TRONOX
Henderson, Nevada

HEALTH AND SAFETY PLAN

PREPARED FOR

Tronox and Northgate Environmental

PREPARED BY

ENTACT
3129 Bass Pro Dr.
Grapevine, TX 76051
(972) 580-1323

April 26, 2010

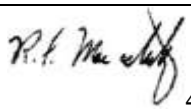
TABLE OF CONTENTS

SECTION **PAGE**

HEALTH AND SAFETY PLAN

ACKNOWLEDGEMENT AND ACCEPTANCE

Acknowledgement

Role	Name	Signature and Date
ENTACT Field Project Manager (Site Superintendent)	Bob Ainslie	
ENTACT Project Health and Safety Coordinator	R. F. (Rick) MacIntyre, CSP	 4/29/10
ENTACT Health and Safety Officer (Onsite Safety Officer)	Amy Hearnsberger	

Acceptance

Role	Name	Signature and Date
Tronox, LLC Project Manager	Susan Crowley	
Project Manager Northgate Environmental (Oversight)	Jim Carolan	

EMERGENCY CONTACTS

It is essential that site personnel be prepared in the event of an emergency. Emergencies can take many forms; illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. This table should be posted in the worksite trailer.

EMERGENCY CONTACTS	
Emergency Response Agencies	
Fire Department	911 – Emergency
Police Department	911 – Emergency
Ambulance	911 – Emergency
St Rose Dominican Hospitals 102 E Lake Mead Pkwy, Henderson, NV 89015	(702)564-2622 Emergency Room
Concentra Occupational Health Clinic - Henderson 149 N Gibson Rd Henderson, NV 89014	(702) 558-6275
National Response Center	(800) 424-8802
Center for Disease Control	(404) 488-4100
Chemtrec	(800) 424-9300
National Capital Poison Center	(800) 222-1222
U.S. Coast Guard National Response	(800) 424-8802
Underground Service Alert - North	(800) 227-2600
Nevada Power	(877) 213-1053

Project Personnel	
Erik Gehringer ENTACT Project Coordinator	Office: (630) 986-2900 Cell: (561) 707-7088
Don Self ENTACT Corporate Health and Safety Director	Office: (972) 580-1323 Cell: (630) 669-4259
Bob Ainslie ENTACT Project Manager	Cell: (307) 359-1141
Rick MacIntyre, CSP ENTACT Project Health and Safety Coordinator	Office: (972) 580-1323 Cell: (214) 663-3282
Amy Hearnsberger ENTACT Health and Safety Officer	Cell: (630) 453-1797
Susan Crowley Tronox, LLC Henderson, Nevada	Cell: (702) 592-7727

Project Personnel	
Jim Carolan Project Manager Northgate Environmental	Office (510) 839-0688 Cell: (510) 504-6927
Devin Gordon Nevada Dept. of Environmental Protection On-Site Representative	Office: (702) 371-7864

HOSPITAL

St Rose Dominican Hospital
102 E Lake Mead Pkwy
Henderson, NV 89015
Emergency Room: (702) 564-2622

Summary: 4.1 miles (6 minutes)

Mile	Instruction	For	Toward
0.0	**Depart 8000 W Lake Mead Pkwy, Henderson, NV 89015 on SR-564 (West)**	**0.3 mi**	
0.3	Road name changes to SR-146	0.3 mi	
0.6	Road name changes to I-215 [SR-146]	0.1 mi	
0.8	At exit 2, turn RIGHT onto Ramp	0.4 mi	Gibson Rd
1.1	Keep STRAIGHT onto Local road(s)	21 yds	I-215
1.1	Turn LEFT (South) onto S Gibson Rd	131 yds	
1.2	Turn LEFT (East) onto Local road(s)	21 yds	I-215
1.2	Take Ramp onto I-215 [SR-146]	0.3 mi	I-215
1.6	At exit 1, road name changes to SR-564 [W Lake Mead Pkwy]	2.4 mi	
4.0	Turn LEFT (North-West) onto SR-582, then immediately turn LEFT (South-West) onto SR-564 [E Lake Mead Pkwy]	174 yds	
4.1	**Arrive 102 E Lake Mead Pkwy, Henderson, NV 89015**		

OCCUPATIONAL CLINIC

Concentra - Henderson
149 N Gibson Rd
Henderson, NV 89014
Main: (702) 558-6275

Summary: 1.5 miles (2 minutes)

Mile	Instruction	For	Toward
0.0	**Depart 8000 W Lake Mead Pkwy, Henderson, NV 89015 on SR-564 [W Lake Mead Pkwy] (West)**	**0.3 mi**	
0.3	Road name changes to SR-146 [W Lake Mead Pkwy]	0.3 mi	
0.6	Road name changes to I-215 [SR-146]	0.1 mi	
0.8	At exit 2, turn RIGHT onto Ramp	0.4 mi	Gibson Rd
1.1	Turn RIGHT (North) onto N Gibson Rd	0.4 mi	
1.5	Turn LEFT (West) onto Mary Crest Rd	21 yds	
1.5	**Arrive 149 N Gibson Rd, Henderson, NV 89014**		

HASP-AT-A-GLANCE – MOBILIZATION

ACKNOWLEDGEMENTS

See table of emergency contacts for telephone numbers.

Responsibility:	Signature:	Date:
ENTACT Health and Safety Officer		
ENTACT Field Project Manager		

This summary sheet is provided for a quick reference for field activities at the Tronox Manganese Tailings Project. The remainder of this HASP provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this HASP are outlined in Section 1.4.

PROJECT ACTIVITIES

Site preparation includes establishment of an on-site trailer, mobilizing equipment to the work area, locating utilities, setting up a fuel delivery cell, and reviewing soil conditions. Most activities will be performed in clearing designated for ENTACT's trailer.

Constituents of Concern

The following constituent of concern (COC) is present at the site:

- Manganese Tailings
- Nuisance dust (particulates not otherwise regulated)

Sections 5.0 and 8.0 describe the health hazards and air monitoring requirements, respectively, of the COC at the site. Exposure to the COC is limited during this task.

Hazard Analysis

Site preparation activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting
- Fires

- Weather, including heat or thunderstorms
- Earthquake
- Underground and overhead utilities
- Uneven terrain
- Hand injuries

Site preparation activities could be affected by the following biological hazards:

- Insect bites and stings
- Poisonous plants
- Reptiles, such as snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection [1]	Escape respirator
Chemical protective clothing [2]	None
Hand protection: inner gloves	None
Hand protection: outer gloves	Cotton or leather work gloves
Foot protection: inner boots	Steel-toe, leather work boots
Foot protection: outer boots	None
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	None
Other protective clothing	High visibility, reflective vest, such as an orange traffic type vest
Hearing protection	Ear plugs or muffs with NRR of at least 25
[1] Escape respirator is required by all personnel on site. [2] Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Additional information on PPE and respiratory protection is provided in Sections 7.0 and Attachment L.

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 5.0. All field personnel will notify the site ENTACT Health and Safety Officer (HSO) and ENTACT Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

Air Monitoring

Air monitoring of personnel and the work area is not required for this job task. Dust suppression methods will be used to control nuisance dust with the goal of dust suppression being the avoidance of any visible dust. Section 8 provides additional information on air monitoring.

HASP-AT-A-GLANCE – INSTALLATION OF SILT FENCE & CHECK DAMS

ACKNOWLEDGEMENT

See table of emergency contacts for telephone numbers.

Responsibility:	Signature:	Date:
ENTACT Health and Safety Officer		
ENTACT Field Project Manager		

This summary sheet is provided for a quick reference for field activities at the Tronox Manganese Tailings Project. The remainder of this HASP provides general health and safety procedures that must be adhered to while conducting work at the project site. Procedures for updating or amending this HASP are outlined in Section 1.4.

PROJECT ACTIVITIES

This activity includes the installation of silt fencing and check dams (stormwater controls) prior to the start of excavation and other soil disturbing activities. These activities involve the use manual labor and heavy equipment.

Constituents of Concern

The following constituent of concern (COC) is present at the site:

- Manganese Tailings
- Nuisance dust (particulates not otherwise regulated)

Sections 5.0 and 8.0 describe the health hazards and air monitoring requirements, respectively, of the COC at the site. Exposure to the COC is limited during this task.

Hazard Analysis

Silt fence and check dam activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Slip, trips, falls

- Heavy lifting
- Weather, including heat or thunderstorms
- Earthquake
- Underground and overhead utilities
- Uneven terrain
- Hand injuries

Site preparation activities could be affected by the following biological hazards:

- Insect bites and stings
- Poisonous plants
- Reptiles, such as snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection [1]	Escape respirator
Chemical protective clothing [2]	None
Hand protection: inner gloves	None
Hand protection: outer gloves	Cotton or leather work gloves
Foot protection: inner boots	Steel-toe, leather work boots
Foot protection: outer boots	None
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	None
Other protective clothing	High visibility, reflective vest, such as an orange traffic type vest
Hearing protection	Ear plugs or muffs with NRR of at least 25
[1] Escape respirator is required by all personnel on site. [2] Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Additional information on PPE and respiratory protection is provided in Sections 7.0 and Attachment L.

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 5.0. All field personnel will notify the site ENTACT Health and Safety Officer (HSO) and ENTACT Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

Air Monitoring

Air monitoring of personnel and the work area is not required for this job task. Dust suppression methods will be used to control nuisance dust with the goal of dust suppression being the avoidance of any visible dust. Section 8 provides additional information on air monitoring.

HASP-AT-A-GLANCE – HAUL ROAD IMPROVEMENT ACTIVITIES

ACKNOWLEDGEMENTS

See table of emergency contacts for telephone numbers.

Responsibility:	Signature:	Date:
ENTACT Health and Safety Officer		
ENTACT Field Project Manager		

This summary sheet is provided as a quick reference for select activities at the Tronox Manganese Tailings Project. Not every task listed in the scope of work will have a HASP-At-A-Glance (HAAG) the remainder of this HASP provides general health and safety procedures that must be adhered to while conducting any work at the project site. Procedures for updating or amending this HASP are outlined in Section 1.4.

PROJECT ACTIVITIES

These activities include the improvement and upgrading of existing haul roads for heavy truck traffic. A combination of manual labor and mechanical equipment will be employed to accomplish these tasks.

Mechanical equipment will include the use of excavators, bulldozers and road graders. Manual labor will include the use of hand tools.

Constituents of Concern

The following constituents of concern (COC) are present at the site:

- Manganese tailings
- Nuisance dust

Sections 5.0 and 8.0 describe additional health hazards and air monitoring requirements, respectively, of the COC at the site. Exposure to the COC is limited during this task.

Hazard Analysis

Haul road improvement activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects

- Rotating equipment
- Noise
- Vehicle traffic
- Slip, trips, falls
- Heavy lifting (ergonomics)
- Earth work
- Weather, including heat or thunderstorms
- Earthquake
- Underground and overhead utilities
- Uneven terrain
- Hand injuries

Haul road improvement activities could be affected by the following biological hazards:

- Insect bites and stings (ticks) Lyme disease or Rocky Mountain Spotted Fever
- Poisonous plants
- Reptiles, such as snakes

Minimum Protective Clothing and Equipment Requirements

Level D personal protective equipment (PPE) is anticipated for this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection [1]	Escape respirator
Chemical protective clothing [2]	None
Hand protection: inner gloves	None
Hand protection: outer gloves	Cotton or leather work gloves
Foot protection: inner boots	Steel-toe, leather work boots
Foot protection: outer boots	None
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	None
Other protective clothing	High visibility, reflective vest, such as an orange traffic type vest
Hearing protection	Ear plugs or muffs with NRR of at least 25

Level D PPE	
Protective Gear	**Type**
[1] Escape respirator is required by all personnel on site. [2] Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Additional information on PPE and respiratory protection is provided in Sections 7.0 and Attachment L.

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined above and in Section 5.0. All field personnel will notify the site ENTACT Health and Safety Officer (HSO) and ENTACT Field Project Manager (FPM) when reporting for and leaving work by signing in at the on-site trailer. In addition, if miscellaneous construction activities are conducted within an exclusion zone personnel will sign in and out on the exclusion zone log.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

Air Monitoring

Real-Time dust monitoring of the work area is to be completed in accordance with Section 8. Dust suppression methods will be used to control nuisance dust with the goal of dust suppression being the avoidance of any visible dust. Section 8 provides additional information on air monitoring.

HASP-AT-A-GLANCE – EXCAVATION AND LOADING OF TAILINGS

ACKNOWLEDGEMENTS

See table of emergency contacts for telephone numbers.

Responsibility:	Signature:	Date:
ENTACT Health and Safety Officer		
ENTACT Field Project Manager		

This summary sheet is provided as a quick reference for select activities at the Tronox Manganese Tailings Project. Not every task listed in the scope of work will have a HASP-At-A-Glance (HAAG) the remainder of this HASP provides general health and safety procedures that must be adhered to while conducting any work at the project site. Procedures for updating or amending this HASP are outlined in Section 1.4.

PROJECT ACTIVITIES – EXCAVATION AND LOADING OF TAILINGS

This task involves the use of heavy equipment and manpower for excavation and loading of manganese tailings from onsite stockpiles into over-the-road trucks. Equipment will include excavators, dozers, loaders and over the road dumps.

Constituents of Concern

The following constituents of concern (COC) are present at the site:

- Manganese Tailings
- Nuisance dust

Sections 5.0 and 8.0 describe additional health hazards and air monitoring requirements, respectively, of the COC at the site. Exposure to the COC is limited during this task.

Hazard Analysis

Excavation and loading activities could be affected by the following physical hazards:

- Exposure to nuisance dust
- Pinch points/sharp objects
- Noise
- Vehicle traffic
- Heavy equipment hazards

- Slip, trips, falls
- Heavy lifting (pumps, hoses)
- Weather, including heat or thunderstorms
- Underground and overhead utilities
- Uneven terrain

Excavation and loading activities could be affected by the following biological hazards:

- Insect bites and stings (ticks) Lyme disease or Rocky Mountain Spotted Fever
- Poisonous plants
- Reptiles, such as snakes (rattlesnakes)

Minimum Protective Clothing and Equipment Requirements

Level D+ personal protective equipment (PPE) is anticipated for personnel on the ground and not within enclosed cabs during this task and is defined below.

Level D PPE	
Protective Gear	**Type**
Respiratory protection [1]	Escape respirator
Chemical protective clothing [2]	None
Hand protection: inner gloves	None
Hand protection: outer gloves	Cotton or leather work gloves
Foot protection: inner boots	Steel-toe, leather work boots
Foot protection: outer boots	None
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection	None
Other protective clothing	High visibility, reflective vest, such as an orange traffic type vest
Hearing protection	Ear plugs or muffs with NRR of at least 25
[1] Escape respirator is required by all personnel on site. [2] Associates may wear Tyvek or similar coveralls as protection from ticks and insects.	

Certain work activities carried out within the exclusion zone, with limited potential for contact with impacted materials, will not require the use of disposable coveralls. Truck drivers and equipment operators transported to their enclosed cab air conditioned vehicles

are permitted to utilize standard Level D protection and boot/shoe covers.

Authorized visitors, project oversight and owners representatives entering the exclusion zone and remaining within enclosed cab air conditioned vehicles required standard Level D PPE.

Additional information on PPE and respiratory protection is provided in Sections 7.0 and Attachment L.

Engineering and Administrative Controls

All activities will be conducted in accordance with provisions outlined in Section 5.0. All field personnel will notify the site ENTACT Health and Safety Officer (HSO) and ENTACT Field Project Manager (FPM) when reporting for and leaving work. In addition, personnel performing these activities will sign in and out on the exclusion zone log.

Fire extinguishers must be available in the trailer and each vehicle or piece of equipment.

Dust suppression will be accomplished using water trucks to keep dust levels low.

Air Monitoring

Real-Time dust monitoring of the work area is to be completed in accordance with Section 8 of this HASP and in accordance with current OSHA standards for worker protection. Dust suppression methods will be used to control nuisance dust with the goal of dust suppression being the avoidance of any visible dust.

Section 8 provides specific ENTACT requirements for project air monitoring.

COMPREHENSIVE HEALTH AND SAFETY PLAN

1.0 PURPOSE AND POLICY

1.1 INTRODUCTION

This document describes the health and safety guidelines developed for the Tronox Manganese Tailings Project located in Henderson, Clark County, Nevada to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. It is ENTACT's policy to provide a safe and healthy workplace for all employees.

The purpose for this site-specific health and safety plan (HASP) is to set forth, in an orderly and logical fashion, appropriate safety procedures to be followed during on-site activities at the site by ENTACT. This HASP cannot include all of the policies and procedures set forth in the ENTACT Behavior Based Safety System; therefore, they are incorporated by reference and available at: http://connected.entact.com/index.php.

All attachments that are referenced in this Health and Safety Plan are compiled and maintained under separate cover.

1.2 REGULATORY FRAMEWORK

All work practices and procedures implemented on site will be designed to minimize associate contact with hazardous materials and to reduce the possibility of physical injury. All work will be performed in accordance with the following:

- Occupational Safety and Health Administration (OSHA) regulations found in Title 29 of the *Code of Federal Regulations* (CFR) Parts 1910 and 1926
- National Institute for Occupational Safety and Health (NIOSH) Publications 85-115
- American Conference of Governmental Industrial Hygienists (ACGIH) Publication *Threshold Limit Values and Biological Exposure Indices*
- US Environmental Protection Agency (EPA) Publication No. PB9285.1-03
- American National Standards Institute (ANSI) guidelines (various)
- Nevada Dept. of Business and Industry, Occupational Safety & Health Enforcement Section Workplace Safety Program

1.3 APPLICATION OF BBS

BBS is utilized to prevent or reduce losses and safety incidents using tools and management techniques to achieve a safe work environment with the ultimate goal of zero accidents. This is accomplished by focusing on work activities and behaviors, and identifying and eliminating hazards before an incident occurs. BBS is implemented as follows:

- JTR – performed by all associates to briefly assess the risk of each work task prior to work beginning. In addition, associates will perform a self-assessment to determine if they are fit for duty to perform their tasks. If an associate feels he/she is not fit for duty, their supervisor must be notified immediately before work begins.
- JSA – developed for all major work tasks and processes, reviewed before the task is done (daily, if applicable,) and updated or revised as needed to address changes in the workplace, equipment, personnel, etc.
- JTO – conducted on a planned and regular basis
- NLI/LI – performed as needed to determine root causes and contributing factors of near loss and loss incidents

1.4 MODIFICATIONS TO THE HASP

The procedures and guidelines contained herein were based upon the best available information at the time of the plan's preparation. Specific requirements will be revised when new information is received or conditions change. Any amendments to this plan will be documented on the form in Attachment A, Site Safety Plan Amendment, and will be approved by the Field Project Manager, Project Health and Safety Coordinator, and Health and Safety Officer. A hasp amendment log will also be maintained in Attachment A.

1.5 STOP WORK AUTHORITY

All on-site personnel are empowered, are expected, and have the responsibility to stop their own work and the work of co-workers, client employees, or other contractors if any person's safety or the environment are at risk. NO repercussions will result from this action.

Site or project conditions that are possible reasons to stop work and to consider modifications to the HASP include:

- Deviation from planned work activities. The deviation must be discussed and approved by the FPM and the HSO before work can proceed.

- Recognition of new or unidentified hazards
- Site temperatures outside the range predicted in this HASP (possibly resulting in greater risk of heat or cold stress)
- PPE breakthrough or unexpected degradation
- Unusual odors that can't be identified
- Unexplained, elevated readings on an organic vapor monitor
- Unexpected changes in soil coloration or texture that might indicate undisclosed contamination.

This list is not comprehensive and should be used only as guidance (also refer to Section 6.0, for emergency response procedures).

If anyone is discouraged from exercising the "Stop Work Authority" or if there are penalties for doing so, then affect individuals should report this action to the ENTACT Health and Safety Director at (972) 580-1323.

1.6 SUBCONTRACTOR COORDINATION

ENTACT recognizes that safety begins with a commitment. Supporting the ENTACT Behavior Based Health and Safety System is as important a responsibility as are all other project concerns. ENTACT places the same emphasis on subcontractors.

Certain activities performed at the site may require the use of subcontractors. ENTACT's Health and Safety Plan will be made available to all subcontractors, which they must adopt and comply with at a minimum. This plan is applicable to the subcontractors insofar as ENTACT will be directing the work. If subcontractor performs work not addressed in ENTACT's Heath and Safety Plan, the subcontractor will provide ENTACT with a copy of their Health and Safety Plan and JSAs applicable to the job tasks being performed, or a summary of their scope of work and applicable JSAs. All subcontractors will participate in ENTACT site safety meetings.

Subcontractor personnel working on site will be enrolled in their company's medical monitoring program per OSHA regulations. Subcontractors will supply their own PPE and other safety equipment.

Subcontractors are responsible for the safety and well being of their personnel and the condition and maintenance of their equipment, vehicles, and tools.

Subcontractor personnel working on site will be enrolled in their company's medical monitoring program. Subcontractor personnel will have a medical monitoring exam within the previous 12 months.

See Section 4.0 for subcontractor training requirements.

2.0 SITE DESCRIPTION AND SCOPE OF WORK

This section provides a site description and information about previous site investigations and the scope of work.

2.1 SITE DESCRIPTION

Tronox, LLC intends to remove stockpiled historic manganese tailings on the Tronox property located at 8000 W. Lake Mead Parkway in Henderson, NV. The work site is located within the active Tronox facility.

The site map is shown as Figure 2.1.

2.2 SITE HISTORY

Tronox owns the central portion of the BMI Complex. Tronox was formerly Kerr-McGee Chemical LLC. The Tronox facility is located within the Black Mountain Industrial (BMI) complex. The facility is approximately 450 acres in size and is the largest "facility" in the complex. Our work is limited to removal of stockpiled Manganese Tailings.

2.3 SCOPE OF WORK

An overview of the scope of work, as provided in bid package, is as follows:

- Pre-mobilization activities (HASP, Temporary Security Facilities etc.)
- Mobilization
- Installation of Erosion and Sediment Controls
- Haul Road Improvements
- Excavation and Loading of Tailings
- Final Grading
- Demobilization

The tasks listed above are grouped by hazard and may not strictly follow the objectives or chronology of events detailed in the ENTACT work plan. Field activities are scheduled to begin on April 27, 2010 and are schedule to be completed by June 30, 2010.

2.4 PHOTOGRAPHS AND VIDEO

Pictures and video are not allowed under any circumstances without the permission of the client representative.

2.5 WASTE MANAGEMENT

All excavated tailings will be shipped as non-hazardous waste to the Apex landfill, 13550 N. US Highway 93, Las Vegas, NV.

ENTACT will not utilize chemicals when performing the scope of work for this project. General site trash is disposed of in a designated dumpsters and emptied regularly.

FIGURE 2.1

SITE VIEW

3.0 PROJECT TEAM ORGANIZATION AND RESPONSIBILITIES

Responsibilities for ENTACT associates are described below using titles familiar to ENTACT staff. The names of key personnel on this project are listed in Table 3.1 and ENTACT's health and safety organization charts are in Figures 3.1 and 3.2.

3.1 ENTACT PROJECT COORDINATOR

The Project Coordinator will report directly to the client and ensure all project members strive for zero incidents. The responsibilities of the Project Coordinator will be the successful completion of the project, but the number one goal will be a safe and healthy work site with zero incidents.

3.2 ENTACT PROJECT HEALTH AND SAFETY COORDINATOR

The Project Health and Safety Coordinator (PHSC) is responsible for writing, reviewing, and approving the site-specific HASP and implementing ENTACT's Health and Safety Program. The PHSC will serve as the primary contact to review health and safety matters and provide direction to the ENTACT Field Project Manager and On-site Health and Safety Officer(s) as necessary on issues related to health and safety. The PHSC will be responsible for conducting the health and safety orientation meeting prior to the start of field activities, reviewing weekly project safety reports, and conducting health and safety inspections and audits at the site project. The PHSC will also review all BBS reports generated by the project.

3.3 ENTACT FIELD PROJECT MANAGER

The ENTACT Field Project Manager (FPM) will be responsible for directing all site personnel, equipment, subcontractors, and activities to ensure a safe and successful implementation of the on-site activities. The FPM will have overall responsibility for the health and safety of site personnel. The FPM will ensure adequate resources are provided to carry out established health and safety responsibilities and will enforce the site-specific HASP. He will ensure proper communications is established for emergency response. The FPM will coordinate with the on-site Health and Safety Officer in the planning and implementation of all site activities and ensure site personnel are knowledgeable of site hazards and assists with the development of JSA.

3.4 ENTACT HEALTH AND SAFETY OFFICER

The ENTACT Health and Safety Officer (HSO) is responsible for implementing the site-

specific HASP. The ENTACT HSO will conduct periodic site safety audits. Specific duties include, but are not limited to:

- Assume responsibility for health and safety of ENTACT personnel and promote ENTACT's safety culture
- Document safety concerns reported by the field crew and subcontractors
- Supervise decontamination of personnel and equipment
- Ensure air monitoring equipment is calibrated and operational
- Conduct personal air monitoring on all ENTACT personnel as outlined in 29 CFR 1910.120 (h) (4) and this plan
- Perform respiratory fit tests
- Inventory and inspect PPE prior to personnel entering work area
- Prepare summary letter of personal air sampling results
- Select levels of personal protective equipment (PPE) based upon the site-specific HASP, chemical properties, and air sample results
- Post OSHA Log annually or as required by OSHA.
- Ensure that all on-site ENTACT personnel have had medical exam and are fit for duty
- Inspect first aid kits and fire extinguishers
- Assist with the preparation and review of JSAs
- Ensure that all associates have required health and safety training
- Encourage the use of "Stop Work Authority" if required
- Be part of the investigation team for all significant near losses and loss incidents
- Schedule JTOs
- Coordinate safety orientation as well as daily safety meetings
- Work with the FPM daily regarding work activities
- Complete Weekly Project Safety Report and forward it to ENTACT's Project Health and Safety Coordinator
- Ensure all site personnel (ENTACT field crew and subcontractors) have taken the written test and orientation to document understanding of site-specific risks

The HSO and the FPM will work together to promote a safety goal of zero incidents and zero incidents. The alternate HSO will be the Field Project Manager.

3.5 ENTACT FIELD CREW

Each ENTACT associate (field crew member) is responsible for consistently completing their work in a safe manner with a common goal of zero incidents, asking questions if the task is not understood, and understanding and signing the site-specific HASP as well as the following:

- Report any unsafe or potentially hazardous conditions to the FPM or the HSO
- Comply with rules, regulations, and procedures as set forth in this HASP

- Express safety ideas or concerns in the daily safety meetings
- Perform an JTR before performing any task
- Perform JTO under the direction of the HSO
- Utilize "Stop Work Authority" if required
- Take a written test and orientation to document understanding of site-specific risks

By signing the Safety Plan Acknowledgment Form (Attachment B) individuals are recognizing the potential hazards present on-site and the policies and procedures required to minimize exposure and/or adverse effects of these hazards.

3.6 SUBCONTRACTORS

ENTACT will provide basic BBS training to subcontractors during the site orientation and daily tailgate safety meetings. Subcontractors must take a written test to document understanding of site-specific risks.

3.7 OTHER PERSONNEL

Examples of other personnel that may be on site include representatives of the Federal, State, and county agencies, and ENTACT's client. Any person who observes safety problems should immediately report observations or concerns to appropriate key personnel. Although other personnel typically only make on-site observations, they will be expected to read, abide by, and sign the HASP and receive a documented site orientation. Should agency personnel refuse to abide by site safety requirements, work will be stopped while these personnel are on site. Every ENTACT associate has the authority and obligation to stop work in order to prevent incidents and injuries.

Table 3.1
Key ENTACT Personnel

ENTACT Title	Name	Telephone Number
Principle Contractor	ENTACT 3129 Bass Pro Dr. Grapevine, TX 76051	(972) 580-1323
Health and Safety Director	Don Self	Office: (972) 580-1323 Cell: (630) 669-4259
Project Coordinator	Erik Gehringer	Office: (972) 580-1323 Cell: (561) 707-7088
Project Health and Safety Coordinator	R. F. (Rick) MacIntyre, CSP	Office: (972) 580-1323 Cell: (214) 663-3282
Field Project Manager	Bob Ainslie	Cell: (307) 359-1141
Health and Safety Officer	Amy Hearnsberger	Cell: (630) 453-1797

Figure 3.1
ENTACT Health and Safety Organization Chart

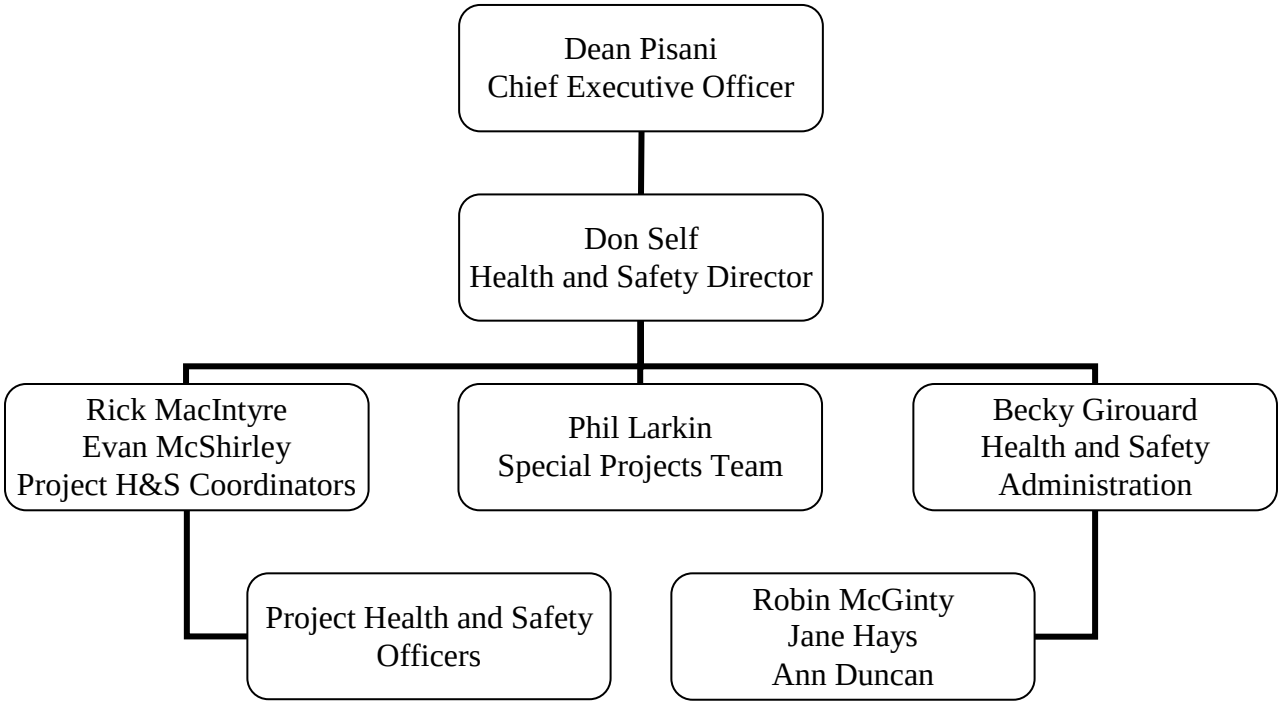
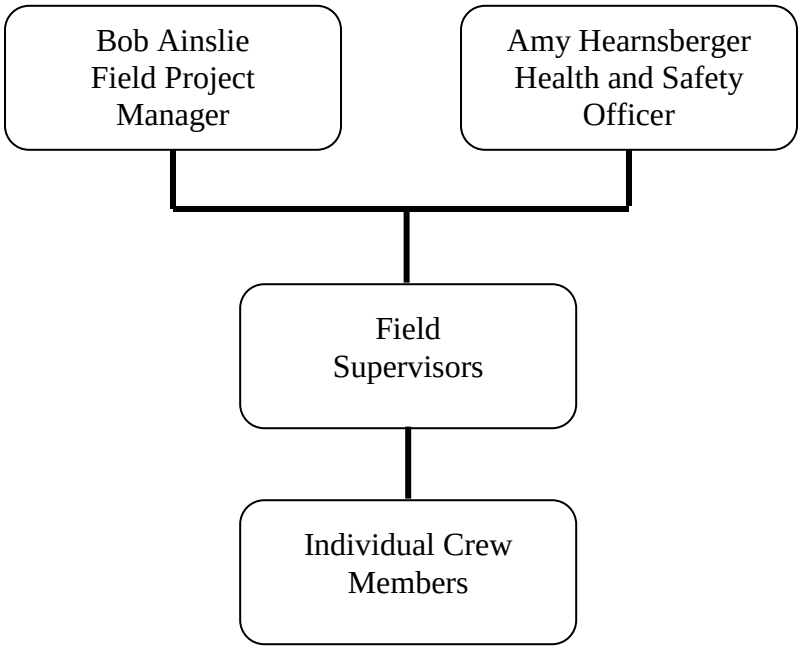


Figure 3.2
Site Specific Health and Safety Organization Chart



4.0 TRAINING AND MEDICAL MONITORING REQUIREMENTS

This section describes the general and site-specific training requirements as well as medical monitoring requirements.

4.1 GENERAL TRAINING

All ENTACT associates are required to complete 40 hours of classroom training in accordance with 29 CFR 1910.120. All field personnel receive 8 hours of refresher training on an annual basis covering the initial 40 classroom topics beginning within the 12 months of the individual's initial 40-hour class. FPMs are required to have 8 hours of training on safe management of hazardous waste sites, also in compliance with 29 CFR 1910.120. Site personnel will have completed BBS training prior to beginning work. In addition, the following criteria shall be met:

- All assigned personnel will receive site-specific training on routes of exposure and adverse health effects associated with the chemicals listed on the table of hazards in Section 5.
- All site assigned personnel will complete BBS training.
- At least one member of each work crew shall have training in the use of portable fire extinguishers in accordance with 29CFR 1910.157 (g).
- Personnel newly assigned to hazardous waste work will receive 3 days of on the job training by an FPM.
- Each person entering the site shall sign a statement attesting to the fact that they have read and understand this site-specific HASP. Refer to Attachment B for sign in sheet.
- All subcontractors entering the decontamination zone and exclusion zone will have adequate training satisfying 29 CFR 1910.120 and other training necessary to their particular task.
- Daily health and safety tailgate meetings will be held each morning and after lunch prior to work beginning. Specific safety topics will be discussed including prior days' activities. All site discussions will be documented.
- First aid/CPR training (minimum of one associate is trained for every 10 crew members).
- All associates will follow the General Site Safety Rules (see Attachment C).
- All ENTACT associates are expected to abide by the terms of the Drug and Alcohol Policy (see Attachment D).
- Hazard Communication (Right-to-Know).
- Traffic routes and hazards.
- Excavation competent person (usually FPM or his/her designee).

