

WARNING

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND NOT FOR PUBLIC VIEWING. THIS DOCUMENT CONTAINS THE FOLLOWING TYPE OF SENSITIVE INFORMATION:

- PRIVACY ACT INFORMATION
- ARCHAEOLOGICAL LOCATION COORDINATES OR MAPS
- ATTORNEY / CLIENT DELIBERATIVE PROCESS INFORMATION
- COMMAND INTERNAL RULES AND PRACTICES
- COMMERCIAL TRADE SECRETS OR CONFIDENTIAL COMMERCIAL INFORMATION
- DRAWINGS OF MILITARY STRUCTURES / BUILDINGS OR FEDERAL BUILDINGS
- STREET LEVEL MAP(S) OF MILITARY INSTALLATIONS OR FEDERAL BUILDINGS
- GEOLOGICAL / GEOPHYSICAL INFORMATION / DATA CONCERNING WELLS

RECORDS OFFICE REMINDER: REVIEW AND SAFEGUARD SENSITIVE INFORMATION CONTAINED IN THE DOCUMENT PRIOR TO PUBLIC ACCESS

**WORK PLAN
CONTRACTOR QUALITY CONTROL PLAN
SAMPLING AND ANALYSIS PLAN
SITE HEALTH AND SAFETY PLAN
STORMWATER TREATMENT PONDS RESTORATION,
NAVAL FUEL DEPOT, POINT MOLATE,
RICHMOND CALIFORNIA**

**Contract No. N62474-93-D-2151
Delivery Order No. 0066**

Submitted to:

**Department of the Navy
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive, Building B-103
San Bruno, California 94066-2402**

Submitted by:

**IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553**



INTERNATIONAL
TECHNOLOGY
CORPORATION

4585 Pacheco Boulevard
Martinez, California 94553-2233
510-372-9100
Fax: 510-372-5220

December 18, 1996

768997-ITNHO-0007

Ms. Lidia Chagonjian, Code 0222LC
Contracting Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive, Building B208
San Bruno, California 94066-2402

Attention: Ms. Judy Harris, Code 0222JH

Contract: N62474-93-D-2151, Environmental Remediation Contract for Sites in Northern and Central California and in Nevada

Subject: Transmittal of Revision 0 Work Plan, Contractor Quality Control Plan, and Health and Safety Plan for the Seawall Repair at Point Molate, Naval Refueling Depot, Richmond, California, Delivery Order 0068

Dear Ms. Judy Harris:

Enclosed are an additional six uncontrolled copies of Revision 0 Work Plan, Contractor Quality Control Plan and Health and Safety Plan for Delivery Order 0068. Please make distribution of these documents as appropriate. These copies were inadvertently not included with the six controlled copies submitted originally. Please excuse the oversight.

Should you have any questions regarding these documents, please contact the undersigned at (510) 372-9100.

Sincerely,
IT CORPORATION


Don Marini, P.E.
Project Manager
Delivery Order 0068


Valerie Crooks, P.E.
Program Manager
EFA-West PMO

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1.0 Work Plan

2.0 Contractor Quality Control Plan

3.0 Sampling and Analysis Plan

4.0 Health and Safety Plan

**WORK PLAN
STORMWATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA**

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Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

Revision 0

January 1997

Issued to: Izzat Ahmadicija

Date: 1/22/97

Copy #:

Controlled

Uncontrolled

WORK PLAN
STORMWATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA

CONTRACT NO. N62474-93-D-2151
Delivery Order No. 0066

Revision 0

January 1997

Approved by: Thomas A. Davis
Thomas A. Davis
IT Contractor Quality Control
Manager

Date: 1-15-97

Approved by: Gary Elston
Gary Elston, P.E.
IT Project Manager

Date: 1/21/97

Approved by: Valerie Crooks
Valerie Crooks, P.E.
IT Program Manager

Date: 01/21/97

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1.0 Introduction

This work plan has been prepared by IT Corporation (IT) for the design and installation of a treatment system to restore the stormwater ponds at the Point Molate Naval Fuel Depot, located on the San Francisco Bay in Richmond, California. Refer to Figure 1 for the Site Plan. The work will be performed under Delivery Order Number 0066 of Contract No. N 62474-93-D-2151, "Environmental Remediation Contract for Sites in Northern and Central California and in Nevada."

The project involves the design and installation of new stormwater treatment equipment and the rehabilitation of the existing stormwater treatment ponds. Constituents of concern are petroleum hydrocarbons. The enhanced stormwater treatment system will process the impacted stormwater through the existing oil/water separators, the existing oxidation ponds, new sand filters, and new organoclay filters, before being discharged to the San Francisco Bay.

The work will be performed in accordance with this Work Plan, based on the Scope of Work dated August 7, 1996 and revised September 18, 1996, and Minutes for the Site Walk and Meeting held on August 14, 1996.

2.0 Design and Plan Development

Prior to procurement and installation, planning and design efforts will be required to execute this project. Those items are outlined in their respective sections which follow.

2.1 Design

Process equipment (aerators, sand filters and organoclay units) will be sized, competitively bid, and vendors selected.

2.2 Development of Plans

In conjunction with this Work Plan and the previously mentioned design and investigative activities, several related plans will be developed. Specifically, a Health and Safety Plan (HASP) and a Contractor Quality Control Plan (CQCP) will be developed and submitted concurrently

with this Work Plan. This project will utilize the Environmental Protection Plan (EPP) for Delivery Order Number 0053 (Appendix A). The Sampling and Analysis Plan (SAP) will be submitted along with the Water Quality Monitoring Plan during Phase II of the project (Phase II involves the equipment installation and other construction activities).

3.0 Site Activities

Following Navy approval of the project plans, site activities will proceed. Work will be performed by subcontractors as well as IT craft labor, with IT maintaining a management staff on site to supervise the work. All delivery order-specific work plan(s) and applicable IT Standard Operating Procedures (SOPs) and Standard Quality Procedures (SQPs) will be incorporated into the appropriate subcontract agreements.

3.1 Mobilization/Temporary Facilities

Existing site facilities will be available for use by IT as a project office. Necessary construction equipment will be mobilized, with IT's site management staff, to the project site. Temporary telephone service will be secured, along with bottled water and portable sanitary facilities.

3.2 Mechanical Survey

Prior to initiating pond restoration activities, a mechanical survey will be conducted to determine the status of the valves and piping in the existing stormwater treatment system and assess how they can be utilized for the new system. The survey will include inspection of the piping and valves from the oil/water separator to the ponds, between the ponds, from the ponds to the chlorination/dechlorination system and the existing sand filters, and from the dechlorination system to the outfall. If valves and/or piping are not operational, the defective equipment will be repaired or replaced, or alternative water transfer mechanisms will be used.

3.3 Pond Rehabilitation

The function of the ponds is to allow biological degradation of fuel related organic constituents in the stormwater. The current aeration system consists of a compressed air distribution system that delivers air to a series of diffusers in each pond. The current system does not provide sufficient mixing or air supply to the ponds to allow significant biodegradation to occur. The new aeration system will provide better mixing and increased air supply to the wastewater.

3.3.1 Aerator Installation

Six floating mechanical aerators will be installed into the ponds. Each aerator will be 5 horsepower, horizontally mixing and self-aspirating. An electrical subcontractor will perform the electrical installation of the aerators and will provide a control panel to allow independent operation of each aerator.

