat exhaustion victim; intravenous fluids will have to be given)
- g. Take temperature every 10 minutes, if the victim's temperature is above 101° F (38.3 C) or shows a steady increase, transport to a hospital immediately and start sponging him/her off with cool water

## 1.4 Heat Stroke

Heat stroke is a true life-threatening emergency having a mortality rate of 20 to 70 percent. This condition results when the heat regulating mechanisms of the body break down and fail to cool the body sufficiently. The body temperature rises to between 104° F and 110° F (40.6 – 43.3° C); no sweating occurs in about 50 percent of the victims. Because no cooling takes place, the body stores increasingly more heat, and eventually brain cells are damaged, causing permanent disability or death.

There are two basic kinds of heat stroke: classic heat stroke and exertional heat stroke. Classic heat stroke, in which people lose the ability to sweat, generally effects the elderly or chronically ill. Exertional heat stroke, in which victims retain the ability to sweat, is accompanied by physical exertion and muscle stress. Exertional heat stroke is the type that will be most commonly encountered on a field operation requiring strenuous physical activity.

### 1.4.1 Symptoms

- a. Oral temperature of 104° F (40° C) or higher
- b. Hot, reddish skin, skin is usually dry
- c. Headache

- d. Dry mouth
- e. Shortness of breath
- f. Nausea or vomiting
- g. Increasing dizziness and weakness
- h. Mental confusion and anxiety; victims may show unusual irritability, aggression, combative agitation, or hysterical behavior
- i. Convulsions, sudden collapse and possible unconsciousness; all heat stroke victims having varying levels of consciousness, ranging from disorientation to coma

#### 1.4.2 Treatment

Emergency care will include:

- a. Remove the victim from the hot environment and from the exclusion zone
- b. Call for trained emergency medical personnel **immediately**
- c. Remove as much clothing as reasonable (especially personal protective clothing); cut clothing with bandage scissors, if necessary, being careful not to injure victim
- d. Pour cool water over the victim, avoiding his nose and mouth
- e. Fan the victim
- f. Place cold packs under the arms and against neck, groin and ankles
- g. Wrap victim in a wet blanket
- h. Continue a combination of these methods until the oral temperature falls below 103° F (39.4° C) (take measures to prevent chilling, if necessary, i.e., use slower cooling if the victim starts shivering)
- i. Elevate the head and shoulders slightly during cooling
- j. Never give the victim anything to drink unless fully conscious and vomiting is unlikely

Because heat stroke involves the entire body, a number of complications may result including brain swelling, convulsions, coma, kidney failure, liver failure, high blood pressure and heart failure.

Therefore, always transport the victim to a hospital even if the body core temperature has lowered to near normal.

#### 1.5 Heat Stroke Verses Heat Exhaustion

The two most reliable and distinct differences between heat stroke and heat exhaustion are:

### 1.5.1 Heat Stroke

- a. Skin flushed (red); may be dry; hot to touch (note: Personnel who have been wearing impermeable clothing may have wet skin from earlier sweating that has ceased.)
- b. Oral temperature above 104°F (40° C)

### 1.5.2 Heat Exhaustion

- a. Skin pale; wet or clammy; cool to touch
- b. Oral temperature usually normal

## 2.0 COLD STRESS

Hypothermia is a drop in the core body temperature below 96.8° F (36° C). The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold at about 95° F (35° C); this is followed by a slowed and sometimes irregular heart beat, a weakened pulse and a drop in blood pressure. Vague or slow slurred speech, memory lapses, apathy, incoherence and drowsiness can occur. Other symptoms may include cool skin, slow, irregular breathing, apparent exhaustion, and fatigue after rest.

### 2.1 Prevention

Hypothermia is caused by prolonged exposure to a cold environment, whether air, water, or snow and ice. Adequate dry clothing with appropriate insulating capacity must be provided to workers to prevent hypothermia, especially if work is performed in air temperatures below 40° F (4.4° C). Wind chill is a critical factor. Work at a slow but steady pace. The job should be a "no sweat" operation.

Unless there are unusual or extenuating circumstances, cold injury to other than the extremities (hands, feet, and head) is not likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against hypothermia. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are special precautions that should be considered for these workers. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

### 2.2 Treatment

First aid for mild hypothermia will be performed as follows:

- a. End the exposure - get the victim out of the cold and wet
- b. Replace wet clothing with dry or add insulation to clothing
- c. Offer warm, non-alcoholic fluids
- d. Increase exercise
- e. Seek shelter from wind, wet and cold

**CAUTION:** If the victim remains cold for a number of hours, chemical changes may have taken place which, on re-warming, may cause major medical problems for the victim and which could result in death. Severely hypothermic victims are best warmed in the hospital under controlled conditions. If a severely hypothermic victim cannot be transported to a hospital within a few hours, re-warming should begin in the field.

## **2.3 Frostbite**

### **2.3.1 Prevention**

Frostbite can be prevented by wearing sufficient protection to prevent skin from coming into prolonged contact with a freezing environment. The following steps can be taken.

- a. Wear sufficient clothing. Mittens are better than gloves. Face masks and wool stocking caps are better than hats. Wind and waterproof hoods protect the face and neck.
- b. Clothing should be loose enough to prevent constriction of blood vessels. Boots must be roomy enough to permit movement of the toes with no feeling of tightness.
- c. Do not contact conductive metals or contact gasoline or other solvents with bare skin as rapid evaporation of solvents may quickly lead to frozen tissues in a cold environment.
- d. Exercise the toes and fingers to maintain circulation.
- e. Observe the condition of your partners' face, hands and ears frequently for signs of frostbite.
- f. Avoid smoking and drinking alcoholic beverages.

### **2.3.2 Symptoms**

Frostbite can occur either before or after the onset of hypothermia when body tissue (usually an extremity) is exposed to freezing temperatures. Frostbite occurs when the fluids surrounding tissue cells freezes. The danger of frostbite increases with increased wind chill and/or reduced temperatures below 32° F (0° C). Frostbite can also occur if tissues are in prolonged contact with a frozen material or object. Skin contact with frozen metal, for example, can result in frostbite in a short period of time, even in a warm environment.

There are three degrees of frostbite:

- a. First degree - freezing without blistering or peeling, "frostnip"
- b. Second degree - freezing with blistering and/or peeling, and
- c. Third degree - freezing resulting in the death of skin tissue and possibly the death of underlying tissues as well

Symptoms of frostbite include the following:

- a. The skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies
- b. Pain may be felt at first, but subsides

- c. Blisters may appear, and
- d. The affected area is cold and numb

### **2.3.3 Treatment**

First aid for superficial (first degree) frostbite is as follows:

- a. Place a warm body part next to the frozen area, applying firm, steady pressure.
- b. DO NOT RUB THE AREA. Rubbing may cause further damage to already injured skin.
- c. Protect the area from further freezing.

First aid for deep frostbite (second and third degree) is as follows:

- a. KEEP THE FROZEN PART FROZEN!
- b. Prevent further injury: avoid rubbing and further freezing of unaffected tissue.
- c. If the part has thawed, the part should NOT be allowed to refreeze or bear weight. A victim with thawed feet should be carried out.
- d. Give the victim plenty of fluids and evacuate to medical assistance as soon as possible.

## **2.4 Trench Foot**

### **2.4.1 Symptoms**

This condition may be caused by long, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. Edema (swelling), tingling, itching, and severe pain occur, and may be followed by blistering, death of skin tissue, and ulceration. When other areas of the body are affected besides the feet, the condition is known as chilblains.

### **2.4.2 Prevention**

Trench foot and chilblains can be prevented by keeping the body as dry as possible at all times. Waterproof boots should be worn when required, but provisions must be made for preventing excessive perspiration to accumulate inside the boots. Socks should be changed at least twice daily and the boots wiped dry inside with each change of socks. The feet should also be wiped dry and foot powder applied.

### **2.4.3 Treatment**

Affected body parts should not be rubbed or massaged, but bathed in water using plain white soap. Dry thoroughly and elevate the body part, allowing the body part to be exposed at room temperatures. If the feet are affected, do not walk during treatment.

(Internal Note – this attachment is a total revision and no revision bars are shown)  
ATTACHMENT 2

## HEAT STRESS MONITORING AND WORK/REST REGIMENS

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### 1.0 INTRODUCTION

Establishing a work/rest regimen that allows work to be completed in a timely manner while providing adequate rest time to prevent heat stress requires involvement of the ESS, Project Supervisors, and individuals involved. In many cases, particularly when wearing normal field type clothing (i.e., level D), awareness and communication are the key elements to a successful program. Allowing and encouraging rest periods on an "as needed" basis while ensuring vigilance for initial symptoms of heat stress, encourages this success.

There are times when this approach is not appropriate. When heat stress contributing protective clothing (e.g., respirators, impermeable coveralls) are worn for extended periods, or when "as needed" work/rest regimens adversely impact either the individuals exposed to the heat source or work completion, a more formal work/rest regimen will be established.

Formal work/rest regimens are based on when Action Levels and TLV limits are approached and: 1) monitoring ambient conditions (e.g., with a Wet Bulb Globe Temperature Index (WBGT), estimating work loads and establishing work/rest times, 2) monitoring physiological conditions and adjusting work/rest periods, 3) applying Job Specific Controls.

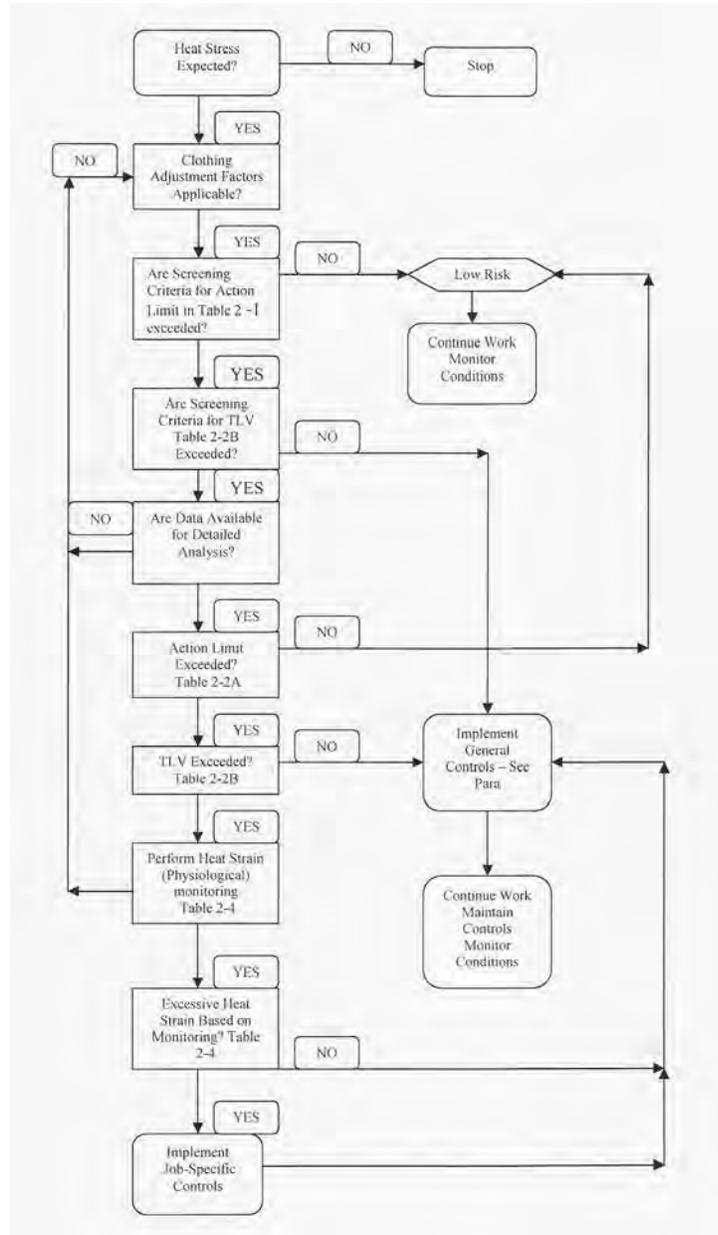
The WBGT, physiological monitors, and personnel heat stress monitors will be used in accordance with manufacturer's instructions. Personnel heat stress monitors will be approved for use by the PESM.

This attachment includes guidance for monitoring and preventing heat stress and heat strain in accordance with the 2007 ACGIH. The 2007 ACGIH Guidelines were revised to include an Action Level and a Threshold Limit Value based on WBGT measurements). The goal is to maintain body core temperatures within +/- 1.8° F of 98.6° F (+/-1° C. of 37° C) The TLV represents conditions under which it is believed that nearly all acclimatized, adequately hydrated, unmedicated, healthy workers may be repeatedly exposed without adverse health effects. The Action Limit is similarly protective of unacclimatized workers and represents conditions for which a heat stress management program should be considered.

This guidance is not a fine line between safe and dangerous. Therefore professional judgment is of particular importance in assessing the level of heat stress and physiological heat strain to provide for protecting nearly all healthy workers with due consideration of individual types and type of work.

The decision process shown in Figure 1-1 should be started if 1) a qualitative exposure assessment indicates the possibility of heat stress, 2) there are reports of discomfort due to heat stress, or 3) professional judgment indicates heat stress conditions.

Figure 1-1 – Evaluating Heat Stress and Strain



Note: At the option and judgement of the ESS, physiological monitoring may be commenced at any time, supplementing or replacing WBGT monitoring.

## 2.0 WBGT-BASED WORK/RECOVERY REGIMENS

### 2.1 Work/Recovery Regimens

When required, the WBGT Index will be used in conjunction with the work load, protective clothing, and other factors to determine the appropriate work/recovery regimen and need for physiological monitoring for personnel.

The ESS will monitor the temperature, work loads, and protective clothing. The WBGT will be adjusted based on the clothing adjustment factors. The Work Loads and the WBGT will then be used to determine the Work and recovery cycles for the workers involved.

The work/recovery regimen using the WBGT procedure will be used as a guideline, as the WBGT is only an index of the environment. Table 2-1 identifies the Clothing Adjustment factors.

**Table 2-1 Clothing-Adjustment Factors for Some Clothing Ensembles**

Clothing Type	Addition to WBGT Index
Work Clothes (Long Sleeve Shirt and Pants)	0° F (0° C)
Cotton (woven material) Coveralls	0° F (0° C)
Double Layer woven Clothing	5.4° F (3° C)
SMS Polypropylene Coveralls	1.0° F (.5° C)
Polyolefin Coveralls	1.8° F (1° C)
Limited-Use Vapor Barrier coveralls	19.8° F (11° C)

Notes on Table 2-1:

For example, WBGT Index is 86° F. If double layer woven overalls (5.4° F) are used with acclimatized workers the Corrected Index Temperature is 91.9° F.