4.2 SITE-SPECIFIC TRAINING

All field team members and subcontractors are required to attend the pre-mobilization safety briefing held before field work begins. The safety briefing will cover the contents of this HASP including roles and responsibilities, a review of job hazard analysis, and safe work practices. The site's emergency response and evacuation practices will be reviewed in detail. A tour of the site and work area will also be included in the pre-mobilization briefing.

Specifically, the pre-mobilization safety briefing will include information on the following:

- Hazards associated with working near overhead or underground utilities.
- Equipment checklist.
- An overview of the requirements contained in the Hazardous Communication (HazCom) Standard.
- Hazardous chemicals present at the site.
- The location and availability of the written HazCom Program.
- Physical and health effects of the hazardous chemicals on-site.
- Methods of preventing or eliminating exposure.
- Emergency procedures to follow if exposed.
- How to read labels and review material safety data sheets (MSDS) to obtain information.
- Location of MSDS file and location of chemical list.
- Equipment being used.
- Site layout.
- All required PPE including hand protection.
- Respirator fit test.
- Locations of fire extinguishers, eye wash stations, and first aid locations.
- Requirements for driving company vehicles, documented weekly inspections, and their upkeep.
- Task analysis.
- Air monitoring protocol and location of results.
- Reporting of all incidents including vehicle or equipment damage.
- Daily safety meetings.
- Tronox Contractor Safety orientation.

Attendance at tailgate safety meetings, which are held each morning and afternoon, is also required. Topics of the tailgate safety meetings will include a discussion of that day's activities and the potential hazards which may be encountered. The ENTACT HSO or designee will lead the meetings and record the topic(s) discussed. All field team members are required to sign-in to document their attendance. Meeting topics will include ENTACT's behavior-based safety system and other pertinent safety information.

4.3 MEDICAL MONITORING

Pursuant to 29 CFR 1910.120, all ENTACT field personnel are required to have a pre-employment medical examination and annual update physicals. All associates must pass a pre-established physical including heavy metals blood work before being assigned to the work site. A copy of the medical pass or fail sheet will be kept on file at the site. In addition, a copy of the certificates for training, refreshers, first aid, CPR, respirator fit tests, medical fitness, and other pertinent information will be filed and available on site.

ENTACT field personnel are routinely monitored for blood lead, cadmium, and arsenic levels. Although exposure to these metals is not anticipated at the site, following any incidental or suspected exposure personnel will be scheduled for a special physical examination. The physical examination will focus on the specific contaminants and the associated target organs as well as test for blood lead, cadmium, and arsenic levels for comparison to previously established baselines.

5.0 SITE HAZARD ANALYSIS

Physical, chemical, and biological hazards exist at the work site. While all potential site hazards cannot be identified during HASP development, many can be anticipated. This section discusses the anticipated hazards and offers controls to minimize risk. Task safety assessments are provided at the end of this section.

5.1 CHEMICAL HAZARDS

Chemical hazards present in environmental media (soil, tailings) include manganese at concentrations of 15 – 25% as manganese dioxide. Project activities performed by ENTACT will likely involve some contact with manganese tailings in environmental media. Particulates (nuisance dust) will represent a general site hazard. Appropriate PPE for site activities are addressed in Section 7.0.

The exposure limits for chemical hazards of concern and nuisance dust are listed in Table 5.1.

TABLE 5.1
CHEMICAL HAZARDS

Chemical	PEL REL TLV IDLH	UEL LEL Flash Point IP	Routes of Exposure	Acute and Chronic Health Hazards
Manganese (as Mn)	PEL: 5.0 mg/m^3 REL: 1.0 mg/m^3 TLV: 0.2 mg/m^3 IDLH: 500 mg/m^3	UEL: NA LEL: NA F Pt.: NA IP: NA	Inh. Ing.	Irritates eyes, skin, throat, upper respiratory system. CNS and pneumonitis.
Nuisance dust (particulates NOR)	PEL:15 total/5 resp mg/m^3 REL: NE TLV: 10 total/3 resp	Varies	Inh. Con.	Irritates eyes, skin, throat, upper respiratory system

Key of Abbreviations

Carc.	Carcinogen	LEL	Lower Explosive Limit
Con.	Contact	PEL	Permissible Exposure Limit
IDLH	Immediately Dangerous to Life and Health	SA	Skin Absorption
F.Pt.	Flash Point	TLV	Threshold Limit Value
Inh.	Inhalation	UEL	Upper Explosive Limit
Ing.	Ingestion	VP	Vapor Pressure
IP	Ionization Potential	f/cc	Fiber per cubic centimeter

5.1.1 MSDS and Right–To-Know

ENTACT will communicate chemical hazards to all associates as required by Title 29 Code of Federal Regulations 1910.1200. The use of chemicals is anticipated to be minimal at the site. A brief list is included below of certain chemicals that may be necessary. Any additional chemicals used will be added to the list and the MSDS will be added to the MSDS folder located at the ENTACT project trailer or administrative offices.

- Gasoline
- Diesel
- Hydraulic Oil
- Motor Oil

MSDS will be discussed at the initial site safety orientation and daily safety meetings as applicable. Site personnel will comply with OSHA Hazard Communication Standards (Right-To-Know) and ENTACT's Hazard Communication Policy. All containers received on site will be inspected by the FPM/HSO who will use the HMIS label. This will ensure that the containers are properly labeled with hazard warnings in compliance with OSHA Hazard Communication regulations.

OSHA and the EPA have established a chemical safety data bank for quick reference to over 800 chemicals. While this does not replace the need for MSDS it is a quick reference for chemical safety and PEL information.

http://www.osha.gov/web/dep/chemicaldata/#target

5.2 NON-CHEMICAL HAZARDS

Physical hazards, such as those associated with excavation, heavy equipment, debris removal, and other construction activities, will likely pose the greatest potential for injury at the site. Physical hazards can be caused by the following:

- Underground and overhead utilities
- Heavy equipment
- Trenching and excavation
- Noise
- Weather
- Slip, trip, and fall
- Fire protection
- Debris removal

- Traffic
- High-pressure cleaning
- Water hazards
- Hazardous energy sources (lock-out/tag-out)
- Hand injury hazard

Injuries that may result from these physical hazards can range from simple slip-trip-fall types of incidents to casualties, including fatalities due to moving or rotating equipment, electrocution, engulfment, or other activities related to construction. Injuries resulting from physical hazards can be avoided through the adoption of safe work practices and associate involvement. If there is any deviation from planned work activities, stop work authority must be initiated immediately. The deviation must be discussed and approved by the FPM and the HSO before work can proceed. Each of the above mentioned physical hazards are discussed below:

5.2.1 Underground and Overhead Utilities

Before heavy equipment is used, all utilities (electricity, natural gas lines, water lines, sewer lines, etc.) must be identified. ENTACT will contact Nevada Underground Service Alert - North (800) 226-2700 for locating utilities and pipelines on the property. In addition, the Federal Communications Commission (FCC) has approved the use of 811 as a national call-before-you-dig telephone number. Each day before work begins, utility locations will be discussed as they relate to planned activities.

Table 5.2
Requirements for Equipment Operation
Near Power Lines (29 CFR 1926.550)

ACTIVITY	LINE RATING	MINIMUM CLEARANCE
Equipment Operation	< 50 kV	10 feet
	> 50 kV	10 feet + 0.4 inches per each kV over 50 kV, or 2 times the length of the line insulator (minimum of 10 feet)
In transit with no load and boom lowered	< 50 kV	4 feet
	> 50 kV to 345 kV	10 feet
	345 kV to 750 kV	16 feet

Note: kV = kilovolts

5.2.2 Heavy Equipment

Heavy equipment and its operation can represent a significant safety hazard if proper experience is not combined with site-required procedures. Only trained and experienced personnel will perform operation of heavy equipment. Personal protective equipment (PPE) such as steel-toed shoes, safety glasses or goggles, hearing protection, hard hats, and high visibility vests must be worn whenever such equipment is present. Equipment will have a fire extinguisher on board, audible backup alarm, and spill kit. See Attachment E, Equipment Safety, for additional requirements for heavy equipment.

5.2.3 Trenching and Excavation

Although most work involves reduction in existing stockpiles, excavation activities may occur to excavate material within the former cooling tower area. Any excavation and trenching activities shall comply with OSHA 29 CFR 1926.650 Subpart P. Attachment F, Excavation Safety, provides excavation and trenching requirements that will be followed if site activities or conditions warrant. Excavation inspections are only required when employee exposure can be reasonably anticipated.

5.2.4 Noise

Heavy equipment, power tools, and other construction equipment and activities may produce noise levels above acceptable standards. High noise levels (85 dBA or higher) can contribute to hearing loss as well as interfere with communication between associates. All personnel shall wear hearing-protective devices with a minimum noise reduction rating (NRR) of at least 25 (either earplugs or muffs) if they are within 25 feet of such operating equipment or when noise levels interfere with normal speech. Hand signals will be established by on-site personnel as appropriate to facilitate communications while involved in high-noise activities.

5.2.5 Weather

Adverse weather conditions will be important considerations when planning and conducting site operations. Hot and cold weather may be encountered as well as thunderstorms and lightning. A break trailer equipped with air conditioning and heating will be part of the site setup. Attachment G, Basic Emergency Medical and First Aid address precautions and treatment of heat and cold stress.

Thunderstorms and Lightning

Thunderstorms and lightning pose a threat to safety for personnel working outdoors. ENTACT follows the 30 – 30 Rule for lightning safety; at any time when there is less than 30 seconds between a lightning flash and the following thunder work will be

suspended and personnel will seek shelter. Work will not resume until 30 minutes after the last lightning strike with an interval less than 30 seconds.

Tornado Related Weather

A tornado watch defines an area where tornadoes and other kinds of severe weather are possible in the next several hours. It does not mean tornadoes are imminent -- just that you need to be alert, and to be prepared to go to safe shelter if tornadoes do happen or a warning is issued. This is the time to:

- turn on NOAA radio
- verify location of fellow workers and subcontractors
- watch the sky
- make sure you have ready access to safe shelter
- contact your Project Manager so they are aware of the weather conditions

A tornado warning means that a tornado has been spotted, or that Doppler radar indicates a thunderstorm circulation which can spawn a tornado. When a tornado warning is issued for Clark County, take immediate cover.

5.2.6 Slip, Trip, and Fall Hazards

Slip, trip, and fall hazards may exist throughout the site. Protection from slip, trip and fall hazards will be provided through standard safety procedures including good housekeeping. Properly locating equipment and tools, removing debris and trash, and taking general precautions during site operations will be standard operating procedures. Associates will be apprized of any potential trip hazards through regularly scheduled health and safety meetings. Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards to associates will be neutralized as soon as they are identified. ENTACT and any subcontractors will be responsible for the use of safety harnesses, lifelines, lanyards, safety nets, etc., for safeguarding their employees when performing elevated work in compliance with 29 CFR 1926.500 Subpart M. Refer to the ENTACT's Behavior Based Health and Safety System for Fall Protection information.

5.2.7 Fire Prevention

Fire extinguishers shall be provided in fuel areas, storage areas, portable buildings, and equipment. All extinguishers will be inspected, serviced, and maintained. No burning of materials will take place at the project site. All flammable liquids and combustibles will be marked and stored in a manner to conform to NFPA and OSHA requirements. A hot work permit will be used when welding or cutting work is performed.

5.2.8 Debris Removal

Debris removal will be accomplished with equipment and manual labor. Proper PPE, daily work requirements, manual lifting techniques, and good housekeeping must be discussed and maintained. Debris removal will be an ongoing process that has many slip, trip, and fall hazards that must be addressed. Nails, metal panels, sharp edges, heavy loads, and biological hazards are some of the hazards associated with this job. Daily work activities will be discussed each day.

5.2.9 Traffic

Site personnel will maintain reasonable dust-free traffic. Dust suppression activities may be implemented. All traffic will follow typical construction safety practices. Specific on-site and off-site traffic routes will be established to accommodate construction activities as well as work crews commuting from their local lodging to the work site. Necessary demarcation of routes, speed limits, and hazards will be made as appropriate. A journey management plan (JMP) will be completed by FPM and HSO before work begins and will be updated or revised as necessary for on-going work activities. A blank JMP is included in Attachment H. Vehicles will be inspected weekly using ENTACT's Company Vehicle Weekly Inspection form.

ENTACT associates must comply with the ENTACT Driver Safety and Cell Phone Policy which states that associates may not talk on cell phones while the vehicle is in motion, driver and passengers must wear seat belts, no one is allowed to ride in the back of pickup trucks, all cargo must be secured (in cab, on trailer, bed, etc. Additionally, this applies to the use of 2-way radios and other electronic equipment that may cause distraction.

5.2.10 High-Pressure Cleaning

Decontamination activities will mostly involve pressure washing of truck tires. If pressure washing is necessary on the jobsite, utilizing pressure in excess of 1,000 PSI requires specific procedures and training that must be followed. Pressure below 1,000 PSI does not mean that it cannot cause injury or requires any less attention to basic procedures. Adequate precautions are required at all pressures. The use of high-pressure water can cause severe injuries and extreme caution and strict compliance with operating procedures must be followed.

- Only trained personnel will be allowed to use the equipment.
- No portion of the body shall ever be placed in front of the water jet. The jets of water can easily puncture and tear the skin or penetrate deeper causing infection or serious internal damage.

- The use of zero tips must be approved by the FPM/HSO prior to use.
- A job review will be made prior to high-pressure water being used.
- Manufacturer's recommendations and requirements will be followed.
- PPE will follow guidelines outlined in Section 7, Level D+ requirements.
- PPE will include full face piece and metatarsal protection
- High-pressure cleaning may require partial body or total entry into tanks with a corresponding increase in PPE and other requirements
- Only essential personnel will be allowed in the work area.

Training will include:

- Hazards associated with the use of high pressure equipment.
- The cutting action of high-pressure water.
- The need and limitations of PPE.
- Operations of system start-up, shutdown, and potential problems.
- The purpose of all safety devices.
- Proper method of connecting hoses (laying out without kinks) using the proper tools for hook-ups.
- The proper stance for sound footing.
- Associate shall demonstrate knowledge and skill in the proper application of the equipment to the FPM/HSO.

5.2.11 Water Hazards

Although water hazards are not anticipated for this project, any work within 5 feet of a water body will follow appropriate safety precautions. Personnel flotation devices (PFD) are required and must meet U.S. Coast Guard requirements. The buddy system will be enforced at all times. No one will work alone. In addition to PFDs, life rings with suitable lengths of rope will be made available when working near swiftly moving water or that of depths greater than 3 feet. Work near water is primarily defined as that work which involves a potential danger of drowning. Evaluation as to whether work could represent a danger of drowning and hence the requirements of this guidance are applicable, will be done on a site-specific basis, as deemed appropriate, by the Basic Work Team (BWT) as part of Health and Safety Plan development.

5.2.12 Hand Injuries

Hand injuries may be encountered in various ways at this job site:

- Severe cuts or lacerations

- Severe abrasions
- Punctures
- Pinch points
- Repetitive stress
- Crushing
- Thermal burns
- Harmful temperature extremes

Hand hazards and protection specific to the job task will be discussed in the daily tailgate meetings, identified in JSAs, and JTRs will be performed prior to beginning every job task in order to prevent hand injuries.

Associates will know and understand the hazards that exist while performing their job task. Hazards will be mitigated by:

- Applying the correct level of hand protection as described in Section 7 – Personal Protective Equipment.
- Reviewing the hasp and signing the Acknowledgement Form in Attachment B acknowledging they understand the scope of work and hazards involved.
- Inspecting hand protection PPE prior to use and are responsible for immediate replacement of damaged or worn PPE.
- Perform an JTR before the hand is to be used.
- Following the "Rules for Safe Use of Hand Tools."
- Associates verbally communicate with each other what is going on and what your co-worker(s) will be doing next.
- Associates will stop all moving parts before placing hands on them, let the energy out of moving parts, make sure hands are away from potentially moving parts before adding energy. Follow Lock-out/Tag-out Policy in Section 5.2.13.
- Use Stop Work Authority should any unsafe condition exist.
- Fixed open blade knives are prohibited to be used as a tool. Exceptions can be made, but must be approved by the Field Project Manager and ENTACT HSO, and complete the Fixed Open Blade Knife (FOBK) Exception Permit located in ENTACT's Hand Protection Policy.

All associates will comply with ENTACT's Hand Protection Policy.

GLOVE SELECTION	
DUTY/HAZARD	**TYPE OF GLOVE MATERIAL**
Light Duty Abrasions/loss of grip/adsorption	Cotton, Leather, Rubber Coated or Kevlar separately or in combination with nylon / nitrile / Teflon®
Medium Duty Laceration/adsorption	Leather or Kevlar separately or in combination with nylon / nitrile / Teflon®
Heavy Duty Laceration/puncture	Kevlar (exposure to sharp or jagged metal, glass, box cutters, etc), stainless core (stainless steel woven into material), HexArmorTM
High Temperature	Kevlar / Nomex / Fibreglass
Low Temperature	Insulating Gloves
Puncture	Aramid, HexArmorTM

5.2.13 Hazardous Energy Sources (Lock-out/Tag-out)

Site specific lock-out tag-out requirements will be implemented to prevent incidents and injury associated with inspection, maintenance, and/or set-up of equipment, machines, or processes where unintentional start-up, or release of stored energy would be expected to cause harm to persons involved in such work, bystanders or property.

ENTACT will utilize lock-out/tag-out tags attached to the ignition source of vehicles and equipment during inspection, maintenance, and/or set-up. The responsible person for each vehicle will retain the operating key in their pocket or in the field office during the lock-out/tag-out process. This person is responsible for ensuring lock-out/tag-out procedures are implemented and followed.

Associates will stop all moving parts before placing hands on them, let the energy out of moving parts, make sure hands are away from potentially moving parts before adding energy.

5.3 BIOLOGICAL HAZARDS

Personnel will be cautioned not to disturb insects or animals. Personnel with particular allergies to bee or wasp stings will not work in areas where contact is possible unless they notify the HSO of the allergy and carry appropriate anti-venom kits as necessary. First aid kits should include remedies for possible encounters, including equipment for poisonous snakebites. Insect repellents will be available on the site at all times. Personnel with particular allergies to such compounds will be cautioned prior to their application of the chemical makeup.

The following biological hazards may be present at the site. The FPM will instruct the field crew of the applicable biological hazards during the site orientation and periodically throughout the project.

5.3.1 Insect Bites and Stings

Insects could be present at this site making the chance of bites possible. Although they can be painful, they rarely cause death. However, some people have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. The following is a list of preventive measures:

- Apply insect repellant prior to fieldwork and/or as often as needed throughout the work shift.
- Wear proper protective clothing (work boots, socks, and light colored pants).
- Field personnel that may have insect allergies should provide this information to the HSO or FPM prior to commencing work.

Bee, Wasp, Hornet, and Yellow Jacket Stings

- A bee will leave behind a stinger attached to a venom sac. Try to remove it as quickly as possible. One way is to gently scrape it out with a blunt-edged object, such as a credit card.
- Wash the area carefully with soap and water. Do this two to three times a day until the skin is healed.
- Apply a cold pack, an ice pack wrapped in a cloth, or a cold, wet washcloth for a few minutes.
- Give acetaminophen for pain.
- For pain and itching, give an over-the-counter oral antihistamine. You could also apply a corticosteroid cream or calamine lotion to the sting area.
- A sting anywhere in the mouth warrants immediate medical attention. That's because stings in the mucous membranes of the mouth can quickly cause severe swelling that may block airways. You should seek medical care if you note a large skin rash, a large area of swelling around the sting site, or if swelling or pain persists for more than 72 hours. You should seek immediate medical care if you notice any of the following signs, which may indicate a serious or even potentially life-threatening allergic reaction:

    - wheezing or difficulty breathing
    - tightness in throat or chest
    - swelling of the lips
    - dizziness or fainting
    - nausea or vomiting

Spider Bites

Most spiders found in the United States are harmless, with the exception of the black widow and the brown recluse (or violin) spider. Both of these are found in warm climates.

- Wash the area carefully with soap and water. Do this two to three times a day until skin is healed.
- Apply cool compresses.
- Give acetaminophen for pain.
- To protect against infection, apply an antibiotic ointment and keep hands washed.
- If you have any reason to suspect a bite from a black widow or brown recluse spider, apply ice to the bite site and head for the emergency room. Symptoms include:
    - a deep blue or purple area around the bite, surrounded by a whitish ring and a large outer red ring
    - body rash
    - muscle spasms, tightness, and stiffness
    - abdominal pain
    - headache or fever
    - general feeling of sickness
    - lack of appetite
    - joint pain
    - nausea or vomiting

Tick Bites

Check for ticks carefully after you've been in or around a wooded area. Common types of ticks include dog ticks and deer ticks (deer ticks may be carriers of Lyme disease). If you find a tick:

- Call a physician. The doctor may want you to save the tick after removal (you can put it in a jar of alcohol to kill it).
- Use tweezers to grasp the tick firmly at its head or mouth, next to the skin.
- Pull firmly and steadily on the tick until it lets go, then swab the bite site with alcohol.
- **Don't** use petroleum jelly or a lit match to kill and remove a tick.

5.3.2 Plants

The potential for contact with poisonous plants exists when performing fieldwork at the

site. Poison ivy, sumac, and oak may be present on site. Poison ivy can be found as vines on tree trunks or as upright bushes (poison oak is another name for the bush form of poison ivy). 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 sumac can be present in the form of flat-topped shrub or tree. It has fern-like leaves that are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down." Poison sumac is white and has "hairy" berry clusters.

Contact with poison ivy, sumac or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin that needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

The following is a list of preventive measures:

- Know what the plants look like and avoid them.
- Use OTC poison ivy blocker.
- Wear appropriate protective clothing (long sleeves, pants, gloves, etc.)

If you are exposed, according to the FDA, you should quickly (within 10 minutes):

- First, cleanse exposed areas with rubbing alcohol.
- Next, wash the exposed areas with water only (no soap yet, since soap can move the urushiol, which is the oil from the poison ivy that triggers the rash, around your body and actually make the reaction worse).
- Now, take a shower with soap and warm water.
- Lastly, put gloves on and wipe everything you had with you, including shoes, tools, and your clothes, with rubbing alcohol and water.

5.3.3 Snake Bites

There could be the potential for contact with snakes when performing field work. If bitten by a snake, remain calm, keep the affected area below the level of the heart and walk, do not run, to the nearest aid station for assistance. The FPM will immediately transport the victim to the closest medical facility for treatment or send for appropriate medical assistance, whichever is faster.

The following precautions should be used when working in areas with snakes:

- Wear appropriate protection equipment (work boots).
- Be alert and aware of surroundings.
- Avoid walking in wooded areas and through bushes, tall grass or brush as much

as possible.

The following is a list of preventive measures:

- Be familiar with your surroundings.
- If you see a snake, back away slowly and do not touch it.
- Leave snakes alone. Many people are bitten because they try to kill a snake or get a closer look at it.
- Stay out of tall grass unless you wear thick leather boots or chaps.
- Keep hands and feet out of areas you can't see.
- Be cautious and alert when working around brush and debris.

The American Red Cross recommends the following first aid treatment:

- Wash the bite with soap and water.
- Immobilize the bitten area and keep it lower than the heart.
- Get medical help.

5.4 HAZARD ANALYSIS AND MITIGATIONS BY TASK

This section assesses the risks of each major project task, as listed in Table 5.3. A Task Safety Assessment has been prepared and is designed to develop awareness of chemical and physical hazards specific to each task. Information in this section should be discussed prior to the start of each new task to be performed and during daily tailgate safety meetings. It is the responsibility of each associate to assess their task and analyze potential risk reduction procedures before performing their job by conducting a JTR.

It would be impractical to repeat in complete detail each control measure for each job task. Sources and hazards will be addressed for job tasks with reference made to applicable control measures in the following tables and site-specific plans. Tables 5.4 to 5.X should be posted at the command post. When the Task Safety Assessment is discussed, additional hazards may need to be addressed. In addition to reviewing the Task Safety Assessments, associates and the ENTACT HSO will prepare a JSA for each significant work process.

Table 5.3
OVERVIEW OF JOB TASKS

Table	Job Task	Hazard Rating	PPE Level
5.4	Mobilization	Low	D
5.5	Installation of Erosion & Sediment Controls	Low	D
5.6	Haul Road Improvements	Low	D
5.7	Excavation and Loading of Tailings	Low – Med	D+
5.8	Final Grading	Low	D
5.9	Demobilization	Low	D

Table 5.4 **MOBILIZATION AND SITE PREPARATION**		
PPE: Level D		Hazard Rating: Low
Hazard	Sources	Control Measures
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Slip/Trip/Falls	Various Sources	Housekeeping rules shall be established and followed. Pre-existing slip, trip, and fall hazards will be marked, barricaded, or eliminated. Areas will be discussed in safety orientation. Refer to the ENTACT Comprehensive Health and Safety Manual for Fall Protection and Housekeeping.
Electrocution	Electrical utilities	Only qualified electrician will be allowed to hook-up circuits. Extension cords will be inspected. GFCI will be used. Verification that electrical services have been disconnected from the exclusion zone or properly marked and identified.
Hot/Cold Temperatures	Weather Conditions	See Section 5.2.5 and Attachment G
Incidental Injury	Mis-communications; General work activities	Site orientation and training. Positive attitude and behavior will show active participation of self-safety analysis by all associates of tasks to be performed.
Biological Hazards	Insects, Snakes, Ticks, Plants	See Section 5.3.
Explosion/Gas/-Asphyxiation	Utilities	Utilities will be disconnected by utility company and tagged. All utilities will be marked and noted on a facility map. Underground utilities must be verified as de-energized/de-pressured prior to work beginning.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 5.5 **INSTALLATION OF EROSION & SEDIMENT CONTROLS**		
PPE: Level D		Hazard Rating: Low to Medium
Hazard	Sources	Control Measures
Hazardous Atmosphere	Nuisance Dust	Dust suppression.
Slips/Trips/Falls	Various Locations	Identifiable areas will be either eliminated or marked. Discuss in safety meetings. Refer to ENTACT's Comprehensive Health and Safety Manual for Fall Protection and Housekeeping.
Hot/Cold Temperatures	Weather Conditions	See Section 5.2.5 and Attachment G
Biological Hazards	Insects Snakes	See Section 5.3.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Physical Labor	Moving heavy objects and routine tasks	Use moving equipment to transport pumps, piping and hoses. A minimum of two people will be used to move heavy items on uneven surfaces.
Heavy Equipment Injury	Machinery	Qualified operators, daily inspection of equipment. Site orientation will include discussion of swing radius hazards and blind spots. Utilize 3-point mount and dismount procedures at all times.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 5.6 HAUL ROAD IMPRIVEMENTS		
PPE: Level D	Hazard Rating:	Low
Hazard	Sources	Control Measures
Hazardous Atmosphere	Nuisance Dust	Dust suppression
Biological Hazards	Insects, Snakes, Ticks, Plants	See Section 5.3.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Vehicle Traffic	In Plant Vehicles	Use flagger or spotter as necessary. Post truck route signs.
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Hot/Cold Temperatures	Weather Conditions	See Section 5.2.5 and Attachment G
Incidental Injury	Mis-communications; General work activities	Site orientation and training. Positive attitude and behavior will show active participation of self-safety analysis by all associates of tasks to be performed.
Uneven terrain	Slope/grade of excavated hillside	Operators must know and work within limitations of equipment. Follow all safe excavation practices (see Attachment F).
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 5.7 **EXCAVATION AND LOADING OF TAILINGS**		
PPE: Level D+		Hazard Rating: Low - Med
Hazard	Sources	Control Measures
Hazardous Atmosphere	Manganese and Nuisance dust	Dust suppression. Personal monitoring.
Hot/Cold Temperatures	Weather Conditions	See Section 5.2.5 and Attachment G
Slips/Trips/Falls	Debris Mud	Remove excess material. Identify pre-existing problems. Housekeeping must be maintained. Refer to ENTACT's Comprehensive Health and Safety Manual for Fall Protection and Housekeeping.
Heavy Equipment Injury	Machinery	Qualified operators, daily inspection of equipment. A fire extinguisher must be located on all heavy equipment. Utilize 3-point mount and dismount procedures at all times.
Biological Hazards	Insects, Snakes, Ticks	See Section 5.3.
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Traffic	Trucks	All drivers will be given site orientation. Specific routes will be established with site speed limits and directional traffic signs.
Utilities	Underground and Overhead Utilities	Confirm with Operations Manager the locations and depth of all utilities.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 5.8 FINAL GRADING		
PPE: Level D	Hazard Rating:	Low
Hazard	Sources	Control Measures
Hazardous Atmosphere	Nuisance Dust	Dust suppression
Biological Hazards	Insects, Snakes, Ticks, Plants	See Section 5.3.
Noise	Machinery	Hearing protection with a NRR of at least 25 will be worn.
Vehicle Traffic	In Plant Vehicles	Use flagger or spotter as necessary. Post truck route signs.
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Hot/Cold Temperatures	Weather Conditions	See Section 5.2.5 and Attachment G
Incidental Injury	Mis-communications; General work activities	Site orientation and training. Positive attitude and behavior will show active participation of self-safety analysis by all associates of tasks to be performed.
Uneven terrain	Slope/grade of excavated hillside	Operators must know and work within limitations of equipment. Follow all safe excavation practices (see Attachment F).
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

Table 5.9 DEMOBILIZATION		
PPE: Level D		Hazard Rating: Low
Hazard	Sources	Control Measures
Manual Labor	Materials Equipment	Stretching and proper lifting techniques and possible use of mechanical equipment or hand trucks. Working in minimum groups of two.
Slip/Trip/Falls	Various Sources	Housekeeping rules shall be established and followed. Pre-existing slip, trip, and fall hazards will be marked, barricaded, or eliminated. Areas will be discussed in safety orientation. Refer to the ENTACT Comprehensive Health and Safety Manual for Fall Protection and Housekeeping.
Electrocution	Electrical utilities	Only qualified electrician will be allowed to hook-up circuits. Extension cords will be inspected. GFCI will be used. Verification that electrical services have been disconnected from the exclusion zone or properly marked and identified.
Hot/Cold Temperatures	Weather Conditions	See Section 5.2.5 and Attachment G
Incidental Injury	Mis-communications; General work activities	Positive attitude and behavior will show active participation of self-safety analysis by all associates of tasks to be performed.
Biological Hazards	Insects, Snakes, Ticks, Plants	See Section 5.3.
Hand Injuries	Pinch points and hand traps	Utilize proper glove for the task. Think before placing hands into hazard zone. Utilize chemical resistant gloves in wet locations.

6.0 EMERGENCY RESPONSE PLAN

The location of the emergency/evacuation meeting point is the guard shack on the haul road. Air horns are available and evacuation will be announced over the two-way radios. ENTACT's Emergency Response Plan complies with 29 CFR 1910.120(l).

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and information on the chemical(s) they may have been exposed to. Any vehicle used to transport contaminated personnel will be cleaned or decontaminated as necessary.

The FPM and HSO are responsible for discussing site-specific emergency response requirements with on-site safety representatives and then informing ENTACT associates of unique procedures. The procedures listed below will be followed in addition to facility-specific requirements.

6.1 HOSPITAL AND CLINIC

ENTACT will use the Concentra Occupational Health Clinic as needed for hazmat physicals, heavy metals blood testing, drug screens, treatment of minor injuries, and so on, that may become necessary on the site. A map to the clinic is located at the front of this health and safety plan.

The St. Rose Hospital will be used for all medical emergencies. A map to the hospital is located at the front of this HASP. Copies of this map should be posted in the decon area, command post, and break area. The use of an ambulance service to the hospital is available for an emergency by dialing 911. The hospital shall be notified of ENTACT's activities and to supply insurance information at the start of job site activities to expedite admission into the trauma center in the event of an emergency situation.

The route to these medical facilities will be driven and verified by the FPM or HSO prior to work beginning. Modifications will be made as needed to the directions to these facilities prior to work beginning.

6.2 COMMUNICATION

A mobile phone stays with the FPM and HSO at all times. In addition, the FPM and HSO may be reached by two-way radios that are assigned to field personnel. A private land-line telephone will not be available at the field office. Emergency signals will be conveyed through an air horn. Three (3) short blasts signal an emergency.

6.3 FIRST AID KITS

First aid kits are located on site and in work vehicles. Posters will indicate the locations of each first aid kit not in a vehicle. An eye wash station will be located near the decontamination area but no more than 100 feet from the exclusion zone. Basic first aid procedures are provided in Attachment G. First aid kits will be inventoried on a monthly basis and materials found to be missing will be replaced. The First Aid Kit Monthly Inventory form should be used to track needed materials

6.4 INCIDENT REPORTING

All incidents, injuries, and near misses must be reported immediately to the associate's supervisor. Subcontractors will promptly report any incident to the ENTACT Field Project Manager. Work will stop until the situation is addressed and work can safety resume. Incident information will be forwarded to the Project Health and Safety Coordinator and Corporate Health and Safety Director within 24-hours. The client or owner representative will be notified according to their requirements.

A thorough investigation will commence to determine the facts of the incident, root causes, solutions, and verification and validation of solutions. A completed Loss Investigation / Near Loss Investigation report and supplemental information (first report of injury, witness statements, supervisor statement, police report, damaged equipment report, monitoring reports, etc.) must be provided to Corporate Health and Safety within 5 working days of all incidents. If applicable, a Why Tree Incident Investigation will commence following established protocol and final report submitted to the Health and Safety Director within two weeks of the incident. ENTACT's Post Accident Drug and Alcohol testing procedures will be followed.

6.5 FIRE PREVENTION

During site mobilization, the fire department will be notified and briefed about the potential hazards at the site. The ENTACT HSO will be responsible for this notification. In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the ENTACT FPM will advise the fire commander of the location, nature, and identification of the hazardous materials on site and that ENTACT has a Spill Control program (see Attachment K.)

ENTACT shall provide fire protection in the form of portable fire extinguishers. This protection shall meet or exceed the requirements of NFPA-10-1984. Fire extinguishers must be tested annually and inspected monthly. The Fire Extinguisher Monthly Inspection form should be used to document inspections.