3.3.2 Pond Rehabilitation Plan

The ponds will be rehabilitated successively. Four aerators will initially be installed in Pond 3. Two aerators will be installed in Pond 1. Pond 3 will be aerated and the water will be recirculated back to Pond 1. The aeration and recirculation will continue until the water in Pond 3 is sufficiently aerated. The nutrient balance in the pond will be checked and nutrients added as necessary. The process will then be repeated for Pond 2. When the treatment of Pond 2 is complete, additional aeration of Pond 1 will commence. At this time Pond 1 will be isolated and stormwater influent will be directed to enter Pond 2. Ponds 2 and 3 will be used as facultative ponds for stormwater treatment until aeration of Pond 1 is complete.

If circumstances warrant, an alternative pond rehabilitation plan may be implemented. The condition of existing valves and piping or other factors may necessitate an alternative treatment scheme.

3.4 Process Equipment Installation

A polishing system will be installed to provide secondary treatment of the aerated stormwater. The polishing system will consist of two pressurized sand filters followed by a three vessel organoclay adsorption system. The sand filters and organoclay vessels will be installed in close proximity to the groundwater treatment system (Delivery Order 0053). Refer to Drawing C-4 for the Process Equipment Layout. Crossover piping will be installed to allow for the use of the sand filters and/or granulated activated carbon units in the groundwater treatment system for backup purposes. A four channel automatic monitoring system will be installed. The system will have sensors for rainfall, dissolved oxygen, pond water level and power outages and will have remote telephone alarm capability. The remote alarm site will be staffed 24 hours a day, 7 days per week, primarily by a licensed plant operator.

3.5 Mechanical & Electrical Connections

Following the installation of process equipment, flanged mortar-lined ductile iron piping will connect the process equipment. Appropriate valves, connections, and appurtenances will be installed. Electrical tie-ins will be made to provide adequate power for the polishing system pump. Refer to drawing C-1 for the Piping and Instrumentation Diagram.

3.6 Chlorination and Dechlorination System

The existing chlorination and dechlorination system will be inspected to determine its operational status. If required, the system will be serviced, repaired and/or modified as necessary to ensure proper disinfection of the stormwater prior to discharge.

3.7 Oil/Water Separators

The existing oil/water separators (OWS) will be inspected to ensure proper operation. The OWS will be serviced and cleaned prior to system startup. Waste oil and/or sludge will be removed from the OWS and properly disposed. The OWS will be cleaned every 1000 hours of operation as part of the operation and maintenance (O&M) program.

3.8 System Startup

Following the mechanical and electrical connections of the process equipment, all piping will be hydrostatically tested at 40 psi for at least one hour. Any leaks or defective work will be repaired or replaced.

An initial system performance test will be conducted prior to discharge of any treated water to the Bay. During this period, the system will operate in a recirculation mode, with pond effluent flowing through the sand and organoclay filters and back to Pond 1. Sampling will be conducted on the influent, effluent, and between the treatment steps to determine if discharge requirements are met and to evaluate the effectiveness of the process equipment. If additional polishing is required, the water will be routed through the crossover piping and through the granulated activated carbon units from the groundwater treatment plant. This test will be implemented to verify compliance of the treated water with the effluent concentration levels permitted by the NPDES discharge permit.

3.9 Demobilization

Following the installation and startup period, the site will be demobilized. Construction equipment will be returned and the site staff will be reduced to an operator to perform O&M activities.

3.10 Operation and Maintenance

In accordance with the NPDES permit, a fully trained, experienced treatment plant operator will be on site to perform O&M activities. The duties of the operator will include:

- Visiting the site at least three times per week to check operation of the treatment system
- Performing sampling, recordkeeping and routine maintenance
- Overseeing all contractor/subcontractor work on the treatment system
- Overseeing pond discharges
- Being on call and available to respond 24 hours per day, 7 days per week.

4.0 Site Restoration

After completion of all field activities, IT will initiate site restoration activities. Any disturbed areas will be restored to conditions existing prior to disturbance. Any fence relocations will be repaired or reinstalled.

5.0 Post Construction Submittals

Following the installation and startup of the stormwater treatment system, several post construction documents will be submitted.

As-built drawing(s) of the process equipment, piping and electrical installation will be submitted.

A detailed O&M manual for the complete startup, operation, maintenance and shutdown of the stormwater treatment system and all of its individual components will be developed and submitted.

A Post Construction Report will be developed and submitted to provide all documentation of the construction activities.

6.0 Project Organization

The Project Manager will be the point of contact for the Navy and will be responsible for the project execution, continuity, and reporting. The site management team will consist of a Site Superintendent, Contractor Quality Control (CQC) Manager, Site Health and Safety Officer and Site Administrator. IT laborers as well as subcontractors will be on site under the direction and supervision of IT's Site Superintendent.

7.0 Management Approach

The project will be implemented using site management staff from the PMO Office of IT in Martinez, California. IT employees and subcontractors will be utilized for craft labor, electrical installation efforts, and investigative activities.

Project costs will be accrued on a weekly basis and provided for the review of the Project Manager. Using this data, the Project Manager will evaluate the progress of the project and maintain continual updates of the project schedule. In accordance with the contract, IT will provide this data to the Navy through monthly project status reports.