These values must not be used for completely encapsulating suits, often called Level A. Clothing Adjustment factors cannot be added for multiple layers. **The coveralls assume that only modesty clothing is worn underneath, not a second layer of clothing.**

These values may also apply to other protective clothing, such as rain suits, when worn where the body is fully covered and the worker does not have the option of opening or venting the clothing while working (e.g. individuals in a radiological zone or other hazardous areas).

Tables 2-2-A and 2-2-B outline the work/recovery regimens based upon WBGT temperature and workload.

**Table 2-2A Permissible Heat Exposure Action Limit Values**

(Values are given in °F and (°C) WBGT Index)\*

Allocation of Work in a Cycle of Work and Recovery	Work Load Category			
	Light	Moderate	Heavy	Very Heavy
75% to 100%	82.4 (28.0)	77.0 (25.0)		--
50% to 75%	83.3 (28.5)	78.8 (26.0)	75.2 (24.0)	--
25% to 50%	85.1 (29.5)	80.6 (27.0)	77.9 (25.5)	76.1 (24.5)
0% to 25%	86.0 (30.0)	84.2 (29.0)	82.4 (28)	80.6 (27)

**Table 2-2B Permissible Heat Exposure Threshold Limit Values)**  
(Values are given in °F and (°C) WBGT)\*

Allocation of Work in a Cycle of Work and Recovery	Work Load Category			
	Light	Moderate	Heavy	Very Heavy
75% to 100%	87.8 (31.0)	82.4 (28.0)	---	--
50% to 75%	87.8 (31.0)	84.2 (29.0)	81.5 (27.5)	--
25% to 50%	89.6 (32.0)	86.0 (30.0)	84.2 (29.0)	82.4 (28.0)
0% to 25%	90.5 (32.5)	88.7 (31.5)	86.9 (30.5)	86.0 (30.0)

Notes on Table 2-2-A & 2-2-B:

- a. The values in Table 2-2A & 2-2B are for fully acclimatized workers wearing light weight pants and long sleeved shirts. For conditions other than this, use this table with the Clothing Adjustment factors from Table 2-1. For unacclimatized workers, the Action Limit Values should be used as TLVs.
- b. These values assume that workers drink frequently and have properly increased salting of food prior to exposure.
- c. These values are guidelines. Actual levels may be modified based on individual physiological response and actual work and rest conditions.
- d. These values assume that the rest location is cool enough to alleviate heat load conditions.
- e. See Table 2-2C for Work Load Categories.
- f. Values in the table are applied by reference to the "Work-Rest Regimen" section and assume 8-hour workdays in a 5-day workweek with conventional break.
- g. Because of the physiological strain associated with Heavy and Very Heavy work among less fit workers, regardless of the WBGT Index, criteria values are not provided for continuous work and for up to 25% rest in an hour for Very Heavy work. The screening criteria are not recommended, and a detailed analysis and/or physiological monitoring should be used.
- h. WBGT Index values are expressed to the nearest .5°C and .1°F

Table 2-2C provides examples of work activity categories for use in table 2-2A and 2-2B. Recovery rest areas should be near the work areas, shaded, and with adequate supplies of cool water. Aids to assist in evaporative cooling such as fans or blowers should be considered.

**Table 2-2C Work Load Categories**

Categories	Example Activities
Resting	Sitting quietly
Light	Sitting with light manual work with and or hands and arms, and driving. Standing with some light arm work and occasional walking.

Moderate	Sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, or light pushing and pulling. Normal walking.
Heavy	Intense arm and trunk work, carrying, shoveling, manual sawing, pushing and pulling heavy loads; walking at a fast rate.
Very Heavy	Very intense activity at fast to maximum pace,

## 2.2 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full heat acclimatization requires physical activity under heat-stress conditions similar to those anticipated for the work. With a recent history of heat-stress exposures of at least 2 continuous hours (e.g. 5 of the last 7 days to 10 of 14 days) a worker can be considered acclimatized for the purposes of the TLV shown in table 2-2B.. Its loss begins when the activity under those heat-stress conditions is discontinued, and a noticeable loss occurs after 4 days and may be completely lost in 3 to 4 weeks. Because acclimatization is to the level of the heat stress exposure, a person will not fully acclimatize to a sudden higher level, such as during a heat wave.

Numerous factors can affect acclimatization and a worker's ability to work in heat, including age and off-work activities (amount of sleep, consumption of alcoholic beverages, prescription and nonprescription medications (e.g. antihistamines and other medications that decrease the body's ability to carry water or reduce sweating).

## 2.3 WBGT Determination

WBGT device should be operated in accordance with the manufacturer's instructions. The location of the WBGT device should be evaluated based on the work. Work inside buildings (no wind), within depressions or excavations, over asphalt or black liners (such as HPDE) would dictate that the device should be located near the area to account for the difference in the globe temperature due to radiance and reflection. Work on open soil/gravel will have a lesser affect on the readings and will allow the readings to be indicative of a large area (up to several miles). (Note WBGT Index readings for the area can frequently be obtained on a real-time basis from weather stations, or from the internet).

## 3.0 HEAT STRAIN GENERAL WORK CONTROLS

General controls for Heat Strain prevention and control include:

- Provide accurate verbal and written instructions, annual training programs and other information about heat stress and strain.
- Encourage drinking small volumes (approximately 1 cup) of cool, palatable water (or other acceptable fluid replacement drink, (e.g. sport drink) about every 20 minutes.
- Permit self-limitation of exposures and encourage co-worker observation to detect signs and symptoms of heat strain in others.
- Counsel and monitor those who take medications that may compromise normal cardiovascular, blood pressure, body temperature regulation, renal or sweat gland functions and those who abuse or are recovering from the abuse of alcohol or other intoxicants.
- Encourage healthy life-styles, idea body weight and electrolyte balance

- Adjust expectations of those returning to work after absence from hot exposure situations and encourage consumption of salty foods (with approval of physician if on a salt-restricted diet).
- Consider preplacement medical screening to identify those susceptible to systemic heat injury.
- Monitor the heat stress conditions and reports of heat related disorders.

#### **4.0 JOB SPECIFIC CONTROLS FOR HEAT STRAIN STRESS**

When excessive heat strain is observed or predicted based on monitoring, the some or all of the following Job Specific Controls should be considered:

- Engineering controls that reduce the metabolic rate, provide general air movement, reduce process heat and water vapor release, and shield radiant heat sources, among others.
- Administrative controls that set acceptable exposure times, allow sufficient recovery, and limit physiological strain.
- Personal protection that is demonstrated effective for the specific work practices and conditions at the location.

#### **5.0 PHYSIOLOGICAL MONITORING**

##### **5.1 Monitoring Frequencies**

Physiological monitoring will commence at the discretion of the ESS, or when WBGT Index monitoring is not used and the ambient temperatures exceed 70° F (21° C). Physiological monitoring may be used whenever work/recovery regimens are implemented to verify the effectiveness of the work/rest ratio including the cool down periods. Physiological monitoring should be used whenever workers have the potential to exceed the TWA or TLV, and must be used when personnel are working in impermeable clothing

Work in impermeable protective clothing should include consideration of a buddy rule (no lone workers), particularly at higher temperatures. The observers should be watching for sudden or severe fatigue, lightheadedness, loss of balance, loss of judgment or clumsiness that may indicate heat fatigue or heat stress.

The monitoring frequencies may be adjusted for individuals after experience with their work in heat stress environments has been gained provided the work involved, PPE, and other factors remain the same.

Attachment 4 is an Example forms that may be used for WBGT monitoring and individual physiological monitoring

##### **5.2 Pulse Rate Monitoring**

The level of stress may also be monitored by an individual's pulse rate. If either of the following occur, the individual should be removed from heat stress exposure:

- A sustained (several minutes) heart rate is in excess of 180 beats per minute (bpm) minus the individual's age in years (180-age), for individuals with normal cardiac performance. or
- A recovery heart rate greater than 120 bpm one minute after a peak work effort

The affected individual should be removed from the heat stress exposure and allowed to recover.

A recovery heart rate less than 110 bpm at indicates the individual can return to work but the work period should be adjusted. Shorten the next work period by one third while maintaining the same rest period. Increase the monitoring on the individual.

Pulse rates can be taken with an electronic pulse meter, or manually with a stopwatch for 30 seconds.

### 5.3 Body Core Temperature

Obtaining an accurate body core temperature for sustained work can be difficult, as the body will start to cool as soon as work is stopped or if protective clothing is removed and evaporation rates are increased. Monitor personnel as soon as possible to obtain an accurate temperature following the manufacturer's instructions for the particular instrument used. A body core temperature greater than 101.3° F (38.5° C) for medically selected and acclimatized personnel, or greater than 100.4° F (38° C) in unselected, unacclimatized workers may mark excessive heat strain and an individual's exposure to heat stress should be discontinued.

Average Body temperature varies between individuals and within individuals, typically fluctuating 1 degree F above or below the scientific "norm" of 98.6° F (37° C) oral temperature, depending on activity and general health.

Temperatures taken at the ear (tympanic temperature) has been developed. Current information indicates that an ear temperature reading will be 0.5 to 1.0° F (0.3 to 0.6° C) higher than an oral temperature reading, since the eardrum shares blood supply with the hypothalamus in the brain. An armpit (axillary) temperature is typically 0.5 to 1.0° F (0.3 to 0.6° C) lower than an oral temperature reading and may take up to 10 minutes to get an accurate reading.

Temporal or forehead thermometers use skin temperature to determine the body temperature. Due to the variations of the location and effects of evaporation, these are not as accurate as electronic and ear thermometers, however they offer other benefits of speed and accessibility when an individual may be fully suited.

Take the oral, ear or temporal temperature immediately at the start of the rest period. If the temperature exceeds 99.5° F (37.5° C) (oral or adjusted to oral) shorten the next work period by a third. Do not return the worker to hot work in semi-permeable or impermeable clothing until the body temperature is less than 99.5° F (37.5° C).

Body temperatures may be taken with disposable oral thermometers or infrared ear drum scanners. Temporal infrared thermometers are also available and may be considered to be less intrusive to the workers than oral or ear measurement devices.

(Note- Instruments coming in contact with skin or body fluids (sweat, saliva, etc) should either be used with disposable covers or sanitized between use.)

### 5.4 Removal from Exposure

If an individual requires a shortening of the work period on more than two consecutive monitoring periods, or repeatedly over a few days, they should be removed from exposure to hot environments, wearing semi-permeable, impermeable protective clothing until examined and cleared for such work by the consulting physician.

**If a worker appears to be disoriented or confused, suffers inexplicable irritability, malaise, or chills, the worker should be removed for rest in a cool location with rapidly circulating air and kept under skilled observation. Absent medical advice**

**to the contrary, treat this as an emergency with immediate transport to a hospital. An emergency response plan is necessary.**

**The heat stroke victim is often manic, disorientated, confused, and delirious or unconscious. treat this as an emergency with immediate transport to a hospital. The victim's body core temperature is greater than 104° F (40° C). If signs of heat stroke appear, start aggressive cooling immediately. Emergency care and hospitalization are essential. An emergency response plan is necessary.**

Prolonged increases in deep body temperature and chronic exposures to high level of heat stress are associated with other disorders, such as temporary infertility (male and female), elevated heart rate, sleep disturbance, fatigue and irritability. During the first trimester of pregnancy, a sustained core temperature greater than 102.2° F (39° C) may endanger the fetus.

## ATTACHMENT 3

### COLD STRESS MONITORING AND WORK/RECOVERY REGIMENS

#### 1.0 INTRODUCTION

Cold Stress TLVs are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV Objective is to prevent the deep body temperature from falling below 96.8° F (36° C) and to prevent cold injury to body extremities. For a single, occasional exposure to a cold environment, a drop in the core temperature to no lower than 95° F (35° C) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

This attachment includes guidance for monitoring and preventing cold stress in accordance with the 2007 ACGIH.

#### 2.0 COLD STRESS EVALUATION AND CONTROL

Workers that will subject to working in cold environments should be familiarized with the symptoms and effects of cold work. This should include awareness of the effects of medication, use of alcohol on the worker, as well as recognizing the symptoms of frostnip, frostbite, and hypothermia.

The ESS with support by the PESM should evaluate the workplace conditions and implement the controls appropriate for the work being performed and the work environment.

#### 2.1 Thresholds

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -25.6° F (-32° C). Superficial or deep local tissue freezing will occur only at temperatures below 30.2° F (-1° C) regardless of wind speed. Table 1 provides the Equivalent Chill Temperatures on exposed flesh.

At air temperatures of 35.6° F (2° C), or less, it is imperative that workers who have become immersed in water or whose clothing becomes wet be immediately provided a change of clothing and treated for hypothermia.

Special protection of the hands is required to maintain manual dexterity for the prevention of accidents, including:

- If fine work is to be performed with bare hands for more than 10-20 minutes in a temperature below 60.8° F (16° C), special provisions should be made for keeping workers hands warm, such as warm air jets, radiant heaters or contact warm plates. Metal handles of tools and control bars should be covered with thermal insulating materials below 30.2° F (-1° C).
- If the air temperature falls below 60.8° F (16° C) for sedentary, 39.2° F (4° C) for light, 19.4° F (-7° C) for moderate work, and fine manual dexterity is not required, then gloves should be used by workers.
- To prevent frostbite, the workers should wear anti-contact gloves.

- When cold surfaces below 19.4° F (-7° C) are probable, a warning to workers should be given to prevent inadvertent contact by bare skin.
- If air temperatures are 0° F (-17.5° C) or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so they can be handled and used without removing the mittens.

Provisions for additional total body protection are required if work is performed in an environment at or below 39.2° F (4° C), including:

- Workers should wear cold protective clothing appropriate for the level of cold and physical activity.
- If the air velocity at the work site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.
- If only light work is involved and the worker may become wet on the job site, the outer type of clothing in use may be of a type impermeable to water. With more severe work under such conditions, the outer layer should be water repellent and the outerwear changed as it becomes wetted. Outer garments should have provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If a worker's clothes have become wet by sweat, the worker should change into dry clothes before entering the cold area. Workers should change socks and any removable liners or felt insoles at regular daily intervals, or use vapor barrier boots.
- If exposed area of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should be supplied in auxiliary heated versions.
- If the available clothing does not give adequate protection to prevent frostbite or hypothermia, work should be modified or suspended until adequate clothing is available or until weathers conditions improve.
- Workers handling evaporative liquids (gasoline, alcohol, etc) at air temperatures below 39.2° F (4° C) should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporate cooling.