In the event of a fire that cannot be controlled with available equipment, the local fire department will be summoned immediately by the FPM or his designee. The FPM shall

inform the fire department of the situation and any site hazards upon their arrival. If firefighters have to enter the Exclusion Zone, decontamination will be required upon leaving.

In the event of fire or explosion, or if vapor concentrations of explosive vapors or gasses approach or exceed 10 percent of the LEL as indicated by an explosion meter, personnel will evacuate the area immediately.

6.6 EVACUATION

Evacuation routes will be established by work zones and all outside work areas will be provided with designated exit points. Evacuation should be conducted immediately, without regard to equipment under conditions of extreme emergency. Emergency evacuation routes are being discussed and will be presented during site orientation.

- Evacuation notification will be three (3) blasts on an air horn, or by verbal communication on radios.
- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation is not via the decontamination corridor, site personnel should remove contaminated clothing once they are in a location of safety and leave it near the exclusion zone.
- The ENTACT FPM will conduct a head count to ensure all personnel have been evacuated safely.
- In the event of an emergency site evacuation, all personnel should escape from emergency situation, decontaminate to the maximum extent practical, and meet at the pre-determined off-site location.

6.7 EVACUATION RESPONSIBILITIES

The ENTACT FPM has primary responsibility for responding to and correcting emergency situations. ENTACT's representative will:

- Ensure that an evacuation drill is performed at the start of the project and every 6 months thereafter
- Take appropriate measures to protect personnel including:
  - Withdrawal from the exclusion zone
  - Total evacuation and securing of the site
  - Upgrading or downgrading the level of protective clothing and respiratory protection
- Take appropriate measures to protect the public and the environment including:
  - Isolating and securing the site

  - Preventing run-off to surface waters
  - Ending or controlling the emergency to the extent possible
- Ensure that appropriate federal, state, and local agencies are informed, and emergency response plans are coordinated. In the event of a fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities should be informed in order to assess the need for evacuation. In the event of a spill, sanitary districts and drinking water systems may need to be alerted.
- Ensure that appropriate decon treatment or testing for exposed or injured personnel is obtained.
- Determine the cause of the incident and make recommendations to prevent the recurrence.
- Ensure that all reports have been prepared.

The FPM must immediately report emergency situations and take appropriate measures to protect site personnel.

6.8 EMERGENCY DECONTAMINATION

Any person who becomes ill or injured as a result of chemical exposure must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed if possible and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed. First aid should be administered while awaiting an ambulance. General hygiene activities will be followed if associates are wearing Level D PPE. All injuries and illnesses should be reported to the ENTACT FPM and designated HSO.

6.9 OFF-SITE EMERGENCIES

Site management will comply with local municipal or State Emergency Management procedures in the event of disasters including fire, flood, earthquake, telecommunications failure, wildfire, winter or other natural or technological incidents.

6.10 EMERGENCY DRILLS

Emergency drills will be performed periodically to ensure associates understand what is expected during an emergency, ensure that the nearest exits are known, places of refuge or storm shelters are known, all exit routes and storm shelter areas are accessible, and to ensure associates understand their emergency assignments. The FPM and HSO will coordinate and plan site emergency drills. All site associate will participate. Drills will be documented.

6.11 SPILL RESPONSE

Spill response requirements apply to generated waste from soil and groundwater remediation and facility decommissioning activities which include:

- Tailings
- Oil to water discharges
- Releases

See Attachment K, Spill Control.

6.11.1 Reporting Releases

ENTACT requires the reporting of any spill or release of liquid to the FPM. The PHSC and HSD will be notified and an Incident Investigation will commence. The client representative will be notified and provided a copy of the investigation. See Emergency Contacts at the front of this document.

7.0 LEVELS OF PERSONAL PROTECTION FOR SITE ACTIVITIES

The materials of concern present at this site have been identified by previous site sampling. Currently, nuisance dust, and manganese oxide are the materials of concern. Based on the information available, most tasks will be conducted in Level D. Certain tasks (direct contact with soils, etc.) will be conducted in Level D+. This level of protection is used when additional dermal protection is required but respiratory protection is not necessary. In addition, some tasks involving potential for significant exposure may be conducted in level C during the sampling and evaluation of exposure potential.

Tables 7.1 to 7.3 list the components of Level D, D+, and C PPE required for site activities to be conducted by ENTACT personnel and subcontractors. Subcontractors are required to submit a Job Safety Analysis with task specific PPE required for their activities that are not identified in Tables 7.1 to 7.3.

The ENTACT HASP will be the controlling HASP for this project. The ENTACT HSO has authority over all site workers, subcontractors, visitors and other personnel entering the site. Additional information regarding PPE is provided in Attachment L, PPE and Respiratory Protection. ENTACT's Respiratory Protection Program is available under separate cover.

Table 7.1 Level D PPE	
Protective Gear	**Type**
Respiratory protection [1]	Escape respirator
Chemical protective clothing [2]	None
Hand protection: inner gloves	None
Hand protection: outer gloves	Cotton or leather work gloves
Foot protection: inner boots	Steel-toe, leather work boots
Foot protection: outer boots [3]	None; metatarsal guards during decon
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection[4] (equipment decon)	Standard face shield
Other protective clothing	High visibility, reflective vest, such as an orange traffic type vest. Personal floatation device (PFD) required for all work within 5 feet of ponds.
Hearing protection	Ear plugs or muffs with NRR of at least 25

[1] Escape respirator is required by all personnel on site.

[2] Associates may wear Tyvek or similar coveralls as protection from ticks and insects.

[3] Metatarsal guards are required for power washing.

[4] Splash protection is required when there is a potential for contact with groundwater, process water, or for power washing.

Table 7.2 Level D+ PPE	
Protective Gear	**Type**
Respiratory protection [1]	Escape respirator
Chemical protective clothing	Tyvek, or equivalent disposable coveralls
Hand protection: inner gloves	None
Hand protection: outer gloves	Cotton or leather work gloves
Foot protection: inner boots	Steel-toe, leather work boots
Foot protection: outer boots [2]	Rubber boot covers; metatarsal guards
Head protection	Standard hard hat
Eye protection	Standard safety glasses with side shield or goggles
Splash protection [3]	Standard face shield
Other protective clothing	High visibility, reflective vest, such as an orange traffic type vest. Personal floatation device (PFD) required for ant work within 5 feet of creek or ponds.
Hearing protection	Ear plugs or muffs with NRR of 25
[1] Escape respirator is required by all personnel on site. [2, 3] Splash protection including face shield and metatarsal guards will be worn during high-pressure cleaning (Decon).	

Table 7.3 Level C PPE (not anticipated)	
Protective Gear	**Specific Type**
Respiratory protection [1]	North Full-Face Air Purifying Respirator (APR) with particulate cartridges (P-100) Escape respirator
Chemical protective clothing	Disposable Tyvek or equivalent
Hand protection: Inner gloves	None
Hand protection: Outer gloves	Cotton/Latex dipped
Foot protection: Inner boots	Steel-toe leather work boots
Foot protection: Outer boot [2]	Rubber boot covers; metatarsal guards
Head protection	Standard hard hat
Eye protections	Standard safety glasses with side shields or goggles
Splash protection [3]	Standard face shield
Other protective clothing	High visibility, reflective safety vest, such as orange traffic type vests
Hearing Protection	Ear plugs or muffs with NRR of 25
[1] Escape respirator is required by all personnel on site. [2, 3] Splash protection including face shield and metatarsal guards will be worn during high-pressure cleaning (Decon).	

PPE will be upgraded:

- If new hazards are found with unknown toxic or physical hazards.
- If hazards exhibit higher toxic or physical hazards that require upgrading of PPE. Air monitoring will be closely monitored.
- If associate requests an upgrade, including the voluntary use of respirators when not required by the HASP.

If work site conditions dictate the need to upgrade PPE, the FPM or HSO will issue a stop work order and will contact the Project Health and Safety Coordinator to revise or amend this HASP.

7.1 PERSONAL USE FACTORS AND EQUIPMENT LIMITATIONS

Certain personal features of workers may jeopardize safety during equipment use. Protective or precautionary measures will be taken as necessary for the following personal features:

- Facial hair and long hair that passes between the face and the sealing surface of the respirator is prohibited because it interferes with respirator fit and wearer vision, whereby excessive contaminant penetration may occur. Long hair must be effectively contained within protective hair coverings.
- Eyeglasses with conventional temple pieces will interfere with the respirator-to-face seal of a full face-piece. A spectacle kit should be installed in the facemasks of workers requiring vision correction, providing a tight seal. Prescription eyeglasses worn on-site must meet ANSI Standard Z87.1. Contact lenses may trap contaminants and/or particulate between the lens and the eye, causing irritation. Wearing contact lenses with a respirator in a contaminated atmosphere is prohibited.
- Gum and chewing tobacco are prohibited during respirator use because they may cause the ingestion of contaminants and may compromise the respirator fit.

During equipment use, workers will be encouraged to report any perceived problems or difficulties to their supervisor(s). These malfunctions include, but are not limited to the following:

- Degradation of the protective ensemble;
- Perception of odors;
- Skin irritation;
- Unusual residues on PPE;
- Discomfort;
- Resistance to breathing;
- Fatigue due to respirator use;
- Interference with vision or communication;
- Restriction of movement; and
- Personal responses such as rapid pulse, nausea and chest pain.

If a supplied air respirator is being used, all hazards that might endanger the integrity of the airline should be removed from the working area prior to use. During use, other workers and vehicles should be excluded from the area.

7.2 WORK DURATION

In selecting PPE, the anticipated duration of the Work will be considered. Several factors may limit the Work length, including air supply, equipment effectiveness and

temperature. The HSO will make all decisions regarding selection of PPE and Work duration.

7.2.1 Suit/Ensemble Permeation, Degradation, And Penetration

The possibility of chemical permeation, degradation, or penetration of protective ensembles during the Work may limit Work duration. No single clothing material is an effective barrier to all chemicals or all combinations of chemicals, and no material is an effective barrier to prolonged chemical exposure.

7.2.2 Ambient Temperature

The ambient temperature may have a major influence on Work duration as it affects both the worker and the protective integrity of the ensemble. Heat stress, which can occur even in relatively moderate temperatures, presents the greatest immediate danger to an ensemble encapsulated worker. Hot and cold ambient temperatures also can affect:

- Valve operation on suits and/or respirators;
- The durability and flexibility of suit material;
- The integrity of suit fasteners;
- The breakthrough time and penetration rates of chemicals; and
- The concentration of airborne contaminants.

All of these factors may decrease the duration of protection provided by a given piece of clothing or respiratory equipment.

7.3 PERSONAL PROTECTIVE EQUIPMENT STORAGE AND MAINTENANCE

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Many equipment failures can be directly attributed to improper storage.

Different types and materials of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake. Protective clothing will be folded or hung in accordance with manufacturer's recommendations. Contaminated clothing for reuse will remain in the contamination reduction zone (CRZ).

Self-contained breathing apparatus (SCBA), supplied air respirators, and air-purifying respirators, if required, will be dismantled, washed and disinfected after each use. SCBAs will be stored in storage chests supplied by the manufacturer. Air-purifying respirators

should be stored individually in their original cartons or carrying cases, or in heat-sealed or re-sealable plastic bags.

The technical aspects of PPE maintenance procedures vary by manufacturer and type of equipment. Manufacturers frequently restrict the sale of certain PPE parts only to individuals or groups who are specially trained, equipped and authorized by the manufacturer to purchase them.

7.4 PPE TRAINING AND PROPER FITTING

This section provides details regarding personal protective equipment training and procedures for proper fitting for respirators.

7.4.1 PPE Training

Employees must be trained in the proper use of protective equipment prior to using any equipment at the Site. The purpose of the training will be to: (1) become familiar with the equipment in a non-hazardous situation; (2) instill confidence and awareness in the user of the limitations and capabilities of the equipment; (3) increase the operating and protective efficiency of PPE use; and (4) reduce maintenance expenses.

7.4.2 Respirator Fit Testing

The "fit" of the face piece-to-face seal of a respirator will be tested on each potential wearer to verify a tight seal. Every face piece does not necessarily fit every wearer. Certain features, such as scars, very prominent cheekbones, deep skin creases, dentures or missing teeth and the chewing of gum and tobacco may interfere with the respirator-to-face seal. Under conditions where these features may impede a good seal, a respirator must not be worn. Personnel who may wear a respirator will be qualitatively fit-tested with irritant smoke, iso-amyl acetate, or equivalent methods according to 29 CFR 1910.134, Appendix A at least annually.

7.5 PPE DONNING AND DOFFING PROCEDURES

The PPE program includes clearly defined donning and doffing procedures as indicated in the following sections.

7.5.1 Personal Protective Equipment Donning

A routine has been established for donning and evaluating all levels of protective clothing and equipment. If the clothing is too small, the likelihood of tearing the suit material and accelerating worker fatigue will increase. If the clothing is too large, the possibility of snagging the material and compromising the dexterity and coordination of the worker is increased. In either case, better fitting clothing will be provided.

7.5.2 Personal Protective Equipment Doffing

Exact procedures for removing PPE have been established and will be followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others. These procedures will be performed only after decontamination of the suited worker.

7.6 PERSONAL PROTECTIVE EQUIPMENT INSPECTION PROCEDURES

An effective PPE inspection program features four different inspections:

- Inspection and operational testing of equipment received from the factory or distributor;
- Inspection of equipment as it is issued;
- Inspection before and after use or training and prior to maintenance; and
- Periodic inspection of stored equipment.

7.7 PERSONAL PROTECTIVE EQUIPMENT PROGRAM EVALUATION

At a minimum, the PPE program is reviewed annually to evaluate the effectiveness of the following factors:

- The number of personnel-hours that are spent in various PPE ensembles;
- The degree to which the Site complies with the Hazardous Waste Operation Emergency
- Response (HAZWOPER) standards on PPE use, inspection, maintenance, and record keeping;
- Accident, injury, and illness statistics as well as recorded levels of exposure;
- The adequacy of operating procedures to guide the selection of PPE;
- The degree of coordination with comprehensive and Site-specific health and safety programs; and
- Recommendations for and results of program improvement and modification.

8.0 FREQUENCY AND TYPES OF AIR MONITORING

Personal and work area air monitoring will be required at this job site. However, ENTACT is not responsible for any community air monitoring program at this work site.

Dust suppression methods will be used to control nuisance dust with the goal of dust suppression being the avoidance of any visible dust. If work site conditions indicate that other chemical hazards are present, the FPM or HSO will issue a stop work order and will contact the Project Health and Safety Coordinator to revise or amend this HASP.

Personal and work area air monitoring will be required at this job site and during performance of certain tasks. A combination of real-time direct reading instrumentation (PDR) and personal monitoring for metals (manganese) will be accomplished during excavation and loading activities with a high potential for exposure.

8.1 RESPIRABLE DUST MONITORING

Real time monitoring for respirable dust will be performed using a field-portable monitor that displays airborne dust concentrations immediately and continuously on a digital LCD screen in units of milligrams per cubic meter of air (mg/m3) with a data logging feature. These units use optical light scattering and has a built-in power source. These units are sometimes referred to as real-time aerosol monitors (RAM) or personal dataRAM (PDR.) Calibration of the RAM will be in accordance with the manufacturer's instructions. Monitoring will be performed as needed, such as for newly detected particulates which were not previously detected or anticipated. Sustained readings above 0.1 mg/m^3 will require additional dust suppression. Note that the standard site work practice is to stop work and increase the application of water for dust suppression whenever dust is visible.

8.2 METALS SAMPLING

Initial and periodic personal monitoring for manganese will be accomplished using personal air monitors to collect breathing zone samples from the worker. Collection and analysis will be in general accordance with applicable NIOSH and OSHA methods which collect airborne dusts containing metals on a filter cassette and laboratory analysis.

8.3 AIR MONITORING LOG AND POSTING OF RESULTS

The Field Project Manager will ensure that all air monitoring data is logged including instruments, data, work process, location, calibration, and analyte concentration. All air monitoring results will be posted in the site break area within two days of receiving the results.

9.0 SITE CONTROL MEASURES

The following section describes how workers will be allowed onto the site and what the various work zones are.

9.1 SITE ACCESS

Access to the site is restricted to authorized personnel only. All employees, subcontractors, vendors and visitors must report to the ENTACT trailer to sign-in and receive a site orientation. Personnel onsite for the first time must attend the Tronox safety orientation in addition to ENTACT's task specific orientation.

9.1.1 Cameras and Electronic Equipment

Cameras or other electronic equipment may not be used without prior approval from the Field Project Manager.

9.2 WORK ZONES

At this time, site control (such as required by 29 CFR 1910.120) is not required for the project. However, if work tasks, work areas, or site conditions change, this HASP must be amended. In the event of a HASP amendment, the following sections will apply.

The purpose of site control is to minimize potential contamination of associates, protect the public from the site activities, and prevent vandalism. To prevent exposure to unprotected personnel and migration of contamination due to tracking by personnel or equipment, work areas along with PPE requirements will be clearly identified. The areas of designation will be:

- Support zone (clean)
- Decontamination zone (transitional)
- Exclusion Zone (contaminated)

The FPM and the team will properly identify, mark, and enforce all zones of operation.

9.2.1 Support Zone

The support zone will be designated by signs and caution tape. It shall be secured against active or passive contamination from the work site. The support zone will consist of

those areas adjacent to the exclusion zone where the administrative offices, decontamination trailer, and equipment are staged. Eating and drinking will only be allowed in this area.

The uncontaminated support zone will be the area outside the exclusion and decontamination zones and within the geographic perimeters of the site. This area is used for staging of materials, parking of vehicles, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the exclusion zone. All personnel arriving in the support zone will upon arrival, report to the command post and sign the site entry/exit log. There will be one controlled entry/exit point from the clean zone to the decontamination zone.

9.2.2 Decontamination Zone

The decontamination (decon) zone will provide a location for removal of contaminated personal protective equipment when personnel leave the exclusion zone during the day and the final decontamination at the end of the day. Coveralls will not be worn more than one work shift without being washed or discarded. ENTACT personnel will decontaminate by properly disposing of contaminated clothing and washing the face, forearms and hands as they exit the decon area and before leaving the site.

An on-site decontamination facility (boot wash and portable decon sink) shall be provided by ENTACT. ENTACT shall be responsible for providing the appropriate decontamination tools, equipment, solutions, liquids, containers, and supplies along with a concrete pad or other suitable base on which to perform decontamination activities.

All personnel shall be decontaminated before leaving the site (leaving the exclusion zone and entering the contamination reduction zone). Decontamination shall be required prior to breaks, when picking up tools, equipment, or materials in the support zone, or any other activities where the potential exists for contaminant transfer.

Equipment shall be cleaned and decontaminated prior to use on-site and prior to leaving the site. Wheels on any equipment in contact with potentially contaminated soil shall be cleaned prior to leaving any work area. Care shall be taken to avoid the possibility of contaminating formerly uncontaminated material or areas through the use of contaminated equipment.

Decontamination facilities shall be designed to meet all requirements of the approved work plan and all local, state, and federal requirements.

Decontamination facilities shall be designed to:

- Isolate contamination;

- Prevent cross-contamination;
- Be substantially watertight;
- Prevent contamination from leaving the site;
- Be large enough to contain run-off and spray water; and
- Have provisions for the collection and removal of accumulated water.

All decontamination liquids shall be collected and characterized to determine an appropriate disposal method. The decontamination facilities shall have a sump, pump, and piping system or other acceptable means to evacuate decontamination water in a timely manner.

Decontamination solids, PPE, and debris shall be handled with demolition materials.

The decontamination facility shall be resistant to chemical attack by the materials that will be contained in the facility.

The decontamination stations may be temporary and transportable; side panels shall be used as needed to control fugitive emissions from the decontamination stations.

All equipment shall be free of visual contamination prior to leaving the site. All tires and tracks shall be free of soil, grease, oil, slag, or other contaminants.

Decontamination facilities shall be capable of providing decontamination of the undercarriage and exterior of a vehicle to remove particulate matter using high-pressure spraying from the sides and bottom.

9.2.3 Exclusion Zone

The exclusion zone will be the areas outside the support zone and decontamination zone. The exclusion zone and the decontamination zone will continually change as work progresses. Entry to and exit from this zone will be made through the decontamination zone. Appropriate warning signs to identify the exclusion zone will be posted (such as. DANGER - AUTHORIZED PERSONNEL ONLY). Upon exiting the exclusion zone personnel and equipment must be decontaminated.

The exclusion zone will be identified with a yellow caution banner guard and/or signs. While in the exclusion zone, personnel will wear Level C PPE and refrain from horseplay, use of tobacco products, eating, drinking, and generating open flames.

9.3 SECURITY OF PERSONNEL AND ASSETS

Site security is vital for protecting not only equipment and other valuable assets, but protects on-site personnel as well.

The Field Project Manager and Health & Safety Officer share responsibility for site security. They are responsible for ensuring that tools, vehicles, equipment, computers and facilities are secured at the end of the workday. Thefts and vandalism are crimes of opportunity that can often be prevented by removing the keys from vehicles and equipment, locking office doors, securing supplies and equipment and providing exterior lighting. Under certain circumstances and when authorized by the client, private security patrols may be provided. ENTACT's Site Security Checklist will be utilized to ensure security measures are in place.

10.0 DECONTAMINATION PROCEDURES

In general, items entering the exclusion zone on the site must either be decontaminated or properly discarded upon exit from the exclusion zone. All personnel, including Federal, State, and local officials, must enter and exit the exclusion zone through the decon area. All personnel must be documented on the exclusion zone entry/exit log. Prior to demobilization, contaminated equipment will be decontaminated and inspected by the ENTACT FPM or designate before it is moved into the support zone. Any material that is generated by decontaminated procedures will be stored in a designated area in the exclusion zone until disposal arrangements are made.

10.1 SIMPLIFIED DECONTAMINATION

For work in areas not subject to the exclusion zone decontamination requirements a simplified decontamination process for personnel has been established:

Station 1 Equipment Drop

Deposit equipment used on-site on plastic drop cloths. These items must be decontaminated (dry decon or wet wipe) prior to removal from the exclusion zone.

Station 2 Outer Boot and Outer Glove Decon

Scrub outer boots with detergent water and rinse off using water. If disposable boot covers are utilized, remove and discard the covers into waste container. Remove and discard outer gloves.

Station 3 Inner Glove Removal

Remove inner gloves. Deposit in waste container for disposal.

Station 4 Field Wash

Thoroughly wash hands, forearms and face with biodegradable soap and water.

10.2 EQUIPMENT DECONTAMINATION

Equipment, vehicles, or tools that have entered the exclusive zone will be decontaminated prior to removal. Some equipment decontamination may require pressurized water. In this case face shields will be utilized. Equipment will be decontaminated to meet visual standards.

10.3 DISPOSITION OF DECONTAMINATION WASTES

All equipment used for decontamination shall be decontaminated or disposed of with the established waste streams. Established waste streams are those specified in the work plan. Discarded clothing (PPE) will be disposed of along with the waste streams.

10.4 DECONTAMINATION FACILITIES

Decontamination facilities for personnel, PPE and equipment will be provided by ENTACT. ENTACT personnel will decontaminate prior to leaving the site and taking breaks (washing hands, forearms, and face with soap and water prior to breaks and leaving site). ENTACT personnel will leave the ENTACT operations site in clean street clothing. Contaminated equipment will be placed into assigned containers for disposal or further decontamination. Equipment will be visually inspected and decontaminated with a high-pressure water spray or other suitable means until no visible contamination remains on the equipment.

A decontamination area will be constructed for equipment, personnel, PPE, and the storage of PPE utilized by site personnel. All personnel and equipment will be decontaminated prior to leaving the exclusion zone.

The decontamination of heavy equipment will be carried out by dry decon methods and visual inspection. When necessary, pressure washers may be used for decontamination of caked on material.

All personnel must use the decontamination zone to enter and exit the exclusion zone.

ATTACHMENTS

ATTACHMENT A SITE SAFETY PLAN AMENDMENT

TRONOX MANGANESE TAILINGS PROJECT E7856 HENDERSON, NV
Health and Safety Plan Amendment Number:
Date of Work Activities:
Reason for Amendment:
Alternate Safeguard Procedures:
Air Monitoring:

Required Changes in PPE:	
Signatures:	
ENTACT FIELD PROJECT MANAGER	Date
ENTACT PROJECT HEALTH & SAFETY COORDINATOR	Date
ENTACT HEALTH & SAFETY OFFICER	Date

ENTACT
Health and Safety Plan Revision (Amendment) Log

Project Name and Number:

Amendment Date	**Amendment Number**	**Brief Description**	**Approval Complete? (FPM, HSO, Client Rep)**
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

ATTACHMENT B SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand and will abide by the procedures set forth in the Health and Safety Plan and Amendments for the site.

Printed Name	Signature	Company	Date

Page _____ of _____

ATTACHMENT C GENERAL SITE SAFETY RULES

The following guidelines have been implemented and are constantly monitored and reviewed, so as to fully comply with ENTACT's objective of keeping a safe and healthy work environment for all our associates and customers. An "associate" as used in this HASP, is any ENTACT employee.

1. Horseplay, running, or jumping of any obstacles is prohibited.
2. Associates, visitors, and/or subcontractors will observe and comply with all posted signs indicating danger, warning, caution, or unauthorized areas.
3. There will be no unauthorized use or operation of ENTACT or customers equipment.
4. Other unsafe acts, such as jumping from a vehicle or structure or running or throwing objects, are unacceptable.
5. Use or possession of narcotics, intoxicating substances, or guns and ammunition is prohibited.
6. Reporting for work under the influence of narcotics or intoxicating substances is prohibited. NOTE: If on prescription drugs with a "stated" warning, let supervisor know.
7. All associates are authorized to stop any work that they may consider hazardous to Company personnel or equipment or subcontractor personnel.
8. Associates have a responsibility to report for work on time and in condition to work in a safe and efficient manner.
9. The safety and security regulations of our customers must be strictly adhered to. This also applies to government standards and regulations.
10. Associates are required to verbally report any injury or incident to their supervisor, no matter how small it may seem. Failure to do so before leaving work for the day may result in a delay or denial of benefits that the associate may otherwise is entitled to. A written report should follow as soon as possible.
11. Before setting up operations, take a few moments to locate the nearest phone, eye wash, emergency shower (if available,) and fire alarm.
12. Tampering with or by-passing any safety device will not be tolerated.
13. Before setting up your operations, check the surrounding area for potential hazards and conflicts; overhead cranes, plant traffic, including railroads, associates in area, electrical wires, etc.
14. You should inform your supervisor of any incident or problem which may have occurred during that shift immediately. This would include, but not be limited to, injuries, near misses, faulty or defective equipment, use of fire extinguisher, customer requests or concerns, damage to equipment, vehicular incident, etc.
15. Smoking and the use of open flames are strictly prohibited in areas where flammable liquids, gases, or highly combustible materials are stored, handled, or processed, and also in the decontamination or exclusion zones. Obey "NO SMOKING" signs. Smoke only in designated areas.
16. All posted warning, safety, and security signs and barriers shall be observed. Additionally, ENTACT shall provide warning signs, barriers, barricades, etc., wherever such protection is needed. Where signs and barricades do not provide adequate protection, particularly along a

road way, flagman will be used.

17. ENTACT personnel will not be permitted to use hoists and powered apparatus belonging to customers unless approval is obtained in each instance from the customer and ENTACT representative.
18. ENTACT personnel will not be permitted to carry cameras or take pictures without prior approval from the customer. If progress or finished construction photographs are desired, request for same should be made through the ENTACT representative and/or the customer representative and security.
19. Prior to beginning work, associates will be instructed on emergency procedures to be followed. The supervisor is responsible for notifying the associates of emergency situations and the evacuation. In the event of an evacuation, do not go home or leave the work site until released by your supervisor.
20. Areas sealed with polyethylene may become slick especially when disposable booties are worn - extra caution should be taken to secure footing and maintain proper balance during these situations.
21. Working from elevated platforms, scaffolding, and ladders can pose a great danger. Do not overreach, move ladder, scaffold or platform. Avoid shortcuts on scaffolding, ladders, and platforms. All provision of 29 CFR 1926 Subpart L must be complied with when working in or around platform, scaffolding, and ladders.
22. Good housekeeping procedures will be maintained during all project operations. Tools, materials, and equipment are more easily located and placed into service when good housekeeping procedures are followed.
23. Associates are prohibited from the unauthorized removal of any property or Company materials without the special authorization. Associates involved with theft of company property without authorization are subject to immediate termination. Associates involved in theft activities are also liable to the company for full restitution of monies and/or properties taken from ENTACT, and are subject to criminal prosecution by the Company. Theft of Company property, client's property, or personal property belonging to associates will not be tolerated, and violators will be prosecuted.
24. Associates are cautioned that the Company will not be responsible for loss of personal property due to theft. Associates are advised to leave jewelry items, valuables, and personal items in a locked and secured area away from the job site.
25. Associates will wear all required personal safety protective equipment as required by ENTACT, while inside or outside the containment areas or exclusion zones.
26. Associates, visitors, and subcontractors are required to be dressed in the proper work uniforms at all times as per the requirements of the job.
27. Associates will obtain proper authorization prior to leaving the job site.
28. Safety guards, safety plugs, and/or any other electrical safety device shall not be bypassed, removed, or compromised in any way.
29. Step ladders, scaffolding, and/or platforms are to be used as designed and instructed by the supervisor. Step ladders are to be used in the fully extended position only.
30. Respiratory equipment will be worn properly in accordance with EPA and OSHA rules.
31. Respiratory equipment will be kept clean and sanitary for reuse. Respirators not in use will be cleaned and stored in sealed protective bags.
32. Respirator cartridges new or used will be kept clean at all times. Cartridges that are spent

should be properly discarded to prevent incidental re-use.

33. Optical eye-wear other than industrial safety eye-wear is prohibited from use on the job site.
34. Safety body harness and lanyards are to be worn properly when required.
35. Specific maintenance and service to equipment and/or tools is to be conducted only by skilled maintenance personnel. Equipment used at the site will be inspected daily by a competent person.
36. Intentional violations of associate rights concerning health and physical well being will be cause for termination. Willfully causing an incident and/or injury to ones self or to a fellow associate will be cause for immediate termination.
37. Hand tools are to be used for the specific purpose of their design. Hand tools, electrical tools, and mechanically operated tools are to be free obstructions.
38. Trash bags marked for asbestos containing materials shall not be used for disposal of non-asbestos trash.
39. Waste identification labels will not be applied to any material that does not correspond with label (i.e. hazardous waste labels).
40. All safety equipment and tools are to be inspected for defects routinely by each associate prior to use. Damaged tools or equipment must be reported immediately to a supervisor and taken out of service.
41. All job site personnel must be aware of and know where to locate all fire extinguisher and emergency evacuation routes.
42. Hand tools are not to be left on the floor, scaffolding, ledges, and/or ladders.
43. Extension type ladders should be used with a 1 to 4 ratio - one foot out for every four feet of elevation.
44. Ladder users will face the ladder while ascending and descending. The top and second to top steps are not to be used for standing. Only one person at a time on a ladder. Bracing on the back of the ladder should not be used for climbing. Ladders should be secured to a fixed object when possible.
45. Guardrails and toe boards should always be installed on scaffolding. Associates should be careful to keep all debris bagged and obstacles off the floor. All components such as cross braces, railing, pin connectors, planking, toe boards, or scaffold grade lumber should be available before the unit is assembled.
46. Mobile scaffolding base dimensions should be at least one-half of the height. Scaffolding ten feet high or higher must have rigid guardrails.
47. All electrical equipment used on the job site will have electrical grounding devices with ground fault circuit interrupters. An extension cord without a ground wire plug is never to be used. Damaged electrical cords will be discarded or turned into the office for repair. All electrical cords and boxes are to be considered live until tested otherwise. Never spray water on or near open panels or electrical boxes. All 110v, 15-20 amp circuits must be protected with ground fault circuitry, or an assured grounding program. Electrical tools should be unplugged prior to servicing.
48. ENTACT requires that an electrical lock out program be in effect at all job sites.
49. While preparing to do work around energized equipment such as transformers and/or electrical panel boxes, all aspects of 29 CR 1926 Subpart K must be complied with. Equipment that cannot be de-energized during the abatement will be covered and sealed on three sides only. There must be adequate ventilation to the panels and or boxes, or else there

is the possibility and danger of explosion.
50. ENTACT prohibits the use of open blade knives.
51. Use of bungee cords is prohibited.

MOTOR VEHICLES

1. Any person operating a company vehicle must have a current, valid and appropriate driver's license. In addition, all applicants considered for positions that include driving a company vehicle, will be subject to a Motor Vehicle Record search and evaluation.
2. All company vehicles must be equipped with a first aid kit at all times.
3. All company vehicles must be equipped with a fire extinguisher and flares or reflectors.
4. All company vehicles must be maintained in good mechanical condition. A pre-trip inspection shall be performed, and any defects or malfunctions must be reported to the supervisor before the vehicle leaves the yard.
5. The number of persons inside the vehicle shall be limited by the number of seat belts available for use.
6. The driver is responsible to see that he/she and each authorized passenger is properly wearing a seat belt while riding in a company vehicle.
7. All rules of the road and all customer regulations concerning vehicles must be obeyed.
8. Use extreme caution when backing a vehicle. If at all possible, use a spotter to guide you or back into the parking space to be able to pull forward when leaving.
9. All vehicles will be maintained in a clean and orderly manner to prevent injuries and fire hazards. This includes the cab as well as the inside and outside of the truck.
10. When your job assignment requires you to drive a company vehicle, you are considered to be a professional driver. Failure to drive courteously and to obey the rules of the road may result in the loss of this privilege and termination of your employment.
11. The use of company vehicles shall be restricted to the specific job to which you are assigned. Any unauthorized use will be cause for disciplinary action up to and including discharge.
12. All vehicles must be parked in authorized areas only.

ATTACHMENT D DRUG AND ALCOHOL POLICY

INTRODUCTION

It is the purpose of ENTACT to provide a drug and alcohol free work environment and to maintain the highest safety and health standards for our clients and our associates. This policy was designed to eliminate incidents that may result from associate use of controlled substances (defined below) and alcohol. The use of controlled substances and alcohol increase the risk of incidents, jeopardize the safe work environment, and causes harm to an individual's health and personal life. With a goal of "Zero Incidents" we are establishing this policy for all ENTACT associates.