8.0 Health and Safety

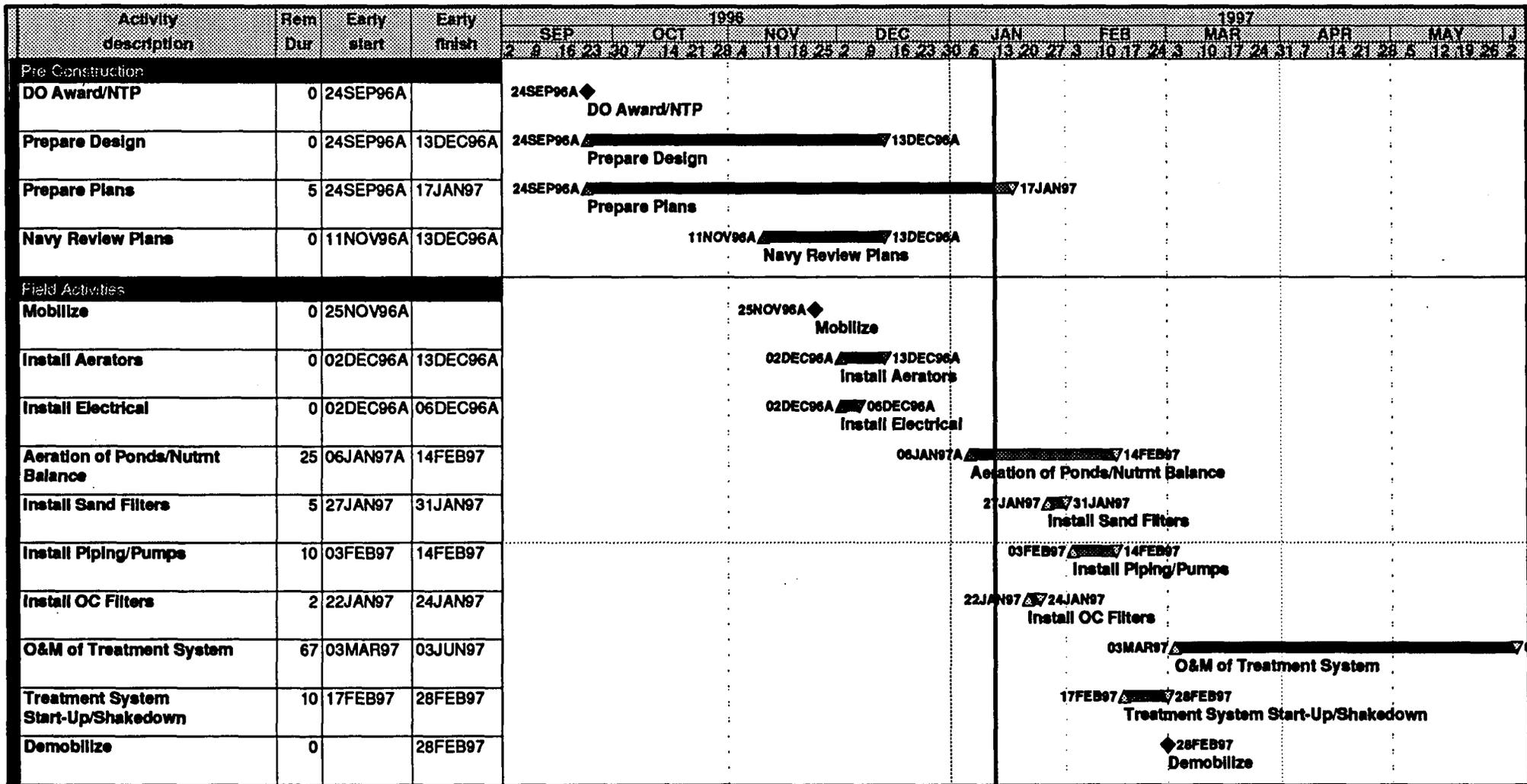
A Site Health and Safety Officer will be present at the site during all field construction activities to ensure implementation of the requirements of the Health and Safety Plan. Air monitoring will be performed during all intrusive construction activities to monitor breathing zones. It is currently projected that the majority of site work can be performed in Level D personal protective equipment (PPE). If necessary, the level of protection will be upgraded in accordance with the approved Health and Safety Plan.

9.0 Quality Assurance

The Site CQC Manager will be present at the site during all construction activities to monitor sampling, testing, and perform inspections to maintain the level of quality control required under the terms of the contract. The CQC Manager will prepare Daily Quality Control Reports as required by the contract. All submittals during the project will be approved by the CQC Manager prior to submittal to the Navy.

10.0 Schedule

The project schedule is provided as Figure 2.



Project Start 13AJUN96
 Project Finish 28MAY97
 Data Date 13JAN97
 Plot Date 21JAN97



FIGURE 2

FIGURE 2
 EFA WEST, POINT MOLATE, DO#06
 PROJECT SCHEDULE

Sheet 1 of 1



PUMP AND BLOWER SYMBOLS

- ROTARY BLOWER
- CENTRIFUGAL PUMP, INCLUDES MOTOR
- METERING PUMP
- SUMP PUMP
- SUBMERSIBLE WELL PUMP
- AIR OPERATED DIAPHRAM PUMP

LINE SYMBOLS

- PRIMARY PROCESS FLOW LINE
- UTILITY/SECONDARY PROCESS LINE
- VENDOR SUPPLIED ITEM, LIMIT LINE
- GENERAL LIMIT LINE
- SOFTWARE LINK
- ELECTRIC/SIGNAL LINE
- INSTRUMENT AIR SUPPLY LINE
- INSTRUMENT PANEL
- FENCE

PIPING/MECHANICAL SYMBOLS

- AREA DRAIN
- BASKET STRAINER
- BACKFLOW PREVENTER
- BLIND FLANGE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- EXPANSION JOINT
- AIR OIL FILTER
- FLEX HOSE, CONNECTOR
- MOTOR
- AIR COMPRESSOR WITH RECEIVER
- EMERGENCY SHOWER/EYEWASH
- FLAT BOTTOM TANK WITH ROOF
- MIXER (STATIC)
- PRESSURE RELIEF VALVE
- THREE-WAY VALVE

ACTUATORS

- DIAPHRAGM ACTUATOR
- SOLENOID ACTUATOR
- CYLINDER ACTUATOR

VALVE SYMBOLS

- BALL VALVE
- BUTTERFLY VALVE, CLOSED
- BUTTERFLY VALVE, OPEN
- CHECK VALVE
- DIAPHRAGM VALVE
- GATE VALVE, OPEN
- GATE VALVE, CLOSED
- GLOBE VALVE
- AIR VENT/VACUUM VALVE

MISCELLANEOUS INSTRUMENTS

- FLOW METER, PROPELLER TYPE
- RESTRICTION ORIFICE

INSTRUMENT AND CONTROL SYMBOLS

- FIELD MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT
- INSTRUMENT MOUNTED BEHIND CONTROL BOARD
- INSTRUMENT WITH TWO SERVICES OR FUNCTIONS (MULTIPOINT UNIT)
- INTERLOCK OR LOGIC
- LOGIC CONTROLLER (LC)
- PLC INTERFACE
- INDICATOR, CONTROLLER, ALARM OR RECORDER COMPUTER DISPLAY
- PANEL MOUNTED LIGHT (COLOR: W-WHITE, R-RED, G-GREEN)
- FLOW STREAM NUMBER
- SIGNAL CONTINUATION
- PROCESS TO/FROM INDICATOR

DRAWING LIST		
DWG. NO.	SHEET	TITLE
768494-E3	G-1	DRAWING LIST AND STANDARD SYMBOLS
768494-E4	G-2	SITE LAYOUT
768494-E2	C-1	PIPING & INSTRUMENTATION DIAGRAM
768494-E5	C-2	PROCESS EQUIPMENT LAYOUT
768494-E8	C-3	PIPING DETAILS

INSTRUMENT IDENTIFICATION

FIRST LETTER	PROCESS VARIABLE OR ACTUATION	SUBSEQUENT LETTER	PROCESS VARIABLE OR ACTUATION
A	ANALYSIS	A	ALARM
B	BURNER/FLAME	C	CONTROL
C	CONDUCTIVITY (ELECTRICAL)	D	DIFFERENTIAL
D	DENSITY/SP.GR	E	ELEMENT
E	VOLTAGE (EMP./ELECTRICAL)	G	GAUGE
F	FLOW RATE	H	HIGH
G	GAGING (DIMENSIONAL)	I	INDICATING
H	HAND (MANUALLY)	L	LOW
I	CURRENT/AMPS	F	FLOW
J	POWER/WATTS	O	ORIFICE
K	TIME	Q	TOTALIZING
L	LEVEL	R	RECORDING
M	MOISTURE/HUMIDITY	S	SWITCH
N	(UNCLASSIFIED)	T	TRANSMITTER
O	(UNCLASSIFIED)	V	VALVE
P	PRESSURE/VACUUM		
Q	QUANTITY/NUMBER/TOTALIZE INTEGRATE		
R	RADIOACTIVITY		
S	SPEED/FREQUENCY		
T	TEMPERATURE		
U	MULTIVARIABLE		
V	UNCLASSIFIED		
W	WEIGHT/FORCE		
X	(UNCLASSIFIED)		
Y	(UNCLASSIFIED) SECOND LETTER RELAY		
Z	POSITION		