## 2.2 Work Warming Regimens

For work performed continuously in the cold at an equivalent chill temperature (ECT) or below 19.4° F (-7° C), heated warming shelters should be made available nearby with workers encouraged to use these shelters at regular intervals. The frequency of use should be dependent of the severity of the exposure. Table 2 provides a Work/Warm-up schedule for a four-hour schedule.

The onsite of shivering, minor frostbite, the feeling of excessive fatigue, drowsiness, or euphoria are indications for immediate return to the shelter. When entering the heated shelters, outer clothing should be removed and the remainder of clothing loosened or opened to permit sweat evaporation or a change of dry clothing provided.

Dehydration occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee or other diuretics should be limited.

For work practices at or below 10.4° F (-12° C) the following should be considered:

- Workers should be under constant protective observation (buddy system or supervision)
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work must be performed, rest periods should be taken in heated shelters and the opportunity for changing into dry clothing provided.

- New employees should not be required to work fulltime in the cold during the first few days until they become accustomed to the working conditions and the required protective clothing.
- The weight and bulkiness of clothing should be factored into the estimates of required work performance and weights to be lifted by the worker.
- Work should be organized so that sitting still or standing still for long periods is minimized. Unprotected metal chairs should not be used. The worker should be protected from drafts to the greatest extent possible.
- Eye protection for workers employed out-of-doors in a snow or ice covered condition should be supplied. Special safety goggles to protect against ultraviolet light and glare that can cause temporary conjunctivitis and or temporary loss of vision, and blowing ice crystals when there is an expanse of snow coverage.
- Workers should be instructed in safety and health procedures related to cold environments work, including:
  - Proper rewarming procedures
  - First aid treatment
  - Proper eating and drinking habits
  - Recognition of impending frostbite
  - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
  - Safe work practices

### **2.3 Workplace Monitoring**

Suitable thermometry should be arranged at the any workplace where the environment is below 60.8° F (16° C) so that overall compliance with the TLV can be maintained. Whenever the air temperature falls below 30.2° F (-1° C), the dry bulb temperature should be measured and recorded at least every 4 hours.

Wind speed should be monitored and recorded when the rate exceeds 5 mph (2 m/s). When monitoring, the Equivalent Chill Temperature (ECT) should be recorded with the temperature and wind speed.

Individual employees should be excluded from working in cold at 30.2° F (-1° C) or below if they are suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -11.2° F (-24° C) with no wind, or -18° F (0° C) with wind speeds above 5 mph should be medically evaluated as suitable for such temperatures.

Provisions for providing first aid for trauma sustained in freezing or subzero conditions are required because an injured worker is predisposed to cold injury and should be protected against preventing hypothermia or freezing of damaged tissues in addition to providing the first aid.

**Table 1 - Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)\***

Estimated Wind Speed (in mph)	Actual Temperature Reading (° F)												
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	
	Equivalent Chill Temperatures (° F)												
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68	
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95	
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112	
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121	
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133	
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140	
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145	
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148	
Wind Speeds > 40 mph have little additional Effect	<b>LITTLE DANGER</b> In < hr with dry skin. Maximum danger of false sense of security			<b>INCREASING DANGER</b> Danger from freezing of exposed flesh within one minute				<b>GREAT DANGER</b> Flesh may freeze within 30 seconds					
	Trenchfoot and immersion foot may occur at any point on this chart												
	Grayed areas = Equivalent Chill Temperature requiring dry clothing to maintain core body temperature above 96.8° F (36° C) per cold stress TLV												

\* Developed by U.S Army Research Institute of Environmental Medicine, Natick, MA. As provided in American Conference Of Governmental Industrial Hygienists TLVs and BEIs 2006

**TABLE 2 – WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT**

Air Temperature Sunny Sky		No Noticeable Wind		5 mph Wind (8 k/hr)		10 mph Wind (16 K/hr)		15 mph Wind (24 k/hr)		20 mph Wind (32 k/hr)	
°F (Approx)	°C (Approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks
-15 to -19	-26 to -28	Normal breaks	1	Normal breaks	1	75 min.	2	55 min.	3	40 min.	4
-20 to -24	-29 to -31	Normal Breaks	1	75 min.	2	55 min.	3	40 min	4	30 min.	5
-25 to -29	-32 to 34	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease	
-30 to -34	-35 to -37	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease			
-35 to -39	-38 to -39	40 min.	4	30 min.	5	Non-Emergency work should cease					
-40 to -44	-40 to -42	30 min.	5	Non-Emergency work should cease							
-45 & below	-43 & below	Non-Emergency work should cease									

**Notes:**

1 Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step low. For example, at -30 F (-35 C) with no noticeable wind (step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (step 5).

2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph - light flag moves, 10 mph – light flag fully extended, 15 mph – raises newspaper sheet, 20 mph – blowing & drifting snow.

3. TLVs apply only for workers in dry clothing.

**Purpose:** This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.

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6.0 REFERENCES

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## **1.0 PURPOSE**

This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.

## **2.0 SCOPE**

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations.

## **3.0 MAINTENANCE**

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

## **4.0 DEFINITIONS**

### **4.1 Benching**

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

### **4.2 Competent Person**

A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

### **4.3 Excavation**

Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

### **4.4 Hazardous Atmosphere**

An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

## **4.5 Protective Systems**

A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

## **4.6 Sloping**

A method of protecting employees from cave-ins by forming sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

## **4.7 Support System**

A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

## **4.8 Trench**

A narrow excavation made below the surface of the ground. In general the depth is greater than the width, but the width of a trench measured at the bottom is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

## **5.0 DISCUSSION**

### **5.1 Responsibilities**

#### **5.1.1 Competent Person**

The competent person(s) shall be responsible for:

- Day-to-day oversight of open excavations and trenches
- Conducting soil classifications
- Selection of protective systems
- Conducting daily inspections of open excavations and trenches; and
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.

#### **5.1.2 Line Management**

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure
- Providing the necessary resources for compliance with this procedure; and
- Designating competent personnel in consultation with the Project Environmental, Health and Safety Manager (PESM)

### **5.1.3 Environmental, Health and Safety Personnel**

The ESS shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure
- Conducting periodic reviews of open trenches and excavations
- Consulting with the project manager and competent person on excavation issues; and
- Maintaining required records.

## **5.2 Designation of Competent Personnel**

Prior to the start of any excavation work the project manager shall designate a competent person to fulfill the requirements of this procedure.

## **5.3 General Requirements**

The following section provides general requirements governing activities in and around excavation and trenches, as well as the requirements for the selection and use of protective systems.

- Surfaces surrounding open trenches and excavations shall have all surface hazards removed.
- All utilities shall be located and cleared prior to initiating digging. Public or facility utility groups shall be utilized where possible for this purpose. In the absence of either, the ESS shall specify the procedures to be used to clear utilities in consultation with the project PESH and project manager. When the excavation is open, utilities shall be supported and protected from damage. Clearance and support methods shall be documented on the daily inspection checklist.
- Where structural ramps are used for egress they shall be installed in accordance with 29 CFR 1926.651(c)(1).
- Stairways, ladders, or ramps shall be provided as means of egress in all trenches 4 feet or more in depth. Travel distance shall be no more than 25 feet between means of exit.
- Employees exposed to vehicular traffic shall wear traffic vests.
- No employee shall be permitted under loads being lifted or under loads being unloaded from vehicles.
- When vehicles and machinery are operating adjacent to excavations warning systems such as stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling on employees.

- Excavated and loose materials should be kept at least 3 feet from the edge of excavations, but at a minimum of 2 feet from the edge of the excavation in accordance with OSHA requirements.
- Walkways or bridges with standard railing shall be provided at points employees are to cross over excavations or trenches.
- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

#### **5.4 Hazardous Atmospheres**

Where atmospheres containing less than 19.5 percent oxygen or other types of hazardous atmospheres may exist the following requirements shall be implemented.

- Atmospheric testing shall be done prior to employees entering excavations 4 feet or greater in depth.
- Testing methods shall be listed on the daily inspection checklist and results documented daily in field logs.
- Control measures such as ventilation and personal protective equipment (PPE) shall be used to control employee exposure to hazardous atmospheres below published exposure limits.
- Ventilation shall be used to control flammable and combustible vapors to below 10 percent of their lower explosive limit.
- Testing shall be repeated as often as necessary to ensure safe levels of airborne contaminants.
- Emergency equipment shall be provided and attended when the potential for a hazardous atmosphere exists. This equipment shall include but not be limited to emergency breathing apparatus, harnesses, lifelines, and basket stretchers. Required equipment will be listed on the daily inspection checklist and reviewed daily.

## 5.5 Protection From Water Hazards

When water has collected or is collected in excavations and trenches the following requirements shall be applied.

- Employees shall not work in excavations in which water has, or is, accumulating without the use of additional protection such as special support systems or water removal.
- Water removal shall be monitored by a competent person.
- Barriers such as ditches and dikes shall be used to divert runoff from excavations and trenches.
- Trenches shall be reinspected prior to re-entry after water accumulation due to heavy rainfall or seepage.

## 5.6 Stability of Adjacent Structures

When excavating or trenching near an adjacent structure the following practices shall be implemented.

- Support systems such as shoring, bracing, or underpinning shall be provided where the stability of buildings, walls, or other structures is endangered by excavation.
- Excavation bases or footings of foundations shall be prohibited unless support systems are used, the excavation is in stable rock, a professional engineer has determined the structure is sufficiently removed from the site as to not pose a hazard, or the PE determines that the excavation shall not pose a hazard to employees due to the structure.
- Support systems shall be used when it is necessary to undermine sidewalks, pavements, and appurtenant structures.
- Surcharge load sources and adjacent encumbrances shall be listed with their evaluation date on the daily inspection checklist.

## 5.7 Daily Inspections

Inspections shall be performed daily on all excavations, adjacent areas, and protective systems before personnel enter the trench. The checklist provided in Attachment A or equivalent shall be used.

## 5.8 Soil Classification

To perform soil classification, the competent person shall use a thumb test, pocket penetrometer, or shear vane to determine the unconfined compressive strength of the soils being excavated. In soils with properties that change (i.e., one soil type mixed with another within a given area) several tests may be necessary. When different soil types are present the overall classification shall be that of the type with the lowest unconfined compressive strength. Classifications shall result in a soil rating of Stable Rock, Type A, Type B, or Type C in accordance with 29 CFR 1926.652, Appendix A. Soil classifications shall be listed on the daily inspection checklist. The soils analysis checklist provided in Attachment B or equivalent shall be used for soil classifications.

## 5.9 Sloping and Benching

All sloping and benching shall be done in accordance with 29 CFR 1926.652, Appendix B. Selection of the

sloping method and evaluation of surface surcharge loads shall be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications shall be listed on the daily inspection checklist.

#### **5.10 Protective Systems**

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 reveals conditions that may result in cave-ins.

Selection and installation of protective systems shall be done in accordance with 29 CFR 1926.652, Appendices C & D, or manufacturers data for shoring and shielding systems. Selection of a protective system shall be made based upon soil classification and job requirements by a competent person. Protective systems and specifications shall be listed on the daily inspection checklist.

#### **5.11 Training**

Competent persons shall 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 shall 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, Appendix A; and
- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

### **6.0 REFERENCES**

29 CFR 1926, Subpart P, Excavations.  
Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping  
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration),

### **7.0 ATTACHMENTS**

Attachment A - Daily Excavation Inspection Checklist  
Attachment B - Soils Analysis Checklist

**EHS 6-3 ATTACHMENT A  
DAILY EXCAVATION INSPECTION CHECKLIST**

**Click the icon below to launch or download.**



EHS 6-3 Attachment A 04-03-03.doc

**Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.**

**EHS 6-3 ATTACHMENT B  
SOILS ANALYSIS CHECKLIST**

**Click the icon below to launch or download.**



EHS 6-3 Attachment B.doc

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**EHS 6-3 ATTACHMENT A**



**TETRA TECH EC, INC.**

**DAILY EXCAVATION INSPECTION CHECKLIST**

**To be completed by a "Competent Person"**

Site location	_____		
Date	Time	Competent Person	
Soil Type(s)	_____		
Soil Classification(s)	Excavation depth	Excavation width	
Type of protective system used	_____		

*Indicate for each item by circling: Y (Yes), N (No), - Address in Comments, Not Applicable (N/A.)*

**I. General Inspection of Job Site**

- |  |   |   |     |
|--|---|---|-----|
| A. Surface encumbrances removed or supported   | Y | N | N/A |
| B. Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the excavation        | Y | N | N/A |
| C. Hard hats worn by all employees   | Y | N | N/A |
| D. Spoils, materials, and equipment set back at least 2 feet from the edge of the excavation                             | Y | N | N/A |
| E. Barriers provided at all remotely located excavations, wells, pits, shafts, etc.                                      | Y | N | N/A |
| F. Walkways and bridges over excavations 4 feet or more in depth are equipped with standard guardrails                   | Y | N | N/A |
| G. Warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic | Y | N | N/A |
| H. Warning system established and utilized when mobile equipment is operated near the edge of the excavation             | Y | N | N/A |
| I. Employees prohibited from working on the faces of sloped or benched excavations above other employees                 | Y | N | N/A |

**II. Utilities**

- |  |   |   |     |
|--|---|---|-----|
| A. Utility companies contacted and/or utilities located                              | Y | N | N/A |
| B. Exact location of utilities marked when approaching the utilities                 | Y | N | N/A |
| C. Underground installations protected, supported or removed when excavation is open | Y | N | N/A |

**III. Means of Access and Egress**

- |   |   |   |     |
|---|---|---|-----|
| A. Lateral travel to means of egress no greater than 25 feet in excavations 4 feet or more in depth                     | Y | N | N/A |
| B. Ladders used in excavations secured and extended 3 feet above the edge of the trench                                 | Y | N | N/A |
| C. Structural ramps used by employees designed by a competent person  | Y | N | N/A |
| D. Structural ramps used for equipment designed by a registered professional engineer (RPE)                             | Y | N | N/A |
| E. Ramps constructed of materials of uniform thickness, cleated together on the bottom, equipped with a no-slip surface | Y | N | N/A |
| F. Employees protected from cave-ins when entering or exiting the excavation  | Y | N | N/A |

**EHS 6-3 ATTACHMENT A  
DAILY EXCAVATION INSPECTION CHECKLIST**

**IV. Wet Conditions**

- |   |   |   |     |
|---|---|---|-----|
| A. Precautions taken to protect employees from the accumulation of water                    | Y | N | N/A |
| B. Water removal equipment monitored by a competent person                                  | Y | N | N/A |
| C. Surface water or runoff diverted or controlled to prevent accumulation in the excavation | Y | N | N/A |
| D. Inspections made after every rainstorm or other hazard increasing occurrence             | Y | N | N/A |