Subcontractors working on client's properties that require controlled substance and alcohol testing and/or random testing will follow and adhere to ENTACT's Drug and Alcohol Policy.

POLICY

ENTACT explicitly prohibits:

- The use, manufacture, purchase, transfer, possession, solicitation for, or sale of controlled substances and/or alcohol (including the use of over-the-counter and prescription medication in a manner inconsistent with their normal and intended use) at any time during working hours, on ENTACT's or customer's premises, while operating ENTACT vehicles or equipment, or otherwise while performing ENTACT business.

- Being under the influence of controlled substances and/or alcohol at anytime during working hours, on ENTACT's or customer's premises, while operating ENTACT vehicles or equipment, or otherwise while performing ENTACT business.

- Being under the influence of over-the-counter and/or prescription medications at any time during working hours, on ENTACT's or customer's premises, while operating ENTACT vehicles or equipment, or otherwise while performing ENTACT business where such use is inconsistent with the proper and intended use of such substances and/or impair the associate's ability to safely perform his or her job duties.

- Testing positive on a required or requested controlled substance or alcohol test.

- Any violation of ENTACT's Drug and Alcohol Policy.

"Controlled substances" specifically include, but are not limited to, narcotics; depressants; stimulants; intoxicants; inhalants; opiates, including heroin; hallucinogens, including marijuana, mescaline, and peyote; cocaine; phenecyclidine (PCP); and prescription drugs, including amphetamines and barbiturates, and any other illegal controlled substances as defined by applicable federal and state law which are not obtained and used in a manner consistent with their normal and intended use under a prescription lawfully issued to the associate possessing them.

"Premises" is used in the broadest sense and includes, but is not limited to, all land, property, buildings, structures, installations, vehicles, or equipment.

TYPES OF TESTING

Controlled substance or alcohol "test" means any test using blood, urine, breath or other samples to determine the presence of controlled substances or alcohol in the body. ENTACT will require controlled substance and/or alcohol testing under any of the following circumstances:

- NEW HIRE: After offer of employment, but prior to the applicant starting work.

- RANDOM TESTING: All ENTACT associates will be placed in the random controlled substance and alcohol testing pool. Fifty percent of associates that are established in the random controlled substance and alcohol testing pool will be tested within a 12-month period. ENTACT will use an independent third party that will select individuals for random testing. The identities of the individuals selected will be kept strictly confidential until prior to them being asked to be tested.

- FOR CAUSE TESTING: ENTACT may ask an associate to submit to a controlled substance and alcohol test at any time it has a reasonable suspicion that the associate may be under the influence of controlled substances or alcohol, including, but not limited to, the following circumstances: evidence of controlled substances or alcohol on or about the associate's person or in the associate's vicinity; unusual conduct on the associate's part that suggests he or she is under the influence of controlled substances or alcohol (e.g., the appearance, behavior, speech, attitude, mood, and/or breath of an associate); Near Loss and Loss Investigations; and equipment or property damage.

- POST-INCIDENT TESTING: Any associate may be asked to submit to a controlled substance and/or alcohol test if he/she is involved in an on-the-job incident, near-miss or incident in which safety precautions are violated or careless acts are performed, and reasonable suspicion exists that suggest possible use or influence of controlled substances or alcohol. "Involved" means not only the associate who was injured, but also any associate who potentially contributed to the incident or event in any way. Controlled substance and alcohol testing is required for the following circumstances when preliminary evaluation indicates appropriate procedures, precautions, work set-up, or judgment were not employed:

    1. Serious incident causing injury to self and/or other person,
    2. Motor vehicle incident, **whether or not there was significant damage to personal or private property,**
    3. Significant release, which fouls the environment (air, land, water),
    4. Any serious near-miss incident that could have caused injury to persons or the environment.

- REHABILITATION: After an associate has participated in a rehabilitation program.

- LEGAL REQUIREMENT: When testing is required by federal or state law or regulation.

Consent to take or to release information to ENTACT regarding such tests constitutes a condition of continued employment.

CONSEQUENCES

Positive Results

Any ENTACT associate who tests positive will be given an opportunity to discuss the results with a Medical Review Officer (MRO). If the MRO confirms the positive test, the associate will be suspended pending discharge. If associate is discharged they may request to be rehired after a six month period.

Negative Results with Diluted Specimen

Any ENTACT associate with a negative drug screen result that has a *Diluted specimen* noted by the MRO (Medical Review Officer) will be retested immediately with observation.

Negative Results with Fit for Duty Evaluation

Any ENTACT associate with a negative drug screen result that has a recommendation from the MRO for a fit for duty evaluation due to a valid prescription will be asked to provide a statement from the prescribing physician that they have the ability to safely perform their assigned duties while taking the medication as prescribed. This is to be provided prior to starting and continuing in assigned job task.

Outside Employment

If an associate is tested for controlled substances or alcohol outside of the employment context and the results indicate a violation of this policy, the associate may be subject to appropriate disciplinary action, up to and including termination.

Refusal

Refusal to sign this consent form or submit to testing is a violation of this policy. Any associate refusing to submit to testing or the disclosure of test results to ENTACT will face appropriate disciplinary action, up to and including termination of employment. The following behaviors constitute a refusal:

- Refusal to appear for testing.
- Failure to remain at the testing site until the testing process is complete.
- Failure to provide a urine, blood, breath, or other appropriate specimen.
- Failure to allow observation or monitoring if required.
- Refusal to sign the testing form.
- Failure to cooperate in the testing process (i.e., any action which prevents the completion of the test).
- Verified adulterated or substituted test reported by the MRO.
- Failure to provide sufficient quantities of specimen to be tested without a valid medical explanation.
- Failure to undergo a medical examination or evaluation when directed.
- Tampering with, attempting to adulterate, adulteration or substitution of the specimen, or interference with the collection procedure.
- Failure to report to the collection site in the time allotted.
- Leaving the scene of an incident without a valid reason before the tests have been conducted.

Report to Law Enforcement

ENTACT reserves the right to bring a matter involving the use, manufacture, purchase, transfer, possession, solicitation for, or sale of controlled substances to the attention of appropriate law enforcement authorities. Any conviction for criminal conduct involving controlled substances, whether on or off duty, may lead to disciplinary action, up to and including immediate termination.

SEARCHES AND INSPECTIONS

Unless prohibited by law, ENTACT reserves the right at all times on its premises or various project site locations to conduct unannounced searches and inspections of associates, subcontractors, vendors, and other persons, including their effects, lockers, baggage, desks, tool boxes, clothing and vehicles. The sole purpose of such searches and inspections is to ensure compliance with this policy. Any controlled substance or items prohibited by this policy, or any materials that are illegal to posses, will be retained by ENTACT and may be destroyed or turned over to the appropriate law enforcement agency.

FOLLOW-UP AND RETURN TO WORK

Any associate who has been required to or voluntarily undergoes rehabilitation for substance abuse must submit to a controlled substance and/or alcohol test and receive a confirmed negative test result before returning to work. In addition, the associate will be subject to follow-up testing (including participation in the random controlled substance and alcohol testing pool) not to exceed 24 months following the associate's return to work.

PRESCRIPTION MEDICATIONS

The associates will, when controlled substances are prescribed by a licensed health care provider, inquire of the health care provider whether the controlled substance prescribed has any side effects, which may impair the associate’s ability to safely perform the associate’s job duties. If the answer from the health care provider is yes, the associate shall obtain a statement from his or her health care provider indicating any work restrictions and their duration. The associate shall present that statement to his or her supervisor prior to going on duty. Failure to communicate this information is a violation of this policy.

EMPLOYEE ASSISTANCE PROGRAM

Associates should contact their Human Resources representative to discuss available EA services.

SUBCONTRACTORS

Subcontractors working on client’s properties that require controlled substance and alcohol testing and/or random testing will follow and adhere to ENTACT’s Drug and Alcohol Policy.

ATTACHMENT E EQUIPMENT SAFETY

The following equipment safety standards are applicable for equipment and vehicles owned or leased by ENTACT and their subcontractors. Safety standards are divided into two categories, heavy equipment and vehicles. Heavy equipment includes rubber-tired and crawler type excavation materials handling equipment, haul trucks, and cranes. Vehicles include pick-ups, passenger vans, and cars.

Heavy equipment and vehicles that will be used on site include the following:

- Excavator
- Dozers
- Haul trucks
- Water trucks
- Front end loader
- Grader
- Pick up trucks

HEAVY EQUIPMENT

Parking: All equipment left unattended at night, adjacent to a roadway in normal use, or adjacent to active construction areas shall have appropriate lights or reflectors, or barricades with appropriate lights or reflectors, to identify the location of the equipment.

Bulldozer blades, end-loader buckets, dump bodies, and similar equipment: These shall either be fully lowered or blocked when being serviced or not in use. All controls shall be in a neutral position, with the motors stopped and the brakes set.

Audible Alarms: All equipment shall be equipped with a reverse signal alarm. The alarm shall be distinguishable from the surrounding noise level, and shall be maintained in an operable condition.

Vehicle Cabs: All equipment with operator cabs shall be equipped with windshields and power wipers. All cab glass shall be safety glass, or equivalent, that does not introduce visible distortion affecting operation. Cracked and broken glass shall be replaced.

Seat Belts: Seat belts shall be provided in all equipment. Operators will be required to wear seat belts while the equipment is in operation. Seat belts are not required for equipment that is designed for stand-up operation.

Riders: Only equipment operators will be allowed on the equipment when it is in operation. Associates will not be allowed to ride on the equipment.

Working Under Power Lines

Except where electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work or where insulating barriers have been erected to prevent physical contact with the lines, equipment shall be operated in accordance with the following:

- Lines rated 50 kV or less - minimum clearance between the lines and any part of the equipment shall be 10 feet;

- Lines over 50 kV - minimum clearance between the lines and any part of the equipment shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV;

- A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

- Electrical lines will be marked-off with caution tape to help visually locate the lines.

Roll-Over Protection Structures (ROPS)

All rubber-tired and crawler type equipment owned or leased by ENTACT and any subcontractors shall be equipped with roll-over protective structures which meet the minimum performance standards, as prescribed in 29 CFR1926.1001 and 1926.1002.

VEHICLES

Driver Policy: Only authorized ENTACT drivers will be allowed to drive company vehicles.

Brakes: All vehicles shall have a service brake system, an emergency brake system and a parking brake system. These systems may use common components and shall be maintained in working order.

Lighting: All vehicles shall be equipped with two headlights and two taillights, and shall be maintained in working order. All vehicles or combination of vehicles shall have brake lights in operable condition.

Seat Belts: Seat Belts meeting DOT regulations shall be maintained in all vehicles. ENTACT associates will be required to wear their seat belts when operating or as passengers in company vehicles.

Riders: ENTACT associates will not ride in the back of pickups or on tailgates or fenders. No riders are allowed in the bed of a pickup.

Loads: Materials and tools will be firmly secured to prevent movement when transported in the same compartment with ENTACT Associates.

Audible Alarms: No associate shall use any vehicle having an obstructed view of the rear unless:

- The vehicle has a reverse signal alarm audible above the surrounding noise level

OR

- The vehicle is backed up only when an observer signals that it is safe to do so

COMMERCIAL TRUCKS

All commercial drivers will receive an orientation from the ENTACT HSO on their responsibilities and safety requirements.

Once trucks are loaded, drivers will proceed to the truck decontamination area. After the truck is decontaminated, drivers will cover their loads prior to leaving the site. ENTACT associates will wear an orange vest directing traffic to allow trucks to safely exit the property.

WORKING NEAR UNDERGROUND AND OVERHEAD UTILITIES

ENTACT Project Number and Name:		Date:	
Project Address:			
Phone Number:		Fax Number:	
Emergency Contact: Name:		Phone Number:	

SURVEY

Before beginning any project, you must first survey your work area to find power lines at the job site. (See job site sketch below.)

IDENTIFY

After finding all of the power lines at your site, identify the activities you'll be doing that may put you or your workers at risk. Mark one or more of the following:

- ☐ Cranes (mobile or truck mounted)
- ☐ Drilling rigs
- ☐ Backhoes/Excavators
- ☐ Long-handed tools
- ☐ Other tools/high-reaching equipment
- ☐ Concrete pumper
- ☐ Aerial lifts
- ☐ Dump trucks
- ☐ Ladders
- ☐ Material Handling & Storage
- ☐ Scaffolding
- ☐ Other (specify): _____

ELIMINATE OR CONTROL

Before beginning any project, you must first survey your work area to find power lines at the job site. (See job site sketch. Utility company must be identified and contacted prior to initiating any work within the line location. Voltage of line must be determined by utility company to ensure proper distance is maintained during the operation. Job Safety Analysis must be developed prior to beginning any high hazard work.

After identifying the power line and high-risk activities on our job site, we must determine how to eliminate or control the risk of electrocution (a successful determination is often reached only after consultation with the utility). Mark one or more of the following:

1. Locate and identify all overhead power lines. Determine voltage before construction begins.

2. Have lines moved, insulated, or de-energized. In urban areas, insulating or "rubberizing" power lines is often most practical. Contact the local utility.

3. Use a signaler whenever a backhoe, crane, or similar device is closer than one boom length to a live power line of 750 volts or more.

4. The signaler from established safe distance must warn the operator when any part of the machine or its load approaches the minimum distances allowed in the construction regulation.

5. Jump clear. If an emergency such as fire forces you to leave the equipment, jump clear. If part of your body contacts the ground while another part touches the machine, current will travel through you. In cases of high-voltage contact, jump clear and shuffle away in small steps. With voltage differential across the ground, one foot may be in a higher voltage area than the other. The difference could kill you.

☐ Move the activity
☐ Change the activity
☐ Have the utility de-energize the power line
☐ Have the utility move the power line
☐ Use a protective technology
☐ Boom cage guard
☐ Use barrier protection (insulated sleeves)
☐ Use an observer
☐ Use warning lines with flags
☐ Use non-conductive tools
☐ Insulated link
☐ Proximity device

Always maintain your minimum safe clearance distance from the power line, except when the utility has de-energized and visibly grounded the power line.

Voltages	Distance from Power Line
Less than 50 kV	10 feet
More than 50 kV	10'+(0.4") (# of kV over 50 kV)

WARNING!
It is unlawful to operate any piece of equipment within 10' of energized lines

Jobsite Sketch

(Draw in location of power lines and their proximity to construction site, include such things as proposed excavations, location of heavy equipment, scaffolding, material storage areas, etc.)

Completed by:		Date:	
Approved by:		Date:	

ATTACHMENT F EXCAVATION SAFETY

All excavation activities will conform to the excavation requirements prescribed in 29 CFR 1926.650 through 1926.652 (Subpart P.)

- Contact the utility companies or property owners to locate the exact location of any underground installations in the area. If the utility companies or owners do not respond within 24 hours, or if they cannot establish the exact location of the underground installations, the excavation may proceed with caution. In this situation, ENTACT must provide its associates with detection equipment or other safe and acceptable means to locate underground installations. This could include the use of an airknife or other acceptable tool as identified in the JSA. A spotter will be utilized where underground installations may be present, but have not been positively identified. See Attachment E – Equipment Safety, Working Near Underground or Overhead Utilities and Attachment EE – Utility Locate.
- Before heavy equipment is used, all utilities (electricity, natural gas lines, water lines, sewer lines, etc.) must be identified and marked. ENTACT will also contact One Call for locating utilities and pipelines on the property. Each day before work begins, utility locations will be discussed as they relate to planned activities. Deviation from planned activities must be discussed and approved by the FPM and the HSO. Additional training that addresses working around high voltage overhead electrical lines will be completed in the site orientation.
- Abandoned utilities slated for removal must be verified as de-energized or out of service prior to attempted removal.
- Remove or adequately support objects in the excavation area that could create a hazard to ENTACT associates. These may include rubble, debris and stockpiles.
- Classify the type of soil at the site as either stable rock, Type A, Type B or Type C soil. The soil classification, as defined in Appendix A of Subpart P to 1926.652, must be made based on the results of at least one visual and at least one manual analysis conducted by the Competent Person.
- If the excavation is less than 20 feet in total depth, select the maximum allowable side slope from Table A and C. If proper sloping cannot be completed, approved bracing or an approved trench box must be used. If the excavation is less than 20 feet in total depth and is in layered soil, refer to Table B and C for the maximum allowable slope of each material layer. If the total depth of excavation exceeds 20 feet or does not allow for proper sloping, protective systems will be designed and approved by a registered professional engineer.
- All ENTACT personnel and subcontractors will have the authority to shut the operations down if they believe the operations are unsafe. The competent person will review the situation and make the decision on how to proceed.

Table 5.2 Requirements for Equipment Operation Near Power Lines (29 CFR 1926.550)		
ACTIVITY	LINE RATING	MINIMUM CLEARANCE
Equipment Operation	< 50 kV	10 feet
	> 50 kV	10 feet + 0.4 inches per each kV over 50 kV, or 2 times the length of the line insulator (minimum of 10 feet)
In transit with no load and boom lowered	< 50 kV	4 feet
	> 50 kV to 345 kV	10 feet
	345 kV to 750 kV	16 feet

Note: kV = kilovolts

COMPETENT PERSON

As defined in 29 CFR 1926.650, .651, and .652, the Competent Person is the one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to associates. The Competent Person has the authority to take prompt corrective measures to eliminate such hazards.

The FPM will be the designated Competent Person for the site. The FPM reserves the authority to duly elect trained and knowledgeable associates to act in the capacity as Competent Person in his absence.

The Competent Person shall be responsible for inspecting all open excavations on the site on a daily basis or in the event of changing circumstances such as:

- Water
- Weather
- Traffic or
- Any other site concerns

Inspections shall note the integrity of side slopes and sidewalls and insure that only trained and knowledgeable associates are supporting the excavation operations.

Excavation inspections are only required when employee exposure can be reasonably anticipated. See Excavation Inspection checklist.

EXCAVATION HAZARDS

Cave-Ins / Slides: A cave in or slide is defined as the separation or loss of soil material from the side of an excavation and its sudden movement into the excavation, either by sliding or falling, in sufficient quantity so that it could entrap, bury or otherwise injure and immobilize a person.

All personnel will be aware of trench safety and will adhere to the following emergency procedures.

- Know exact location of emergency.
- Know number of victims.
- Know trench measurements.
- Know special hazards.
- Keep all life support and de-watering systems operating.
- Clear associates away from excavation.
- Shut down heavy equipment.
- Be prepared to meet and brief rescue personnel.

DO NOT try to dig the victim out with heavy equipment.
DO NOT allow others into the trench.
DO NOT panic.

ENTACT associates in open excavations will be limited to those persons involved in sample retrieval. Only those associates involved in sampling or required to support excavation activities will be allowed into open excavations.

Access and Egress: A stairway, ladder, ramp or other means of safe access and egress shall be located in excavations that are 4 feet or more in depth. Locations of such means shall require no more than 25 feet of lateral travel for associates.

Falling Loads: No associates will be permitted underneath loads handled by lifting or digging equipment. Associates will be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

Water Accumulation: Associates shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating.

Warning System for Mobile Equipment and Personnel: A barricade of orange expanded fencing will be set up around the excavation site along with yellow caution tape at all times.

Ramps: At least one ramp made of soil will be installed in areas that require mechanical equipment to enter excavation site.

Reflective Clothing: When excavation is adjacent to a public road, reflective vests will be worn by personnel.

SOIL CLASSIFICATIONS

Each soil and rock deposit at an excavation site must be classified by the Competent Person as stable rock, Type A, Type B, or Type C soil.

Stable Rock: Refers to the natural solid mineral matter which can be excavated with vertical sides and remain in tact while exposed.

Type A Soil: Is cohesive with an unconfined compressive strength of 1.5 tons per square foot (tsf). Type A soils include clay, silty clay, sandy clay, clay loam, caliche, hardpan and sometimes silty clay loam and sandy clay loam. No soil should be classified as Type A soil if it is fissured, subject to vibration from traffic or similar effects, previously disturbed or part of a sloped, layered system where the side slopes are four horizontal to one vertical or greater.

Type B Soil: Is cohesive soil with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf. Type B soils include granular cohesion less soils like angular gravel, silt, silt loam, sandy loam and sometimes silty clay loam and sandy clay loam; previously disturbed samples that are not Type C soils; fissured soils and soils subject to vibration that would otherwise be classified as Type A; dry rock that is not stable; and material that is part of a sloped layered system where the layers dip an a slope less steep than four horizontal to one vertical.

Type C Soil: Is cohesive soil with an unconfined compressive strength of 0.5 tsf or less. Type C soils include granular soils such as gravel, sand and loamy sand; submerged soil; soils from which water is freely seeping; submerged rock; submerged rock that is not stable; or material in a sloped, layered system where the layers dip into the excavation at a slope of four horizontal to one vertical or steeper.

MAXIMUM ALLOWABLE SLOPES

Table A defines the maximum allowable slopes.

Table A

Soil or Rock Type	Maximum Allowable Slopes (H:V) For Excavations Less than 20 Feet Deep
Stable Rock	Vertical (90º)
Type A	3/4 : 1 (53º)
Type B	1:1 (45º)
Type C	1-1/2 : 1 (34º)

SLOPING REQUIREMENTS FOR LAYERED SOILS

Table B defines the sloping requirements for layered soils.

Table B			
Layered Soil Type	Type A Layer	Type B Layer	Type C Layer
B over A	3/4 : 1	1 : 1	
C over A	3/4 : 1		1-1/2 : 1
C over B		1 : 1	1-1/2 : 1
A over B	1 : 1	1 : 1	
A over C	1-1/2 : 1		1-1/2 : 1
B over C		1-1/2 : 1	1-1/2 : 1

SLOPING AND BENCHING

Table C

ENTACT

SLOPING AND BENCHING

To slope and bench a site means cutting the walls of your excavation back at an angle to its floor. Sloping uses straight cuts. Benching uses a series of one or more steps. Angled cuts for excavations up to 20 feet deep are allowed by OSHA:

Sloping

Benching

STABLE ROCK
90 degrees

TYPE B
45 degrees

TYPE A
53 degrees

TYPE C
34 degrees

AN EXCEPTION: Excavation is TYPE A SOIL, less than 12 feet in depth and open less than 24 hours, may have a maximum slope or bench of 63 degrees.

DON'T FORGET:

- If the soil condition changes, re-inspect the system. Cut back the angle of slope if needed.
- Evacuate any excavation whose walls show signs of distress.

SOIL STABILITY AS A SAFETY MEASURE

Classifying a soil's stability is an important part of evaluating the site. In general, soil is divided into four classes, from most stable to least stable:

- *Stable Rock*
  Solid mineral matter

- *Type A*
  Cohesive soils, such as clay, silty clay and hardpan.

- *Type B*
  Granular soils, silt, sandy loam, unstable rock, any unstable or fissured Type A soil.

- *Type C*
  Gravel, loamy soil, submerged soil, sandy and any soil that is part of a layered, steeply sloped system.

PROTECTIVE SYSTEMS

The following figures are a graphic summary of the requirements contained in Subpart P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with §1926.652 (b) and (c).

FIGURE 1 – Preliminary Decisions

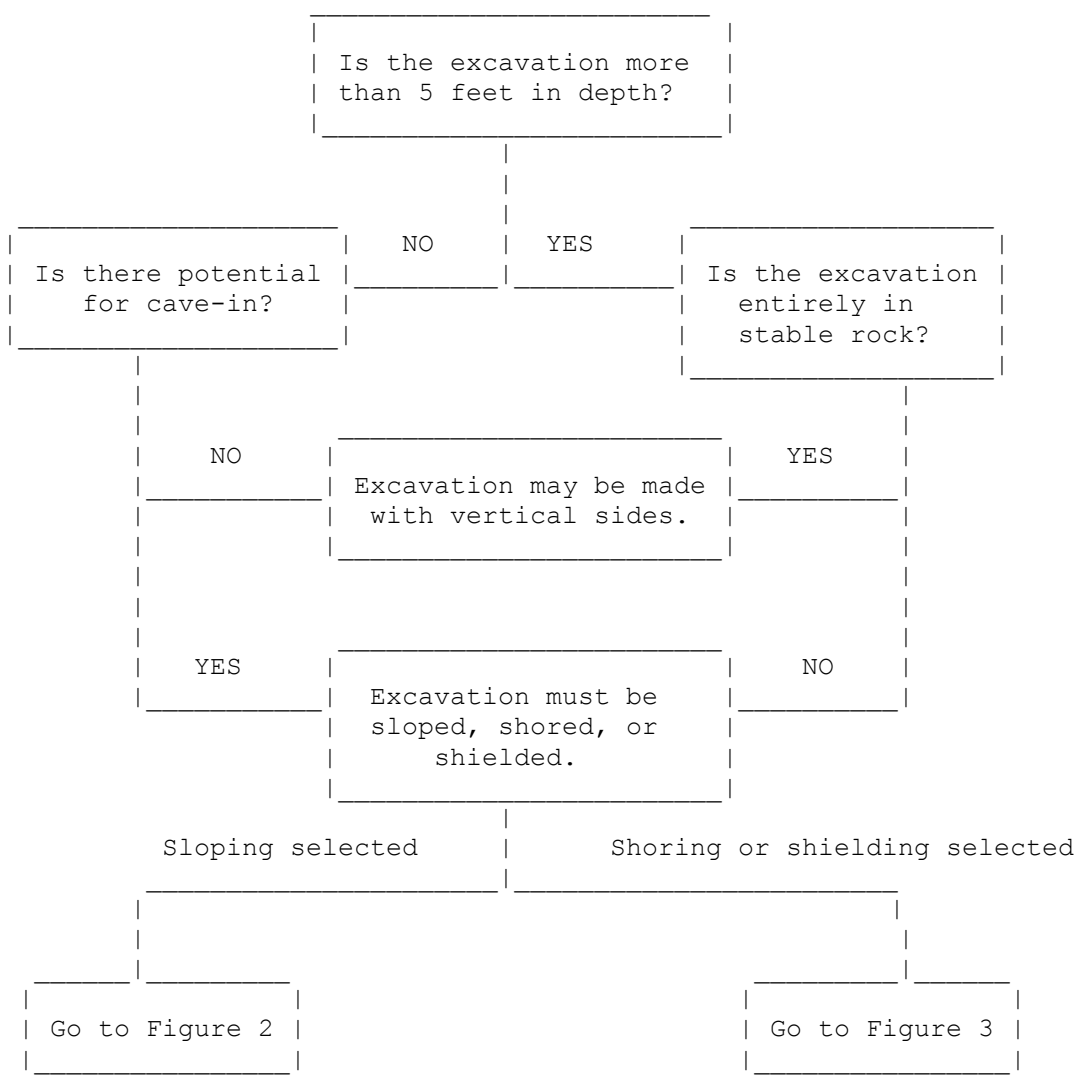


FIGURE 2 – Sloping Options

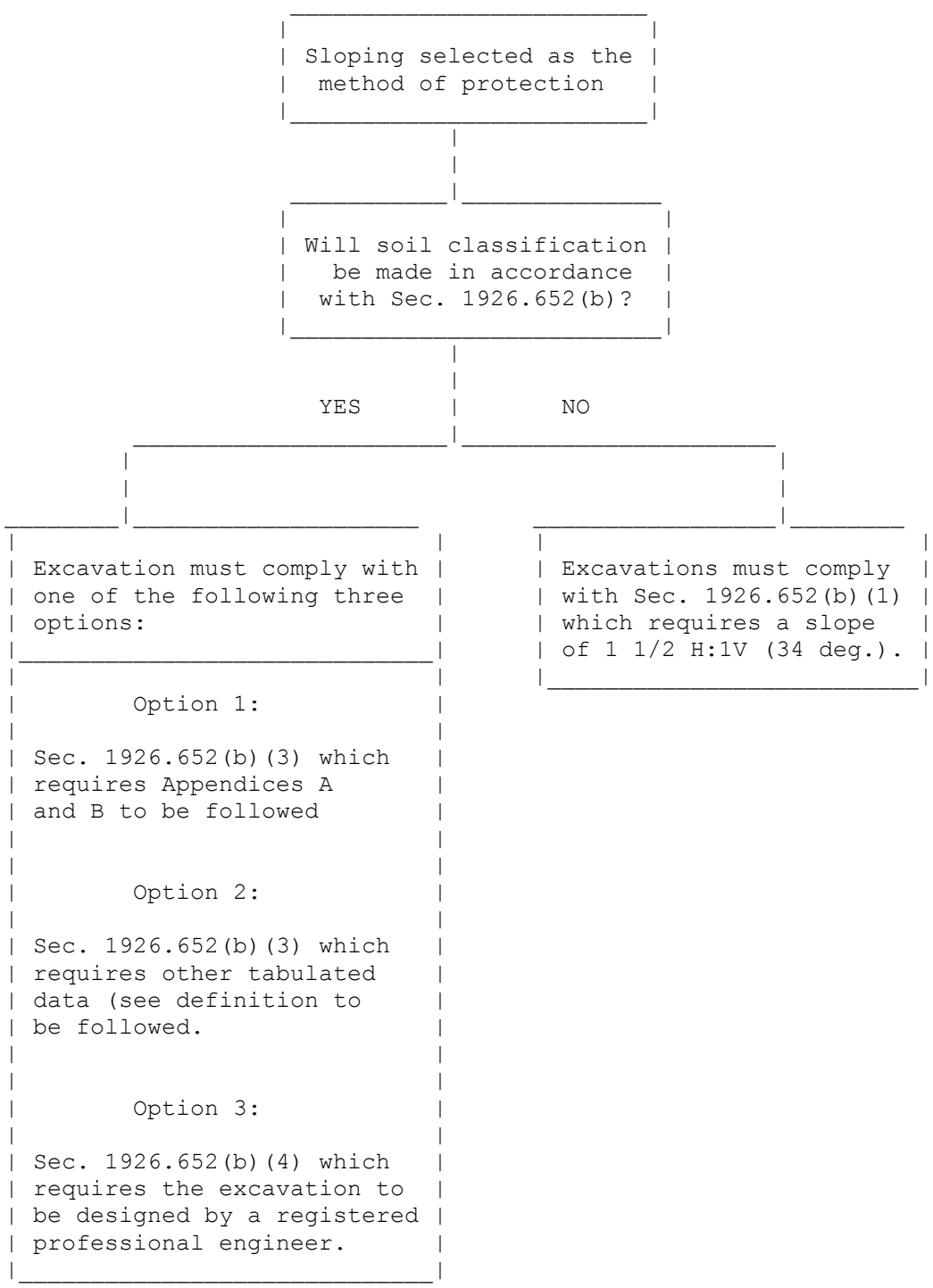
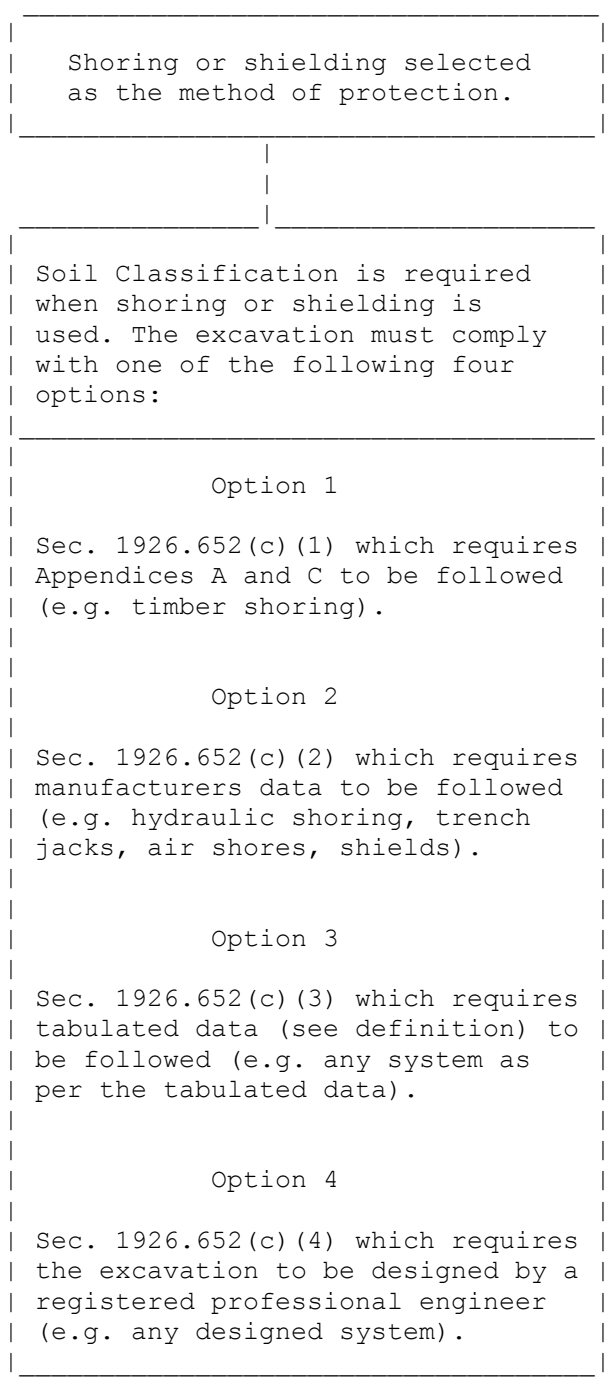


FIGURE 3 – Shoring and Shielding Options



See Tables D-1.1 and D-1.2 for specific spacing requirements for various types of soil

Table D-1.1
Aluminum Hydraulic Shoring
Vertical Shores for **Soil Type A**

Depth of trench (feet)	Hydraulic cylinders				
	Maximum horizontal spacing (feet)	Maximum vertical spacing	Width of trench (feet)		
			Up to 8	Over 8 up to 12	Over 12 up to 15
Over 5 up to 10	8	4	2 inch diameter	2 inch diameter (Note 2)	3 inch diameter
Over 10 up to 15	8				
Over 15 up to 20	7				
Over 20	Note 1				

Table D-1.2
Aluminum Hydraulic Shoring
Vertical Shores for **Soil Type B**

Depth of trench (feet)	Hydraulic cylinders				
	Maximum horizontal spacing (feet)	Maximum vertical spacing	Width of trench (feet)		
			Up to 8	Over 8 up to 12	Over 12 up to 15
Over 5 up to 10	8	4	2 inch diameter	2 inch diameter (Note 2)	3 inch diameter
Over 10 up to 15	6.5				
Over 15 up to 20	5.5				
Over 20	Note 1				