MISCELLANEOUS	
AO	AIR TO OPEN
EW	EXTRACTION WELL
FCV	FLOW CONTROL VALVE
FV	THREE WAY FLOW VALVE
HOA	HAND/OFF/AUTO
HS	HAND SWITCH
IW	INJECTION WELL
MC	MOTOR CONTROLLER
MCC	MOTOR CONTROL CENTER
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
PCV	PRESSURE CONTROL VALVE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PSV	PRESSURE RELIEF/SAFETY VALVE
SP	SAMPLE PORT
VSC	VARIABLE SPEED CONTROLLER
TOC	TOP OF CASING
TOS	TOP OF SLAB

PROCESS LINE DESIGNATIONS	
XX-XXX-XXX	
PIPE MATERIAL OF CONSTRUCTION	
FLUID SERVICE	
LINE SIZE	
FLUID SERVICE	
ACD	ACID
ALK	ALKALINE
BW	BACKWASH
CW	POTABLE WATER
GW	GROUNDWATER INFLUENT
GWE	GROUNDWATER EFFLUENT
GWR	GROUNDWATER RECYCLE
IA	INSTRUMENT AIR
PA	PLANT AIR
PER	HYDROGEN PEROXIDE
PW	PLANT WATER
SW	STORM WATER
MATERIAL OF CONSTRUCTION	
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
DI	DUCTILE IRON
DIML	DUCTILE IRON, MORTOR-LINED
PVC	POLYVINYL CHLORIDE
SS304	STAINLESS STEEL, TYPE 304
VEN	VENDER SPECIFIED PIPE
TFN	TEFLON TUBING

REVISION	DATE	DESCRIPTION	TRG	RH
A	1/21/97	GENERAL REVISIONS FOR FIELD CONSTRUCTION		
DESIGNED:		ENGINEERING FIELD ACTIVITY, WEST NAVAL FACILITIES ENGINEERING COMMAND SAN BRUNO, CALIFORNIA		
DRAWN:		STORMWATER TREATMENT PLANT		
CHECKED:		DRAWING LIST AND STANDARD SYMBOLS		
SUBMITTED:		DATE APPROVED:	SCALE: NOT TO SCALE	SPEC. No.
			G-1	768494-E3
			1 OF 5	