**V. Hazardous Atmospheres**

- |   |   |   |     |
|---|---|---|-----|
| A. Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible or other harmful contaminant exposing employees to a hazard | Y | N | N/A |
| B. Ventilation  | Y | N | N/A |
| C. Testing conducted often to ensure that the atmosphere remains safe   | Y | N | N/A |
| D. Emergency equipment, such as breathing apparatus, safety harness and line, and basket stretcher readily available where hazardous atmospheres could or do exist                  | Y | N | N/A |
| E. Safety harness and life line used and individually attended when entering deep confined excavations  | Y | N | N/A |

**VI. Support Systems**

- |  |   |   |     |
|--|---|---|-----|
| A. Materials and/or equipment for support systems selected based on soil analysis, trench depth and expected loads   | Y | N | N/A |
| B. Materials and equipment used for protective systems inspected and in good condition   | Y | N | N/A |
| C. Materials and equipment not in good condition have been removed from service  | Y | N | N/A |
| D. Damaged materials and equipment used for protective systems inspected by a RPE after repairs and before being placed back into service  | Y | N | N/A |
| E. Protective systems installed without exposing employees to the hazards of cave-ins, collapses or from being struck by materials or equipment  | Y | N | N/A |
| F. Members of support system securely fastened to prevent failure  | Y | N | N/A |
| G. Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.  | Y | N | N/A |
| H. Excavations below the level of the base or footing approved by an RPE   | Y | N | N/A |
| I. Removal of support systems progresses from the bottom and members are released slowly as to note any indication of possible failure   | Y | N | N/A |
| J. Backfilling progresses with removal of support system   | Y | N | N/A |
| K. Excavation of material to a level no greater than 2 feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth | Y | N | N/A |
| L. Shield system placed to prevent lateral movement  | Y | N | N/A |
| M. Employees are prohibited from remaining in shield system during vertical movement   | Y | N | N/A |

**VII. Comments**

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**EHS 6-3 ATTACHMENT B**



**TETRA TECH EC, INC.  
SOILS ANALYSIS CHECKLIST**

This checklist must be completed when soil analysis is made to determine the soil type(s) present in the excavation. A separate analysis must be performed on each layer of soil in excavation walls. A separate analysis must also be performed if the excavation (trench) is stretched over a distance where soil type may change.

Site location: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Competent Person \_\_\_\_\_

Where was the sample taken from? \_\_\_\_\_

Excavation: Depth: \_\_\_\_\_ Width: \_\_\_\_\_ Length: \_\_\_\_\_

**VISUAL TEST**

Particle type:           \_\_\_ Fine Grained (cohesive)           \_\_\_ Course grained (sand or gravel)

Water conditions:       \_\_\_ Wet           \_\_\_ Dry           \_\_\_ Surface water present           \_\_\_ Submerged

Previously disturbed soils? \_\_\_ Yes           \_\_\_ No

Underground utilities? \_\_\_ Yes           \_\_\_ No

Layered soils?           \_\_\_ Yes           \_\_\_ No

Layered soil dipping  
into excavation?       \_\_\_ Yes           \_\_\_ No

Excavation exposed  
to vibrations:         \_\_\_ Yes           \_\_\_ No

Crack-like openings or  
spallings observed?   \_\_\_ Yes           \_\_\_ No

Conditions that may create  
a hazardous atmosphere? \_\_\_ Yes           \_\_\_ No

If yes, identify condition and source: \_\_\_\_\_

Surface encumbrances: \_\_\_ Yes           \_\_\_ No

Work to be performed near  
public vehicular traffic? \_\_\_ Yes           \_\_\_ No

Possible confined  
space exposure?       \_\_\_ Yes           \_\_\_ No

**MANUAL TEST**

Plasticity:               \_\_\_ Cohesive   \_\_\_ Non-cohesive

Dry Strength:           \_\_\_ Granular (crumbles easily)   \_\_\_ Cohesive (broken with difficulty)

**EHS 6-3 ATTACHMENT B  
SOILS ANALYSIS CHECKLIST**

**NOTE:** *The following unconfined compressive strength tests should be performed on undisturbed soils.*

**THUMB TEST** (used to estimate unconfined compressive strength of cohesive soil)

Test performed:  Yes  No

Type A (soil indented by thumb with very great effort)

Type B (soil indented by thumb with some effort)

Type C (soil easily penetrated several inches by thumb with little or no effort). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

**PENETROMETER OR SHEARVANE** (used to estimate unconfined compressive strength of cohesive soils)

Test performed:  Yes  No

Type A (soil with unconfined compressive strength of 1.5 tsf or greater)

Type B (soil with unconfined compressive strength of 0.5 tsf to 1.5 tsf)

Type C (soil with unconfined compressive strength of 1.5 tsf or less). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

**WET SHAKING TEST** (used to determined percentage of granular and cohesive materials). Compare results to soil textural classification chart to determine soil type.

Test performed  Yes  No

Type A (clay, silty clay, sandy clay, clay loam, and in some cases silty clay, loam and sandy clay loam)

Type B [angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam

Type C (granular soil including gravel, sand and loamy sand)

% granular  % cohesive  % silt

**NOTE:** *Type A -- no soil is Type "A" if soil is fissured; subject to vibration; previously disturbed; layered dipping into the excavation on a slope of 4H:1V.*

**SOIL CLASSIFICATION**

Type A

Type B

Type C

**SELECTION OF PROTECTIVE SYSTEM**

Sloping, Specify angle:

Timber Shoring

Aluminum Hydraulic Shoring

**NOTE:** *Although OSHA will accept the above tests in most cases, some states will not. Check your state safety requirements for trenching regulations.*

**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<sup>®</sup>', 'Client Service Quality<sup>®</sup>', and 'Shared Vision<sup>SM</sup>'.

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- 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<sup>®</sup>', 'Client Service Quality<sup>®</sup>', and 'Shared

Vision<sup>SM</sup>.

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 by 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 Co

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](http://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](http://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/](http://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**

- 1. Sample Equivalent/Vehicle Inspection Report
  
- 2. Sample Daily Equipment Inspection Form
  
- 3. Mobile and Crawler Crane Monthly Checklist
  
- 4. Operator/Driver Task Observation Checklist
  
- 5. Insurance Request for Leased Equipment

**Place Your Attachments Here**



CP-7 Att-1 -mod 20090924.doc



CP-7 Att-2 Daily Equip Insp\_m



CP-7 Att-3 FJ.doc



CP-7 Att-4 Operator Observati



CP-7 Att-5 FJ.doc

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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 <u>%</u> <sup>1</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. Interior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Brakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18. Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Steering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19. Wipers/Review Mirrors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Undercarriage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. Heater/AC/Defroster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Suspension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21. Safety Equipment/Belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Engine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22. Signal Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Drive Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. Mounted Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fuel System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Mounted Attachments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cooling System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25. Blade/Bucket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Electrical System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26. Boom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Exhaust System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Outriggers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Hydraulic System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28. Fire Ext./First Aid Kit <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29. Horn/Backup Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Clutch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30. Manufactuer Operating Manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31. Head/Tail/Brake Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. ROP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32. Cleanliness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>1</sup> Note estimated percentage of tread/track usefulness remaining

<sup>2</sup> 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
<b>Steering Mechanisms<sup>1*</sup></b>	_____	_____	_____
<b>Service Brakes<sup>2</sup></b>	_____	_____	_____
<b>Emergency Brakes<sup>1</sup></b>	_____	_____	_____
<b>Parking Brake<sup>1</sup></b>	_____	_____	_____
<b>Transmission &amp; Controls</b>	_____	_____	_____
<b>Suspension &amp; Springs</b>	_____	_____	_____
<b>Hydraulic Leaks</b>	_____	_____	_____
<b>Exhaust System</b>	_____	_____	_____
<b>Warning Gauges</b>	_____	_____	_____
<b>Windshield<sup>1</sup> &amp; Wipers</b>	_____	_____	_____
<b>Lights (Head &amp; Tail)</b>	_____	_____	_____
<b>Brake Lights<sup>1</sup></b>	_____	_____	_____
<b>Mirrors</b>	_____	_____	_____
<b>Seat and Seat Belts<sup>1</sup> (w/ ROPS)</b>	_____	_____	_____
<b>Tires/Tread<sup>1</sup></b>	_____	_____	_____
<b>Regular Horn</b>	_____	_____	_____
<b>Audible Back-up Alarm<sup>1</sup></b>	_____	_____	_____
<b>Steps, Hand-holds</b>	_____	_____	_____
<b>Fire Extinguisher</b>	_____	_____	_____
<b>Engine Coolant</b>	_____	_____	_____
<b>Engine Oil</b>	_____	_____	_____
<b>Hydraulics &amp; Operating Controls</b>	_____	_____	_____
<b>Fenders/Mudflaps</b>	_____	_____	_____
<b>Heater/defroster</b>	_____	_____	_____
<b><u>All items in cab or bed secured</u></b>	_____	_____	_____
<b><u>Cleanliness inside and outside</u></b>	_____	_____	_____

**Remarks:**

<sup>1</sup> Items required to be operational by OSHA 1926.602 before use.

<sup>2</sup> 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: \_\_\_\_\_



## 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	
3 <sup>rd</sup> , 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 \_\_\_\_\_



## 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
<b>A. Pre-use inspection prior to starting</b>				
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 starting 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>B. Starting</b>				
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.				



Operating Safety Observations	S	U	NA	Comments
<b>C. Operation</b>				
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.				



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).				
<b>D. Shutdown</b>				
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.				
<b>E. Overall Appraisal</b>				
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 <b>**Please contact Dan Fisher ASAP regarding insurance for cranes**</b>	
9.	DECLARED VALUE OF EQUIPMENT	
10.	CHARGE NUMBER (FOR VALUE OF EQUIPMENT OVER <b>\$500,000</b> )	
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.*

**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.(TiEC) 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.

<b>Status:</b>	Complete	<b>Approved By:</b>	John DeFeis
<b>Version Date - Type:</b>	12/09/2009 - Revised	<b>Title:</b>	Event Reporting and Investigation
<b>Category:</b>	Company Procedures	<b>Original Issue</b>	02/01/95
<b>Sub-Category:</b>	Departmental/Discipline	<b>Date:</b>	
<b>Keyword Index:</b>	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	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
		<b>Document</b>	Procedure
		<b>Type:</b>	
		<b>Document</b>	Skip Parry
		<b>Owner</b>	

- 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. (TiEC) 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 PESH 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 PESH'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**

<u>EVENT TYPE</u>	<u>SUPERVISOR NOTIFIES...</u>	<u>TIMING<sup>1</sup></u>	<u>... WHO NOTIFIES</u>	<u>TIMING<sup>1</sup></u>
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediately external rep required
	Project Manager	Immediately	Client and Area/Program Manager	Immediately 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	Immediately
			0 OSHA reporting (See 3.5.1)	Immediately
			Insurance <a href="#">AIG through Chartis</a> @ 1-800-910-2667 (Company personnel only)	Immediately
			(Not required inside Washington State)	
Confirmed or Potential OSHA Recordable	Project Manager	Immediately	Area/Program Manager	Immediately
			VP Construction	Immediately
			Client	Immediately
	ESS	Immediately	PESM and Director, EHS Services	Same day
		Insurance <a href="#">AIG through Chartis</a> @ 1-800-910-2667 (Not required in Washington State)	Same day	
	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) Client (other property, if required) Equipment Manager Area/Program Manager VP Construction	Immediate 24 hours 24 hours 24 hours 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 Project QC Manager	Immediately Same Day	Program or Operations Manager Director of Quality Programs	24 hours 24 hours

<sup>1</sup>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 not 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 **Event** 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 PESH to implement the spill/release and permit exceedance 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<sup>1</sup>

#### **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

1. Attachment A - [Event](#)/Near Miss Report and Investigation
2. Attachment B - Quality [Event](#) Report Form
3. Attachment C - [Event](#) Sketch

### Place Your Attachments Here



EHS 1-7, Att A, 2007.doc



EHS 1-7, Att B, 2007.doc



EHS 1-7, Att C, 2007.doc

Draft Only

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**EHS 1-7 ATTACHMENT B**



	<b>HAZARD REPORT AND SUGGESTION FORM</b>	<b>Hazard Type:</b> Condition <input type="checkbox"/> Practice <input type="checkbox"/>
<p><i>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!</i></p>		
<b>DESCRIBE CONDITION OR PRACTICE:</b>		
<b>SUBMITTED BY (OPTIONAL):</b>		<b>DATE:</b>
<b>IMMEDIATE CORRECTIVE ACTION COMPLETED:</b>		<b>COMPLETED BY</b>
		<b>COMPLETION DATE</b>
<b>RECOMMENDATIONS FOR FURTHER CORRECTIVE ACTION</b>		<b>RESPONSIBLE PERSON</b>
		<b>TARGET DATE</b>
		<b>COMPLETION DATE</b>
<b>FOR OFFICE USE ONLY</b>		
<b>POTENTIAL INCIDENT TYPE:</b>		
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: _____		

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		
<b>Short Description/Title Below:</b> (limited to 125 characters). This is the description that will appear in the database listing.		
<b>Type of Event/Near Miss (check all that apply):</b>		
Was a person injured or made ill:		
<input type="checkbox"/> By something at work <input type="checkbox"/> By something outside the work environment <input type="checkbox"/> No injury or illness		
Did this event occur in one of our major offices? <input type="checkbox"/> Yes <input type="checkbox"/> No List Office:		
Did this event occur in a foreign country? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did this event involve:		
A strain?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire?
A motor vehicle accident?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Property damage (>\$500)?
A repetitive motion injury?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Spill/release?
A fall?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Permit exceedence?
Being struck by something?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Event Information</b>		
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? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Event Location:		
What employee/employer category was involved in this event?	<input type="checkbox"/> TtEC permanent <input type="checkbox"/> TtEC craft/temp service <input type="checkbox"/> Subcontractor <input type="checkbox"/> Other	
Employer of affected employee?		
Weather conditions:	Adequate Lighting at Scene? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>What was the employee doing, or what was happening, just before the event occurred?</b> 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."		