Table D-1.3
Aluminum Hydraulic Shoring
Waler Systems for **Soil Type B**

Depth of trench (feet)	Wales		Hydraulic cylinders						Timber uprights		
			Width of trench (feet)						Max. horiz. spacing (on center)		
			Up to 8		Over 8 up to 12		Over 12 up to 15				
	Vertical Spacing (feet)	Section Modulus (in. ^3)	Horiz. Spacing	Cylinder diameter	Horiz. Spacing	Cylinder diameter	Horiz. Spacing	Cylinder diameter	Solid sheet	2 ft.	3 ft.
Over 5 up to 10	4	3.5	8.0	2 in.	8.0	2 in. Note 2	8.0	3 in.			3 X 12
		7.0	9.0	2 in.	9.0	2 in. Note 2	9.0	3 in.			
		14.0	12.0	3 in.	12.0	3 in.	12.0	3 in.			
Over 10 up to 15	4	3.5	6.0	2 in.	6.0	2 in. Note 2	6.0	3 in.		3 X 12	
		7.0	8.0	3 in.	8.0	3 in.	8.0	3 in.			
		14.0	10.0	3 in.	10.0	3 in.	10.0	3 in.			
Over 15 up to 20	4	3.5	5.5	2 in.	5.5	2 in. Note 2	5.5	3 in.	3 X 12		
		7.0	6.0	3 in.	6.0	3 in.	6.0	3 in.			
		14.0	9.0	3 in.	9.0	3 in.	9.0	3 in.			
Over 20	Note 1										

Table D-1.4
Aluminum Hydraulic Shoring
Waler Systems for **Soil Type C**

Depth of trench (feet)	Wales		Hydraulic cylinders						Timber uprights		
			Width of trench (feet)						Max. horiz. spacing (on center)		
			Up to 8		Over 8 up to 12		Over 12 up to 15				
	Vertical Spacing (feet)	Section Modulus (in. ^3)	Horiz. Spacing	Cylinder diameter	Horiz. Spacing	Cylinder diameter	Horiz. Spacing	Cylinder diameter	Solid sheet	2 ft.	3 ft.
Over 5 up to 10	4	3.5	6.0	2 in.	6.0	2 in. Note 2	6.0	3 in.	3 X 12		
		7.0	6.5	2 in.	6.5	2 in. Note 2	6.5	3 in.			
		14.0	10.0	3 in.	10.0	3 in.	10.0	3 in.			
Over 10 up to 15	4	3.5	4.0	2 in.	4.0	2 in. Note 2	4.0	3 in.	3 X 12		
		7.0	5.5	3 in.	5.5	3 in.	5.5	3 in.			
		14.0	8.0	3 in.	8.0	3 in.	8.0	3 in.			
Over 15 up to 20	4	3.5	3.5	2 in.	3.5	2 in. Note 2	3.5	3 in.	3 X 12		
		7.0	5.0	3 in.	5.0	3 in.	5.0	3 in.			
		14.0	6.0	3 in.	6.0	3 in.	6.0	3 in.			
Over 20	Note 1										

EXCAVATION INSPECTION

Date:		Field Project Manager:	
Job Number and Name:		Competent Person:	

GENERAL INSPECTION OF JOB SITE

Activity	Y	N	NA
1. Excavations, adjacent areas, and protective systems inspected daily by the Competent Person prior to the start of work.	☐	☐	☐
2. Competent Person has the authority to remove workers from the excavation immediately.	☐	☐	☐
3. Surface encumbrances supported or removed.	☐	☐	☐
4. Associates protected from loose rock or soil that could possibly pose a hazard by falling or rolling into the excavation.	☐	☐	☐
5. Hard hats worn by all associates.	☐	☐	☐
6. Spoils, materials, and equipment set back a minimum of 2’ from the edge of the excavation.	☐	☐	☐
7. Barriers provided at all remote excavations, well, pits, shafts, etc.	☐	☐	☐
8. Walkways and bridges, over excavations 4’ or more in depth must be equipped with guardrails.	☐	☐	☐
9. High visibility safety vests are worn by all associates.	☐	☐	☐
10. Associates are required to stand away from vehicles being loaded or unloaded.	☐	☐	☐
11. Associates are prohibited from working or walking under suspended loads.	☐	☐	☐
12. Associates are prohibited from working on the faces of sloped or benched excavations above other associates.	☐	☐	☐
13. Warning system is established and utilized when mobile equipment is operating near the edge of an excavation.	☐	☐	☐

UTILITIES

Activity	Y	N	NA
1. Utility companies contacted and/or utilities located.	☐	☐	☐
2. Exact location of utilities is marked when approaching the utilities.	☐	☐	☐
3. Underground installations are protected, supported, or removed when the excavation is open.	☐	☐	☐
See Equipment Safety – Working Near Overhead or Underground Utilities			

MEANS OF ACCESS AND EGRESS

Activity	Y	N	NA
1. Lateral travel distance to a means of egress does not exceed 25' for excavations 4' or more in depth.	☐	☐	☐
2. Ladders, when used, must extend 3' above the edge of the trench and be secured.	☐	☐	☐
3. Structural ramps used by associates must be designed by a Competent Person.	☐	☐	☐
4. Structural ramps used by equipment must be designed by a Registered Professional Engineer (RPE).	☐	☐	☐
5. Ramps must be constructed of materials of uniform thickness, securely cleated together on the bottom, and have a non-slip surface.	☐	☐	☐
6. Associates protected from cave-ins while entering and exiting the excavation.	☐	☐	☐

WET CONDITIONS

Activity	Y	N	NA
1. Precautions taken to protect associates from accumulation of water.	☐	☐	☐
2. Water removal equipment monitored by a Competent Person.	☐	☐	☐
3. Surface water controlled or diverted.	☐	☐	☐
4. Inspection made after each rainstorm.	☐	☐	☐

HAZARDOUS ATMOSPHERE

Activity	Y	N	NA
1. Atmosphere tested when there is a reasonable possibility of oxygen deficiency or build up of other hazardous gases that may expose an associate to a hazard.	☐	☐	☐
2. Oxygen content is between 19.5% and 21%.	☐	☐	☐
3. Ventilation provided to prevent flammable gas from building up to 20% of the LEL of the gas.	☐	☐	☐
4. Testing conducted to ensure that atmosphere remains safe.	☐	☐	☐
5. Emergency Response Equipment readily available where a hazardous atmosphere could or does not exist.	☐	☐	☐
6. Associates are trained on the use of PPE and Emergency Response Equipment.	☐	☐	☐
7. Safety harness and life line must be individually attended when an associates entering a deep confined excavation or bell bottom pier.	☐	☐	☐

PROTECTIVE SUPPORT SYSTEMS

Activity	Y	N	NA
1. Materials and/or equipment selected on soil analysis, expected loads, and trench parameters.	☐	☐	☐
2. Materials and equipment inspected and in good condition.	☐	☐	☐
3. Materials and equipment not in good condition must be removed from service and not returned until repaired, inspected, and approved by a Registered Professional Engineer.	☐	☐	☐
4. Protective systems installed without exposing associates to hazards of cave-ins, collapses, or from being struck by materials of equipment. Install from the top, down, and from the bottom up.	☐	☐	☐
5. Members of protective support system must be securely fastened.	☐	☐	☐
6. Adjacent structures must be securely supported.	☐	☐	☐
7. Excavations below the footing of base must be approved by a Registered Professional Engineer.	☐	☐	☐
8. The backfill process must progress with the removal of the support system.	☐	☐	☐
9. Material excavated to a level no greater than 2’ from the bottom of the protective support system, and only if system is designed to support the calculated loads.	☐	☐	☐
10. Shield system placed to prevent lateral movement.	☐	☐	☐
11. Associate prohibited from remaining in a trench box when being moved vertically.	☐	☐	☐

SOIL ANALYSIS

This checklist must be completed when an analysis is performed to determine the soil(s) type present in the excavation. A separate analysis must be performed for each change in soil conditions, such as layers in the excavation wall, if the trench extends long distances, etc.

Date:	Project :	Competent Person:	
Weather:			
Measurements of Trench:	Depth:	Length:	Width:
Sample:	Location Taken From:		Time:

VISUAL TEST

Particle Type:	☐ Fine Grained (cohesive) ☐ Course Grained (sand or gravel)
Water Conditions:	☐ Wet ☐ Dry ☐ Submerged ☐ Surface Water Present
Previously Disturbed Soil?	☐ Yes ☐ No
Underground Utilities Protected?	☐ Yes ☐ No
Layered Soils?	☐ Yes ☐ No
Layered Soil Dipping into Excavation?	☐ Yes ☐ No
Excavation Exposed to Vibration?	☐ Yes ☐ No
Surface Encumbrances Present?	☐ Yes ☐ No If yes, what type?
Evidence of Cracking or Spalling Observed?	☐ Yes ☐ No
Potentially Hazardous Atmosphere Exists?	☐ Yes ☐ No If yes, identify condition and source. Follow confined space procedures.

Competent Person Printed Name	Competent Person Signature
Site Health and Safety Officer Printed Name	Site Health and Safety Officer Signature

MANUAL TEST

Plasticity:	☐ Cohesive ☐ Non-Cohesive
Dry Strength:	☐ Granular (crumbles easily) ☐ Cohesive (broken w/ difficulty)
NOTE: The following unconfined compressive strength tests should be performed on undisturbed soils.	
THUMB TEST	**Used to estimate unconfined compressive strength of a cohesive soil.**
Test Performed?	☐ Yes ☐ No
Type "A" Soil:	☐ Yes Indented by thumb with very great difficulty.
Type "B" Soil:	☐ Yes Indented by thumb with some difficulty.
Type "C" Soil:	☐ Yes Easily penetrated, or if soil is submerged, seeping, or subject to water, runoff, etc.
PENTROMETER OR SHEARVANE	Used to estimate unconfined compressive strength of saturated soils.
Test Performed?	☐ Yes ☐ No
Type "A" Soil:	☐ Yes Unconfined compressive strength of 1.5 tsf or greater.
Type "B" Soil:	☐ Yes Unconfined compressive strength between 0.5 and 1.5 tsf.
Type "C" Soil:	☐ Yes Unconfined compressive strength of 0.5 tsf or less or if soil is submerged, seeping or subject to water, runoff, etc.
WET SHAKE TEST	Used to determine the percentage of granular and cohesive materials in a soil sample. Compare results to a soil textural classification chart.
% Granular	% Cohesive % Silt
Type "A" Soil:	☐ Yes Clay, silty clay, sandy clay, clay loam, and in some cases silty clay loam, and sand clay loam.
Type "B" Soil:	☐ Yes Angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases silty clay loam, sandy clay loam.
Type "C" Soil:	☐ Yes Granular soil including gravel sand and loamy sand.
NOTE: Type "A" soil – no soil is a Type "A" if the soil is fissured, subject to vibration, previously disturbed, layered dipping into the excavation on a slope of 4H:1V.	
PROTECTIVE SYSTEMS	For selection of the appropriate protective system, use the flow chart in Appendix F of the Standard.
☐ Sloping or Benching (Appendix B) Specify Angle:	
☐ Timber Shoring (Appendix C)	
☐ Aluminum Hydraulic Shoring (Appendix D)	

Competent Person Printed Name	Competent Person Signature
Site Health and Safety Officer Printed Name	Site Health and Safety Officer Signature

ATTACHMENT G BASIC EMERGENCY MEDICAL AND FIRST AID

In the event of personal injury, a site associate trained in first aid will administer treatment to the injured associate after taking precautions to protect him or herself. If necessary, the injured associate will be transported to the nearest hospital. For all areas, emergency arrangements will be made prior to the commencement of work at the project. An ambulance will be provided if necessary. The Field Project Manager is responsible for the completion of an Incident Report Form.

OSHA Subpart K, Medical Services and First Aid, states that an employer shall ensure that medical personnel are readily available for consultation if professional assistance is not in near proximity to the workplace, persons will be adequately trained to render first aid. ENTACT requests that at least one person for every ten associates working is trained in first aid procedures and cardiopulmonary resuscitation (CPR).

ENTACT advises the following procedures in case of an incident; however these recommendations are not a substitution for First Aid Training:

1. Evaluate the situation and take immediate appropriate action. If necessary, remove the victim from a hazardous environment.

2. Rescuers and associates providing medical attention must protect themselves from blood borne pathogens by applying universal precautions learned in CPR and first aid training. Rescuers must avoid direct contact with blood and body fluids by wearing gloves, safety glasses, and masks or face shields. Breathing barriers must be used when performing CPR. If these protective devices are not available, it is better to wait for professional care.

3. Make certain emergency medical support has been notified.

4. Ascertain that the victim is breathing. If not, begin rescue breathing. Make sure the airway is not blocked.

5. Stop bleeding. Follow proper decontamination procedures prior to removing a victim contaminated with hazardous substances. If the victim is not decontaminated, other people and areas could be contaminated.

6. Confirm that help is on the way.

7. Communicate accurate information concerning details of the incident to medical personnel. It is very important that the medical personnel understand what type of chemicals that the victim has been exposed to. The ENTACT office is equipped with specific chemical information and first aid guidelines to assist you and the medical personnel. This information can be accessed and relayed to the hospital or medical personnel within minutes.

Order of Obtaining First Aid

1. If possible, designate another person to go for assistance while you stay with the victim.

2. Notify a physician, make him/her aware of the emergency and follow his/her advice regarding further first aid and transportation of the victim.

3. If it is apparent that the services of an ambulance are necessary, tell the telephone operator it is an emergency and ask him/her to connect you with the local ambulance service. If there is no ambulance service, telephone the nearest city, county, or state police.

4. In the telephone request to the doctor, police, or ambulance, be prepared to give:

    - Phone number calling from
    - Address and directions to the site
    - Describe the incident, number of victims and condition
    - Give your name
    - Do not hang up until emergency personnel end the conversation

5. Stay at the site until the doctor or ambulance arrives.

Condition, Symptoms and Treatment

Breathing Stopped - Breathing stopped completely

1. Check that breathing passages are not blocked.
2. Apply mouth to mouth method of artificial respiration at once.

Shock - Pale skin, body clammy and cold, pulse rapid and weak

1. Keep victim lying down.
2. Maintain normal body heat, but do not allow victim to become overheated.
3. If victim's face is pale, elevate feet slightly.

Bleeding - Blood flowing

1. Apply direct pressure over wound with cloth compress (sterile if possible).
2. If bleeding continues apply pressure at nearest pressure point above the bleeding.

Electrical Shock - Unconsciousness, burns may be present, may convulse

1. Survey the situation carefully. Make certain you are not the second victim.
2. If possible, turn power off.
3. If unable to turn power off move person from contact by moving live wire with a rope or dry board. If the victim remains in contact with the source of the electricity and must be moved use only your feet. By using your hands an electrical current is sent through your entire body

including your heart and is far more serious than current through the legs. An electrical current through the lower extremities is rarely fatal.
4. Check breathing. Check pulse. If necessary, begin CPR. Do not stop life saving measures until medical personnel arrive.

Burns

- 1st degree - skin reddened - cover lightly with sterile dressing
- 2nd degree - skin blistered - cover lightly with sterile dressing
- 3rd degree - deep destruction of tissue usually with charring - cover lightly with sterile dressing and consult physician at once. Do not place grease or oil on any burn.

Fractures

- Simple - pain and swelling, and/or deformed part.
- Compound - broken bone plus break in skin and bleeding.

1. Immobilize fractured part.
2. Stop bleeding and dress wound.
3. Splint securely if patient has to be moved.

Spinal Injuries

Injury to the spinal cord should be suspected in any incident involving a fall or injury to the neck or back or when there is loss of sensation or movement. Move the victim only if necessary. Attempt to keep the body aligned and the back and neck straight. Preferably, the victim should not be moved until an ambulance arrives with a special stretcher and trained personnel.

Choking

An air way obstruction should be suspected if there is violent choking, alarmed expression, attempts at inhalation, discoloration in the face, neck, and hands, unconsciousness

1. If the victim can cough, speak or breathe - DO NOT interfere by pounding on the victim's back.
2. If the victim can not respond or speak, approach the victim from behind and place fisted hands below the rib cage and apply firm pressure in quick, sharp, upward blows to force air from the lungs.
3. If unconscious, turn victim's head to one side, apply same pressure outlined in Step 3.
4. Artificial respiration may be necessary for the unconscious victim after the object has been removed from the throat.

Sudden Illness

- Heart Attack - Chest pain, shortness of breath, pale or bluish skin, shock.

- Stroke - Loss of sensation and/or movement on one side of the body, pupils unequal, inability to talk, unconsciousness.
- Convulsion - Rigidity of body muscles lasting from a few seconds to half a minute, bluish discoloration of face and lips.
- Fainting - Unconsciousness

1. Check breathing. Check pulse. Begin CPR, if necessary.
2. Loosen tight clothing.
3. Keep normal body temperature.
4. In the case of convulsions - protect the victim from injury, but do not attempt to place objects in the victim's mouth.
5. Do not attempt to give liquids to an unconscious victim.

Prevention of Heat Stress

1. Proper clothing - Loose fitting, light weight, light colored, and properly ventilated.
2. Hat - To prevent radiant heat exposure to the head and to shield the face from ultraviolet light.
3. Acclimatization - Heat disorders are more likely to occur at times when associates are not acclimated to working in the heat. Most people require one week to adapt to a hot humid environment.
4. Work loads - During hot temperatures, work loads should be adjusted to each associate's acclimatization rate.
5. Body weight - Monitor your daily weight. A pint of water weighs one pound. If you have lost several pounds in one day, try to replace the amount of weight lost.
6. Heart rate and body temperature - While working in the heat your heart rate and body temperature are good measures of body stress.
7. Fluid intake - The most important measure of prevention adequate fluid intake during the work period.

Exposure to Hazardous Chemicals

The environmental industry is faced with the problem of handling mixtures of unknown substances. Speed is of prime importance in the prevention of injury from chemical exposure. It may not be possible to take the time to determine what particular chemical or combination of chemicals are responsible for the exposure. Even once a chemical is known it may require valuable time to refer to specific chemical exposure guidelines. If "worst case" exposure guidelines are followed then valuable time can be saved. In general, there are four ways that chemicals enter the body: inhalation, skin exposure, eye exposure, and ingestion.

Inhalation

1. Remove from hazardous area to fresh air.
2. If not breathing begin mouth to mouth respiration.
3. Give oxygen.

4. Call emergency services.
5. Identify chemicals.
6. Observation by physician for a 24-hour period depending on specific chemical.

Skin exposure

1. Remove contaminated clothing.
2. Wash under running water for 15 minutes.
3. Call emergency services.
4. Identify chemical
5. Observation by a physician if necessary.

Eye exposure

1. Wash eye for 15 minutes (remove contact lenses first).
2. Call emergency services.
3. Identify chemicals.
4. Evaluation and treatment by physician.

Ingestion

1. Identify chemical ingested.
2. Call poison control center or CHEMTREC 1-800-424-9300.
3. Follow actions given by center.
4. Seek follow-up medical attention if recommended by the center.

Hot Weather

1. Orientation for all associates on heat stress and its related symptoms.
2. Regular break periods with water and Gatorade.
3. Methods to monitor heat stress:
4. Body water loss (BWL) due to sweating should be measured by weighing the associate in the morning and the evening. The clothing worn should be similar at both weighings. BWL should not exceed 1.5% of total body weight. If it does the associate should be instructed to increase his or her daily intake of fluids; or
5. The heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher the next work period should be shortened by 10 minutes while the length of the rest period remains the same.
6. There will be established break periods and breaks on an as needed basis.

If symptoms of heat stress are noted for an associate the associate will be evaluated by measuring the heart rate for 30 seconds.

Signs and Symptoms of Heat Stress

Heat rash may result from continuous exposure to heat or humid air.
Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include;

- Muscle spasms
- Pain in the hands, feet and abdomen
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting
- Tiredness
- Headache
- Weakness

Heat stroke is the most serious form of heat stress. Temperature regulations fail and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, usually dry skin
- Lack of or reduced perspiration
- Nausea
- Dizziness and confusion
- Weak rapid pulse
- Coma or unconsciousness

Cold Weather

- When the air temperature is below 40ºF associates will be reminded of the hazards of cold stress and that proper clothing is required.
- When air temperature is below 36ºF, any time clothing becomes wet it must be replaced immediately.
- Temperatures below 30ºF will require special insulated clothing and fluid replacement with warm, sweet, non-caffeine containing drinks.
- Specific Controls:
  - An area that is heated for breaks and lunch.
  - Areas minimizing air movement to shield wind.
  - Reducing conductive heat transfer.
  - Providing adequate clothing protection.
  - Special cold weather discussions will be held in daily safety meetings when temperatures are expected to be below 36ºF.

See the ENTACT Comprehensive Health and Safety Manual for wind chill chart.

Caring for Poisonous Snake Bites
The following is a summary of current (as of 2005) recognized first aid treatment protocols for bites that occur at field locations where advance medical treatment is not immediately available.

- Try to safely and quickly identify the species of snake if practical. Move victim to safety. Have one person take firm command of the situation. Document the victim's condition and location of the bite and time. Write it down!
- Remove any jewelry or tight fitting clothing. Quickly tie a light restricting band (not a tourniquet) both above and below the bite area a few inches away from the puncture/bite marks.
- Without cutting, apply strong suction, preferably within seconds of the bite directly on the main or deepest puncture/bite marks. This can be accomplished with the mouth or a commercial bite kit suction device. Time is critical here as any venom present will become destructive very quickly!
- Rapidly apply antiseptic cleanser to the entire area and place cold compress (or chemical ice pack) as closely as possible without interfering with suction process.
- Continue strong suction and alternate the location of compress to avoid injury from severe cold.
- Check constriction bands periodically as swelling may occur and loosen as appropriate. A constriction band should not stop the pulse below the band.
- Monitor for symptoms of shock and be prepared to administer appropriate treatment. At any signs of major stress or unusual/unexplained discomfort, check for need to apply other first aid techniques - elevate legs from lying down position, keep warm, immobilize, etc. Do not administer alcohol or cause additional stress to victim. Avoid food or liquid intake.
- Keep victim warm, but do not over heat, and as immobile as practical. Movement to proper treatment facility is more crucial than maintaining immobile status.
- Transport safely at the earliest possible time to competent medical facility. Ideally, all of the above steps can be administered concurrently with transport phase. Keep victim as comfortable as possible and reassure that survival is not in question. Rapid response reduces damage levels.
- If the snake has been killed, take it along for any identification or testing needs. The primary purpose of this first aid is to slow down or reduce the invasion of the venom, to protect the victim from further side effect trauma and generally to get the victim to advanced treatment as quickly and safely as practical.
- Documenting activities, times and treatment will be useful for the advanced medical providers. Remember to write it down.
- Be confident in what you do and remember, early treatment is the best treatment when a bite occurs!

ATTACHMENT H JOURNEY MANAGEMENT PLANNING

Background:
The first step of journey management planning is to "question the need for every trip." The journey management planning process is a simple risk assessment of the relative value of any proposed trip versus the inherent risk that making it presents. This planning process will ensure that all identified hazards are understood and managed and that unnecessary trips or those presenting an unreasonable or uncertain risk are not taken. Depending on the nature of company travel, this assessment may be something as simple as a driver asking themselves what route and time they will travel to a destination to a formal documented project journey management plan (JMP.)

Purpose:
This document provides guidance and outlines requirements regarding journey management planning. Its purpose is to minimize the risk associated with motor vehicle use and transport. This document includes forms which should be used to prepare a JMP.

Scope:
Journey management planning applies to ENTACT Associates and contractor/sub-contractors when on Company property or when using motor vehicles for company related business, including:

- Company-owned or leased vehicles
- Rental vehicles used on Company-authorized business
- Personal vehicles while being used for Company business

Journey management planning excludes multiple transport mode journeys where associated motor vehicle travel is less than 100 miles. Multiple transport mode journeys are those that include the use of, for example, a combination of personal vehicle, airplane, and rental car.

Definitions:
All employees should categorize their business travel into one of the following categories:

Routine journeys: routine and repetitive driving tasks associated with short journeys (those less than 100 miles one way), familiar regions and terrain, and normal driving conditions (such as familiar roads, good weather, and owner's vehicle.) For example, travel to a local site for a weekly project meeting is a routine journey.

Non-routine journeys: driving tasks associated with extended travel distances (greater than 100 miles one way) or duration, unfamiliar regions or terrain, and unusual conditions (such as unfamiliar roads, bad weather, and use of a rental vehicle.) For example, mobilizing to a new project or area that is not familiar to the driver, either because of unfamiliar roads, wildlife, night driving, and bad weather is a non-routine journey. Such journeys may also require specific security and emergency response considerations as well as additional planning and controls.

Basic Operating Standards:
All journeys, whether routine or non-routine, must comply with ENTACT's basic motor vehicle operating standards as follows:

- All vehicle occupants must wear safety belts (seatbelts and shoulder harness if provided)
- No vehicle shall be operated by a driver under the influence of drugs or alcohol
- Keep speed appropriate to conditions and follow all local laws and regulations
- Cellular telephone and 2-way radio use, in either the hand-held or hands free mode, by the driver of a motor vehicle is strictly prohibited while the vehicle is in motion
- Never operate a motor vehicle if you will exceed the "16 Hour Rule"
- Where practical, vehicles will be parked such that the first movement after inspecting and starting the vehicle is in the forward direction

16 Hour Rule:
To minimize risk caused by fatigue, employees will not engage in driving if the journey requires them to exceed 16 hours of continuous duty in one day. For example, a 5 hour road trip at the end of 12 hour work shift can raise the risk of a crash due to fatigue to an unacceptable level. The driver should have adequate rest prior to the start of the trip.

Additional Requirements for Routine Journeys:
Employees on routine journeys should "question the need for every trip" by asking themselves the following:

- Is there an alternative way of achieving this trip's objective, such as using a courier or having a teleconference or net meeting? If the answer to this question is yes, the trip may not be necessary.
- Do I know the route to the destination well? Drivers should have a clear understanding of the best route to the destination in advance. If this is not the case, a better alternative may be to take a taxi or car service.
- Have I considered all environmentally related hazards for the route of travel? Weather conditions, road conditions, and traffic conditions present at the planned time of departure must be considered. Fog, rain, ice, or road construction present hazards that need to be accounted for by selecting an alternative route or delaying or rescheduling the trip.
- Must this journey be made at night? Driving at night increases risk substantially. Consequently, extra caution is required. For night travel on routine journeys, consider what steps must be taken to minimize the risk. Actions such as decreasing speed, altering the route to well lighted streets, or delaying or rescheduling to arrive in daylight hours are possibilities.

Additional Requirements for Non Routine Journeys:
All non-routine journeys require a formal journey management plan (JMP.) The JMP should address security concerns (if applicable) and emergency response issues. At a minimum, all

drivers will inquire about the safest route of travel and notify their business contact and/or supervisor of travel plans and expected arrival time. Copies of completed JMPs should be included with the employee's or contractor's travel itinerary. Completed JMPs should be electronically sent to the destination location. Safe arrival should be confirmed within 4 hours of the estimated arrival time with personnel at the same destination location. Personnel at the destination location should notify the traveler's supervisor if the traveler fails to confirm safe arrival. Additional considerations are as follows:

- Security concerns that may be present on the planned route need to be addressed. For example, planned demonstrations, high risk crime areas, car jacking, and kidnapping are security concerns. If security is an issue for the journey, the JMP should address how that risk will be minimized. Carrying of weapons while on Company business is not permitted.
- Emergency response (ER) services, especially in remote locations may not be available. Arrangements for communication and support, such as cell phone, local 911 service, two way radio must be made. The local emergency response service is an appropriate answer in many cases, however, on some journeys; drivers need to be aware of the limitations and even existence of ER services. The best way to minimize this risk is by ensuring personnel at the destination location know the planned arrival time and what to do in the event the driver does not arrive or make contact.
- Night driving during non-routine journeys should be avoided except in the event of an emergency. The journey should be rescheduled to allow for daylight travel in all other cases.

Related Documents:
Forms (provided on the following pages) have been developed to assist drivers and other affected Associates in complying with this journey management process. The forms include a Journey Assessment Form and Journey Management Plan. Also, a JSA (provided on the following pages) for driving passenger vehicles is applicable and required as part of the overall safety process.

Journey management planning requirements are in addition to other ENTACT requirements that appear in Section 9.0 and 10.0 of the Associate Handbook as well as the Driver Safety and Cell Phone Policies.

JMPs will be prepared in addition to site-specific Health and Safety Plans.

Journey Assessment Form

For use by: ☐ ENTACT Associate ☐ Contractor/Sub-contractor

Assessment developed by: _____ _____ _____
_____ _____ _____

Driving requirement: _____
Is this trip necessary? ☐ Yes ☐ No
Is there an alternative that does not involve driving? ☐ Yes ☐ No
If yes, by what means: _____

Basic Journey Steps

Was a JSA developed or revised for this driving task by employees from the site that will be involved in the task? ☐ Yes ☐ No

Does the JSA break the journey into steps necessary to accomplish the task and describe in "what" not "how" steps? ☐ Yes ☐ No

Are the journey steps numbered for reference? ☐ Yes ☐ No

Potential Crashes or Hazards

Are the hazards associated with each journey step identified by asking "what" driver action, condition, or event can lead to a crash? ☐ Yes ☐ No

Are potential health hazards identified (toxics, heat/cold, fatigue) ☐ Yes ☐ No

Are all potential crashes (struck by, line of fire, pinch points) identified with a corresponding solution or mitigation technique? ☐ Yes ☐ No

Are the potential crashes/hazards numbered for reference? ☐ Yes ☐ No

Safe Procedures and Behaviors

Are safe procedures and behaviors identified for minimizing or eliminating each identified potential crash or hazard? ☐ Yes ☐ No

Are the safe procedures and behaviors specific? ☐ Yes ☐ No

Are vague and general statements avoided? ☐ Yes ☐ No

Are the safe procedures and behaviors numbered for reference? ☐ Yes ☐ No

JSA Process Review

Was the JSA revised because the scope of work changed? ☐ Yes ☐ No

Does the JSA match the task to be performed? ☐ Yes ☐ No

Journey Management Plan

For use by: ☐ ENTACT Associate ☐ Contractor/Sub-contractor

Developed by: _____ _____ _____

_____ _____ _____

Task or Trip description: _____

_____

Is this trip necessary? ☐ Yes ☐ No
Is there an alternative way of achieving the trip objective? ☐ Yes ☐ No
If yes, how: _____

Destination: _____ Contact Phone Number _____

Vehicle	**Driver**	**Passenger**
_____	_____	_____
_____	_____	_____
_____	_____	_____

Departure Time: Estimated Time of Arrival:

Security Escort Required? ☐ **Reason:** _____

Weather ☐ Dry ☐ Windy ☐ Rain ☐ Snow ☐ Fog ☐ Icy ☐ Dust

Road Conditions ☐ Dirt Road ☐ Pot holes ☐ Paved Road ☐ Mixed Conditions

Driver Hours Work hrs _____ + Driving Hrs _____ = Total Hrs _____
(total hours may not exceed 16 hours in any day)

Communications ☐ Cell phone ☐ Two-Way Radio ☐ Other _____

Night Driving ☐ Yes ☐ No Is it essential? ☐ Yes ☐ No
Night driving controls (list) _____

Vehicle condition ☐ **Satisfactory**
Person responsible for the daily inspection of the (these) vehicle(s)? _____

Person responsible for preventive maintenance on the (these) vehicle(s)? _____

Documentation Check	Yes	No
Vehicle registration/license	☐	☐
Proof of insurance	☐	☐

Valid driver's license (or CDL as required)	☐	☐
Valid vehicle inspection (if required)	☐	☐

Journey Hazard Review

Step	Hazard	Mitigation
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

Comments:

Supervisor Approval _____ Date _____

Job Safety Analysis	
Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, success agreements and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each work day. Job Task Review (JTR) procedures must be used during field activities. Also consider weather conditions (heat, cold, rain, lightning).	
Work Type:	Driving - Passenger Vehicle
Personal Protective Equipment (PPE) needed	
Safety Glasses	
Work Boots - Steel Toe, Leather	

Job Steps	Potential Hazard(s)	Critical Action(s)
Conduct JTR	• NLI/LI	Always conduct an JTR prior to start. • Assess the risk. What is the worst that could happen? • Analyze how to reduce the risk. Ask yourself what you could do to make the task safer. If you are uncertain, then ask someone who would know. • Act to ensure safe operations. Use the ideas and tools that make the task safer.
Perform Vehicle Inspection	• Vehicle failure • Incident or injury	• Check overall condition of vehicle. • Inspect tire condition and pressure. • Check all fluids. • Check head lamps, turn signals, and back up lights. • Clean mirrors and windows. • Inspect the interior of the vehicle; including seat belts and gauges. Remove any clutter or items that may affect your driving or visibility. • Follow appropriate maintenance schedule for your vehicle. Verify insurance card, registration and inspection.
Pre vehicle entry	• Injury or incident. • Vehicle or property damage	• Before entering your vehicle, do a complete walk around. • Be sure that there are no persons or objects behind you or in your path. • Consider ground conditions. Is it wet or muddy? Could the vehicle become stuck or slide? • Consider weather conditions. Is there lightning, flooding or high winds?
Configure seating and controls and lock doors	• Visibility • Sitting to far or to close to pedals may effect reaction time in a stop, or have	• Adjust seating to a comfortable position and so that you can easily reach the pedals and steering wheel. • Adjust all mirrors. • Wear seat belt. • If you haven't operated this vehicle before, become familiar with all the controls and where every this is located in the vehicle. • Look for

Job Steps	Potential Hazard(s)	Critical Action(s)
	unexpected results during acceleration.	blind spots in your viewing area. • Refer to the owner's manual if necessary.
Starting Vehicle	• Unexpected vehicle movement. • Engine damage or failure	• Before starting, ensure that the vehicle is in park and the parking break is applied. • After starting, check all gauges for proper temperatures, pressures, etc.
Pulling away from parked area.	• Collision with other vehicles, objects or persons.	• Check mirrors and over the shoulder before pulling away. • Vehicle should be situated so the first movement is forward, however if backing, either use a spotter or blow horn to warn others. • Proceed Cautiously.
Driving	• Auto incident • Pedestrians • Foreign objects in roadway • Cross traffic • Mechanical failure • Becoming lost or disoriented. • Weather	• Always be alert while driving. • Plan your route, review maps before leaving. Stop in a secure areas if you need to review your map again. • NEVER drive under the influence of drugs or alcohol. If under medical treatment, consult your physician about side effects of medications. Inform H&S if you are taking any medications. • Never operate the vehicle if you are abnormally tired. • Obey all laws of the land as well as site procedures. Follow posted signs. • Be observant of pedestrians and other traffic around you. Be prepared to "expect the unexpected". You never know what someone else (or animals) might do. • Watch your gauges and listen to the sounds that the vehicle makes. If something doesn't seem right, pull over and check it out or call for help. • Continually check mirrors. Follow the 3 second rule for following in normal circumstances. • Leave adequate space between you and other when stopping. • Never use a cell phone or 2-way radio while driving. Save phone calls for when you are stopped. If you must take a call, pull off the road in a safe area away from traffic. • Reduce speed during hazardous circumstances. Pull off the road if necessary during bad weather.