N 534,000

N 533,800

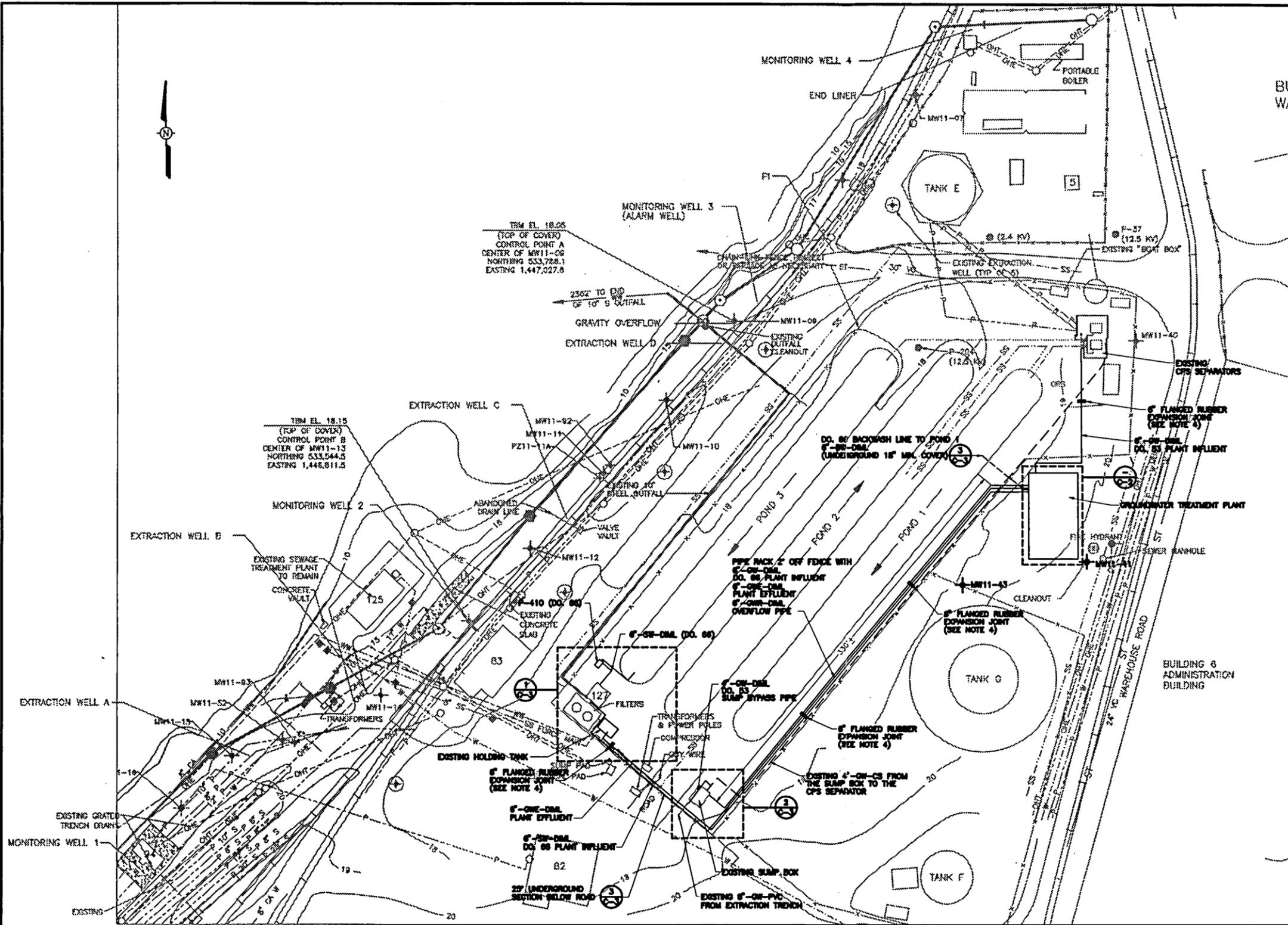
N 533,600

N 533,400

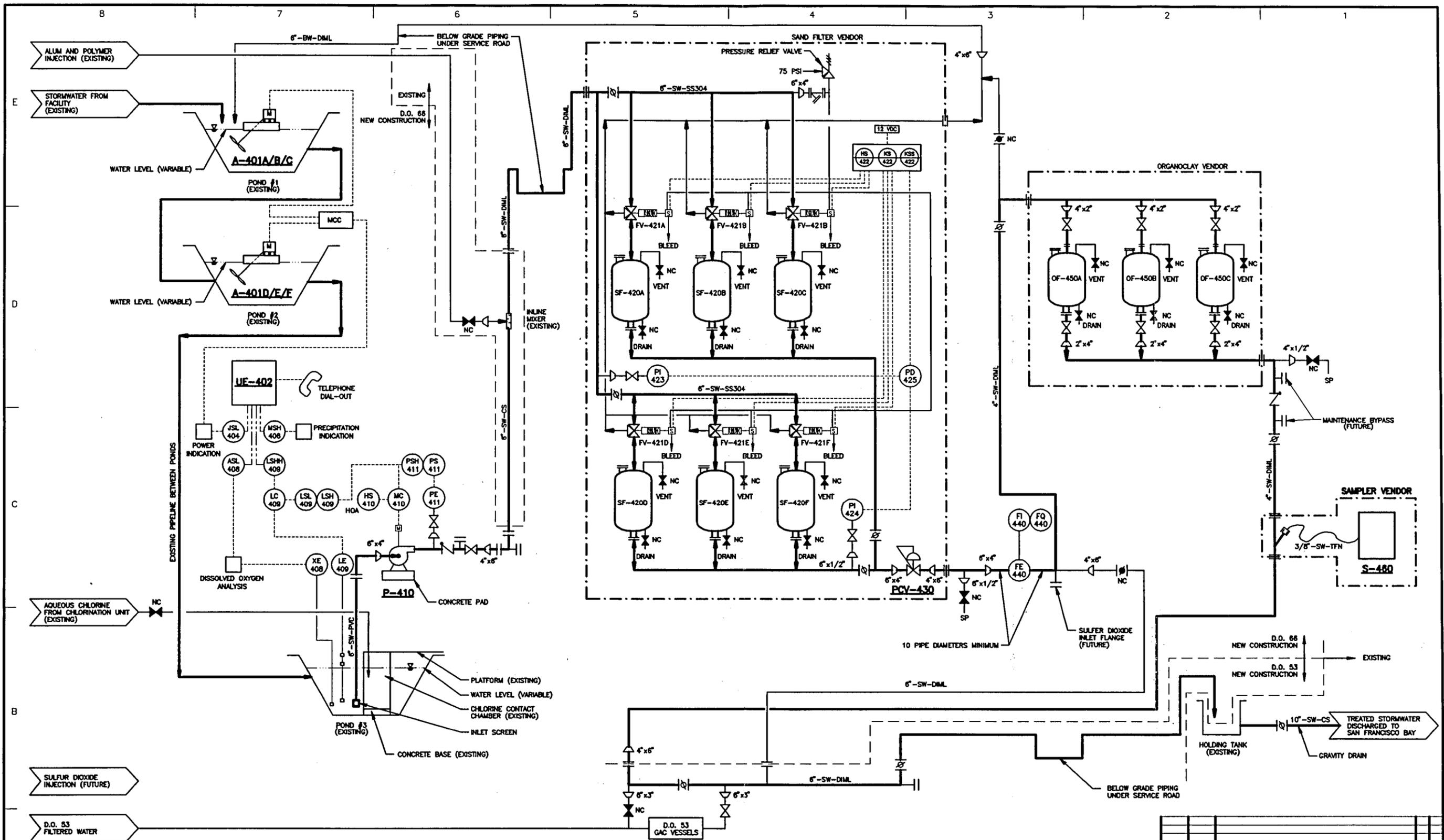
- NOTES:
1. HORIZONTAL AND VERTICAL CONTROL IS BASED ON TBM CONTROL POINTS A AND B.
 2. ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY UTILITY LOCATIONS SUFFICIENTLY IN ADVANCE TO ALLOW FOR DESIGN MODIFICATIONS WITHOUT DELAYING CONSTRUCTION.
 3. THIS DRAWING WAS BASED ON PRC ENVIRONMENTAL MANAGEMENT, INC. NAVFAC DWG. NO. 6442010 (C-1), DATED 3-18-96. IF SCALE IS LESS THAN 1" = 40', THEN THIS IS A REDUCED DRAWING. SCALE DRAWING APPROPRIATELY.
 4. RUBBER EXPANSION JOINTS SHALL BE SIX INCHES, FLANGED, RATED FOR 200 PSIG, WITH VITON GASKETS AND STAINLESS STEEL BOLTS. EXPANSION JOINTS SHALL HAVE A MINIMUM COMPRESSION CAPABILITY OF 1-1/2 INCHES AND A MINIMUM EXPANSION CAPABILITY OF 1/2 INCH.

UTILITIES LEGEND

- ST --- STORM SEWER
- SS --- SANITARY SEWER
- OHT --- OVERHEAD TELEPHONE
- OHE --- OVERHEAD ELECTRIC
- W --- WATER
- P --- FUEL PRODUCT
- X --- FENCE
- ⊙ --- POWER POLE



REVISION	DATE	DESCRIPTION	BY	CHK
A	1/21/97	GENERAL REVISIONS FOR FIELD CONSTRUCTION	TRG	RM
DESIGNED: G. TUNSTALL		4585 PACHECO BLVD. SANTANA, CA 94063 (510) 372-8100		
DRAWN: BJ 11-6-96		NAVAL FUEL DEPOT POINT MOLATE CALIFORNIA		
CHECKED:		ENGINEERING FIELD ACTIVITY, WEST NAVAL FACILITIES ENGINEERING COMMAND SAN BRUNO, CALIFORNIA		
SUBMITTED:		DATE APPROVED:		SPEC. NO.
SHEET G-2 2 OF 5		SCALE 1" = 40'		FILE NO. 768494-E4