Corporate ESQ Report # **Insert number here**  
 Project Name: **Insert name here**

### EHS 1-7, Attachment A Event/Near Miss Report and Investigation

<b>What happened?</b> 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.		
<b>Section 2, Affected Employee Information</b>		
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 <input type="checkbox"/> Male <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>Section 3, Injury/Illness Information (If not applicable, check here <input type="checkbox"/> and go to Section 4)</b>		
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? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did the injury/illness result in <input type="checkbox"/> Days away (with or without restricted days) <input type="checkbox"/> Restricted days only <input type="checkbox"/> No or unknown		
Did employee die? <input type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>Section 4, Vehicle and Property Damage Information (If not applicable, check here <input type="checkbox"/> and go to Section 5)</b>		
Damaged vehicle make:	Damaged vehicle model:	
Damaged vehicle VIN:	Vehicle owner:	
Property damaged:		
Describe property damage:		

Corporate ESQ Report # **Insert number here**  
 Project Name: **Insert name here**

**EHS 1-7, Attachment A  
 Event/Near Miss Report and Investigation**

<b>Section 5, Environmental Release (If not applicable, check here <input type="checkbox"/> and go to Section 6)</b>		
<i>Environmental Release</i>		
Substance spilled or released:		
From where:	To where:	
Estimated quantity/duration:	CERCLA Hazardous substance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
RQ exceeded? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify RQ:	
Reportable to agency? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify (place telecom in project file):	
Responsibility to report: <input type="checkbox"/> TtEC <input type="checkbox"/> Client <input type="checkbox"/> Other	Time frame:	
Written report (place report in project file): <input type="checkbox"/> Yes <input type="checkbox"/> No		
Response action taken:		
<i>Permit Exceedence</i>		
Type of permit:	Permit #:	
Date of exceedence:	Parameter(s):	
Criteria:	Exceedence levels:	
Exceedence duration:	Reportable to agency: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Specify (place telecom in project file):	Written report: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Time frame:		
Response action taken:		
<b>Section 6, Notifications</b>		
Insert names of TtEC personnel notified below:		
Name:	Date:	Time:
Client rep notified:	Date:	Time:
By whom:		
Agency notified:	Date:	Time:
By whom:		
Agency Contact Name:		
<b>Section 7, Persons Preparing Report</b>		
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:		
<i>Note to supervisor:</i> 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.		

Corporate ESQ Report # **Insert number here**  
 Project Name: **Insert name here**

### EHS 1-7, Attachment A Event/Near Miss Report and Investigation

<b>Section 8, Attach Sketches or Photos</b>		
<i>Report Number:</i>		
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.		
<i>Vehicle Events</i>		
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.		
<b>Section 9, Investigative Report</b>		
<b>Date Information:</b>		
Date of event:	Date of investigative report:	
<i>Event Cost:</i>		
Other event costs: \$	WC claim value: \$	Estimated loss: \$
<b>Cause Analysis</b>		
Was the activity addressed in an AHA? <input type="checkbox"/> Yes (attach applicable section) <input type="checkbox"/> No		
<b>Immediate Causes</b>		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
<input type="checkbox"/> Operating equipment without authority	<input type="checkbox"/> Horseplay	
<input type="checkbox"/> Failure to warn	<input type="checkbox"/> Using equipment improperly	
<input type="checkbox"/> Failure to secure	<input type="checkbox"/> Failure to follow procedure	
<input type="checkbox"/> Operating at improper speed	<input type="checkbox"/> Personnel not properly qualified	
<input type="checkbox"/> Making safety devices inoperable	<input type="checkbox"/> Failure to communicate	
<input type="checkbox"/> Removing safety devices	<input type="checkbox"/> Operating equipment outside of specified parameters	
<input type="checkbox"/> Using defective equipment	<input type="checkbox"/> Failure to check equipment prior to acceptance	
<input type="checkbox"/> Failure to use PPE properly	<input type="checkbox"/> Acceptance of defective equipment	
<input type="checkbox"/> Improper loading	<input type="checkbox"/> Failure to provide proper equipment	
<input type="checkbox"/> Improper placement	<input type="checkbox"/> Improper servicing/maintenance of equipment	
<input type="checkbox"/> Improper lifting	<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Improper position for task	<input type="checkbox"/> Servicing equipment in operation	
<input type="checkbox"/> Under influence of alcohol/drugs		
Substandard Conditions		
<input type="checkbox"/> Guards or barriers	<input type="checkbox"/> Exposure to hazardous materials	
<input type="checkbox"/> Protective equipment	<input type="checkbox"/> Extreme temperature exposure	
<input type="checkbox"/> Tools/equipment or materials	<input type="checkbox"/> Illumination	
<input type="checkbox"/> Congestion	<input type="checkbox"/> Ventilation	
<input type="checkbox"/> Warning system	<input type="checkbox"/> Visibility	
<input type="checkbox"/> Fire and explosion hazards	<input type="checkbox"/> Radiation	
<input type="checkbox"/> Poor housekeeping	<input type="checkbox"/> Hazardous environmental conditions	
<input type="checkbox"/> Noise exposure	<input type="checkbox"/> Other substandard conditions	

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
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> 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:

<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Health control
<input type="checkbox"/> Training	<input type="checkbox"/> System evaluation
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Task analysis and procedures	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Task observation	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Emergency preparedness	<input type="checkbox"/> General promotion
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Personal protective equipment	

Corporate ESQ Report # **Insert number here**  
 Project Name: **Insert name here**

**EHS 1-7, Attachment A  
 Event/Near Miss Report and Investigation**

<b>Remedial Actions</b>			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
<b>Section 11, Persons Performing Investigation</b>			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
<b>Management Review</b>			
<b>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.</b>			
Project/Office Manager Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> 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.			

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:			
<input type="checkbox"/> Client concern	<input type="checkbox"/> Nonconformance report	<input type="checkbox"/> Audit report	<input type="checkbox"/> Corrective action request
<input type="checkbox"/> Supervisory review	<input type="checkbox"/> Peer review	<input type="checkbox"/> Project review	<input type="checkbox"/> Other (describe):
<b>Enter Short Description/Title (limited to 125 characters) below.</b> This is the description that will appear in the database listing.			
<b>Issue Summary:</b> 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:			
<i>Note to supervisor:</i> 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: \$
<b>Cause Analysis</b>			
<b>Immediate Causes</b>			
What actions and conditions contributed to this event? Check all that apply:			
Substandard Acts			
<input type="checkbox"/> Operating equipment without authority		<input type="checkbox"/> Inadequate inspection/peer review	
<input type="checkbox"/> Failure to follow/improper execution of procedure		<input type="checkbox"/> Poor judgment	
<input type="checkbox"/> Using equipment improperly		<input type="checkbox"/> Failure to communicate—written and/or verbal	
<input type="checkbox"/> Improper servicing/maintenance of equipment		<input type="checkbox"/> Acceptance of defective equipment/material	
<input type="checkbox"/> Under influence of alcohol/drugs		<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Horseplay			

Corporate ESQ Report # **Insert number here**  
 Project Name: **Insert name here**

### EHS 1-7, Attachment B Quality Event Report and Investigation

Substandard Conditions	
<input type="checkbox"/> Personnel not properly qualified or trained	<input type="checkbox"/> Inadequate oversight
<input type="checkbox"/> Defective equipment/material	<input type="checkbox"/> Inadequate procedure/instruction
Enter brief explanation of each <b>immediate cause</b> below:	
<b>Basic Causes</b>	
What specific personal or job management system factors contributed to this event? Check all that apply:	
Personal Factors	Job Factors
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input checked="" type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input checked="" type="checkbox"/> Excessive wear and tear
	<input checked="" type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> Other job factors
Enter brief explanation of each <b>basic cause</b> below:	
<b>Section 4, Action Plan</b>	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Training	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Critical task analysis and procedures	<input type="checkbox"/> General promotion of Loss Control principles
<input type="checkbox"/> Task observation	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Quality control
<input type="checkbox"/> System evaluation	

Corporate ESQ Report # **Insert number here**  
 Project Name: **Insert name here**

**EHS 1-7, Attachment B  
 Quality Event Report and Investigation**

<i>Remedial Actions</i>			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		
<b>Section 5, Persons Performing Investigation</b>			
Investigator's name:		Date:	
Investigator's name:		Date:	
Investigator's name:		Date:	
<b>Management Review</b>			
<b>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.</b>			
Project/Office Manager Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM, QA) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> 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.			

**EHS 3-1 : Ergonomics**

**Last Revision By: Andrew Hopper on  
02/13/2012**

**Created By: Lisa Kaminski on 05/20/2002**

<b>Purpose:</b>	The purpose of this program is to establish minimum requirements for the implementation of an effective ergonomics program at Tetra Tech EC, Inc. (TtEC). The program is focused on the prevention of cumulative trauma disorders, particularly those associated with the use of computer keyboards and injuries associated with lifting and material handling.		
<b>Version Date:</b>	05/21/2002 - Revised	<b>Original Issue Date:</b>	02/01/95
<b>Category:</b>	Company Procedures	<b>Sections:</b>	ESQ - Environmental Health & Safety Programs
<b>Sub Category:</b>	Departmental/Discipline	<b>Document Type:</b>	Procedure
<b>Keyword Index:</b>	Field Activities/Environmental H&S, Monitoring, Operational Control, Training	<b>Document Owner:</b>	Skip Parry
<b>Approved By:</b>			

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### 1.0 PURPOSE

The purpose of this program is to establish minimum requirements for the implementation of an effective ergonomics program at Tetra Tech EC, Inc. (TtEC). The program is focused on the prevention of cumulative trauma disorders, particularly those associated with the use of computer keyboards and injuries associated with lifting and material handling.



### 2.0 SCOPE

This program applies to all TtEC operations.



### 3.0 MAINTENANCE

The Executive Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



### 4.0 DEFINITIONS



#### 4.1 Ergonomics

The science that studies the physical effects of workstations, tools, and equipment on the human body.



#### 4.2 Cumulative Trauma Disorder

A term for health disorders arising from repeated biomechanical stress due to ergonomic hazards. Other terms used include: repetitive motion injury, occupational overuse syndrome, and repetitive strain injury. Cumulative trauma disorders (CTDs) are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, synovial lubrication of the tendon sheaths, and the related bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck and back. Frequently occurring CTDs include: carpal tunnel syndrome, epicondylitis (tennis elbow), tendinitis, tenosynovitis, synovitis, stenosing tenosynovitis of the fingers, DeQuervain's Disease, and low back pain.



#### 4.3 Ergonomic Hazard

A workplace condition that poses a biomechanical stress to the worker. They include, but are not limited to: faulty work station layout, improper work methods, improper tools, excessive tool vibration, and job design problems that include aspects of work flow, posture, work/rest regimens, and repetition rate.



#### 4.4 Ergonomic Risk Factor

A condition of a job or activity that contributes to the risk of developing CTDs. Examples include: repetitiveness of activity, force required, and awkwardness of posture. They are considered in light of their combined effect in inducing CTDs, i.e., risk factors are synergistic element of ergonomic hazards.



#### 4.5 Health Care Provider/Medical Surveillance Program Administrator

A physician/physicians specializing in occupational health, registered nurse specializing in occupational health, or other health personnel working under the supervision of these individuals.



#### 4.6 Qualified Person

A person with thorough training and experience sufficient to identify ergonomic hazards in the workplace and recommend an effective means of correction.



#### 4.7 Systems Approach

A comprehensive program that addresses workplace processes, activities and conditions as interdependent systems in order to identify and to eliminate or reduce all types of hazard, including ergonomic hazards, to employees.



### 5.0 DISCUSSION



#### 5.1 Responsibilities



##### 5.1.1 Line Management

Line managers are responsible for:

- reviewing and [implementing](#) health and safety recommendations which are intended to reduce the probability that ergonomic disorders will occur.
- [contacting ESQ to perform an office ergonomic survey when:](#)
  - [a new employee is hired](#)
  - [an employee moves to another workstation](#)
  - [an employee obtains new furniture](#)
  - [an employee's assignment changes that significantly increases their computer use](#)
  - [an employee informs their supervisor that they are experiencing symptoms which may be associated with their workstation](#)
- [ensuring office-based employees receive ergonomic awareness training, conduct workstation self-assessments, and report any physical discomfort or problems with their workstation immediately.](#)



### 5.1.2 Environmental, Health and Safety Personnel

The Environmental and Safety Coordinator (ESC) for each office or the Environmental and Safety Supervisor (ESS) for each project is responsible for surveying each workplace per the requirements of this programs, to identify ergonomic hazards and to make recommendations, when necessary, for corrective actions to reduce the probability that ergonomic disorders will occur.

[The ESC shall also respond to employee or supervisory requests for an ergonomic survey.](#)



### 5.2 Pre-Placement Medical Evaluations

Pre-[placement](#) medical evaluations are not required for office personnel.

TtEC job descriptions contain general information regarding the physical exertion required for each job position including standing, walking, bending, climbing, and lifting. For participants in the TtEC medical surveillance program (hazardous waste workers), per EHS 4-5, Medical Surveillance, this information will assist the Corporate Medical Consultant (CMC) to evaluate an individual's ability to perform the job tasks required by their job position. The objective of this evaluation is to identify pre-existing physical conditions which might be aggravated by routine job duties. The results of the medical evaluation will enable Human Resources and operations personnel to determine when reasonable accommodations can be made to avoid aggravation of pre-existing ergonomic disorders or conditions.

[Pre-employment back evaluations are recommended for craft workers who may be at greater risk of developing low back pain or low back injury. This evaluation may be requested by contacting our Corporate Medical Consultant \(CMC\) and may be performed by the local medical provider under the approval and direction of our CMC.](#)



### 5.3 Workplace Evaluations

Surveys shall be performed by qualified persons to identify and evaluate tasks which might result in injuries due to ergonomic hazards. The focus of the surveys will be: 1) Computer workstations which are used by a single person on an average of more than 20 hours per week and those which are used by multiple persons, and 2) Operations which involve the manual lifting and moving of objects of excessive weight or asymmetric size.



#### 5.3.1 Computer Workstation Surveys

Workstation Ergonomic Checklist (Attachment A) shall be used for the evaluation of all computer workstations which are used by a single person on an average of more than 20 hours per week or by multiple persons. This checklist is based on guidelines established in the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations.

If the results of the computer workstation survey indicate that the workstation does not meet the desired characteristics or the workstation is not being properly used, recommendations shall be made to modify the workstation and/or provide additional training.



#### 5.3.2 Material Handling

Potential material handling hazards for field operations will be initially identified during the development of Environmental, Health and Safety (EHS) plans pursuant to EHS 3-2, EHS Plans. Potential hazards are to be addressed through the hazard analysis portions of these plans. The effectiveness of the control measures are to be reviewed during inspections (EHS 3-3, Inspections), ESQ audits (C-2, Audits), and routine observations of workplace activities.

During inspections or audits, or when performing routine observations of workplace activities, Attachment B or an equivalent should be used as a screening tool to identify tasks with ergonomic hazards or risk factors. When ergonomic hazards or risk factors for lifting tasks are identified, the NIOSH "Work Practices Guide for Material Handling" are available as guidelines for evaluating the task.