ATTACHMENT I JOB SAFETY ANALYSIS

The following JSAs are provided as guidance and to assist the site Health and Safety Officer and Field Crew (JSA Development Team) with the development of site-specific JSAs. The Development Team will prepare a JSA for work tasks and equipment by applying work experience and skills learned during training.

Job Safety Analysis			
Work Type:	Heavy Equipment Operation: Dozer		
Personal Protective Equipment (PPE) needed			
Body Suit - Coveralls			
Hard Hat			
Hearing Protection - plugs			
Orange Safety Vest			
Protective Gloves - cotton dipped or leather			
Respiratory Protection - OV/P-100			
Safety Glasses			
Work Boots - leather steel toe			
No	**Job Steps**	**Potential Hazard(s)**	**Critical Action(s)**
1	Conduct JTR.	NLI/LI.	Always conduct an JTR prior to start.
2	Conduct inspection using ENTACT daily inspection check list.	Lack of inspection could cause equipment damage or injury to driver.	Lockout/tag out, make sure ignition key is in your pocket, not in the ignition.
3	Clean/defrost windows and mirrors.	Obstructions in windshield and windows/mirrors could cause injury/equipment damage or even death.	Keep paper towels and window cleaner in equipment at all times. Clean only when equipment is off and parking brake is applied.
4	Entering the equipment.	Slips/falls and pinch points may cause injury or death.	Always use 3 point mount/dismount. Stay clear of pinch points. Utilize approved mounting steps, brackets and handrails. Use required PPE.
5	Configure controls and seating.	Ergonomics/unnecessary physical stress. Incapable of reaching controls. Visual blocks.	Upon sitting, adjust seat fully to accommodate reach and comfort zone. Adjust mirrors. Fasten seat belt. Make certain all controls are set in neutral positions.
6	Starting and warming up.	Unanticipated rolling or movement, engine fire, or mechanical/electrical faults.	Review operator's manual if new to this particular machine. Start engine and

			check controls to ensure all green lights. Allow minimum of two minutes warm up.
7	Moving equipment work area.	Other equipment, personnel, or objects in work area. Uneven terrain.	Conduct JTR. Know the daily task and other people and equipment in the area.
8	Performing tasks.	Other equipment (collision), slopes, ground conditions possible injuries to personnel and equipment, buried obstacles, underground and overhead utilities, and dust. SPOT TRUCKS WHEN DUMPING MAKE SURE THEY ARE LEVEL HAVE COMMUNICATION WITH DRIVER BE AWARE OF OTHER EQUIPMENT IN YOUR WORK AREA NEVER STAND BETWEEN DOZER AND TRUCK WHEN DUMPING	Perform JTR. Know where utilities are located. Be aware of the scope of work to be performed. Know the paths of other equipment or persons entering and leaving your work area. Communicate with supervisors throughout the day with any questions. Stop work immediately and contact a supervisor if you are uncertain of your task, experience equipment failure, or personal injury or near loss. Make visual contact with all site personnel walking in your area of work.
9	Stopping at end of day.	Slips, trips and falls. Fuel splash/spill. Underground movement of equipment, or hydraulic leak.	Park in designated area. Set brake/control locks. Idle two minutes if engine is hot. Lower blade to ground. Turn equipment off, use 3 point dismount. Be sure that you are in a well ventilated area. Grease moving parts.

Job Safety Analysis

Work Type:	Heavy Equipment Operation: Motor Grader

Personal Protective Equipment (PPE) needed

Level D

No	Job Steps	Potential Hazard(s)	Critical Action(s)
1	Conduct JTR	NLI/LI	Always conduct an JTR prior to start.
2	Conduct inspection using ENTACT daily inspection check list	Lack of inspection could cause equipment damage or injury to driver	Lock out/ Tag out, make sure ignition key is in your pocket, not in the ignition. Check all fluids.
3	Clean/Defrost windows and mirrors	Obstructions in windshield and windows/mirrors could cause injury/ equipment damage.	Keep paper towels and window cleaner in equipment at all times. Clean only when equipment is off and parking brake is applied.
4	Entering the Equipment.	Slips/falls and pinch points may cause injury or death	Always use 3-point mount/dismount. Stay clear of Pinch Points. Utilize approved mounting steps, brackets and handrails. Use required PPE.
5	Configure controls and seating	Ergonomics/ unnecessary physical stress. Incapable of reaching controls. Visual blocks.	Upon sitting, adjust seat fully to accommodate reach and comfort zone. Adjust mirrors. Fasten seat belt. Make certain that all controls are set in Neutral positions.
6	Starting and warming up.	Unanticipated rolling or movement, engine fire, or mechanical/electrical faults. Noise	Review operator's manual if new to this particular machine. Start engine and check controls to ensure all green lights. Allow minimum of two minuets warm up. Wear ear plugs or be sure the doors are closed to protect ears from loud noise during startup.
7	Moving equipment to work area.	Other equipment, personnel, or objects in work area. Uneven terrain.	Conduct JTR as the task changes. Know the daily task and other people and equipment in the area.
8	Performing tasks.	Other equipment (collision), slopes, ground conditions possible injuries to personnel, and equipment, buried obstacles, underground and overhead utilities, and Dust.	Know where utilities are located. Be aware of the scope of work to be performed. Know the paths of other equipment or persons entering and leaving your work area. Communicate with Supervisors through out the day with any questions. Stop work immediately and contact a supervisor if you are uncertain of your task, experience equipment failure or personal injury or near loss.
9	Stopping at end	Slips trips and falls, Fuel	Park in designated area. Set

	of day	splash/spill. Unexpected movement of equipment, or hydraulic leak	brake/control locks. Idle two minutes if engine is hot. Lower blade to ground. Turn equipment off, use three point dismounts. Be sure that you are in a well ventilated area. Grease moving parts.

Job Safety Analysis

Work Type:	Heavy Equipment Operation: Articulating Dump Truck

Personal Protective Equipment (PPE) needed
Hard Hat
Level D
Orange Safety Vest
Other - Two way radio, fire extinguisher
Safety Glasses
Work Boots - Steel toe

No	Job Steps	Potential Hazard(s)	Critical Action(s)
1	Conduct JTR.	Failing to identify hazardous conditions resulting in losses or near losses	Follow JTR card. Assess the risks. Determine the hazards of performing the task and survey the work area. Consider weather conditions such as recent rainfall that could cause soft ground and could compromise integrity of excavations; wind that could increase lateral loads when dumping; rain and fog that could decrease visibility; wet or icy conditions that could cause slippery conditions. Always consider the worst case scenario. Analyze the hazards determined. Decide a plan of action to eliminate or reduce these hazards. Act to reduce the hazards. Follow through with the plan determined when analyzing.
2	Perform daily equipment inspection.	Equipment malfunction or damage; hydraulic fluid, fuel, oil leaks/spills; loss of steering, loss of brakes, etc.-incidents; decreased visibility; failing to lo/to; fire	Ensure key is not in ignition. Follow ENTACT equipment inspection form. Check all fluids. Ensure fluids are not too low or too full. Walk around truck. Look for damage. Look for leaking fluids. Ensure proper tire pressure. Clean mirrors and windows. Remove any trash or other debris from cab. Ensure back-up alarm and horn is operational. Ensure fire extinguisher is on equipment and functioning. Inspect the fire extinguisher monthly.
3	Establish communication and plan a haul route with operators and other associates	Personnel and/or equipment damage due to inadequate communication; head on collisions with other truck traffic	Establish hand signals and horn signals for communication. Always maintain clear radio communication. NEVER proceed with the task until communication is clearly

	involved in the task.		established. If communications are unclear, stop work until clear communications are reestablished. Ensure that everyone knows the correct haul route. Inform other relevant site personnel of the route you will be using. If route changes through out the day, notify all relevant site personnel.
4	Enter truck and start.	Slips, trips, falls; failing to fasten seatbelt-injuries and death; failing to adjust mirrors and seat; unexpected movement of equipment	Make sure steps are clear of mud, ice and debris. Use 3 point contact for mounting. Make sure seatbelt is securely fastened. Adjust seat and mirrors appropriately. Ensure truck is in neutral and parking brake is engaged. When entering and exiting truck, walk around to ensure that no people or equipment is in blind spot.
5	Drive forward.	Injury/death due to incidents-contact with other equipment or pedestrians; property and/or equipment damage; failing to remain alert and aware of surroundings-repetitive task; complacency	Check all mirrors before moving. Be aware of surroundings and blind spots. Drive at reasonable amount of speed. Never exceed posted speed limit of 10mph. Reduce speed if conditions such as heavy traffic routes, weather, rough terrain, dust, etc. exist. Be familiar with the route to be used. If route changes throughout the day, notify appropriate personnel. Ensure that routes are free of obstacles such as debris and ruts. NEVER use a route that travels against the flow of haul truck traffic unless the route is coordinated, approved and overseen by Field Project Manager. Be aware that other site sub/contractors use these same roads. Be a defensive driver. Be aware of other site personnel not following safe driving procedures. Obey site traffic rules. Drive with lights on and heed all traffic signs.
6	Drive in reverse.	Injury, death or due to incidents-back off edge of excavation, back into equipment, people or other obstacles; truck turn over-backing onto uneven, badly rutted or extremely soft material; blind spots; poor visibility	Always minimize backing up; plan ahead to ensure first move is forward. NEVER back up if unsure of what is behind the truck. NEVER back up without the aid of a spotter. When using a spotter, NEVER back without knowing his location. Use mirrors and turn body to look out windows to cover all blind spots. Exit cab to check area if unsure of

			conditions such as soft ground, rebar/other debris. Back at a slow rate. Use 6 wheel drive when needed. Never drive close to an edge or back to an edge that could collapse. Never back when vision is obscured by sunlight, darkness, fog, etc. Never back onto an upward slope, badly rutted or extremely soft ground.
7	Receive load.	Injury, death or equipment damage-contact with other equipment, truck tip; miscommunication; falling debris; unexpected equipment movement	Never allow the truck to be loaded with excavator swinging over cab. Never stand next to a truck or allow others to stand next to a truck being loaded. Set parking brake and park a sufficient distance from the equipment loading the truck. Follow instruction from excavator operator on where to park. Maintain radio communication with operator loading truck and others in the area. Ensure the loading area is level, free of ruts and not too soft. Communicate with the operator loading the truck to ensure that the load is centered. Ensure that the truck is not overloaded. If hauling pipe, ensure the pipe is 10 ft or less.
8	Dump load.	Equipment damage, injury or death-truck tip, excavation collapse; overhead utilities; failing to remain alert, complacency	Ensure the truck is on stable, level surface. Have ruts removed. Inspect area for rebar or other debris that could puncture a tire or otherwise cause dumping to be unsafe. Inspect area for overhead power or other lines and mark. Ensure that no people or equipment is in the tip radius of the truck before dumping. Align the cab with the bed. Place truck in neutral, set parking brake, lift up on the lever that starts the bed up. Once the bed is fully up, place the truck in drive. Disengage parking brake and slowly pull forward until bed is empty. STOP MOVING and lower the bed. ALWAYS watch the bed lower in mirrors. Do not continue forward until the bed is more than 50% down. If route from dumping area poses hazards such as over head power lines, turns, unleveled ground etc., lower bed completely before moving. Drive straight on solid, level ground until bed is

			completely down. Always remain alert while operating the truck.
9	Complete task and exit truck.	Unexpected movement of truck; slips, trips, falls	Park truck on level ground in a safe area. Engage parking brake. Turn off and remove key. Dismount using 3 point contact.

Job Safety Analysis

Work Type:	Heavy Equipment Operation: Excavator

Personal Protective Equipment (PPE) needed
Fire Resistant Clothing
Hard Hat
Level D
Orange Safety Vest

No	Job Steps	Potential Hazard(s)	Critical Action(s)
1	Conduct JTR.	Failing to identify hazardous conditions resulting in losses and near losses.	Follow JTR card. Assess the risks. Determine the hazards of performing the task and survey the work area. Consider weather conditions such as recent rainfall that could cause soft ground and could compromise integrity of excavations; rain and fog that could decrease visibility; wet or icy conditions that could cause slippery conditions. Always consider the worst case scenario. Analyze the hazards determined. Decide a plan of action to eliminate or reduce these hazards. Act to reduce the hazards. Follow through with the plan determined.
2	Conduct inspection of equipment using Entact inspection check list.	Lack of inspection could cause equipment damage or injury to driver	Lock/out tag out - make sure ignition key is in pocket, not in the ignition. Bucket should always be on the ground. Check hydraulic hoses to be sure they have enough slack when operating boom. Ensure all pins are in place. Grease equipment every 10 hrs of work.
3	Clean/defrost mirrors and windows.	Obstructions in windshield and mirrors could cause injury/equipment damage-reduced visibility	Keep paper towels and window cleaner in equipment. Clean only when equipment is off and parking brake is applied.
4	Enter the equipment.	Slips and falls; pinch points may cause injury or death	Always use 3 point mount/dismount. Stay clear of pinch points. Utilize approved mounting steps, brackets and hand rails. Use required PPE
5	Configure controls and	ergonomics/unnecessary physical stress, incapable of reaching controls,	Upon sitting, adjust seat fully to accommodate reach and comfort

	seating.	visual blocks	zone. Adjust mirrors, fasten seat belt. Make certain that all controls are in the neutral position.
6	Start and warm up.	unanticipated rolling or movement, engine fire, mechanical/electrical faults	Review operator's manual if new to machine. Start engine and check controls to ensure all green lights. Allow minimum of two minutes to warm up. Ensure parking brake remains engaged while warming.
7	Move equipment to work area.	other equipment, site traffic, overhead utilities, personnel or objects in work area, uneven terrain	Conduct JTR. Know the daily task and tasks of other people and equipment in the area. Raise the bucket off the ground to situate machine in the work area. If traveling from one work area to another, watch for overhead power lines. Travel with boom low and bucket curled. Survey the travel path for overhead utilities ahead of time.
8	Perform task.	Other equipment (collision), slopes, ground conditions changing, possible injuries to personnel/equipment, buried obstacles, underground and overhead utilities and other overhead hazards; muddy or water filled excavations; uncovering drums or other unknown hazardous material, cave-ins	Perform JTR. Know where utilities are located and have them marked. Know the scope of work to be performed. Know the paths of other equipment or persons entering and leaving the work area. Communicate with supervisors throughout the day with questions. Stop work immediately and contact a supervisor if you are uncertain of your task, experience equipment problems or personnel injury or loss. Never enter an excavation that contains water. Survey an excavation that is wet to determine if the soil is to soft to enter. Any questionable excavations should not be entered. Anytime questionable debris, material or drums is uncovered during excavation, the FPM should be notified immediately. Excavation should be stopped until further instruction from the FPM. Never stand or work within 2 ft. of the edge of an excavation. If working on top of a spoil pile, never throw material over the side without checking for others working below. Never let

			other workers stand behind or in front of the excavator while it is being operated. If working at the bottom of a stockpile, remain aware of activity on top of the stockpile. Maintain constant communication with others working in the area.
9	Park, shut down and exit equipment.	Unexpected movement, trespasser starting/moving equipment, unstable ground sloughing	Park equipment on stable ground and lower bucket to ground. Consider weather. Will ground become unstable overnight? Set parking brake and remove keys. Use a 3 pt. dismount.

ATTACHMENT J INCIDENT REPORTING

ENTACT is guided by an established safety policy. This policy is based on a sincere desire to eliminate personal injuries, occupational illnesses, and damage to equipment and property, as well as to protect fellow associates and the general public whenever the public comes in contact with, or is affected by, ENTACT's work.

Managers and supervisors are charged with the responsibility of preventing the occurrence of incidents or conditions that could lead to occupational injuries or illness. While it is management's responsibility to provide a safe environment in which to work, the ultimate success of a safety and health program depends upon the full cooperation of each individual associate.

Safety should never be sacrificed for production. It must be considered an integral part of quality control, cost reduction and job efficiency. Every supervisor will be held accountable for the safety performance demonstrated by the associates under their supervision. Our goal is the total elimination of incidents from our operations. There are three sound reasons for this goal:

1. No endeavor is worthy if it should cause human suffering through disabling injury or loss of life.
2. A good safety record reflects the quality of management, supervisors, and the work force. It also serves to promote business and thereby contributes to the continuing growth and success of ENTACT.
3. Poor incident experience increases costs and results in a loss of profits. Our policy is to accomplish work in the safest possible manner consistent with good work practices. Management at every level is charged with the task of translating this policy into positive actions.

INCIDENT REPORTING PROCEDURES

All incidents, injuries, and significant near misses must be reported immediately to the associate's supervisor. Subcontractors will promptly report any incident to the ENTACT Field Project Manager. Work will stop until the situation is addressed and work can safety resume. Incident information will be forwarded to the Project Health and Safety Coordinator and Corporate Health and Safety Director within 24-hours. The client or owner representative will be notified according to their requirements.

The project management team will use ENTACT's Online Incident Notification System to report losses and significant near losses. This notification system does NOT replace any part of ENTACT's incident notification requirements and investigation process.

http://www.sentact.com/entactincidents/

A thorough investigation will commence to determine the facts of the incident, root causes,

solutions, and verification and validation of solutions. A completed Loss Investigation / Near Loss Investigation report and supplemental information (first report of injury, witness statements, supervisor statement, police report, damaged equipment report, monitoring reports, photographs, drawings, etc.) must be provided to Corporate Health and Safety within 5 working days of all incidents. If applicable, a Why Tree Incident Investigation will commence following established protocol and final report submitted to the Health and Safety Director within two weeks of the incident. ENTACT's Post Accident Drug and Alcohol testing procedures will be followed. Completed incident documentation shall be maintained on-site and at the Corporate Health and Safety office.

Incident reporting forms are located in the Policies and Procedures section of the ENTACT Behavior Based Safety System or are available on the intranet at: http://connected.entact.com/index.php .

Failure to report an incident immediately after it happens may result in dismissal and/or delay or denial of associates' workers compensation benefits.

ENTACT shall maintain a log of occupational injuries and illnesses as required by federal law in accordance with the OSHA record keeping requirements of 29 CFR 1904.2

MOTOR VEHICLE INCIDENT REPORTING

Associates, supervisors, and subcontractors are responsible for reporting all motor vehicle incidents involving ENTACT (business or personal). This includes any incident involving a company owned, leased or rented motor vehicle. Where appropriate, work will stop until the situation is addressed and work can safety resume. Verbal notification of a motor vehicle incident will be given to the HSD or his designee within 24-hours of the incident. An incident investigation will commence as noted above including loss of load and/or damaged to other property. This documentation will be forwarded to the Project Health and Safety Coordinator and Health and Safety Director within 72-hours of the incident. The client or owner representative will be notified.

ATTACHMENT K SPILL CONTROL

Information for this plan will vary from project to project according to site-specific needs. Site-specific information should be added once site operations have begun. The following are provided as guidelines.

Gasoline/Diesel

- Each tank is self-contained up to 110% of capacity of the tank.
- Barricades are installed around the tanks to prevent incidental damage to the tanks.
- Only skilled operators are allowed to refuel the equipment at specific times during the day.
- Tanks are inspected twice a day - once in the morning and once in the afternoon with a twenty-four hour guard service.
- Safety meetings outline spill prevention control measures.

Identifying Material

- Locations will be marked once they are established.
- Material Safety Data Sheets will be available on site for diesel and gasoline.
- "Flammable" signs will be posted at the locations on the gasoline tank.
- The material name will also be posted on all tanks.

Spill Response

The FPM is the responsible person in charge of spill protection and in the case that a spill does occur:

- The FPM will be notified.
- If a spill does occur one of the most important factors is in limiting the environmental damage through a speedy clean-up.
- The FPM will react immediately, stopping the leak, containing the product with absorbent bags and absorbent material.
- Client representatives will be notified as soon as possible.
- One person will be assigned to stand-by with a fire extinguisher.
- All materials picked up will be placed in a 55-gallon drum for proper disposal.
- All unnecessary personnel will be kept away from the area.
- Waste accumulated must be removed from the containment area within twenty-four hours or at the earliest practicable time.

To What Level Is Clean?

The spill material must be cleaned-up so that the environment is returned to as close to its pre-spill condition as possible. Any residue that remains must pose no risk to public health and must be at levels that are acceptable to regulatory agencies.

Disposal of Cleanup Materials

The material cleaned-up from a gasoline or diesel tank would be classified as hazardous waste and all containers would have to be clearly labeled and properly disposed. Material from the treated wastewater will be tested for proper disposal protocol.

Spill Report

After the clean-up has been completed, a detailed report with all circumstances relating to the leak and how the spill response team reacted to the spill with an Estimated Damages Report must be submitted to ENTACT and client representatives. All spills require completion of a Near Loss Incident/Loss Incident Report.

ATTACHMENT L PERSONAL PROTECTIVE EQUIPMENT

The following is a brief description of the personal protective equipment that may be required during remediation activities. The U.S. EPA terminology for Levels A, B, C, and D personal protective equipment will be used.

Respiratory protective equipment shall be NIOSH-approved and use shall conform to OSHA 29 CFR 1910.134 requirements. ENTACT maintains a written respirator program detailing selection, use, cleaning, maintenance, and storage within the ENTACT Comprehensive Health and Safety Manual. A copy shall be available at each project and at ENTACT's Corporate Office in Grapevine, Texas.

Equipment to protect the body against contact with known or anticipated chemical hazards has been divided into four categories or levels according to the degree of protection required:

LEVEL A
Level A provides the highest level of skin and respiratory protection and is used in the following situations:

- The extremely hazardous substance requires the highest level of protection for skin, eyes, and the respiratory system.
- Substances with a high degree of hazard to the skin are known or suspected.
- Chemical concentrations are known to be above IDLH levels.
- Biological hazards requiring Level A are known or suspected.
- Oxygen deficient or potentially oxygen deficient atmosphere (<19.5%) are possible.

Protective Gear:

- Supplied Air respirator- self-contained breathing apparatus (SCBA) or air line with 5-minute egress air pack
- Fully encapsulating chemical resistant suit
- Inner and outer gloves
- Boot covers
- Work gloves
- Steel-toe leather and rubber over boots
- Hard hat
- Hearing protection
- Communication device

LEVEL B
Level B provides the same level of respiratory protection, but a lesser degree of skin protection than Level A. It is used when:

- Substances have been identified and require a high level of respiratory protection but less skin protection.
- Concentrations of chemicals in the air are IDLH or above the maximum use limit of an APR with full-face mask.
- Oxygen deficient or potentially oxygen deficient atmosphere (<19.5%) are possible.
- Incomplete identification of gases and vapors, but not suspected to be harmful to skin.

Protective Gear

- Supplied air respirator – SCBA or air line with 5-minute egress air pack
- Chemical resistant suit
- Inner and outer chemical resistant gloves
- Steel toe leather work boots and over boots
- Hard Hat
- Hearing Protection
- Communication devices

LEVEL C

Level C provides the same level of skin protection as Level B, but a lower level of respiratory protection is required. Level C is used when:

- The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove contaminants.
- The substance has adequate warning properties and all criteria for the use of APR respirators have been met.
- Oxygen concentrations are in the normal range.

Protective Gear

- Air purifying respirator with filters and cartridges
- Chemical resistant Coveralls
- Inner and outer chemical resistant gloves
- Steel Toe Leather, safety boots with outer covers
- Hard Hat
- Safety glasses or goggles
- Hearing Protection
- Communication device

LEVEL D

Level D is a basic work uniform worn when no skin or respiratory hazards exist. Level D is used when:

- The atmosphere contains no known hazard; and,

- Work functions preclude splashes, immersion or the potential for unexpected inhalation of, or contact with, hazardous concentrations of harmful chemicals.

Protective Gear

- Coveralls
- Steel toe, leather work boots
- Hard Hat
- Safety Glasses or goggles
- Hearing Protection

Any personal protective equipment issued to the associate by the company is the personal responsibility of the associate. He/she must ensure that it is kept in a safe and clean condition and in his/her possession at job sites. When in disrepair, it must be returned for repair or replacement.

In certain construction and maintenance operations, personal protective equipment, such as safety glasses, chemical goggles, respirators, hard hats, and protective clothing is required. The type of protective equipment to be worn will be determined by the degree of exposure to the potential hazard. When in doubt about the safety measures to be observed, associates shall contact the supervisor.

Limitations of PPE

While personal protective equipment reduces the potential for contact with harmful substances, ensuring the health and safety of associates requires, in addition, safe work practices, decontamination, site entry protocols, and other safety considerations. Together these protocols establish a combined approach for reducing potential harm to associates.

Personnel must wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases or particulate may be generated, or when direct contact with skin-affecting substances may occur. Respirators can protect lungs, gastrointestinal tract, and eyes against air toxicant. Chemical-resistant clothing can protect the skin from contact with skin-destructive and absorbable chemicals. Good personal hygiene limits or prevents ingestion of materials.

In addition to risks due to contaminants, some physical hazards or hazardous conditions may be present at the site. These include risk of injury while working around heavy equipment, explosive or combustible gas generation, hearing damage from heavy equipment noise, and heat or cold stress.

Additional Information

Eye Protection
Eye protection is required when engaging in operations such as the following:

- Drilling, chipping, grinding, wire brushing.
- Handling caustics and acids.
- Breaking bricks and concrete.
- Hammering and chiseling.
- At least number 2 shaded eye protection for burning and oxy-gas welding.
- Other situations that create a possible eye hazard, e.g., chemical environments.

The following are different types of eye protection used:

- Industrial type safety glasses must be worn. Mono-goggles will be worn over regular prescription glasses, if the glasses are not industrial rated.
- A full-face shield must be worn while performing any job with high-pressure water. A face shield is not to be substituted for safety glasses or goggles, but used in addition to them.
- Chemical splash-guard goggles are required on all operations where solvents, acid, or caustics are used or in the immediate vicinity.
- Appropriate goggles must be worn at any time a hazard exists such as grinding or chipping operations or welding.
- Sandblasting hoods with plastic face shields and piece protection are required while operating a sandblast gun or nozzle. These must be positive pressure fresh air hoods.

Ear Protection

Ear plugs or muffs are required on projects where the noise level is above 85 dBA on an average of eight hours worked. If noise is a problem, associates must wear hearing protection that has NRR of 25.

Hand and Body Protection

Waterproof gloves, wet suits, and rubber boots will provide some protection. Where conditions warrant, additional protection such as acid suits, chemical gloves, metatarsal guards or shin guards must be worn. Personnel using arc welding equipment will comply with 29 CFR 1926.102 and will wear a long sleeve shirt, gloves, head protection, and using a welding hood with a sufficient shaded lens for the type of welding being performed.

Safety Harness and Lifelines

Whenever any associate is exposed to the hazard of falling six feet or more (10 feet on a scaffold), he must wear a serviceable safety harness and lifeline adequately secured to a fixed support. This will be so arranged that he cannot fall freely from a vertical distance more than three feet. This included any associate working on open steel, swing stages, suspended scaffolds, platforms without proper guarding, etc.

- When working on a swing stage or elevated device, the lifeline must be secured to a structure separate from the stage or elevating device.

- All harnesses, lifelines and lanyards are to be inspected before use for fraying or other weak spots. Any defective item must be replaced before using.
- Safety body harness must be in good condition and the "D" ring must be placed in the back.
- Bolts, shackles, safety snap hooks, "D" rings and metal links which connect parts of the lifeline system to each other should be properly inspected and maintained at all times.
- Safety body harness and lifelines are required on all work performed in confined spaces where an oxygen deficiency or toxic vapors may exist.

Back Support Harnesses

When any associate is required to move or lift any materials, dollys, forklifts, pallet jacks, back harnesses, and proper lifting techniques should be utilized. Proper lifting techniques are taught to all associates during training sessions and are as follows:

- Put on a back harness support
- Get a good footing on a solid surface
- Place one foot alongside and the other behind the object
- Squat down beside the object keeping your back as straight as possible
- Tilt the object and firmly grasp at the bottom center
- Draw the object close to your body and lift slowly by straightening your legs
- Do not lift more than you can carry. Get help with bulky or heavy loads.

ATTACHMENT M COMPETENT PERSON EXCAVATION INSPECTION

ENTACT
COMPETENT PERSON EXCAVATION INSPECTION

Project Name & #:	Project Location:
Field Project Manager:	Admin Project Manager:
Inspection Date/Time:	Competent Person:
Weather Conditions:	

CHECKLIST ITEM	YES	NO
Have all surface encumbrances been removed?		
Have underground/overhead utilities been located and marked?		
Have underground and/or overhead utilities been rendered non-hazardous? De-energized _____ Insulated _____ Other _____		
Do trenches have less than twenty-five (25) feet lateral travel between ladders?		
If excavation is a trench, do ladders extend three (3) feet above excavation edge?		
Is vehicular traffic eliminated near excavation? Are associates aware of traffic?		
Is there adequate fencing or barricades surrounding the excavation to limit worker access and provide fall prevention?		
Were atmospheric readings taken and recorded for oxygen deficient and hazardous atmospheres prior to associate ingress?		
Is any water accumulating in the excavation?		
Are pumps used to discharge water from the excavation?		
Are spoil piles (all rocks and soils) located two (2) feet or more from the excavation edge?		
Will excavating undermine the stability of adjoining buildings?		
Proper PPE (body harness, etc.) worn by associates?		
What is the slope of the excavation? _____		

CHECKLIST ITEM	YES	NO
Are any of the following potential hazards present? Vibrations __ Yes __ No Excess weight __ Yes __ No Temp. Changes __ Yes __ No Boiling __ Yes __ No Surface Water __ Yes __ No Tension cracks __ Yes __ No Heaves/bulging __ Yes __ No Spalling of soil __ Yes __ No (Any "yes" response requires corrective action and a reassessment of excavation slope.)		
Has rescue equipment been checked and is it easily accessible?		
All trenches 5 feet or deeper have approved bracing and shoring or an approved trench box or benched and sloped accordingly?		

ATTACHMENT N BEHAVIOR BASED SAFETY: WRITTEN PLAN

Purpose

ENTACT is committed to operating incident free. ENTACT's most valuable resource is its employees. Protecting the members of our team has been and will always be priority number one. Promoting safety at work and empowering employees to be involved in the process has always been our goal. The key to preventing injuries is to be proactive. A behavior-based safety program is built around observing at-risk behaviors and replacing at-risk behavior with safe behavior and work practices. All employees at a ENTACT site will exercise the right to stop work if an unsafe act is occurring or perceived to be occurring. There is always time to discuss the act and come to a consensus to proceed in a safe manner.

Administrative Duties

The ENTACT Project Safety Coordinator, H&S Officer, and the Field Project Manager, is responsible for developing, amending and maintaining the written behavior-based safety program.

Corporate Performance Goals

The following corporate level goals for our behavior-based safety program are:

- Reduce personal injures.
- Reduce vehicle incidents at work and away from work.
- Complete participation from all employees, regardless of position or level.
- Observe, analyze, and reward safe work practices.
- Ensure that each division establishes and has the training to obtain its goals.
- Allow and encourage groups to discuss and achieve their own safety goals.
- Mandate that all employees actively participate in the program.

Theory and Implementation

There are two basic theories about people that are widely accepted in the psychology field. Theory X assumes that people do not like work and must be directed and or coerced into work. Theory Y assumes that people enjoy work, are committed toward achieving goals, and accept and need responsibility. A behavior-based program embraces the second theory and empowers employees to attain their goals. At ENTACT, we feel that people are motivated and we empower them to make decisions and advance themselves.

The focus of this company and its employees is to safely perform all tasks. Each task must be done safely or not at all. Employees will encounter situations where the "easy way" will save them time, but at ENTACT the "easy way" is unacceptable. Our team believes that injuries are preventable, but prevention takes effort and we are willing and determined to protect our

employees.

As part of our program:

- Each employee will set individual, departmental and participate in setting company goals
- ENTACT will provide training and mentoring to all employees

Safe Work Environment

ENTACT tries to provide a work environment free of hazards by:

- Ensuring channels of communication are always open (open door policy)
- Provide employees with communication devices, so that field personnel can up-channel information or questions
- Create an atmosphere where trust is paramount, because trust is essential to open communication

Even with channels of communication open, steps need to be taken to ensure the working environment is free of physical, chemical, and environmental hazards. Employees have the right to work in a hazard free workplace. To keep our workplace safe, we have programs and training in the following:

- Hazard communication (per 29 CFR 1910.1200)
- Hazard identification (per 29 CFR 1910.120)
- HAZWOPER certifications are maintained (per 29 CFR 1910.120)

Observation and Feedback

At the heart of behavior-based safety is observation of tasks. At ENTACT observations are to be conducted by all employees. The observer must be trained in the task in which they are observing. The observation record must illustrate how many listed behaviors were recorded. Every behavior is rated as safe or unsafe. Immediately following the observation appropriate personnel will discuss and provide feedback.

All observations are recorded and forwarded the job site trailer at 2210 W. Pine River Rd, Breckenridge, MI, 48615.

Feedback and guidance is the key to field corrections. Observers are instructed to **STOP WORK IMMEDIATELY** if a behavior could cause an injury. Observers must also provide positive feedback for actions that are done safe. Feedback needs to constructive. Feedback may be negative or positive. When providing feedback, keep in mind that the goal of this program is to make the site safer for all personnel. Do not become condescending or authoritarian in tone or manner.

Evaluate and Record

ENTACT continually tracks information from the observations. Every month, ENTACT will update tables and do a trend analysis for all at-risk behaviors. The results of our observations will be shared with all personnel working on the project. ENTACT will also do a quarterly analysis to assess the success of our safety program. Quarterly evaluations were being shared with all employees. The sharing of information will be continuous and not restricted to monthly or quarterly. Charts and graphs of at-risk practices will be posted and reviewed by all employees working on ENTACT projects.