A-401A/B/C/D/E/F
 POND AERATORS (6)
 5 h.p. TEFC MOTOR
 480VAC, 3ø, 60Hz

UF-402
 REMOTE MONITORING SYSTEM
 110 VAC, 60 Hz

P-410
 STORMWATER TRANSFER
 SELF-PRIMING CENTRIFUGAL PUMP
 400 gpm @ 50 psig
 25 h.p. TEFC MOTOR
 480VAC, 3ø, 60 Hz

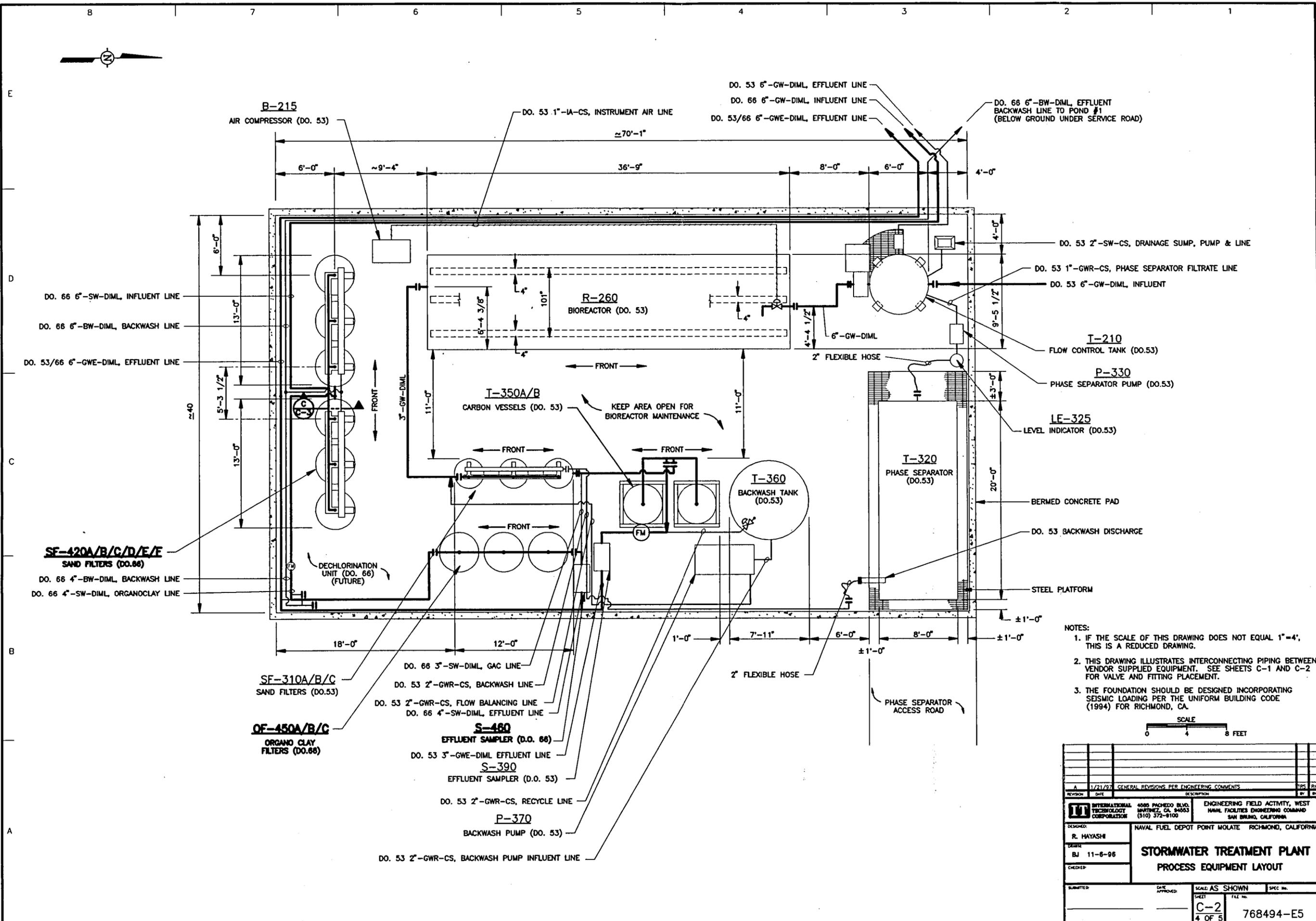
SF-420A/B/C/D/E/F
 STORMWATER SAND FILTERS (6)
 75 ft² MINIMUM SURFACE AREA
 SKID MOUNTED CARBON STEEL CONSTRUCTION
 #20 SAND EACH VESSEL
 SERVICE FLOW = 70 gpm PER VESSEL/400 gpm TOTAL
 MAXIMUM OPERATING PRESSURE = 100 psi
 BACKWASH FLOW = 200 gpm PER VESSEL

PCV-430
 4" PRESSURE CONTROL VALVE
 10 TO 25 psig, ADJUSTABLE

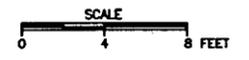
OF-450A/B/C
 ORGANOCCLAY FILTERS (3)
 FLAT BOTTOM, EACH VESSEL: 48" I.D.
 CARBON STEEL CONSTRUCTION
 SERVICE FLOW = 50 gpm PER VESSEL

S-460
 AUTOMATIC EFFLUENT SAMPLER
 5 gal. GLASS OR
 6 gal. POLYETHYLENE
 115 VAC, 60 Hz, 2 AMP
 TEMPERATURE RANGE = -20°F TO 122°F
 W28" x D28" x H48"
 SAMPLER EMPTY WT. = 175 lbs
 HIGH SPEED PERISTALTIC PUMP
 W/ 27 FT. MAXIMUM LIFT

REVISION	DATE	DESCRIPTION	DESIGNED BY	DATE
A	1/21/97	GENERAL REVISIONS FOR FIELD CONSTRUCTION	IR	IR
<p>INTERNATIONAL TECHNOLOGY CORPORATION 4888 PACHECO BLVD. MARTINEZ, CA 94553 (510) 372-9100</p>				
<p>ENGINEERING FIELD ACTIVITY, WEST NAVAL FACILITIES ENGINEERING COMMAND SAN BRUNO, CALIFORNIA</p>				
DESIGNED BY	NAVAL FUEL DEPOT POINT MOLATE RICHMOND, CALIFORNIA			
DRWN	STORMWATER TREATMENT PLANT			
CHECKED	PIPING AND INSTRUMENTATION DIAGRAM			
DATE	DELIVERY ORDER 0066			
SCALE	NOT TO SCALE			
SHEET	C-1			
FILE NO.	768494-E2			
3 OF 5				



- NOTES:
1. IF THE SCALE OF THIS DRAWING DOES NOT EQUAL 1"=4', THIS IS A REDUCED SCALE DRAWING.
 2. THIS DRAWING ILLUSTRATES INTERCONNECTING PIPING BETWEEN VENDOR SUPPLIED EQUIPMENT. SEE SHEETS C-1 AND C-2 FOR VALVE AND FITTING PLACEMENT.
 3. THE FOUNDATION SHOULD BE DESIGNED INCORPORATING SEISMIC LOADING PER THE UNIFORM BUILDING CODE (1994) FOR RICHMOND, CA.



REVISION	DATE	DESCRIPTION	TIPS	BY
A	1/21/97	GENERAL REVISIONS PER ENGINEERING COMMENTS		
DESIGNED:		ENGINEERING FIELD ACTIVITY, WEST		
R. HAYASHI		NAVAL FACILITIES ENGINEERING COMMAND		
DRAWN:		SAN BRUNO, CALIFORNIA		
BJ 11-6-96		NAVAL FUEL DEPOT POINT MOLATE RICHMOND, CALIFORNIA		
CHECKED:		STORMWATER TREATMENT PLANT		
		PROCESS EQUIPMENT LAYOUT		
SUBMITTED:		SCALE AS SHOWN	SPEC No.	
		SHEET	FILE No.	
		C-2		
		4 OF 5	768494-E5	

APPENDIX A

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APPENDIX A

ENVIRONMENTAL PROTECTION PLAN

1.0 Introduction

This Environmental Protection Plan has been specifically developed to meet the requirements of performing work in a manner that protects the environment during the field work activities. Environmental Protection, for the purpose of this project is defined as maintaining the environment in its natural state to the greatest extent possible during project construction, and the enhancement of the appearance of disturbed sites in its final condition.

To accomplish environmental protection, consideration will be given to air, water, and land resources including management of visual aesthetics, natural, historical, and archaeological resources; noise; and solid waste. The IT Corporation (IT) project manager will implement the Environmental Protection Plan so all work is performed in a manner that minimizes the pollution of air, water, and land resources, and complies with federal, state, and local regulations.

1.1 Project Scope of Work

The project work consists of installing a stormwater treatment system to process contaminated stormwater, reduce contaminant concentration levels, and discharge the treated water to San Francisco Bay. The work includes installing aerators, sand filters, organoclay vessels and associated piping and utilities.

2.0 Preconstruction Condition Survey

Prior to the start of construction activities, a preconstruction survey will be conducted to determine the preconstruction condition of landscape features, ground cover, shrubs and trees in and immediately adjacent to the work areas, storage areas, and access routes. The survey will be conducted jointly by the IT project manager and the RPM. The intent of this survey is to document prework site conditions and to identify potential environmentally sensitive areas that might be adversely impacted by construction activities.

The Site Superintendent will mark areas identified by the Navy which are to be preserved and provided protection, as appropriate. Monuments and markers will be identified and protected before construction begins. Mutually agreeable areas for administrative facilities, storage, and stockpiles (if necessary), will be identified and delineated.