Recommendations shall be made as necessary to modify the work activity and/or provide additional training. The NIOSH evaluation criteria accounts for the following variables for each lifting task: weight of object, horizontal location, vertical location, vertical travel distance, frequency of lifting, and duration of period of lifting.



### 5.3.3 Frequency of Workplace Surveys

Computer workstation surveys shall be conducted:

- [ergonomic evaluation upon initial assignment, upon a move, upon use or receipt of new furniture/chairs, computers, monitors, \(etc\). and upon request of an employee, supervisor or office manager.](#)
- [for new hires within one month of workstation permanency](#)
- [when an employee moves to another workstation](#)
- [when an employee obtains new furniture](#)
- [when an employee informs their supervisor that they are experiencing symptoms which may be associated with their workstation](#)
- [when requested by an employee or his/her supervisor](#)

Material handling surveys will be conducted as part of the TtEC EHS inspection and audit programs, EHS 3-3, Inspections, and C-2, Audits.



### 5.3.4 Action Items and Follow-up Report

The ESS or ESC shall develop an Action Item and Closure Report (Attachment C or an equivalent) that identifies the recommendations, proposed schedule for implementation and responsible parties. The Operations Manager ([for field sites](#)) shall complete [and forward](#) the Action Item and Closure Report within 60 days [of receipt](#) to the ESS or ESC. The ESS or ESC shall send copies to Manager, EHS Services and [to the Director, EHS Services. The ESS or ESC will notify the Operations Manager and manager, EHS Services when Closure Reports are delinquent.](#)



### 5.3.5 Records

Manager, EHS Services shall maintain copies of all ergonomics surveys and completed Action Item and Closure Reports.



## 5.4 Hazard Prevention and Control



### 5.4.1 Workstation Configuration

The recommended design specifications for TtEC work stations are:

- Adequate work space to perform the job;
- Consideration of individual body size in relation to design of chair, height of work surface, and access to various elements of the work station, including the monitor screen;

- Work surface, monitor and keyboard height within parameters established in the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations (ANSI/HFS 100-1988), or preferably, a height adjustable work station (including capability to adjust monitor height and keyboard height if VDT is used);
- Adequate leg room;
- No direct reflection of light on screen, adequate illumination (normally 28-50 footcandles), minimum contrast between a monitor screen and the surrounding work area; and
- Direction of air supply ducts away from person.

The recommendations for chair design are:

- Adjustable seatpan, and lumbar-supportive backrest that can be adjusted for height and depth to individual users;
- [five legs](#);
- [adjustable for height](#);
- [laterally and vertically adjustable armrests](#);
- [backrest adjustable for tilt and](#);
- [chair can swivel](#)

Recommendations for miscellaneous workstation accessories include:

- VDT workstations: footrest, [natural shaped keyboard](#), adjustable copy holder, wrist rest, mouse rest, antiglare screen (if needed or wanted).

All newly purchased TtEC workstations, desks, and/or chairs shall meet the above specifications. Existing furniture shall be modified as necessary on the basis of the evaluation using the workstation ergonomic checklist.



#### 5.4.2 Work Practice Controls for Computer Workstations

Work practice controls for workstations include setting the work station up correctly, proper posture, taking eye breaks, and exercises.

The set-up of a VDT workstation should be as follows:

- The center of the screen should be at chin level. Position the screen at 14 to 24 inches from the eyes.
- Adjust the chair to fit body. Keep the back supported, knees at hip level, feet flat on floor or [on a footrest](#).
- Place keyboard low enough so arms hang loosely, [shoulders are relaxed](#), and [the upper arm is at a right angle to the forearm](#).
- Set document holder close to screen and at same distance [from eyes](#) to avoid frequent head and eye movements [and refocusing](#).
- Every 20 minutes, focus on an object at least 20 feet away. Move eyes up down, sideways, and diagonally. Eliminate sources of reflective glare. Correct posture includes holding head and spine upright and sitting well back in the chair - aim buttocks where seat and backrest meet.
- Keep wrist in line with hands and forearms. Maintain a light touch on keyboard.
- [Allow hand to rest on mouse](#).
- [Support lower arms by using the chair armrests to eliminate need to hold up arms and shoulders](#).



#### 5.4.3 Material Handling Controls

Material handling equipment such as lift trucks, hand trucks, lift gates, etc. shall be utilized whenever possible.

When mechanical lifting and moving aids cannot be used, team lifting shall be used as a minimum for loads over 50 pounds and for awkward loads. When team lifting is not indicated, personnel are to be trained in and required to use proper lifting techniques.



#### 5.4.4 Hand Tool Selection

Hand tools shall be selected to minimize the following stressors: chronic muscle contraction or steady force, extreme or awkward finger/hand/arm positions, repetitive forceful motions, excessive gripping, pinching, pressing with hand and fingers.



## 5.5 Personal Protective Equipment

TtEC shall not provide personal protective equipment (PPE) for reducing ergonomic risk factors without the authorization of the CMC or Manager, EHS Services. This includes, but is not limited to, "back" belts, wrist splints, and forearm wraps for "tennis" elbow.



## 5.6 Training

The employees identified below and supervisors of such employees shall be trained in accordance with the requirements specified in this section.

- Employees who use a computer workstation on an average of more than 20 hours per week;
- Employees who share work station with multiple persons;
- Employees who conduct operations which involve the manual lifting and moving of objects of excessive weight or asymmetric size; and
- Employees identified through the ergonomic survey as requiring training.

The training shall be geared toward field or office duties, as appropriate. It shall include, but not be limited to:

- Types of ergonomic disorders, especially CTD's and back/upper body strains;
- What risk factors cause or contribute to ergonomic disorders;
- How to recognize and report symptoms;
- Ergonomic hazards associated with their assigned tasks;
- Proper workstation design, use, and posture, if applicable;
- Proper lifting techniques; and
- Work practice controls.
- Summary TtEC Ergonomic program with employees.
- [Employees who experience symptoms/pain possibly associated with their workstation.](#)

This training shall be conducted as part of office or site-specific orientation.



## 6.0 REFERENCES

ANSI (American National Standards Institute) Human Factors Engineering of Visual Display Terminal Workstations.

Compliance Procedure C-2, Audits

Environmental, Health & Safety - Programs Procedure EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance

NIOSH (National Institute for Occupational Safety and Health) Revised Guide for Manual Lifting.

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration) Ergonomics Program Management Guidelines for Meatpacking Plants (1991).

Personal Health Design Bytes of Advice for Comfort and Health, Loudonville, NY (1992).



## 7.0 ATTACHMENTS

Attachment A - Workstation Ergonomic Checklist  
Attachment B - Identification of Ergonomic Risk Factors  
Attachment C - Action Item and Closure Report



**EHS 3-1 ATTACHMENT A  
WORKSTATION ERGONOMIC CHECKLIST**

Click the icon below to download and complete.



EHS 3-1 Att A-Revision2.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



**EHS 3-1 ATTACHMENT B  
IDENTIFICATION OF ERGONOMIC RISK FACTORS**

Click the icon below to download and complete.



EHS 3-1 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



**EHS 3-1 ATTACHMENT C  
ERGONOMICS ACTION ITEM AND CLOSURE REPORT**

Click the icon below to download and complete.



EHS 3-1 Attachment C040301.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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Tetra Tech EC, Inc.

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**APPENDIX D**  
**FIELD INSPECTION FORMS**

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**EHS 3-3 ATTACHMENT E**



**TETRA TECH EC, INC.**

**ACTION ITEM REPORT**

***CONFIDENTIAL***

**Project Name:**

**Location:**

**Delivery Order No.:**

**Date of Inspection:**

<b>ACTION ITEM</b>	<b>CLASS* MA/MI/R<sup>1</sup></b>	<b>RESPONSIBLE PARTY</b>	<b>SCHEDULE</b>	<b>DATE COMPLETED</b>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				

Reviewed by: \_\_\_\_\_  
Project Manager/ Operations Manager

\_\_\_\_\_ Date

**PESM Inspections:**

***Return original, completed Action Item Report to PESM within 60 days of Inspection date. PESM to forward original to Director, Quality Programs and copy to Regional ESQ Manager.***

**Office/Warehouse Inspections:**

***Send copies of completed Action Item Report to ESC and Regional ESQ Manager.***

\* Recommendations shall be entered as observations in the EtQ Solutions database

\_\_\_\_\_  
<sup>1</sup> Ma – Major, Mi - Minor, R - Recommendation  
Revision Date 04/03/03



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
<b>Steering Mechanisms<sup>1*</sup></b>	_____	_____	_____
<b>Service Brakes<sup>2</sup></b>	_____	_____	_____
<b>Emergency Brakes<sup>1</sup></b>	_____	_____	_____
<b>Parking Brake<sup>1</sup></b>	_____	_____	_____
<b>Transmission &amp; Controls</b>	_____	_____	_____
<b>Suspension &amp; Springs</b>	_____	_____	_____
<b>Hydraulic Leaks</b>	_____	_____	_____
<b>Exhaust System</b>	_____	_____	_____
<b>Warning Gauges</b>	_____	_____	_____
<b>Windshield<sup>1</sup> &amp; Wipers</b>	_____	_____	_____
<b>Lights (Head &amp; Tail)</b>	_____	_____	_____
<b>Brake Lights<sup>1</sup></b>	_____	_____	_____
<b>Mirrors</b>	_____	_____	_____
<b>Seat and Seat Belts<sup>1</sup> (w/ ROPS)</b>	_____	_____	_____
<b>Tires/Tread<sup>1</sup></b>	_____	_____	_____
<b>Regular Horn</b>	_____	_____	_____
<b>Audible Back-up Alarm<sup>1</sup></b>	_____	_____	_____
<b>Steps, Hand-holds</b>	_____	_____	_____
<b>Fire Extinguisher</b>	_____	_____	_____
<b>Engine Coolant</b>	_____	_____	_____
<b>Engine Oil</b>	_____	_____	_____
<b>Hydraulics &amp; Operating Controls</b>	_____	_____	_____
<b>Fenders/Mudflaps</b>	_____	_____	_____
<b>Heater/defroster</b>	_____	_____	_____
<b><u>All items in cab or bed secured</u></b>	_____	_____	_____
<b><u>Cleanliness inside and outside</u></b>	_____	_____	_____

Remarks:

<sup>1</sup> Items required to be operational by OSHA 1926.602 before use.

<sup>2</sup> 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: \_\_\_\_\_



# 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
<b>A. Pre-use inspection prior to starting</b>				
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 starting 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>B. Starting</b>				
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.				



Operating Safety Observations	S	U	NA	Comments
<b>C. Operation</b>				
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.				



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).				
<b>D. Shutdown</b>				
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.				
<b>E. Overall Appraisal</b>				
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).

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)
<b>Weather Conditions at time of Inspection</b> _____.		
<b>Work Conditions</b>		
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		
<b>Equipment</b>		
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		
<b>Material Handling Equipment</b>		
17. Hoisting and Rigging		
18. Lifting Aids Used When Possible		
19. Proper Lifting Techniques Used		
<b>Electrical Safety</b>		
20. Power Cords		
21. GFCI		
22. Generators		
23. Breaker Box Access/Clearance		
<b>Hazardous Materials</b>		
24. Hazardous Chemical List Current		
25. MSDS		


**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		
<b>Emergency Systems</b>		
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		
<b>Protective Equipment</b>		
36. PPE used, stored, and maintained in accordance with EHS plan		
37. Respirator use, storage, and maintenance		
<b>Hazardous Waste Storage Area (HWSA)/Satellite Accumulation Area (SAA)</b>		
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:		


**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.		
<b>Hazardous Waste Tank Storage Area</b>		
49. Daily written inspection is being conducted and is maintained on site. The inspection requirements in the plan are being documented as required.		
<b>Waste/Stockpiles</b>		
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		
<b>TSCA PCB Wastes</b>		
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		


**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)
<b>Spill Prevention and Preparedness</b>		
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?		
<b>Stormwater Pollution Prevention and Erosion Controls</b>		
59. Are site activities causing land disturbance being performed (grading, excavating, clearing and grubbing, demolition and foundation removal, etc?		


**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.		
<b>Other Conditions or Work Practices</b>		
65.		
66.		
67.		
68.		


**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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## **APPENDIX E**

### **CONTRACTOR SIGNIFICANT INCIDENT REPORT (FORM AND INSTRUCTIONS)**

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- Initial Report
- Follow-up Report
- Final Report

## Contractor Significant Incident Report (CSIR)

1. General Information		
Contracting Activity/ROICC Office:		
<b>Accident Classification:</b>		
<input type="checkbox"/> Injury <input type="checkbox"/> Fatality <input type="checkbox"/> Environment <input type="checkbox"/> Procedural Issues <input type="checkbox"/> Lessons Learned <input type="checkbox"/> Illness <input type="checkbox"/> Property Damage <input type="checkbox"/> Other _____		
<b>Involving:</b>		
<input type="checkbox"/> Confined Space <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Heavy Construction Equip.) <input type="checkbox"/> Hazardous Material <input type="checkbox"/> Crane and Rigging <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Material Handling) <input type="checkbox"/> Trenching/Excavation <input type="checkbox"/> Diving <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Man-Lift/Elevated Platform) <input type="checkbox"/> Waterfront/Marine Operations <input type="checkbox"/> Demolition/Renovation <input type="checkbox"/> Fall from Ladder <input type="checkbox"/> Fall from Scaffold <input type="checkbox"/> Other _____ <input type="checkbox"/> Electrical <input type="checkbox"/> Fall from Roof <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> 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):	
<b>Additional Witnesses:</b> <i>(List any additional witnesses on a separate sheet and attach.)</i>		
<input type="checkbox"/> Yes <input type="checkbox"/> No		

4. Contract Information		
<b>Type of Contract:</b> <input type="checkbox"/> A/E <input type="checkbox"/> BOS <input type="checkbox"/> CLEAN <input type="checkbox"/> Construction <input type="checkbox"/> Design Build <input type="checkbox"/> FSCC <input type="checkbox"/> FSSC <input type="checkbox"/> JOC <input type="checkbox"/> RAC <input type="checkbox"/> Service <input type="checkbox"/> Other _____		
<b>Contract Number &amp; Title:</b>		<b>Industrial Group &amp; Industrial Type:</b>
<b>Prime Contractor Name/Address/Phone &amp; Fax No:</b>		<b>Sub Contractor Name/Address/Phone &amp; FAX No:</b>
<b>Safety Manager (Last, First, MI):</b>		<b>Safety Manager (Last, First, MI):</b>
<b>Insurance Carrier:</b>		<b>Insurance Carrier:</b>
5. Accident Description		
<b>Date of Accident:</b>	<b>Time of Accident:</b>	<b>Exact Location of Accident:</b>
Describe the accident in detail in your words: <i>(Use the back of page if you need additional space)</i>		
<b>Direct Cause(s) of Accident:</b>		