Team Building

Teams are the building block of our behavior-based safety program. With a team structure, no single person is obligated to carry the program. Success of the program is based on the team ensuring that they meet there team goals. Each team will develop there goals, but each team is a working unit within the total program.

Roles and Responsibilities

Each employee is expected to be a professional and each professional is responsible for his or her own safety. Employees must accept this responsibility or the safety of everyone is at-risk.

ENTACT accepts the responsibility of implementing a behavior-based safety program and developing a culture that promotes and lives safety. The only way to meet our goals is to ensure that every employee receives and understand our goals. Training will be conducted to ensure that employees are knowledgeable in the plans and procedures of their company. All new employees will go thru a comprehensive orientation program and will be mentored.

New employee training will consist of:

Instruction will involve multiple types of media. Our training program is both classroom and field based. Training will cover the following topics:

- Definition of behavior-based safety
- Safety goals of the company
- Training on goals setting and productivity
- Hazardous communicate and hazard recognition
- A review of Standard Operating Procedures for all appropriate tasks
- Introduction to observation and feedback tactics
- How observations are evaluated
- Stop work authority
- A review of trends and at-risk behaviors
- The team philosophy
- Team training
- Roles and responsibilities within behavior-based safety
- OSHA HAZWOPER (initial or refresher)

Training is done either in-house or by an outside company. Training is lead by a competent person who is knowledgeable in the topic. All personnel are encouraged to conduct training sessions in their area of expertise. Employees are encouraged to be actively involved in their health and safety program.

All employees are mandated to conduct a formal observation of a co-worker once every two weeks for a total of two per month. These observations are the backbone of the behavior-based safety program. The observations will be recorded into a database, which will enable ENTACT to track at-risk behaviors. All data output will be discussed and or posted so that all employees can review the information.

ATTACHMENT O LOCKOUT TAGOUT

LOCKOUT TAGOUT

I. INTRODUCTION

The purpose of this program is to prevent accidents and injury associated with confined space entry, inspection, maintenance, and/or set-up of equipment, machines, or processes where unintentional start-up, or release of stored energy, product, or process material would be expected to cause harm to persons involved in such work, bystanders or property.

II. SCOPE

This program will apply to confined space entry, equipment maintenance, utility maintenance or other work involving energized equipment performed at ENTACT and covers all hazardous energy sources including, electrical, mechanical, pneumatic, hydraulic, steam and other similar sources.

Contractors/subcontractors performing work at ENTACT project sites will be informed of the existence of this program and its requirements. Contractors/subcontractors will comply with the provisions of this program, or provide to ENTACT in writing with an equivalent means of protection to persons/property in situations in which implementation of this program would be necessary prior to work beginning.

III. RESPONSIBILITIES

A. Health and Safety Department

- Develop and implement effective lockout/tagout procedures and training.
- Provide training and support to Project Managers, Field Project Managers, Health and Safety Coordinators, and associates regarding interpretation and implementation of the procedure.
- Conduct audits and inspections of project sites to assure program is being effectively implemented, where necessary. Periodic inspections will be performed by authorized associate that is not involved with procedure being inspected.
- Review program at least annually to assure it remains relevant to the operation of ENTACT project sites. Where lockout is utilized, the periodic inspection with each authorized associate will review their responsibilities under the energy control procedure being inspected. If tagout is used for energy control the inspection will review each authorized associate and the affected associate responsibilities under the energy control procedure being inspected.. Documentation of the periodic inspection will include the type of equipment the

energy control procedure was being utilized, the date of inspection, the associates included in the inspection and the authorized associate performing the inspection. After review is complete, any deviations or inadequacies that are discovered will be corrected by retraining associates involved with the procedure. All documentation will be forwarded to Entact Health and Safety Director for review.

B. Project Managers

- Designate a qualified and authorized person (Health and Safety Coordinator) to implement the lockout/tagout program.
- Provide supplies, equipment and site personnel to effectively implement this program.
- Notify contractors/subcontractors of the lockout/tagout program, allowing time for review, and answering questions regarding involvement of contractors/subcontractors in hazardous energy control situations.
- Enforce compliance with the requirements of this program.

C. Health and Safety Officers

- Evaluate work to be performed on equipment, machines and/or processes to determine when control of hazardous energy is required.
- Identify and designate qualified authorized persons to perform the tasks required in this procedure.
- Assure suitable restraining, security, and test equipment is available for control and measurement of hazardous energy.
- Conduct pre-work meetings with affected associates to discuss the work and their involvement.
- Provide training to ensure that the purpose and function of the energy control program are understood by associates authorized to do maintenance and that the knowledge and skills required for the safe application, use, and removal of the energy controls are acquired by the associates, as required by the lockout/tagout program. Authorized associates will be trained annually in the recognition of hazardous energy sources, type and magnitude of energy available in the workplace and the methods necessary to achieve energy isolation and control. Affected associates will be trained on the purpose and use of energy control procedures
- Training will include all associates whose work is or may be in the area of energy control procedure being implemented. Associates will be instructed on recognition of hazardous energy sources, methods and means to control energy, classification of workers and the prohibition relating to attempting to restart or reenergize machinery or equipment that has been locked out or tagged out.
- Training will provide in the instruction the limitations of tags. Tags are essentially warning devices affixed to energy isolating devices and will not

provide the physical restraint of a lock. Tags that are attached as energy isolating are not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored or otherwise defeated. Tags must be legible and understandable by all authorized associates, affected associates, and all other associates whose work is or may be in the area. Tags and their attachments must be made of material which will withstand the environmental conditions of the workplace. Tags must be securely attached to energy isolating devices so they cannot be inadvertently detached during use. Associates will be instructed on the false sense of security offered by tags, if their true meaning is not understood by all involved

- Provide retraining for other authorized and affected associates when there is a change in job assignments, machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.
- Train associates in emergency evacuation and rescue procedures.
- Post warnings about the existence, location and danger of permit-required confined spaces.
- Coordinate energy control procedures among work crews when work is of a duration that energy control procedures must be confined to another shift.
- Coordinate energy control procedures between ENTACT and contractor/subcontractor when it has been determined that joint energy control procedures must be implemented.
- Assure that all persons included in an energy control procedure are present, or positively accounted for prior to restoring energy to a previously controlled energy situation.
- Conduct pre-work inspections to assure hazardous energy has been properly secured.
- Authorize commencement of work in hazardous energy control situations.
- Conduct post-work inspections to assure work in energy control situations has been property completed.
- Authorize removal of lockout hardware and restoration of energy to machine, equipment or process.
- Complete Lockout Permit.

D. Authorized/Qualified Site Personnel

- Perform work as directed by the Health and Safety Coordinator.
- Report unusual conditions as they pertain to control of hazardous energy to the immediate supervisors.
- Maintain hardware provided by ENTACT in a serviceable condition and ready for immediate use.
- Report absences to supervisor when the facility or job site must be left for any reason.
- Apply and remove energy control hardware assigned specifically to them.
- NOT removing lockout hardware assigned to others.

IV. DEFINITIONS

Affected Associate: An associate whose job requires operation/use of equipment, machine, or process, which is being serviced, maintained, or set-up under lockout conditions or whose job requires work to be performed in areas in which such work is being performed.

Authorized/Qualified Site Personnel: An associate who locks or implements a lockout procedure on machines, equipment, or processes to perform servicing, maintenance, or set-up upon that machine, process, or equipment. An authorized associate and an affected associate may be the same person when the affected associates duties also include performing maintenance or service on a machine, equipment, or process which must be locked out. The associate(s) will be able to demonstrate, by experience, training, or both, the ability to recognize potentially hazardous energy and its potential impact upon facility or conditions, and has the knowledge to implement adequate means and methods to control and isolate such energy.

Capable of Being Locked Out: An energy isolating device will be considered to be capable of being locked out, if it is designed with a hasp, other attachment or integral part, to which or through which, a lock can be affixed, or if it has a locking mechanism built in to it. Other energy isolating devices will also be considered to be capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability.

Dissipate: For the inclusion within this program the terms dissipate and dissipation will always be related to energy control. It's meaning will be to cause energy to be spread out or reduced to a level tolerable to humans.

Energized: Connected to an energy source or containing residual or store energy.

Energy Isolating Device: A device that physically prevents the transmission or release of energy. Such devices may include, but not be limited to, the following:

- A manually operated electrical circuit breaker.
- A mechanical, electrical, hydraulic, or pneumatic disconnect switch.
- A slide gate.
- A slip blind.
- A line valve.
- Blocks.
- Similar devices used to block or isolate energy.

Energy Source: As used within this program the term energy source will be considered to be any of the following, either singly or in combination:

- Mechanical energy due to motion,
- Potential energy due to pressure, springs, or gravity,
- Electrical energy due to generated electrical current, static electricity, or residual stored electrical energy,
- Thermal energy from high or low temperatures,
- Chemical reaction energy.

Isolated Energy: Energy is considered isolated or blocked when its flow would not be reactivated by a foreseeable unplanned event. The term "isolate" means to set apart from others. The term "block" means an obstacle or obstruction; or, to make unsuitable for passage or progress by obstruction, to prevent normal functioning.

Lockout: The placement of a lockout device on an energy isolating device, in accordance with this procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device: A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine, equipment or process.

Residual Energy: Energy such as electrical, chemical, thermal or mechanical which is stored within a port, component, or subsystem of an equipment or process following shutdown of equipment/process. Examples of residual energy would be electricity in capacitors, tension in springs, or the potential energy of an unsupported suspended load.

Tagout Device: A prominent warning device capable of being securely attached to an energy isolating device that identifies the applier or authority who has control of the lockout, and contains information/instructions to prevent operation of an energy isolating device.

V. LOCKOUT/TAGOUT PROCESSES

To prevent the unintentional, unwanted activation of equipment, machines, or processes upon which ENTACT associates work, it is necessary to identify, locate, and control energy sources capable of activating such equipment, machines, or processes. The procedures contained within this program will meet this objective if applied effectively on a consistent basis.

These procedures are required when work must be performed upon equipment, which if inadvertently operated, could cause injury to persons, damage to property, or both.

The responsibility for effectively implementing the procedure is a joint supervisor /associate undertaking. Management will provide the means and direction to implement the program while affected associates must adhere to the provisions of the program. Only those associates

authorized by their immediate supervisors are permitted to perform duties requiring a lockout procedure.

VI. PROCEDURE

A. Lockout Preparation

It is necessary to completely evaluate energized equipment, which must undergo work to assure its energy sources are identified, located, and controlled prior to start-up of work. Preparations must be made to assure appropriate lockout hardware and test equipment is available to isolate energy and evaluate the effectiveness of energy controls. The following will be evaluated and documented on the Lockout/Tagout Permit by the Supervisor.

- Equipment, machine, process requiring work
- Scope of work
- Energy sources (Includes residual)
- Energy isolation devices
- Lockout devices
- Tags
- Test procedures
- Authorized persons

B. Pre-Work Safety Meeting

The supervisor responsible for the completion of the work will convene a pre-work meeting of all affected associates to discuss the job. The supervisor will review the information pertaining to the job as recorded on the Lockout/Tagout Permit. Associates will have the opportunity to ask questions about the work and to have them answered to their satisfaction before the start of work. Associates will sign the lockout worksheet to indicate their understanding of the work being performed, and their specific assignments. The supervisor will discuss the following items at the pre-work safety meeting.

- Equipment, machine, process to be worked
- Scope of work
- Anticipated duration
- Energy source(s). Includes residual
- Energy isolation device(s)
- Lockout devices
- Locks *
- Tags *
- Energy isolation test procedures
- Designation of authorized person(s)

*NOTE: These items will be distributed to associates implementing the lockout of

they are not in their possession prior to the start of the pre-work safety meeting.

C. Equipment, Machine, Process Shutdown

The equipment, machine, or process which must undergo work should be shutdown in an orderly manner so as not to create an additional hazard to associates in the work area. Shutdown should be accomplished as follows:

1. Inform affected associate(s) in the vicinity of the need to shutdown equipment, machine, or process.
2. Clear area in vicinity of work area if shutdown will present a known or potential hazard to bystanders.
3. Locate on/off switch.
4. Shutdown equipment, machine, or process.
5. If on/off or activation/deactivation controls are not energy isolation devices, locate these devices and place in an OFF position.
6. Supervisor, or authorized person(s), will then apply lockout device to prevent operation of the energy isolation device and secure the device with a lock. Each associate involved in the work should apply their own individual ENTACT issued lock with their name on it to assure a maximum level of protection is provided to the affected associates.
7. When lockout procedures must involve multiple crews, or groups of associates, application of individual locks may not be possible. When such conditions exist, the supervisor of each crew or group will apply a lock for their group. That lock may then be removed only by that supervisor, or the superior of the supervisor.
8. Tags bearing the legend "DANGER - EQUIPMENT LOCKOUT" will be affixed to the lockout device bearing the name of the person applying the device, the date, and the time.
9. An entry will be made on the Lockout/Tagout Permit indicating the date, time and persons applying, lockout device(s) to equipment, machine, or process energy isolation device(s).

D. Residual Energy

Residual, or stored energy, within a system, component, or part of an equipment, machine or process can present a greater hazard to associates than the primary energy source due to its sometimes “hidden” nature. To assure sources of residual energy have been identified, located, and controlled, the following diagnostic procedure will be followed:

1. Qualified, authorized personnel familiar with the equipment, machine, or process being worked will review instruction manuals, manufacturer’s literature, wiring diagrams and other available information to identify and locate sources of residual energy.
2. An appropriate method of controlling any residual energy will be selected and the suitable hardware obtained to implement the control. Residual energy controls may include, but not be limited to, electrical circuit grounding,

releasing pneumatic/hydraulic line pressure, allowing a suspended object to come to rest at ground level, relieving spring compression.

3. A lockout device will be applied and secured to the residual energy control. The control must stay in place throughout the duration of the job to prevent re-accumulation of the residual energy or because removal would permit residual energy to be transmitted to equipment, machine, process being worked.
4. A tag will be applied to the residual energy lockout device.
5. Application of the residual energy controls will be recorded on the Lockout/Tagout Permit with the time, date, and name of person(s) applying device(s).

E. Pre-Work Inspection/Energy Isolation Verification

Prior to releasing equipment, machine, process for work following implementation a lockout procedure, it is necessary to verify the effectiveness of the applied controls. This task should be performed by the work crew's supervisor. As an alternative, it may be performed by a qualified, authorized associate who has been designated by the supervisor and granted the authority to release the equipment for work, or to reject the lockout procedure as being unsatisfactory, based upon the outcome of energy isolation verification procedures. When lockout procedures must be implemented which involve multiple crews, the verification task should be performed by the supervisors of each work crew. The inspection/test sequence should be performed as follows:

1. Use Lockout/Tagout Permit to account for all personnel involved in lockout.
2. Clear points of operation of all personnel/material, which could be affected by start-up of equipment, machine, process.

3. Inspect energy isolation devices to assure they are in the off position, secured with locks, and appropriately tagged.
4. Inspect residual energy control devices to assure they are in place, secured with locks, and appropriately tagged.
5. Conduct any necessary testing of equipment, machine, process systems, components or parts to assure they are free of energy.
6. Attempt to operate energy isolation device, and observe equipment, machine, and process to assure it remains inoperative.
7. Attempt to operate equipment, machine, process controls. Observe to assure it remains inoperative.
8. Return activation controls to off position following testing.
9. If equipment, machine, process remains inoperative and testing indicates residual energy has been controlled, the equipment may be released for work by supervisor or designated qualified authorized person.
10. The date, time, and name of person(s) conducting the inspection(s) and test(s) will be recorded on Lockout/Tagout Permit.
11. Authorization to commence work will then be given to affected associates by

designated qualified, authorized associate.

12. If inspection/testing reveal inadequate control of primary/residual energy source(s), the immediate supervisor responsible for completion of the work will be contacted by person(s) performing testing prior to taking any further action. The inadequacy of the controls must be recorded on the Lockout/Tagout Permit with the date, time and name of person making the entry.
13. If it is necessary to safety test the equipment, clear away tools, remove employees from the area, remove the LO/TO device, energize the equipment and test. Next de-energize the equipment and re-apply LO/TO.

F. Release for Work

Upon completion of the necessary inspection and tests, the immediate supervisor responsible for completion of the work will release the equipment, machine, process to the authorized person(s) for completion of the work. The release for work will be performed as follows:

1. Supervisor will assure all required inspections/tests have been performed by checking Lockout/Tagout Permit entries.
2. Supervisor will assure all affected associates are aware of the release for work status of the equipment, machine, and process by verbally informing them and noting the communication on Lockout/Tagout Permit.
3. Supervisor will note on Lockout/Tagout Permit the date and time that the equipment, machine, process was deemed safe and able to be worked upon by authorized person(s).

G. Energy Restoration - Purpose

Upon completion of assigned tasks the authorized person(s) will inform supervisor that job has been completed. It will then be necessary to prepare the de-energized equipment, machine, or process for start-up and to restore energy in a manner which will minimize hazards to persons/property in the area. Energy restoration will be performed as follows:

1. Authorized person performing work will inform supervisor that assigned tasks have been completed.
2. Supervisors will use the Lockout/Tagout Permit to account for all personal involved in lockout procedure and work to be completed. (See H if all associates cannot be accounted for.)
3. Supervisor will instruct affected associates and others in area to remain clear of points of operation of equipment, machine, process.
4. Supervisor will inspect equipment, machine, process to assure points of operation are free of tools, debris, or other material which could be placed

into motion if equipment, machine, process were to immediately restart following restoration of energy.

5. Lockout serving residual energy controls will be removed by those who applied them.
6. Residual energy control devices will be removed by those who applied them.
7. Energy isolation lockouts will be removed by those who applied them.
8. Energy isolation controls will be removed by those who applied them.
9. Supervisor will again check area around equipment, machine, process to assure personnel are clear of points of operations.
10. Energy will be restored to equipment, machine, or process through activation of energy isolation device.
11. Proper operation of equipment, machine, or process will be verified by supervisor prior to releasing equipment, machine, process for routine use.
12. Tags will be removed from equipment, machine, or process following verification of proper operation.
13. Completion of work, removal of lockout devices, verification of proper operation, and release for routine use will be recorded on Lockout/Tagout Permit with date, time and name of supervisor or qualified authorized person responsible for completion of work.
14. Lockout/Tagout Permit will be retained in a permanent file available for inspection/audit. Such files may include maintenance job files or Health and Safety files.

H. Absent Associates and Group LO/TO

Accounting for associates involved in lockout procedures is required prior to removal of lockout hardware and re-energization of equipment to assure associates are clear of areas which could expose them to existing or potential hazards when equipment, machine, process is reenergized and tested prior to releasing it for routine operations. Should there be any associates who cannot be accounted for the supervisors responsible for completion of the lockout related work will initiate the following to attempt to locate the absent associate(s).

1. Lockout/Tagout Permit will be used to account for affected and authorized associate(s).
2. Supervisors will obtain a Lockout Absent Associate Notification Form.
3. Supervisor will record name(s) of absent associate(s).
4. Supervisor will instruct crew members as needed to search work area for absent associate(s) as determined by size and configuration of equipment, machine, process which has undergone lockout related work. Page associate over public address system if one is available.
5. Searchers will pay special attention to locations in which associate presence would result in physical harm through start-up of equipment, which is undergoing lockout.

6. When it has been established through a comprehensive search of the work area that the absent associate is not present and is incapable of being injured by start-up of equipment, machine, process the supervisor will dispatch an associate to contact the house(s) of the absent associate(s) and to search other outlying areas as needed.
7. Upon completion of the searches conducted in G if the associate(s) have still not been located, the supervisor will sign the Absent Associate Notification Form attesting to the conduct of the required searches and inability to account for absent associate(s).
8. The supervisor will appoint associate(s) in numbers dictated by equipment, machines, process which has undergone work to secure all possible points of access to prevent the absent associate(s) from returning to the area.
9. The supervisor will then release the equipment, machine, process for routine use providing all other conditions in paragraphs F and G have been fulfilled.
10. Copies of the Absent Associate Notification Form will be posted conspicuously in the work area.
11. Supervision of the area in which the equipment, machine, process are located will be informed of the absent associate(s) identity and that the associate(s) are to be prevented from entering the work area until they have been informed that the lockout is no longer in effect.

ENTACT associates utilize single owner LO/TO devices however, in the event a group LO/TO device is utilized overall responsibility must be given to a single authorized employee to ensure continuity of protection. Each crew, craft or individual will then affix their personal LO/TO device to the group LO/TO when they begin work. The individual LO/TO device will be removed upon completion of the task.

VII. DISCIPLINE

Effective implementation of this program is dependent on <u>all</u> affected associates complying with its provisions. All affected associates will be informed during training of the contents of this program that failure to abide by any of its provisions will be grounds for discipline which will be progressive up to and including discharge.

VIII. TRAINING

All affected, authorized associates will be trained in the provisions of this procedure prior to engaging in any lockout related work. Verification of an associate's training in the contents of this procedure will be performed before associate may be assigned to lockout created work. Training will be conducted annually for those associates who will be required to perform lockout/tagout procedures. Training will follow OSHA 29cfr1910.147 and will include energy control procedures, documentation, periodic inspection, associate training and retraining on new or modified equipment, associate

protection, application of energy control, release from lockout/tagout, testing of equipment, outside personnel, group lockout/tagout requirements.

ENTACT will provide retraining when there is a change in job assignment, machinery, equipment or process that introduce or create a new hazard or if the procedure itself is revised, and whenever inspections reveal inadequacies in the program or ENTACT has reason to believe that deviations from or inadequacies in the associate's knowledge of the program.

The training associates will receive will include:

- Safe application, usage and removal of the energy controls.
- Authorized Associates – recognition of hazardous energy sources, type and magnitude of the energy available in the workplace and the methods necessary to achieve energy isolation and control.
- Affected Associate – Instructed in the purpose and use of the energy control procedure.
- Other Associates whose work is or may be in the area are instructed about the procedure and about the prohibition relating to attempting to restart or reenergize machinery or equipment that has been locked out or tagged out.
- Tags are warning devices and do not provide physical restraint that is provided by a lock.
- Tags are not to be removed without authorization of the authorized person, bypassed, ignored or otherwise defeated.
- Tags must be legible and understandable by all personnel whose work is or may be in the area.
- Means used to attach tags must withstand the environmental conditions of the workplace.
- Tags may evoke a false sense of security and their meaning needs to be understood by all involved.
- Tags must be securely attached so that they cannot be inadvertently or accidentally detached.

IX. REVIEW

This program will be reviewed annually to assure it is relevant to ENTACT operations. It will be amended and redistributed when changes are made.

ENTACT GENERAL LOTO CHECKLIST	
Date:	Associate Performing Inspection:
Associate(s) Observed:	

	Check
Manufacturer/Model/Serial Number of Equipment or System:	☐
The general procedures for the various types of energy sources are as follows:	
Review the manufacturers literature and/or wiring and mechanical schematics to assure that all energy sources have been identified, otherwise, inspect the equipment/machine to identify all energy sources. During this inspection do NOT perform work near exposed energized circuits unless you are a person qualified to work on electrical systems, and do NOT put any part of your body in any area where moving parts may cause injury. If you are unsure of the hazard, STOP WORK and contact your supervisor for guidance.	☐
ELECTRICAL CONTROLS	
Isolate the machine or piece of equipment by using an electrical plug lock or by locking and tagging the disconnect switches. A special adaptor may be needed to LO/TO circuit breakers. Document where the LOTO are applied:	☐
Bleed any stored electrical energy to a "zero energy state". If this type of hazard is present, document here:	☐
Ensure that all power sources are LOTO by using a tester to check that all circuits are de-energized.	☐
PNEUMATIC CONTROL	
Release the pressure to reach a "zero energy state".	☐
Document where the LOTO are applied. LOTO the energy source(s).	☐
HYDRAULIC CONTROL	
Release the pressure to reach a "zero energy state".	☐
Document where the LOTO are applied. LOTO the energy source(s).	☐
FLUIDS AND GASES	
Evaluate all hoses and valves connecting to the system or equipment. Determine what type of fluid or gas may be present and, if necessary, obtain and review the Material Safety Data Sheet (MSDS) for the material. Take precautions as needed to protect you from exposure to any hazardous material that may be contained in the system. Contact your supervisor as needed for guidance.	☐
Close all valves on supply lines, and as necessary, bleed or drain the contents. Contact your supervisor as needed for guidance on proper disposal of the material.	☐

ENTACT GENERAL LOTO CHECKLIST	
If working on a pressurized system where valve leaks may re-pressurize the line, insert a blank or blind in the line.	☐
Use lockout valves, chains, and locks and tags at the isolating source. Document where the LOTO are applied, and document all related hazards:	☐
MECHANICAL CONTROL	
Release or block all stored mechanical energy. Be cautious of springs, tension, elevated mechanical arms or platforms that could lower, and other sources of energy that are not always obvious. If needed, restrain the system by inserting blocks.	☐
Document where the LOTO are applied. LOTO the energy source(s):	☐
Recheck all areas for potential sources of energy.	☐
Review the LOTO procedure with your supervisor if the procedure, the system, or the equipment is new or unfamiliar.	☐
Review the type and magnitude of the energy and the required controls.	☐
Inform all affected associates, and all other associates working in or entering the work area, that LOTO is to be performed. Instruct these associates that they must not attempt to start equipment that has been locked/tagged out, and that locks/tags must not be bypassed or removed.	☐
Shutdown the equipment/process/system.	☐
Locate the necessary energy isolating device(s) for the equipment/process/system and operate them to isolate them from the energy sources. Affix LOTO devices.	☐
Relieve all stored or residual energy and take appropriate measures to ensure the energy will not re-accumulate. Affix lockout/tagout devices as necessary.	☐
Verify that all sources of energy have been isolated and stored energy relieved after ensuring that associates are not exposed and before beginning work. Activate equipment or system controls in a safe manner to ensure that the equipment or system will not operate, and then deactivate the controls.	☐
Perform the servicing or maintenance.	☐
Replace all guards and safety devices. Remove all tools and equipment from the work site. Assure that all personnel are clear of the equipment.	☐
Notify all affected personnel that the system will be reactivated.	☐
Lockout/tagout devices are removed by the authorized associate(s) who installed the devices. Document this authorized entrant:	☐
LOCKOUT/TAGOUT DEVICE REMOVAL BY SUPERVISOR	
If it becomes necessary to remove a LOTO of an associate who is unavailable on site, the removal of this device must be done using the following procedure. • The supervisor must ensure that the associate who applied the lock or tag is <u>not</u> available at the workplace; and	

ENTACT **GENERAL LOTO CHECKLIST**
• The supervisor must make all reasonable efforts to contact the authorized associate to inform him or her that his/her lockout and/or tagout device has been removed; and, • The supervisor ensures that the associate is made aware that his or her lock or tag was removed before he or she resumes work at that worksite.
GROUP LOCKOUT/TAGOUT
When a lockout/tagout job involves numerous lockout/tagout devices and many associates, the group lockout/tagout procedures should be used.
CONTRACTORS
All contractors must comply with ENTACT and OSHA safety requirements.

LOCKOUT TAGOUT SAFETY PERMIT

SAFETY PERMIT	
DATE:	PERMIT ISSUED TO:
TIME ISSUED:	EXPIRATION TIME:
PURPOSE:	
DESCRIPTION OF WORK TO BE DONE:	
CHECKED PRECAUTIONS WILL BE OBSERVED	
☐ TAG & DISCONNECT ELECTRIC EQUIPMENT	☐ FIRE EXTINGUISHER AT SITE
☐ LINES BLINDED	☐ CONTAINS SPARKS
☐ VALVES CLOSED & TAGGED	☐ KEEP AREA FREE OF COMBUSTIBLES
☐ LOCKED OUT	☐ BARRICADE AREA
☐ LINES DISCONNECTED	☐ SHIELD ARC
☐ BLEEDERS OPEN	
PROTECTIVE EQUIPMENT REQUIRED	
☐ WEAR GOGGLES FACE SHIELD	☐ WEAR RUBBER BOOTS
☐ WEAR GLOVES RUBBER THERMAL	☐ WEAR SAFETY BELT & LINE
☐ WEAR HOOD ACID THERMAL	☐ WEAR RESPIRATOR DUST CHEMICAL
☐ WEAR SUIT RUBBER THERMAL	

OTHER PRECAUTIONS

APPROVALS

ENTACT FIELD PROJECT MANAGER	DATE/TIME
ENTACT ASSOCIATE	DATE/TIME
SUBCONTRACTOR REPRESENTATIVE	DATE/TIME
Work must begin within ninety minutes of issuance of this permit. If the work is interrupted, the foreman, craftsman, or contractor must indicate equipment condition to operations foreman or operator when leaving job for more than two hours or when job is complete.	
❑ JOB COMPLETED	❑ JOB INCOMPLETE
THIS PERMIT IS TO BE KEPT ON THE JOB UNTIL WORK IS COMPLETED, PERMIT EXPIRES OR IS REVOKED	

ATTACHMENT P BBS FORMS

ENTACT
JOB TASK OBSERVATION

Project Name and No.:			**FPM:**	
HSO:			**Field Supervisor:**	
Observer:			**Observation Date:**	
Job Task Observed	**Field Area Work (job task):**			
	Office Area (job task):			
Location on the site where the observation took place:				
Number of Personnel Observed (individual, crew of #, etc.)	**ENTACT**	**Subcontractor: (name)**	**Other: (name)**	

Listing	GOALS Ref. #	Safe	Concern	Comments
Personal Protective Equipment				
Hand Protection	1.1			
Eye & Face Protection	1.2			
Head Protection	1.3			
Foot Protection	1.4			
Hearing Protection	1.5			
Monitors (Air)	1.6			
Body Use & Position				
Line Of Fire	2.1			
Lifting/Pulling/Pushing/Carrying	2.2			
Walking – Eyes on Path	2.3			
Eyes On Work	2.4			
Ergonomics – PC Workstation	2.5			
Pinch Points	2.6			
Tools				
Tool Use/Selection	3.1			
Tool Condition	3.2			
Job Planning				
Pre-Job Inspection*****	4.1			
Tailgate Safety Meeting*****	4.2			
Work Permits	4.3			
Working Environment				
Walking/Working Surface	5.1			
Housekeeping	5.2			
Vehicle Operation				
Driving/Seat Belts	6.1			
Parking/Backing	6.2			
Safety Procedures				
Familiar w/Emergency Procedures	7.1			

Listing	GOALS Ref. #	Safe	Concern	Comments
Safety Reporting Requirements	7.2			
Safety Procedures	7.3			
Other				
	8.1			

*Ask questions to confirm.

ENTACT
JOB TASK OBSERVATION

GOALS Ref. #	Feedback Discussion	Solution Implemented

Tenets of Operational Excellence

We believe:

- All incidents are preventable.

Two Key Principles:

- Do it safely or not at all.
- There is always time to do it right.

We ALWAYS:

1. Operate within design or environmental limits.
2. Operate in a safe and controlled condition.
3. Ensure safety devices are in place and functioning.
4. Follow safe work practices and procedures.
5. Meet or exceed customer's requirements.
6. Maintain integrity of dedicated systems.
7. Comply with all applicable rules and regulations.
8. Address abnormal conditions.
9. Follow written procedures for high risk or unusual situations.
10. Involve the right people in decisions that affect procedures and equipment.

ENTACT
JOB TASK OBSERVATION PROCESS

GOALS Action List

Following is the GOALS Action List (GOALS) that was specifically selected and designed to encourage positive and open communication between the observer and observed during the observation process. GOALS are grouped by major categories, sub-categories, and specific examples of safe behavior. In most cases, the sub-categories are the GOALS on the observation worksheet. Periodically, the list is updated to help foster safety communication on special issues.

1.0 PERSONAL PROTECTIVE EQUIPMENT

1.1 Hand Protection
- Proper gloves used to avoid exposures to electrical, cuts, burns, crude oil, and chemicals.

1.2 Eye and Face Protection
- General: Use approved safety glasses with side shields or "wrap-around" protection.
- Outside: Face shield / welding helmet.
- Next to face: Goggles are required. Check the distinction between goggles and safety glasses. Goggles make full skin contact around the eyes.

1.3 Head Protection
- Hard hats will be worn at all times by all personnel working in the field, except when in Office.

1.4 Foot Protection
- Steel-toed leather work boots or steel-toed rubber work boots as conditions warrant.

1.5 Hearing Protection
- Used in posted areas.
- Used by Equipment Operators.

1.6 Monitors
- H_2S meters are to be worn at all times.
- VOC meters, at least once daily and as conditions warrant.
- When air monitor is used, it must be downwind of all crewmembers' work.

2.0 BODY USE AND POSITION

2.1 Line of Fire
- Based on discussion, employees know sources of lines of fire hazards on their work site and know how to work safely with the hazards.
- Body was positioned to avoid being sprayed, struck or contacted by solids, liquids or gas when/if material lets go, moves, gives way, releases or falls.
- When using copy machine, used cover to shield eyes from bright light.

2.2 Lifting/Pulling/Pushing/Carrying
- Positions work close to body using elevation device – ladders, work benches, blocks, etc.
- Stand over the object to be lifted and face the direction intended to move.

- Lift with legs rather than back, maintain natural back curve and chin level, and face forward.
- Load close to the body, lean back to keep center of gravity over feet, and feet apart but not wider than shoulder width.
- Firm hold of object.
- Turn entire body by moving feet rather than twisting body.
- Smooth motions.
- Get other individuals or mechanical lifting devices before attempting to lift anything that can't be handled easily or weighs 50 pounds or more.
- Work as a team when two or more people lift a heavy load.
- Position work below shoulder height.

2.3 Walking - Eyes on path

- Chose working walking path free of defects and hazards.
- Be aware of other activities and people working when carrying a load.
- Maintain clearance from equipment.
- Use caution when going from office to hallway, and in/out of doors.
- Pay attention to walking path and watch next step.
- Proceed with caution around corners and other blind spots.
- Walk with caution on slippery surface such as wet metal walkways, loose or muddy soils.
- Wipe shoes before stepping on hard surface like tile, metal, wood, or cement.
- Look both ways before stepping in vehicle traffic lane, from between trucks or vans, building structures, or other obstacles.
- Utilize pedestrian crossing signal and lane to cross street. Be aware of approaching traffic and vehicles making right and left hand turns across the intersection.
- Make eye contact with driver before crossing in front of vehicle.
- In parking areas, watch for tripping hazards such as curbs, holes, protruding objects from vehicles and landscaping.

2.4 Eyes on work

- Avoid being distracted and look away from the task involved in.
- If swinging or moving large objects (excavator), check all clearances.