3.0 Protection of Environmental Resources _____

3.1 Protection of Air Resources

All construction activities associated with this project will be conducted in a manner to minimize the release of airborne particulates within or outside of the site boundary. Real-time air monitoring will be employed to verify the effectiveness of the program.

3.1.1 Air Monitoring

Air monitoring will be conducted according to provisions of the air monitoring program described in the site Health and Safety Plan (H&S Plan). This includes real-time air monitoring to assure that site workers and off-site receptors will not be exposed to harmful levels of airborne toxic chemicals in particulate form. This project does not involve activities which would normally be considered as potentially causing airborne particulate or vapors. However, as with all projects, IT will document air monitoring to identify/correct problems as they arise.

Real-time monitoring will be performed prior to commencement of work in order to establish the baseline conditions existing at the site.

IT will initiate mitigative action at any time that monitored levels are found to be in excess of the respirable dust action level as defined in the Health and Safety Plan. IT's Health and Safety Officer and the ROICC will consider any departures from the general background levels and determine the required mitigative action. All real-time information will be recorded daily on data sheets which will be provided to the ROICC.

3.1.2 Dust, Particulates, and Odor Control

Construction activities associated with this project are not expected to result in release of respirable particulates. The work procedures will be designed to control, prevent, and minimize

these occurrences. All work will be performed in accordance with applicable California and federal air pollution regulations.

Control of fugitive particulates will involve dust control measures such as watering down dry or barren areas and roadways.

Procedures will be developed for decontamination/cleaning of all construction equipment leaving the site. All equipment will be inspected for general cleanliness of frame and tires and be approved by the Health and Safety Officer. No vehicle or roll-off bin will leave the site unless they are in a broom clean condition, free of dirt on the tailgates, axles, wheels, etc. Vehicles that cannot be broom cleaned will be washed and allowed to dry before leaving the site.

3.2 Soil Erosion and Sediment Control

A fabric silt fence will be installed around the perimeter of any trench, excavation, or likewise disturbed surface. Silt fence is judged to be adequate to control runoff of any silt laden storm water from such small areas. If necessary, diversion ditches or dikes will be installed and regrading conducted to control sediment migration. Soil will be compacted and graded to minimize erosion.

Any installed erosion and sediment control measures will be properly maintained throughout the duration of the project.

4.0 Materials Handling

Wastes, both contaminated and noncontaminated, may be generated by excavation activities. These wastes will be properly managed to mitigate environmental impacts and comply with applicable regulations. Materials excavated during the concrete foundation construction will be loaded into dump trucks and disposed off-site.

5.0 Notifications/Safety Measures

5.1 Notifications

The Site Superintendent will have primary responsibility to report any damage to utility line(s) or subsurface features immediately to the RPM, ROICC, and Point Molate Fuel Depot Operations. The local fire department, the Contra Costa County Emergency Response Division, and the Coast Guard will be notified as directed by the ROICC and/or the Point Molate operations personnel.

5.2 Safety Equipment

Safety equipment will include:

- Fire extinguishers,
- Brooms,
- Absorbent pads,
- Explosion proof pumps,
- Yellow caution tape,
- Precautionary signs, for example, "No Smoking" signs.

5.3 Inspections

- Fire extinguishers will be inspected to meet current regulations,
- Monitoring equipment will be calibrated and checked daily,
- Postings, markers, and flags will be checked daily.

6.0 Noncompliance/Corrective Action

If IT is notified that it is in nonconformance with federal, state, or local environmental regulation, IT will investigate the nature of the noncompliance notification and will respond, if appropriate, with a proposed corrective action. Once the proposed corrective action is approved, IT will implement this corrective action and notify the appropriate parties when the corrective action is completed. After the noncompliant situation has been eliminated, the Project Manager will send written notification to the RPM of the results of the corrective action.

7.0 Post Construction Cleanup

Upon project completion and subject to instruction by the ROICC, IT will perform the final site cleanup which will include the following:

- Collection and disposal of all contractor generated contaminated material, debris, and rubbish,
- Removal of support area facilities
- Removal of temporary fences and signs installed under this contract,
- Mechanical broom sweeping of all work areas and haul routes,
- Restore facility to preconstruction condition.

**CONTRACTOR QUALITY CONTROL PLAN
STORM WATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA**

**CONTRACT NO. N62474-93-D-2151
DELIVERY ORDER NUMBER 0066**

Submitted to:

Department of the Navy
Engineering Field Activity West
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 95814-2922

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

Revision 0

January 1997

Issued to: Izzat Ahmadliya Date: 1/22/97

Copy #: Controlled Uncontrolled

CONTRACTOR QUALITY CONTROL PLAN
STORM WATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA

CONTRACT NO. N62474-93-D-2151
DELIVERY ORDER NUMBER 0066

Revision 0

January 1997

Approved by: Thomas A Davis Date: 1-15-97
Thomas A. Davis
IT Program Contractor Quality
Control Manager

Approved by: Gary Elston Date: 1-21-97
Gary Elston, P.E.
IT Project Manager

Approved by: Valerie Crooks Date: 01/24/97
Valerie Crooks, P.E.
IT Program Manager

1.0 Introduction

This Contractor Quality Control Plan (CQCP) has been prepared to describe those QC actions which will be implemented during the design and installation of new storm water treatment equipment and the rehabilitation of existing storm water treatment ponds at Point Molate for Delivery Order 0066.

The CQCP will be used in conjunction with the Program Contractor Quality Control Plan (PCQCP), Revision 2, and Standard Quality Procedures (SQP)/Standard Operating Procedures (SOP), as applicable and described below:

2.0 Program Contractor Quality Control Plan

Section 0.0 - Policy Statement; Applicable in its entirety

Section 1.0 - Introduction; Applicable in its entirety

Section 2.0 - Organization and Responsibilities; Applicable with the following modification:

As applicable to QC organization in Figure 1 (Quality Control Organization Chart)

Section 3.0 - Quality Control Management; Applicable with the following modification:

3.4: Change the word "biweekly" in the first sentence of paragraph 3.4 to read "weekly."

Section 4.0 - Personnel Training and Qualification; Applicable in its entirety

Section 5.0 - Instructions, Procedures and Drawings; Applicable in its entirety

Section 6.0 - Document Control; Applicable in its entirety

Section 7.0 - Procurement; Applicable in its entirety

Section 8.0 - Data Quality Objectives; Not applicable

Section 9.0 - Field Activities; Applicable with the following modification:

add to 9.3: Field QC samples will be collected and analyzed in accordance with the Sampling and Analysis Plan.