<b>Indirect Cause(s) of Accident:</b>	
<b>Action(s) taken to prevent re-occurrence or provide on-going corrective actions:</b>	
<b>Corrective Action Beginning Date:</b>	<b>Anticipated Completion Date:</b>
<b>Personal Protective Equipment:</b> <input type="checkbox"/> Available and used <input type="checkbox"/> Available and not used <input type="checkbox"/> Not Required <input type="checkbox"/> Not related to Mishap <input type="checkbox"/> Wrong PPE for job  <b>List PPE Used:</b>	
<b>Type of Construction Equipment (Make, Model, Serial #, VIN#) Involved:</b>	
<b>Was Hazardous Material Spilled/Released?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Please List Hazardous Material(s) Involved:</b>	
<b>Who provided first aid or cleanup of mishap site?</b>	
<b>Any blood-borne pathogen exposure, other than EMTs?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  <b>Who?</b>	
<b>List OSHA and EM-385-1-1 standards that were violated:</b>	
<b>Was site secured and witness statements taken immediately?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  <b>By Whom?</b>	

6. Injury Illness/Fatality Information		
<b>Severity of Injury/Illness:</b>		
<input type="checkbox"/> Fatality	<input type="checkbox"/> Lost Workday Case Involving Days Away From Work	
<input type="checkbox"/> Temporary Disability	<input type="checkbox"/> Recordable Workday Case Involving Restricted Duty	
<input type="checkbox"/> Permanent Total Disability	<input type="checkbox"/> Other Recordable Case	<input type="checkbox"/> Recordable First Aid Case
<input type="checkbox"/> Permanent Partial Disability	<input type="checkbox"/> Non-Recordable Case	<input type="checkbox"/> No Injury
<b>Estimated Days Lost:</b>	<b>Estimated Days Hospitalized:</b>	<b>Estimated Days Restricted Duty:</b>
<b>List Primary Body Part Affected:</b>	<b>List Other Body Part(s) Affected:</b>	
<b>Nature of Injury/Illness for Primary Body Part (Examples: Amputation, Burn, Hernia):</b>		
<b>Type of Accident (Examples: Fall same level, Lifting, Bitten, Exerted):</b>		
<b>Source of Accident (Examples: Crane, Carbon Monoxide, Ladder, Welding Equipment):</b>		
7. Causal Factors <i>(Explain answers on supplementary sheet)</i>		
• Design – Design of facility, workplace, or equipment was a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Inspection/Maintenance – Inspection & Maintenance procedures were a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Persons Physical Condition – In your opinion, the physical condition of the person was a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Operation Procedures – Operating procedures were a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Practices – One or more job safety/health practices not being followed when the accident occurred contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Human Factors – One or more human factors, such as a person's size or strength contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Environmental Factors – Heat, cold, dust, sun, glare, etc., contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> 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?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Office Factors – Office setting such as lifting office furniture, carrying, stooping, contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Support Factors – Inappropriate tools/resources were provided to perform the task?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• PPE – Improper selection, use or maintenance of PPE contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Drugs/Alcohol – In your opinion, were drugs or alcohol a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Hazard Analysis – The lack of an adequate (IAW-EM-385-1-1 Sec 01.A) activity hazard analysis was a contributing factor.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Hazard Analysis – JHA was not site specific and/or did not address the type of work/operations performed when the mishap occurred.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Management – A lack of adequate supervision contributed to the accident.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Management – Inadequate information was provided at pre con meeting.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>8. OSHA Information</b>			
<b>Date OSHA was Notified:</b>	<b>Date(s) of Investigation:</b>	<b>Date of citation: (Attach Copy)</b>	<b>Dollar amount of Penalties:</b>
<b>9. Report Preparer</b>			
<b>Name (Last, First, MI):</b>		<b>Date of Report:</b>	
<b>Title:</b>		<b>Signature:</b>	
<b>Employer:</b>			
<b>Phone #:</b>			

# 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 title 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**

**SEVERITY 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.) <b>FIRE, FLAME, SMOTE (NOT TABACCO)</b> 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) MECHANICAL 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) MECHANICAL 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 provisions 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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# AMERADA HESS CORPORATION

## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### EMERGENCY OVERVIEW

#### DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT  
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF  
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

### 1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-04)

**Amerada Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER (24 hrs):**

**CHEMTREC (800)424-9300**

**COMPANY CONTACT (business hours):**

Corporate Safety (732)750-6000

**MSDS Internet Website**

[www.hess.com/about/enviro.html](http://www.hess.com/about/enviro.html)

**SYNONYMS:** Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

### 2. COMPOSITION and INFORMATION ON INGREDIENTS \* (rev. Jan-04)

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

# AMERADAHESSE CORPORATION

## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### 3. HAZARDS IDENTIFICATION (rev. Dec-97)

#### **EYES**

Moderate irritant. Contact with liquid or vapor may cause irritation.

#### **SKIN**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

#### **INGESTION**

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

#### **INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

#### **CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

#### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

### 4. FIRST AID MEASURES (rev. Dec-97)

#### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

#### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

#### **INGESTION**

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

#### **INHALATION**

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

# AMERADAHESSCORPORATION

## MATERIAL SAFETY DATA SHEET

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### 5. FIRE FIGHTING MEASURES (rev. Dec-97)

#### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

#### **FIRE AND EXPLOSION HAZARDS**

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

#### **EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

#### **FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

### 6. ACCIDENTAL RELEASE MEASURES (rev. Dec-97)

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product

# AMERADA HESS CORPORATION

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**Gasoline, All Grades**

**MSDS No. 9950**

vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### 7. HANDLING and STORAGE (rev. Dec-97)

#### HANDLING PRECAUTIONS

\*\*\*\*\*USE ONLY AS A MOTOR FUEL\*\*\*\*\*

\*\*\*\*\*DO NOT SIPHON BY MOUTH\*\*\*\*\*

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

#### STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

#### WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

### 8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-04)

#### EXPOSURE LIMITS

Component (CAS No.)	Source	Exposure Limits			Note
		TWA (ppm)	STEL (ppm)		
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	800	--	2003 NOIC: 1000 ppm (TWA) Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	

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Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	50	--	A4 (skin)	
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

### **ENGINEERING CONTROLS**

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

### **EYE/FACE PROTECTION**

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

### **SKIN PROTECTION**

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

### **RESPIRATORY PROTECTION**

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## **9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jan-04)**

### **APPEARANCE**

A translucent, straw-colored or light yellow liquid

### **ODOR**

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

### **ODOR THRESHOLD**

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

### **BASIC PHYSICAL PROPERTIES**

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %

# AMERAD HESS CORPORATION

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**Gasoline, All Grades**

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SOLUBILITY (H<sub>2</sub>O): Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

### 10. STABILITY and REACTIVITY (rev. Dec-94)

**STABILITY:** Stable. Hazardous polymerization will not occur.

#### **CONDITIONS TO AVOID**

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

#### **INCOMPATIBLE MATERIALS**

Keep away from strong oxidizers.

#### **HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

### 11. TOXICOLOGICAL PROPERTIES (rev. Dec-97)

#### **ACUTE TOXICITY**

Acute Dermal LD50 (rabbits): > 5 ml/kg

Acute Oral LD50 (rat): 18.75 ml/kg

Primary dermal irritation (rabbits): slightly irritating

Draize eye irritation (rabbits): non-irritating

Guinea pig sensitization: negative

#### **CHRONIC EFFECTS AND CARCINOGENICITY**

Carcinogenicity: OSHA: NO IARC: YES - 2B

NTP: NO

ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

### 12. ECOLOGICAL INFORMATION (rev. Jan-04)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API ([www.api.org](http://www.api.org)) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

### 13. DISPOSAL CONSIDERATIONS (rev. Dec-97)

Consult federal, state and local waste regulations to determine appropriate disposal options.

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**14. TRANSPORTATION INFORMATION** (rev. Jan-04)

DOT PROPER SHIPPING NAME: Gasoline  
 DOT HAZARD CLASS and PACKING GROUP: 3, PG II  
 DOT IDENTIFICATION NUMBER: UN 1203  
 DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



**15. REGULATORY INFORMATION** (rev. Jan-04)

**U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION**

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

**CLEAN WATER ACT (OIL SPILLS)**

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

**CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)**

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

**SARA SECTION 311/312 - HAZARD CLASSES**

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	--	--

**SARA SECTION 313 - SUPPLIER NOTIFICATION**

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION WT. PERCENT</u>
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents ([www.epa.gov/tri](http://www.epa.gov/tri)) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

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### CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)

Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

### 16. OTHER INFORMATION (rev. Jan-04)

**NFPA® HAZARD RATING** HEALTH: 1 Slight  
FIRE: 3 Serious  
REACTIVITY: 0 Minimal

**HMIS® HAZARD RATING** HEALTH: 1 \* Slight  
FIRE: 3 Serious  
REACTIVITY: 0 Minimal  
\* CHRONIC

**SUPERSEDES MSDS DATED:** 12/30/97

### ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than  
N/A = Not Applicable N/D = Not Determined ppm = parts per million

### ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
AIHA	American Industrial Hygiene Association	OPA	Oil Pollution Act of 1990
ANSI	American National Standards Institute (212)642-4900	OSHA	U.S. Occupational Safety & Health Administration
API	American Petroleum Institute (202)682-8000	PEL	Permissible Exposure Limit (OSHA)
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	RCRA	Resource Conservation and Recovery Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]	REL	Recommended Exposure Limit (NIOSH)
EPA	U.S. Environmental Protection Agency	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
HMIS	Hazardous Materials Information System	SCBA	Self-Contained Breathing Apparatus
IARC	International Agency For Research On Cancer	SPCC	Spill Prevention, Control, and Countermeasures
MSHA	Mine Safety and Health Administration	STEL	Short-Term Exposure Limit (generally 15 minutes)
NFPA	National Fire Protection Association (617)770-3000	TLV	Threshold Limit Value (ACGIH)
NIOSH	National Institute of Occupational Safety and Health	TSCA	Toxic Substances Control Act
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	TWA	Time Weighted Average (8 hr.)
		WEEL	Workplace Environmental Exposure Level (AIHA)
		WHMIS	Workplace Hazardous Materials Information System (Canada)

### **DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



## Material Safety Data Sheet

Issue Date: October 27, 2008

Revised Date: March 20, 2013

Reason: Revised to Current Date.

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product name:** Super Lube® Grease

**Item No's:** 82340, 21006, 21010, 21030, 21036, 41150, 41160, 41050, 41030, 41120, 41140, 21013, 21014, 21015, 11520  
/1, /0, /00, /000 identifies NLGI-1, 0, 00, or 000 consistency.

**Product use:** Lubricant

**Company address:**

Synco Chemical Corporation  
24 DaVinci Dr., P.O. Box 405  
Bohemia, NY 11716

**Contact Information:**

Telephone: 631-567-5300  
Emergency telephone: 800-424-9300  
Internet: [www.super-lube.com](http://www.super-lube.com)  
E-Mail: [info@super-lube.com](mailto:info@super-lube.com)

### 2. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

**Physical state:** Semi-solid

**Color:** Translucent

**Odor:** Mild

**WARNING:**

MAY CAUSE SKIN OR EYE IRRITATION

**WHMIS hazard class:** Not Hazardous

**HMIS codes:** Health - 0

Fire - 1

Hazard - 0

Other - 0

**Relevant routes of exposure:**

Skin, Eyes

**Potential Health Effects**

**Inhalation:**

Not expected to cause respiratory tract irritation during normal conditions of use.

**Skin contact:**

Repeated or prolonged contact may be irritating to skin.

**Eye contact:**

Contact with eyes may cause irritation.

**Ingestion:**

Not expected under normal conditions of use.

**Existing conditions aggravated by exposure:**

None generally recognized.

**See Section 11 for additional toxicological information.**

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Components</u>	<u>%</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER</u>
Polyalphaolefin 68037-01-4	<85	5mg/m <sup>3</sup> TWA (mist:) 10mg/m <sup>3</sup> STEL (mist:)	5mg/m <sup>3</sup> TWA (mist:)	None
White mineral oil (petroleum) 8042-47-5	<25	5mg/m <sup>3</sup> TWA (mist:) 10mg/m <sup>3</sup> STEL (mist:)	5mg/m <sup>3</sup> TWA (mist:)	None
Fumed Silica 68611-44-9	<5	10mg/m <sup>3</sup> TWA	6mg/m <sup>3</sup> TWA	None
Polytetrafluoroethylene 9002-84-0	<4	Not established	Not established	None
Antioxidant 41484-35-9	<2	Not established	Not established	None
Polyglycol 025322-69-4	<1			AIHA WEEL is 50 ppm Total 10mg/m <sup>3</sup> aerosol only
Polyisobutylene 9003-27-4	<0.5	Not established	Not established	None

### 4. FIRST AID MEASURES

<b>Inhalation:</b>	Remove to fresh air. If discomfort persists seek medical attention.
<b>Skin contact:</b>	After contact with skin, wash immediately with plenty of water. Immediately flush skin with plenty of water (using soap, if available). Get medical attention if symptoms develop and persist.
<b>Eye contact:</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
<b>Ingestion:</b>	Do not induce vomiting. Get medical attention.

### 5. FIRE-FIGHTING MEASURES

<b>Flash point:</b>	>428° F (220° C) COC
<b>Auto ignition temperature:</b>	Not available
<b>Flammable/Explosive limits-lower %:</b>	N/A

**Flammable/Explosive limits-upper %:** N/A

**Extinguishing media:** Carbon dioxide (CO<sub>2</sub>). Dry chemical. Foam.

**Special fire fighting procedures:** None

**Unusual fire or explosion hazards:** None

**Hazardous combustion products:** Oxides of carbon.

**Sensitivity to mechanical impact:** Not available

**Sensitivity to static discharge:** Not available

## 6. ACCIDENTAL RELEASE MEASURES

**Environmental precautions:** No special precautions required.

**Clean-up methods:** Scrape up and dispose of in accordance with local and national regulations.

## 7. HANDLING AND STORAGE

**Handling:** Good manufacturing procedures should be followed in handling and storage.

**Storage:** Keep in cool, dry area.

**Incompatible products:** Oxidizing agents.

## Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering controls:** Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination below occupational exposure limits.

**Respiratory protection:** If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted, NIOSH approved, organic vapor/particulate respirator.