2.5 Ergonomics – computer workstation

- Take mini breaks from repetitive tasks or with body in odd positions throughout the day to shrug shoulders, shake arms, stretch legs and back, rotate wrists, close eyes, and get up and walk around. Take break from computer every thirty minutes.
- Move mouse from the shoulder.
- Forearms, wrists, and hands approximately parallel to floor.
- Wrists straight.
- Shoulders relaxed.
- Arms close to the body with elbows close to sides.
- Neck straight, not bent or twisted and back had natural curve.
- Viewing distance between 13 and 28 inches.
- Body to leg angle between 90 and 105 degrees.
- Feet flat on floor or foot rest.
- Have an airspace between back of knee and seat.

2.6 Pinch Points

- Keep hands and fingers in sight, or checked before putting out of sight.
- Based on a discussion, employee knows pinch point hazards for the work site being worked on and how to work safely with the hazard.
- De-energize source of moving parts.
- Open one file cabinet drawer at a time; close after use.
- Use caution when loading stapling machines.
- When using a paper cutter, keep fingers clear of blade, and secured when not in use.
- Use caution when clearing paper jams in copy machines, paper shredders, or fax machines. When unfamiliar with machine, get help.

3.0 TOOLS

3.1 Tool Use /Selection

- Use ladder and step stools to reach overhead.
- Use leverage devices, breaker bar, etc. to avoid over exertion.
- Use vises or other means to secure small objects and equipment firmly.
- Do not carry sharp tools in pockets.
- Never use a wrench as a hammer.
- Never use a screwdriver for a chisel.
- Fixed blade knives are prohibited.

3.2 Tool Condition

- No defective tools in use or in the toolbox.
- Tools cleaned and put in place in the toolbox after use.
- Jaws on wrenches and vices clean and in good condition.

4.0 JOB PLANNING

4.1 Pre Job Inspection (may need to ask questions to confirm)

- Potential hazards identified and noted before starting work.
- Job Task Review performed before beginning each task.
- All affected parties notified of work in progress.

4.2 Tailgate Safety Meeting (may need to ask questions to confirm)

- Work process, potential hazards, and emergency response plan discussed and appropriate level of PPE determined.
- Job Safety Analysis reviewed and signed before beginning task.

4.3 Work Permits

- A work permit prepared based on the following ENTACT safety regulations or work situation:
- ENTACT safety regulations:
    - Waste manifest.
    - Hot work area of combustibles.
    - Opening any vessel. Confined space entry (requires additional permit).
    - Entry into excavations over 5 feet.
    - Exceptions to writing a permit:
    - Hot work permits are not needed if the work is over 50 feet from a source of ignition, facility, or well.

5.0 WORKING ENVIRONMENT

5.1 Walking/working surface

- Proper access and egress routes in use.
- Routes clear of debris / obstructions.

5.2 Housekeeping

- No office clutter that could pose tripping hazards or blocking evacuation routes.
- Telephone and flexible cords positioned so they weren't tripping hazards.
- Work areas are free of hazards including vehicles and equipment.

6.0 VEHICLE OPERATION (COMMENTARY DRIVE CHECKLIST)

6.1 Driving/Seat belt

- Wear seat belts.
- Make full stops.
- Inside of vehicles free of distractions/loose items.
- Cell phones, radios, not used in moving vehicles or equipment.
- Concentration on driving.
- Appropriate speed for conditions, terrain, intersections, etc.
- Comply with posted speed limit; allowed space to stop for pedestrians or other vehicles; reduce speed for adverse driving conditions.
- Establish eye contact, moving eyes every two seconds.
- Special attention around parked vehicles and intersections.
- Work to maintain space cushion from obstacles and other vehicles.
- Full stop.
- In area with limited sight lead-time, keep to right side of road.
- Stopping – Can see tires/pavement contact of vehicle in front.
- Stopping – Pause 3 seconds before moving.
- 4 – 6 seconds following time.
- Stale green light.
- 5 – 8 seconds mirror check.

6.2 Parking/Backing

- First move is forward, turn motor off, and set brake.
- Glance over shoulder before curb pull out.
- Walk around vehicle to check for obstructions.
- Don't park in another vehicle's blind spot; parked where visible.
- In parking lots, only park in marked stalls, and park so the first move is forward.
- In parking lots, drive with caution around blind corners and through intersections. Never assume that the other car will stop. Watch for pedestrians moving from between vehicles. Always ready to stop.
- Back vehicle into parking stall so first move is forward. While backing, use mirrors and look around frequently to ensure a safe distance from other vehicles and objects are maintained. Position vehicle within line striping.

7.0 SAFETY PROCEDURES

7.1 Familiar with Emergency Procedures

- Site evacuation and copy of emergency procedures.
- Building evacuation and copy of emergency procedures posted near door.
- Medical, bomb threat, earthquake (stay away from windows and area's where objects may fall), or other emergency.
- Know emergency contact and reporting procedures. (Notify supervisors of an emergency as soon as practical.)

7.2 Safety reporting requirements

- Frayed or damaged cables or cords-report for repair.
- Report defective or missing paper cutter guard.
- Broken or defective furniture and equipment taken out of service and reported.
- Trash, boxes, storage under stairs, or tripping hazards cleaned up or reported.
- Damage to carpeting or stairs reported.
- Corridors/hallways free of obstructions, boxes, furniture, etc.
- Report body discomfort from operating computer.

7.3 Safe procedures

- No open flames (candles) in office areas.
- All office type electric power devices are approved, power strips for multiple plug outlets, space heaters, fans, and cup warmers.
- Smoking in designated area.
- No heavy objects on high shelves.
- Cabinets and shelves over 5 feet high are braced.

Guidelines for effective observations:

A key to effective observations is to make the safe/at-risk feedback part of the observation very specific, very factual, and timely. It is better to have fewer rather than too many behaviors marked. When someone sees a behavior marked safe and it doesn't fit, then the observation may not be as effective as it could be. In addition, the person may leave thinking their behavior is safe and it may be at risk. When making observations, consider the following: Only record safe/at-risk for a behavior you observed during the specific time period of the observation. For example, you observed someone installing a pipe clamp but didn't observe them driving to the work. Record safe/at-risk for the behaviors that you actually observed -- gloves, parking (first move forward), etc. -- but not for driving to the site.

Another item that you observed, for example "walking - eyes on path," is actually seeing their eyes looking at the walking path. You may observe that the person got from point A to B but, if you didn't see them looking at their walking path, you don't know if their behavior is safe or at risk. In fact, if you mark the behavior "walking - eyes on path" as safe and the person isn't focusing on their path, you may have set them up to get hurt in the future.

Keep discussions to policy that is currently in place. For example, gloves are required to avoid exposure to cuts, chemicals, etc. but are not required at all times.

If you observe a behavior that exceeds ENTACT's policy, be careful to encourage the behavior.

ENTACT
JOB SAFETY ANALYSIS

Date:	Project # and Name:	FPM/HSC:	
Work Type (Task):			
Development Team:		Master ☐ Revision ☐ (maintain hard copies on site for audit)	Rev#:

Equipment / Tools / Materials Required	Personal Protective Equipment	Reason for JSA Revision

Step#	Job Steps	Potential Risks / Hazards	Critical Actions / Mitigation	Responsible Person
	Discuss emergency contingency plan (required)			

☐ Stop Work Authority – All on-site personnel are empowered, expected, and have the responsibility to stop their own work and the work of co-workers, or other contractors if any person's safety or the environment is at risk. NO negative repercussions will result from this action.
☐ Safety Tools – Site personnel are participating in the daily safety tools including JTR, JTO, NLI, and JSA.
☐ JSA Review – This JSA was reviewed after completion of the job. ☐ JSA adequately addressed the task, hazards, and mitigations. ☐ Changes to JSA are noted in Changes or Revisions section.

CONFIRMATION OF JOB SAFETY ANALYSIS REVIEW:

I have reviewed and understand the chemical and/or physical hazards, critical actions, and my responsibility and accountability to actively participate in JSA review and implementation steps.

Printed Name	Signature	Date

APPROVAL OF JOB SAFETY ANALYSIS:

I have reviewed and approve this version of the JSA.

FPM, HSC or Supervisor Printed Name	Signature	Date

CHANGES OR REVISIONS:

Date	Job Steps	Potential Risks / Hazards	Critical Actions / Mitigation	Responsible Person	Development Team Initials Changes

Job Hazard Assessment

Potential Hazards					
☐	Chemical Exposure	☐	Ignition Sources/Static Elec	☐	Fire/Explosion
☐	Hazardous Atmosphere/Dust	☐	Energy Sources/Pressure	☐	Spills/Releases
☐	Confined Spaces	☐	Manual Handling	☐	Slips/Trips/Falls
☐	Excessive Noise (> 85 dB)	☐	Overhead/Underground	☐	Chips/Slivers/Flying
☐	Working/Walking Surfaces	☐	Falling/Dropping Objects	☐	Pinch Points/Crush
☐	Environment/Weather/Biological	☐	Equipment/Machinery/Processes	☐	Workplace Design
☐	Arc/Flash/Hot Surfaces	☐	Temperature Extremes	☐	Simultaneous
☐	Open Hole/Excavation	☐	Working Near or Over Water	☐	Splash
☐	Isolated Work Areas	☐	Visibility	☐	Work Near
☐	Caught In-Between	☐	Contact/Struck By/Strike	☐	Hand Hazards
☐	Work Area	☐	Repetitive Stress/Duration	☐	Swing Radius
☐	Other				
☐	Other				

Hazard Controls					
☐	Eliminate Hazard	☐	Spill Control/Contingency Plan	☐	Rest/Breaks/Stretch
☐	Engineering Controls (Isolation, Design, Change, Substitution)	☐	Ventilation/Redirection	☐	Adjust Work Schedules
☐	Administrative Controls (Reduction, Rotation, Training)	☐	JSA (JLA)s/SOPs/Procedure	☐	Decontamination
☐	PPE (Level D, C, B, or A)	☐	Monitoring	☐	Work Area Inspection
☐	Exposure Time Limits	☐	Buddy System	☐	Manufacturer Guidelines
☐	Physical Barriers	☐	Fire Fighting	☐	Equip/Tool/PPE Inspectio
☐	Safety Equipment	☐	Emergency Response Proced	☐	Competent Person
☐	Ignition Source Controls	☐	Communication Plan	☐	Fit For Duty
☐	Lock-Out/Tag-Out	☐	Eyewash/Safety Shower	☐	Multi-Contractor Meetings
☐	Work Permits	☐	Material Safety Data Sheets	☐	Site Orientation
☐	Other (specify):				
☐	Other (specify):				

PPE and Safety Equipment Required					
☐	Hard Hats	☐	Reflective Safety Vest	☐	Respiratory Protection
☐	Steel Toe Safety Boots	☐	Overboots	☐	Fire Extinguisher
☐	Safety Glasses	☐	Double Lanyard w/ Shock	☐	Fire Retardant
☐	Safety Glasses w Side	☐	Welding Helmet/Gloves	☐	Decontamination Supplies
☐	Face Shield	☐	Life Line	☐	Lock-Out/Tag-Out Devices
☐	Goggles	☐	Safety Cable	☐	Gas Detector
☐	Cotton Gloves	☐	Safety Barricade/Cones/Tape	☐	Hearing Protection
☐	Leather Gloves	☐	Seat Belt	☐	Adsorbent Pads
☐	Rubber/Chemical Gloves	☐	Chemical Resistant Clothing	☐	Containment Pans
☐	Full Body Harness	☐	Tyvek/Cotton Coveralls	☐	Heavy Duty Electrical
☐	First Aid Kit/Eye Wash	☐	Metatarsal Guards	☐	2-Way Radio/Phone
☐	Emergency Air Horn	☐	Life Jacket/Life Ring	☐	Chemical Apron
☐	Other (specify):				
☐	Other (specify):				

ENTACT LOSS / N EAR LOSS INVESTIGATION

Incident Date/Time			
Project Number and Name		**FPM and HSO:**	

Loss Type	☐ Near Loss ☐ Theft ☐ Lost Workday Injury ☐ Restricted Duty Injury ☐ Vehicle Accident ☐ To Be Determined	☐ Near Loss (Potential Inj/Ill) ☐ First Aid Injury ☐ Notice of Violation ☐ Spill / Leak ☐ Fire	☐ Equipment/Property Damage ☐ Injury Not Otherwise Classified ☐ OSHA Recordable ☐ Third Party Injury / Fatality ☐ Non-Compliance
Work Type			
Organization	ENTACT Services, LLC		
Stop Work Authority Used	☐ Yes ☐ No		

Investigation Date/Time		**Investigation Supervisor**	

Employee Title		**Supervisor**	
Employment Status	☐ Regular ☐ Part Time	**How long in present job**	

Incident Location	
Incident Reported To	

Description of Incident / Near Loss (Describe what happened and how it happened)

Investigation Team	**Position/Title/Phone**	**Primary Contact**
		☐

"5-Why" Investigation (there may be more than one root cause, may need 5-why more than once)			**Verification (visual, interviews, expert, written data, testing, etc.)**
A	Why did incident happen?		
B	Why did "A" happen?		
C	Why did "B" happen?		
D	Why did "C" happen?		
E	Why did "D" happen?		

Refer to Why Tree Handbook, page 18 for additional assistance on 5-Why Investigations.

Root Cause and Contributing Factors: (Describe in Detail Why Incident / Near Loss Occurred)	
1	
2	
3	
4	
5	

Explanation of Root Cause(s) Analysis Numbers (RCA No): ***(Revised 8/28/07)***			
1	Lack of skill or knowledge (Associate does not have necessary understanding of proficiency to do the job - PERSONAL FACTOR)	5	Lack of or inadequate operational procedures (No work standards or incomplete work standards (SOP, JSA, etc.) - JOB FACTOR)
2	In the past, did not follow procedures or acceptable practices and no incident occurred (injury, product quality incident, equipment damage, regulatory assessment or production delay) (Associate thinks there is no personal benefit to following safe work practices - PERSONAL FACTOR)	6	Inadequate communication of expectations regarding procedures or acceptable practices (Work standards are in place, but supervisors haven't communicated with every employee to let them know what they're suppose to be doing - JOB FACTOR)
3	Doing the job according to procedures or acceptable practices takes more time/effort (Associate thinks it is easier and faster to get the job done rather than follow established safe work practices - PERSONAL FACTOR)	7	Inadequate tools or equipment (available, operable and safely maintained, proper task and workplace design) (Tools and equipment are not available, they're not designed to do the job properly, or they're not maintained and in proper working condition - JOB FACTOR)
4	Short-cutting procedures or acceptable practices is positively reinforced or tolerated (Supervisor either accepts, or positively reinforces associate to not do the job exactly the way it should be done - PERSONAL FACTOR)	8	External factors (Have taken all the necessary precautions to prevent the loss from occurring and still cannot prevent it)

BE SURE ROOT CAUSE AND SOLUTIONS MATCH			
	PERSONAL FACTORS	**JOB FACTORS**	**EXTERNAL FACTORS**
ROOT CAUSES	RCA1 – always include the word "training." If an employee or contractor doesn't know how to do the job, the recommended solution should be training. RCA2 – Lack of motivation - Include some significant communication between the supervisor and the employee about the personal consequences (not disciplinary action) to the employee physically if the employee continues to do the job contrary to work standards – this is telling the employee that he/she needs to understand the cost to him/herself or to others (such as family members) when his/her actions result in an injury. RCA3 – Lack of motivation – same RCA4 – Lack of motivation – same	RCA5 – The solution should specify which steps the organization needs to take, such as developing or modifying work standards, communicating work expectations regarding standards, and providing proper tools and equipment. RCA6 – same RCA7 – same	RCA8 – Even though the root cause may not be controllable, solutions should focus on minimizing loss when the situation occurs again. Make sure you have asked "why" enough to justify using RCA #8.

Item No	RCA No	Solution(s): How to Prevent Incident / Near Loss From Recurring	Person Responsible	Due Date	Date Completed	Verified/ Validated by First Line Supervisor

Results of Solution Verification and Validation

Injury or Illness Information			
Date of Injury or Onset of Illness			
Employee's Specific Activity			
Equipment, Materials, or Chemicals Used			
Specific Injury or Illness			
Treatment Provider Name & Address		Phone No	
Hospital Name & Address (if hospitalized)		Phone No	
Employee Missed Work? (other than day of injury)	☐No ☐Yes, first day absent was:		
Returned To Work?	☐No ☐Yes, first day back was:		
Others Injured?	☐No ☐Yes If yes, provide names:		

Third Party Incident Information			
Description of Damage			
Owner Name & Address		Phone No	
Witness1 Name & Address		Phone No	
Witness2 Name & Address		Phone No	

LESSONS LEARNED

ATTACHMENT Q HEALTH AND SAFETY PLAN TEST

Project Name/Number: Paterson Plank Road Superfund Site	FPM:
Your Name (please print):	Date:
Company:	
Score:	Corrected to 100%:

1. If a person's safety or the environment are at risk all on-site personnel are empowered, expected, and have the responsibility to stop their own work and

   a) the work of co-workers
   b) subcontractor employees
   c) other contractors
   d) all of the above

2. Subcontractors will prepare their own HASP, which must

   a) meet or exceed the requirements of ENTACT's HASP.
   b) be reviewed by the PM and PHSC before work begins.
   c) include ENTACT's scope of work.
   d) a and b

3. All injuries will be reported to

   a) the Health and Safety Officer.
   b) a co-worker.
   c) the police.

4. The chemical hazards on this site are:

5. All ENTACT field associates are required to

   a) have OSHA 40-Hour HAZWOPER training.
   b) have BBS 8-Hour training.
   c) both a and b.

6. Tailgate meetings are held

   a) in the morning.
   b) at the end of the day.
   c) in the morning and afternoon.

7. The PEL for nuisance dust is

   a) PEL:15 total/5 resp mg/m^3
   b) PEL:25 total/10 resp mg/m^3
   c) PEL:35 total/15 resp mg/m^3

8. Name at least five of the physical hazards (non-chemical) that exist on this site.

9. Three (3) short blasts signal

   a) tailgate meeting time.
   b) the scheduled time for JTOs.
   c) an emergency.

10. An eye wash station will be located near the decontamination area but no more than _____ feet from the exclusion zone.

    a) 50
    b) 100
    c) 150

11. What level of PPE is required at this site?

    a) Level D
    b) Level D modified
    c) Level C
    d) Level B
    e) Level A

12. Name at least three job tasks that will be performed on this site (other than mobilization and demobilization):

13. Who are ENTACT's project management team for this site?

a) Field Project Manager:
b) Health and Safety Coordinator:
c) Client Representative:

14. Air monitoring is performed to determine associate exposure levels to

a) physical hazards.
b) airborne dust/heavy metals/organics.
c) biological hazards.

15. Name at least three biological hazards may be encountered at this site?

16. What is the name, address and phone number of the hospital for this site?

17. Where is the emergency meeting point(s) for this site?

18. What types of heavy equipment will be used at this site?

19. What types of JSA's are included in this HASP?

20. Journey management planning applies to ENTACT Associates and contractor/sub-contractors when on Company property or when using motor vehicles for company related business, including:

a) Company-owned or leased vehicles
b) Rental vehicles used on Company-authorized business
c) Personal vehicles while being used for Company business
d) all of the above

ATTACHMENT R DAILY WORK PERMIT

Project:		Project No.:
Date:	Day:	Activity:

PERSONNEL				
Role	Name	Hours	Job Task	PPE Level

HAZARDS ANTICIPATED			ACTION TAKEN
Electrical Lines	☐ Yes	☐ No	
Fall Hazards	☐ Yes	☐ No	
Confined Space	☐ Yes	☐ No	
Trenching and Excavation	☐ Yes	☐ No	
Chemicals 1. 2. 3.	☐ Yes	☐ No	
High Pressure Air Lines	☐ Yes	☐ No	
Gas Lines	☐ Yes	☐ No	
Propane Lines	☐ Yes	☐ No	
Water Lines	☐ Yes	☐ No	
Hot Conditions (Weather)	☐ Yes	☐ No	
Cold Conditions (Weather)	☐ Yes	☐ No	
High Pressure Washing	☐ Yes	☐ No	
Other Hazards Identified 1. 2. 3.	☐ Yes	☐ No	

EXPLAIN ANY SPECIAL CONDITIONS AND WHAT HAS BEEN DONE TO ELMINATE HAZARDS OR RISKS:

FORMS COMPLETED TODAY
❑ Fall Protection
❑ Air Monitoring
❑ Hot Work Permit Completed
❑ Confined Space Permit Completed
❑ Heavy Equipment Inspected
❑ Demolition Form Completed
❑ Incident/Incident Report
❑ Weekly Safety Report

PPE REQUIRED TODAY		
Circle one: Level D	Level C	Level B Level A
Additional check:		
❑ Full Face	❑ Goggles	❑ Tyvek
❑ PAPR	❑ Face Shield	❑ Body Harness
❑ Special Filters	❑ Rubber Rain Gear	❑ Lanyards

OTHER SITE ACTIVITIES DAILY WORK SUMMARY:
LIST ANY INCIDENTS THAT OCCURRED TODAY:

PROBLEMS/DELAYS:

SPECIAL REQUESTS:

PM SIGNATURE	H&S OFFICER SIGNATURE	CREW LEADER

ATTACHMENT S ORIENTATION FORMS

ASSOCIATE SITE HEALTH & SAFETY ORIENTATION

Project Name & #:	**Project Location:**
FPM/HSO (please print):	**FPM/HSO Signature:**
Associate Name/Title (please print):	**Associate Signature:**
Date(s) of Orientation:	**Date Orientation Complete:**

Health & Safety Orientation shall consist of a minimum of 4 to 6 hours of site-specific safety awareness, hazards identification, safe behavior and attitude, and participation in safe behavior activities.

TASK	DATE COMPLETE
ENTACT's Behavior Based Safety System (JTR, JTO, L/NLI, JSA) (Chevron CEMC OE Tenets, LPS Process - SPSA/LPSA, LPO, L/NLI, JSA/JLA).	
Stop Work Authority.	
JSA and Job Hazard Assessment (safety processes).	
Company Harassment Policy and Violation of health and safety policy.	
Scope of work, general and site specific hazards including high risk hazards.	
Discussion of HASP, hazard analyses, emergency response. Signature required for HASP acknowledgement.	
Incident Reporting, Notification, and Investigation (RCA) requirements (ENTACT and client specific requirements).	
Associate has completed a negative drug test **prior** to arriving on-site.	
Associate training and medical records are on-site and are current.	
Chemical hazards and exposure control methods have been discussed. Chemical hazards on this site include: _____	
Associate MVR is completed. Defensive driving training, driving observation, and commentary drive are complete or are scheduled.	
Site-specific safety checklist is complete and signed-off. Establish clear understanding of site risks and safety requirements.	
Identify hazardous atmospheric conditions. Discuss air monitoring lab results.	
Discuss Industrial Hygiene Monitoring (air sampling equipment): Calibration, use, maintenance, sample handling and analysis, and interpreting results.	
Discuss Right-To-Know (HazComm) and location of chemicals used at the site. MSDS, labeling, storage, routes of entry etc.	
Discuss "Hand-To-Mouth" contamination prevention. No eating, chewing gum, or use of tobacco products is permitted in work zones.	

TASK	DATE COMPLETE
Discuss Work Zone locations and minimum PPE enforced for all areas: Support, Exclusion, and Decon (Personnel Trailer & Equipment Pad).	
Review Respiratory Protection Program. Perform and record fit test.	
Record PPE issued and demonstrate proper procedures for: Donning, Doffing, Disposal, Decontamination and Storage.	
Discuss decon procedures and PM's expectations for equipment and personnel.	
Review site map and locations of fire extinguishers, eye wash, first aid, emergency meeting point, shelter in place, emergency equipment, emergency routes, etc.	
Discuss emergency signals and procedures. Discuss evacuation relocation procedures.	
Discuss heavy equipment work zones, operations, and expectations.	
Review special hazards/procedures (Chevron PTW).	
SSE/mentor requirements (Chevron).	
Site specific environmental protection requirements.	
Daily project start time and work days.	
Spill control procedures.	
Loose fitting jewelry, earrings, etc.	
Medical surveillance requirements.	
Use of fixed open blade knives (FOBK) is prohibited.	

5/20/08

TRUCK DRIVER POLICY AND ORIENTATION

I. INTRODUCTION

Truck drivers operating on ENTACT project sites must observe unique safety precautions to help protect the driver's safety and the safety of others. This policy describes these minimum requirements.

II. REQUIREMENTS

Truck drivers on ENTACT project sites are required to comply with ENTACT's Behavior Based Health and Safety System requirements including the following:

A. This Truck Driver Orientation must be completed prior to entering the site. Be aware of site specific hazards and site operational responsibility.
B. Drivers must have current driver's license and proof of insurance at all times.
C. Operate vehicle in a safe manner with existing road, weather, and traffic conditions.
D. May not be under the influence of alcohol or drugs, and will not drive if tired or fatigued.
E. Vehicles must be properly parked when not in use so that the first move is forward whenever possible.
F. Participate in daily safety meetings. Review JSAs.
G. All personnel entering the Exclusion Zone are subject to drug and alcohol testing. Drugs, alcohol, and firearms are not allowed on-site.
H. Obey posted speed limit on-site at all times.
I. Conduct yourself in a professional manner, courteous of those dumping before and after you.
J. Stay in your vehicle while truck is being loaded and/or while you are in the Exclusion Zone.
K. No smoking or use of other tobacco products is allowed on-site.
L. Keep truck windows closed while loading/unloading.
M. Obey the spotter's directions at all times. If you do not understand the spotter's direction, clarify what he/she is directing prior to moving.
N. Be totally aware of all ground personnel and obstructions, as well as overhead power lines and electrical wires, and maintain appropriate safe distances.
O. Decontamination and documented inspection of vehicle is required prior to leaving the job site.
P. All loads must be tarped prior to leaving property if applicable. All loads must be tarped or secured on the bed or trailer, or in the cab.
Q. The bed of the truck must be completely lowered prior to moving.
R. Cleaning of truck beds is allowed only in designated areas.
S. Watch oncoming traffic when exiting the job site.
T. Proper documented daily truck maintenance is required for safe operation.
U. Vehicles with obvious unsafe conditions will be refused access.

V. Any truck incidences or accidents are to be reported to the ENTACT Field Project Manager as soon as possible (no later than 24-hours after incident). Follow ENTACT accident reporting procedures.
W. Be sure you have received all required paperwork prior to departure (CVX sites require JMP or guidance and Vehicle Selection form). Also, be sure to deliver the previous load's paperwork (with the arriving weight) to the designee signing manifests.
X. Road safety in and out of the facility as well as road safety to and from the project site is of paramount importance. Negative feedback from flagmen and/or other drivers can be grounds for dismissal from the project.
Y. If you must leave your vehicle for any reason (going to office, restroom, etc.) you must shut the truck engine off and set the brake before leaving the vehicle.
Z. Driver and passengers are required to wear seat belts.
AA. Cell phones will not be used by the driver if the truck is moving or being loaded.
BB. Personnel are not allowed to ride in the back of pickup trucks.
CC. Goods and supplies carried on flatbed or pickup trucks must be secured. If cargo is carried in the passenger section of the vehicle, it must be restrained and segregated from the passengers and driver in such a manner as not to cause a hazard.
DD. Documented vehicle inspections must be performed each day.
EE. Drivers are not allowed to exceed the 16-hour rule.
    a. CVX Heavy Vehicles (> 10,000 GVW) may not exceed 14 hours.
    b. CVX Light Vehicles (< 10,000 GVW) may not exceed 16 hours.
FF. STOP WORK AUTHORITY: All on-site personnel are empowered, are expected, and have the responsibility to stop their own work and the work of co-workers, EMC employees, or other contractors if any person's safety or the environment is at risk. NO repercussions will result from this action.
GG. Chevron sites require each driver to utilize a Journey Management Plan or guidance document to communicate site specific routes and associate hazards prior to arrival at the site.
HH. Chevron sites must comply with CEMC OE Tenets:

CHEVRON TENETS OF OPERATIONAL EXCELLENCE	
1. Always operate within design or environmental limits.	2. Always operate in a safe and controlled condition.
3. Always ensure safety devices are in place and functioning.	4. Always follow safe work practices and procedures.
5. Always meet or exceed customer's requirements.	6. Always maintain integrity of dedicated systems.
7. Always comply with all applicable rules and regulations.	8. Always address abnormal conditions.
9. Always follow written procedures for high-risk or unusual situations.	10. Always involve the right people in decisions that affect procedures and equipment.

III. SITE SPECIFIC HAZARDS

Site specific hazards are identified in ENTACT's Health and Safety Plan and Journey Management Plans. Listed below are the hazards associated with truck driving on your particular site.

ENTACT Project Name and Location:	Date:
ENTACT FPM:	Subcontractor:
Chemical and Physical Hazards:	
Site Specific Requirements:	

Truck Driver Name (print)

Company Name

Truck Driver Signature

Date

ENTACT Associate Completing Orientation

ENTACT Contact Numbers:
1.
2.
3.

VISITOR, OCCASIONAL WORKER, SUBCONTRACTOR ORIENTATION

Project Name:	Date:	
FPM:	HSC:	
Signed Visitor Log and received a Visitor badge.		☐
I acknowledge that eating, drinking, smoking and use of tobacco at non-designated areas is prohibited.		☐
I will stay with my assigned escort at all times. My escort is: _____		☐
I have reviewed the Health and Safety Plan and I am aware of the physical, chemical, and biological hazards that may exist at the project site. I will obey all safety signs, comply with all safety requirements as set forth in the HASP, and will report any unsafe condition(s) immediately.		☐
I have reviewed the site air monitoring plan.		☐
I have reviewed this list of site-specific hazards with the FPM and/or HSC and have discussed how I may come into contact with them. SITE HAZARDS AT-A-GLANCE CHEMICAL HAZARDS 1. 2. 3. PHYSICAL HAZARDS 1. 2. 3.		☐
I have reviewed and will comply with the visitor PPE requirements as set forth in the site-specific Health and Safety Plan. I have been provided the following PPE: ☐ Hard Hat ☐ Protective Clothing ☐ Safety Glasses ☐ Half-Face Respirator w/ P-100 Filters ☐ Gloves ☐ Half-Face Respirator w/ Combination Filters ☐ Hearing Protection ☐ Other:		☐
If I require access into the Exclusion Zone and Contamination Reduction Zone I have provided to the FPM/HSC the following certifications: OSHA 40-Hr HAZWOPER and current refresher, behavior based safety certification, current hazmat physical, current respirator certification and fit test.		☐
I will report any unsafe acts, conditions, or Near Losses and Loss Incidents to the FPM.		☐
I have been shown and know the locations of first aid care, emergency phone numbers, MSDSs, first aid stations, eye wash stations (showers), fire extinguishers, restrooms, emergency evacuation procedures, and emergency meeting point.		☐
I have been show and know boundaries of all work zones (support, decon and exclusion zones).		☐
I agree to abide by ENTACT's Health and Safety policies. I understand that any violation of this Orientation and/or Health and Safety Plan requirements may result in my being dismissed from the project site.		
Name (Printed and Signature):	Date:	
Company:		

ATTACHMENT T SITE SECURITY CHECKLIST

ENTACT
Site Security Checklist
(Forward a completed copy to your Project Health and Safety Coordinator)

Project Name: _____ Project Number: _____

Field Project Manager: _____

Health and Safety Officer: _____

Project Start Date: _____ Anticipated Completion Date: _____

Date checklist was completed and forwarded: _____

Yes	No	Activity
		Property, trailers, and equipment are protected with a locked security fence. If "no", explain how you will prevent the public from having access to the site and equipment:
		All ENTACT offices or trailers have secure locks on doors and windows. If "no", please explain:
		All windows in ENTACT offices or trailers have window shades or blinds that can be closed when personnel have left the site.
		All laptop computers and other portable electronic equipment are securely stored each night.
		A security service is provided for the site. Please provide the security company's name, phone number, and hours of service at the site. Who is the ENTACT contact for the security guard? Security Company: _____ Phone Number: _____ Hours of service: _____ ENTACT Contact: _____ Home phone and pager: _____ If a security service is not used please explain the procedures to be used to protect ENTACT property after working hours: _____ _____ _____ _____ _____ _____ _____

		All personnel entering the site or entering offices or trailers after working hours will sign-in noting the time entering and leaving.
		Petty cash is locked up each night. The ENTACT associate responsible for petty cash is:
		Keys for offices or support trailers are signed for and keys are returned if the associate is terminated from the site. Extra keys are not left outside the office or trailer.

Heavy Equipment

Yes	No	Activity
		All heavy equipment is stored in a securely fenced area. If a fenced area is not practicable, please explain how heavy equipment is being protected. Who is responsible to ensure the equipment is properly stored each night? Responsible associate: _____
		Keys to heavy equipment are removed from the equipment each night and kept in a secured area. If not, please explain:
		Equipment was inspected prior to use and pictures were taken to verify condition.
		Equipment is inspected weekly and the findings are documented. (See Driver Safety and Cell Phone Policy, Weekly Inspection for ENTACT Vehicles)
		The type of work performed by ENTACT in most cases allows the use of used equipment instead of new equipment. On this project used equipment was leased.
		Projects are instructed to immediately report any incidents or equipment damage to Don Self (972/580-1323) in Dallas within 48-hours of their occurrences. (See Vehicle and Equipment Damage Report)
		All equipment (owned or leased) valued over $1,000 is listed on the vehicle and equipment sheet.

Leasing Agreements

Acknowledgement	Activity
	Always read leasing agreements and understand what you are signing. Ensure the following is comparatively stated: Equipment lost or stolen will be replaced "like in kind". Example: Used equipment will not be replaced with new equipment.
	If negligence was *not* involved ENTACT will not be responsible for the *loss of use* of stolen equipment.

Driving on Company Business

Acknowledgement	Activity
	Associates will be required to have an approved Motor Vehicle Record check. Associates must be approved by ENTACT's Health and Safety Department. (See Driver Safety and Cell Phone Policy)
	The Project Manager will be responsible for ensuring that only approved drivers are allowed to drive company vehicles or personal vehicles on company business. (See Driver Safety and Cell Phone Policy)

Extra Security

Yes	No	Activity
		Motion detection lighting is installed at the site.
		An alarm system is installed on site. If "yes", what does it monitor and is it connected to a central monitoring service? Alarm system will monitor: _____ _____ Central monitoring service and phone: _____ _____
		Other:

Additional Comments