**Skin protection:** Nitrile or PVC, impermeable gloves.

**Eye/face protection:** Safety glasses with side-shields.

**See Section 3 for exposure limits.**

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b>	Semi-solid
<b>Color:</b>	Translucent
<b>Odor:</b>	Mild
<b>Odor Threshold:</b>	Not determined
<b>Vapor pressure:</b>	Not determined
<b>pH:</b>	Not determined
<b>Boiling point/range:</b>	Not applicable
<b>Melting point/range:</b>	None
<b>Specific gravity:</b>	.89
<b>Vapor density:</b>	Not available
<b>Evaporation rate:</b>	Not available
<b>Solubility in water:</b>	Not soluble
<b>Partition coefficient (n-octano/water):</b>	Not determined
<b>VOC content:</b>	Essentially zero

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable
<b>Hazardous polymerization:</b>	Will not occur.
<b>Hazardous decomposition products:</b>	None under normal use.
<b>Incompatibility:</b>	Oxidizing agents.
<b>Conditions to avoid:</b>	None known

## 11. TOXICOLOGICAL INFORMATION

**Product toxicity data:** Not Toxic

**Toxicologically synergistic products:** Not available

**Refer to the following for irritancy of Product, Sensitization to Product, Carcinogenicity, Reproductive Toxicity, Teratogenicity, and Mutagenicity.**

### Ingredient Toxicity Data & Carcinogen Status

Components	LD50s & LC50s	Other LD50s and LC50s	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen	ACGIH-Carcinogen
Polyalphaolefin Proprietary	None	None	No	No	No	No
MineralOil(petroleum) 8042475	OralLD50(Rat) >5000mg/kg	None	No	No	No	No

Antioxidant 41484-35-9	Oral LD50 (Rat) >5000 mg/kg Dermal LD50(Rabbit) >3000 mg/kg Inhalation LC50 (Rat) >3.5 mg/m <sup>3</sup>	None	No	No	No	No
Fumed Silica 68611-44-9	Oral LD50 (Rat) >5000 mg/kg	None	No	No	No	No
Polytetra- fluoroethylene 9002-84-0	Not determined	None	No	No	No	No
Polyglycol 025322-69-4	Oral LD50 (Rats) >10,000 mg/kg Dermal LD50 (Rabbit) >10,000 mg/kg	None	No	No	No	No

### Literature Referenced Target Organ & Other Health Effects

Components	Health Effects/Target Organs
Polyalphaolefin Proprietary	No target organs
White mineral oil (petroleum) 8042-47-5	Irritant
Antioxidant 41484-35-6	No target organs
Fumed Silica 68611-44-6	Nuisance dust, irritant to eyes and skin
Polytetrafluoroethylene 9002-84-0	Irritant
Polyglycol 025322-69-4	No target organs

## 12. ECOLOGICAL INFORMATION

**Ecological information:**

General Notes: Water hazard class 1 (self assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground or sewage systems.

## 13. DISPOSAL CONSIDERATIONS

**Information provided is for unused product only.**

**Recommended method of disposal:** Dispose of in accordance with federal and local regulations.

## 14. TRANSPORT INFORMATION

### Transportation of Dangerous Goods – Ground:

<b>Proper shipping name:</b>	Not regulated
<b>Hazardous class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

### International Air Transportation (ICAO/IATA):

<b>Proper shipping name:</b>	Not regulated
<b>Hazardous class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

### Water Transportation (IMO/IMDG):

<b>Proper shipping name:</b>	Not regulated
<b>Hazardous class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None
<b>Marine pollutant:</b>	None

## 15. REGULATORY INFORMATION

### Canada Regulatory Information

**CEPA DSL/NDL Status:** All components are listed on or are exempt from listing on the Domestic Substances List.

### United States Regulatory Information

**TSCA 8 (b) Inventory Status:** All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

### New Zealand Regulatory Information

**New Zealand HSNO Status:** All components are listed or are exempt from listing on the Hazardous Substances and New Organisms Act.

### European Union Regulatory Information

**Regulation No. 1907/2006 (REACH):** Components are Pre-registered and in compliance.

## SECTION 16: OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Product Regulations.

Data prepared by Environment protection department.



by Tyco Fire Suppression & Building Products

# MATERIAL SAFETY DATA SHEET

## ABC Fire Extinguisher

Issue Date: 04-13-2011

### 1. Product and Company Identification

<b>Material name</b>	ABC Fire Extinguisher
<b>Version #</b>	02
<b>Revision date</b>	04-13-2011
<b>CAS #</b>	Mixture
<b>Product use</b>	Fire Extinguisher
<b>Manufacturer / Importer / Supplier</b>	
<b>Name</b>	Tyco Fire Protection Products
<b>Address</b>	One Stanton Street Marinette, WI 54143-2542
<b>Phone</b>	715-732-3465
<b>Internet</b>	<a href="http://www.pyrochem.com">http://www.pyrochem.com</a>
<b>Emergency Phone Number</b>	CHEMTREC 800-424-9300 or 703-527-3887

### 2. Hazards Identification

<b>Emergency overview</b>	WARNING  Irritating to eyes and skin. Prolonged exposure may cause chronic effects.
<b>Potential health effects</b>	
<b>Routes of exposure</b>	Eye contact. Skin contact. Inhalation. Ingestion.
<b>Eyes</b>	Contact with eyes may cause irritation.
<b>Skin</b>	Avoid contact with the skin. May cause skin irritation.
<b>Inhalation</b>	Inhalation of dusts may cause respiratory irritation.
<b>Ingestion</b>	Not a likely route of entry.
<b>Target organs</b>	Eyes. Respiratory system. Skin.
<b>Signs and symptoms</b>	Irritation of eyes and mucous membranes.

### 3. Composition / Information on Ingredients

Non-hazardous components	CAS #	Percent
AMMONIUM HYDROGEN SULFATE	7783-20-2	10 - 30
Other components below reportable levels		> 60

### 4. First Aid Measures

<b>First aid procedures</b>	
<b>Eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.
<b>Skin contact</b>	Wash off with warm water and soap. Get medical attention if irritation develops and persists.
<b>Inhalation</b>	Move to fresh air.
<b>Ingestion</b>	Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
<b>General advice</b>	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

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## 5. Fire Fighting Measures

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### Extinguishing media

**Suitable extinguishing media** This product is not flammable. Use extinguishing agent suitable for type of surrounding fire.

### Protection of firefighters

**Specific hazards arising from the chemical** None known.

**Protective equipment for firefighters** None known.

**Special protective equipment for fire-fighters** None known.

### Explosion data

**Sensitivity to mechanical impact** Not available.

**Sensitivity to static discharge** Not available.

**Hazardous combustion products** Carbon monoxide and carbon dioxide.

---

## 6. Accidental Release Measures

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**Personal precautions** Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of dust from the spilled material. Wear a dust mask if dust is generated above exposure limits.

**Environmental precautions** Do not contaminate water.

**Methods for containment** If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Prevent entry into waterways, sewer, basements or confined areas.

**Methods for cleaning up** Should not be released into the environment. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. Avoid the generation of dusts during clean-up. Clean up in accordance with all applicable regulations. Following product recovery, flush area with water.

**Other information** Clean up in accordance with all applicable regulations.

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## 7. Handling and Storage

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**Handling** Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. Avoid contact with eyes. Wash thoroughly after handling. Wear personal protective equipment.

**Storage** Guard against dust accumulation of this material. Use care in handling/storage.

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## 8. Exposure Controls / Personal Protection

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### Personal protective equipment

**Eye / face protection** Wear safety glasses with side shields (or goggles).

**Skin protection** Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection.

**Respiratory protection** In the case of respirable dust and/or fumes, use self-contained breathing apparatus.

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## 9. Physical & Chemical Properties

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### Appearance

**Form** Powder.

**Color** Yellow.

**Odor** Odorless.

**Physical state** Solid.

**pH** Not available.

**Melting point** Not available.

**Freezing point** Not available.

**Boiling point** Not available.

**Flash point** Not available.

---

<b>Evaporation rate</b>	Not available.
<b>Flammability limits in air, upper, % by volume</b>	Not available.
<b>Flammability limits in air, lower, % by volume</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Specific gravity</b>	Not available.
<b>Relative density</b>	Not available.
<b>Solubility (water)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.

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## 10. Chemical Stability & Reactivity Information

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<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Incompatible materials</b>	Strong acids.
<b>Hazardous decomposition products</b>	Carbon oxides.

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## 11. Toxicological Information

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<b>Toxicological information</b>	The toxicity of this product has not been tested.
<b>Chronic effects</b>	Prolonged inhalation may be harmful. Not expected to be hazardous by WHMIS criteria.

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## 12. Ecological Information

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### Ecotoxicological data

Components	Test Results
AMMONIUM HYDROGEN SULFATE (7783-20-2)	EC50 Water flea (Ceriodaphnia dubia): 52 - 67 mg/l 48.00 hours LC50 Pink salmon (Oncorhynchus gorbuscha): 0.068 mg/l 96.00 hours

<b>Ecotoxicity</b>	This material is not expected to be harmful to aquatic life.
<b>Environmental effects</b>	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
<b>Persistence and degradability</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available

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## 13. Disposal Considerations

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<b>Disposal instructions</b>	Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations.

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## 14. Transport Information

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### TDG

Not regulated as dangerous goods.

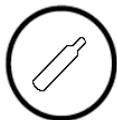
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## 15. Regulatory Information

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<b>Canadian regulations</b>	This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
<b>WHMIS status</b>	Controlled
<b>WHMIS classification</b>	A - Compressed Gas

## WHMIS labeling



### Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

## 16. Other Information

<b>Further information</b>	HMIS® is a registered trade and service mark of the NPCA.
<b>HMIS® ratings</b>	Health: 1* Flammability: 0 Physical hazard: 0
<b>NFPA ratings</b>	Health: 1 Flammability: 0 Instability: 0
<b>Disclaimer</b>	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
<b>Issue date</b>	04-13-2011



# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**  
US GHS

**Synonyms:** Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquids - Category 3  
Skin Corrosion/Irritation – Category 2  
Germ Cell Mutagenicity – Category 2  
Carcinogenicity - Category 2  
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)  
Aspiration Hazard – Category 1  
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Flammable liquid and vapor.  
Causes skin irritation.  
Suspected of causing genetic defects.  
Suspected of causing cancer.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

#### Precautionary Statements

##### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**

Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Avoid breathing fume/mist/vapours/spray.

## Response

In case of fire: Use water spray, fog or foam to extinguish.  
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.  
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.  
IF exposed or concerned: Get medical advice/attention.

## Storage

Store in a well-ventilated place. Keep cool.  
Keep container tightly closed.  
Store locked up.

## Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \* \* \* Section 3 - Composition / Information on Ingredients \* \* \*

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

## \* \* \* Section 4 - First Aid Measures \* \* \*

### First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

### First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## \* \* \* Section 5 - Fire Fighting Measures \* \* \*

### General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

### Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

### Unsuitable Extinguishing Media

None

### Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

## \* \* \* Section 6 - Accidental Release Measures \* \* \*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

### Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

## Prevention of Secondary Hazards

None

## \* \* \* Section 7 - Handling and Storage \* \* \*

### Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

### Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

### Incompatibilities

Keep away from strong oxidizers.

## \* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \*

### Component Exposure Limits

#### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m<sup>3</sup> TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)  
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Naphthalene (91-20-3)

ACGIH: 10 ppm TWA  
15 ppm STEL  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
NIOSH: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
15 ppm STEL; 75 mg/m<sup>3</sup> STEL

## Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

## Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

## Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

## \* \* \* Section 9 - Physical & Chemical Properties \* \* \*

<b>Appearance:</b>	Clear, straw-yellow.	<b>Odor:</b>	Mild, petroleum distillate odor
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	0.009 psia @ 70 °F (21 °C)	<b>Vapor Density:</b>	>1.0
<b>Boiling Point:</b>	320 to 690 °F (160 to 366 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H<sub>2</sub>O):</b>	Negligible	<b>Specific Gravity:</b>	0.83-0.876 @ 60°F (16°C)
<b>Evaporation Rate:</b>	Slow; varies with conditions	<b>VOC:</b>	ND
<b>Percent Volatile:</b>	100%	<b>Octanol/H<sub>2</sub>O Coeff.:</b>	ND
<b>Flash Point:</b>	>125 °F (>52 °C) minimum	<b>Flash Point Method:</b>	PMCC
<b>Upper Flammability Limit (UFL):</b>	7.5	<b>Lower Flammability Limit (LFL):</b>	0.6
<b>Burning Rate:</b>	ND	<b>Auto Ignition:</b>	494°F (257°C)

## \* \* \* Section 10 - Chemical Stability & Reactivity Information \* \* \*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.

# Safety Data Sheet

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## Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

## Incompatible Products

Keep away from strong oxidizers.

## Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

## \* \* \* Section 11 - Toxicological Information \* \* \*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

#### B: Component Analysis - LD50/LC50

##### Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m<sup>3</sup> 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

### Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

### Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

### Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

### Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

### Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

### Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

### Carcinogenicity

#### A: General Product Information

Suspected of causing cancer.

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Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

## B: Component Carcinogenicity

### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

### Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

## Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

## Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

## Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

## Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

## \* \* \* Section 12 - Ecological Information \* \* \*

## Ecotoxicity

### A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

#### Fuels, diesel, no. 2 (68476-34-6)

##### Test & Species

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]

##### Conditions

#### Naphthalene (91-20-3)

##### Test & Species

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]

##### Conditions

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96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

## Persistence/Degradability

No information available.

## Bioaccumulation

No information available.

## Mobility in Soil

No information available.

### \*\*\* Section 13 - Disposal Considerations \*\*\*

## Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

## Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

### \*\*\* Section 14 - Transportation Information \*\*\*

## DOT Information

Shipping Name: Diesel Fuel

NA #: 1993 Hazard Class: 3 Packing Group: III

Placard:



### \*\*\* Section 15 - Regulatory Information \*\*\*

## Regulatory Information

### Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

#### Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

#### SARA Section 311/312 – Hazard Classes

<u>Acute Health</u>	<u>Chronic Health</u>	<u>Fire</u>	<u>Sudden Release of Pressure</u>	<u>Reactive</u>
X	X	X	--	--

# Safety Data Sheet

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## SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

## State Regulations

### Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

### Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

### Additional Regulatory Information

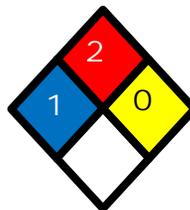
### Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

## \*\*\* Section 16 - Other Information \*\*\*

**NFPA® Hazard Rating**

Health	1
Fire	2
Reactivity	0



**HMIS® Hazard Rating**

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal

\*Chronic

# Safety Data Sheet

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## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

## Literature References

None

## Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

**APPENDIX G**  
**TOXIC AGENT INVENTORY AND MATERIAL SAFETY DATA SHEETS OR SAFETY**  
**DATA SHEETS**

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