Section 10.0 - Analytical Activities; Applicable in its entirety

Section 11.0 - Report Preparation; Applicable in its entirety

Section 12.0 - Review of Work Activities; Applicable in its entirety

Section 13.0 - Inspections; Applicable in its entirety

Section 14.0 - Calibration and Maintenance of Measuring and Test Equipment; Applicable in its entirety

Section 15.0 - Test Control; Applicable in its entirety

Section 16.0 - Non-conformance Control and Corrective Actions; Applicable in its entirety

Section 17.0 - Change Control; Applicable in its entirety

Section 18.0 - Audits and Surveillance; Applicable with the following modification:

delete subsections 18.1 through 18.8

Section 19.0 - Records Management; Applicable in its entirety

3.0 Procedures

3.1 Standard Quality Procedures

The following Standard Quality Procedures (SQP) have been determined to be applicable:

SQP 1.1 Contractor Quality Control Program

SQP 3.2 Indoctrination and Training

SQP 4.1 Document Control

SQP 4.2 Records Management

SQP 5.1 Preparation, Revision and Approval of Plans and Procedures

SQP 6.1 Preparation, Review and Approval of Procurement Documents

SQP 7.1 Quality Inspections and Inspection Records

SQP 7.2 Receipt Inspection

SQP 8.2 Calibration and Maintenance of Measuring and Test Equipment
SQP 10.1 Non-conformance Control
SQP 10.2 Corrective Action
SQP 10.3 Stop Work Order
SQP 11.1 Field Work Variance/Request For Information
SQP 12.1 Quality Audits
SQP 12.2 Management Assessment
SQP 12.3 Quality Surveillances
SQP 13.1 Coordination of Subcontracted Analytical Laboratories

3.2 Standard Operating Procedures

The following Standard Operating Procedures (SOP) have been determined to be applicable:

SOP 1.1 Chain of Custody
SOP 2.1 Sample Handling, Packaging and Shipping
SOP 3.1 Surface and Shallow Subsurface Soil Sampling
SOP 6.1 Sampling Equipment and Well Material Decontamination
SOP 6.2 Drilling and Heavy Equipment Decontamination
SOP 7.1 Surface and Subsurface Geophysics
SOP 17.1 Sample Labeling
SOP 17.2 Sample Numbering
SOP 18.1 Field QC Sampling
SOP 19.1 On-Site Sample Storage
SOP 23.1 Land Surveying

4.0 Attachments

CQC Manager Letter of Designation
Alternate CQC Manager Letter of Designation
CQC Organization Chart
Definable Features of Work Matrix
Testing Plan and Log
Submittal Registers

**STORM WATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA
DELIVERY ORDER 0066**

**ALTERNATE CQC MANAGER
LETTER OF DESIGNATION**

January 15, 1997

Mr. Thomas A. Davis:

This letter will serve to assign you as IT Corporation's alternate site CQC Manager for the above captioned delivery order. In the case where the designated CQC Manager, Mr. Dan Brennan, is unable to perform the CQC Manager's duties, you will serve in that capacity. In this role, you will have the responsibilities and authorities designated in Sections 2.1.3 of the Program Contractor Quality Control Plan, Revision 2. Additionally, you will have Stop Work authority and will exercise this authority consistent with the Program CQC Plan, Section 16.4 and SQP 10.3. You are granted the authority to approve submittals which have been certified by qualified submittal reviewers as identified on the CQC Organization Chart for this delivery order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work. You will be authorized to act as an alternate for 14 consecutive working days or 30 nonconsecutive working days at a maximum. In the case where it is believed that these time periods will be exceeded, you must notify me so that I may arrange with EFA-West and the ROICC to have this position replaced. You will report directly to me and will administer the established requirements of the delivery order CQC Plan.

If you have any questions or require additional information, please contact me at (510) 372-9100.

Sincerely,
IT CORPORATION



Valerie Crooks, P.E.
EFA-West Program Manager

**STORM WATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA
DELIVERY ORDER 0066**

**CQC MANAGER
LETTER OF DESIGNATION**

January 15, 1997

Mr. Dan Brennan:

This letter will serve to assign you as IT Corporation's site CQC Manager for the above captioned delivery order. In the case where you are not able to perform the CQC Manager's duties, Mr. Tom Davis will serve as your alternate CQC Manager. In the role of CQC Manager you have the responsibilities and authorities designated in Section 2.1.3 of the Program Contractor Quality Control Plan, Revision 2. Additionally, you are granted Stop Work authority and will exercise this authority consistent with the Program CQC Plan, Section 16.4 and SQP 10.3. You are granted the authority to approve submittals which have been certified by qualified submittal reviewers as identified in the CQC organization chart for this delivery order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work. In this capacity you will report directly to me and will administer the established requirements of the delivery order CQC Plan.

If you have any questions or require additional information, please contact me at (510) 372-9100.

Sincerely,
IT CORPORATION



Thomas A. Davis
Program CQC Manager

**CONTRACTOR QUALITY CONTROL PLAN
STORM WATER TREATMENT PONDS RESTORATION
NAVAL FUEL DEPOT, POINT MOLATE
RICHMOND, CALIFORNIA**

DELIVERY ORDER No. 0066

DEFINABLE FEATURES OF WORK MATRIX

Spec. Section	Para. No.	Feature of Work	Prep		Initial		Follow-up	Remarks
			Req	Date	Req	Date	Req	
SOW	N/A	Install Pressurized Sand Vessels	X		X		X	
SOW	N/A	Install Organic Clay Absorption Columns	X		X		X	
SOW	N/A	Inspect/Service/Clear/Modify Characterization/De-chlorinization System	X		X		X	
SOW	N/A	Service Oil Water Separators	X		X		X	
SOW	N/A	Pond Rehabilitation	X		X		X	
SOW	N/A	Electrical Connections	X		X		X	
Work Plan	3.5	Piping, Valves and Appurtences	X		X		X	
Work Plan	3.8	System Start-Up	X		X		X	

TESTING PLAN AND LOG

CONTRACT NO. N62474-93-D-2151		PROJECT TITLE AND LOCATION					CONTRACTOR			
DELIVERY ORDER NO. 0066		Storm Water Treatment Ponds Restoration Naval Fuel Depot, Pt. Molate, Richmond, California					IT Corporation			
SPECIFICATION SECTION AND PARAGRAPH NUMBER	TEST PROCEDURE	TEST NAME	ACCREDITED/ APPROVED LAB		SAMPLED BY	LOCATION OF TEST ON OFF SITE SITE	FREQUENCY	DATE COMPLETE	DATE FORWARDED TO CONTR. OFF	REMARKS
			YES	NO						
Work Plan 3.8	40 PSI/1Hr.	Pipe/Valve Hydrostatic Test	N/A		IT	On site	Once			Until successful

3.0 SAMPLING AND ANALYSIS PLAN

To Be Incorporated

**STORM WATER TREATMENT PONDS RESTORATION
SITE HEALTH AND SAFETY PLAN
NAVAL FUEL DEPOT
POINT MOLATE, CALIFORNIA**

CONTRACT NO. N62474-93-D-2151
Delivery Order No. 0066

Revision 0

January 1997

Approved by: *Valerie Crooks*
Valerie Crooks, P.E.
IT Program Manager

Date: 01/03/97

Approved by: *William J. Hetrick*
William J. Hetrick
IT Program CIH

Date: 1/3/97



**STORM WATER TREATMENT PONDS RESTORATION
SITE HEALTH AND SAFETY PLAN
NAVAL FUEL DEPOT
POINT MOLATE, CALIFORNIA**

CONTRACT NO. N62474-93-D-2151
Delivery Order No. 0066

Submitted to:

Department of the Navy
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive, Building B-103
San Bruno, California 94066-2402

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

Revision 0

January 1997

Issued to: Izzat Ahmadikya Date: 1/22/97

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List of Acronyms

ABIH	American Board of Industrial Hygiene
AIDS	Acquired Immune Deficiency Syndrome
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
ATSDR	Agency for Toxic Substances and Disease Registry
bpm	Beats Per Minute
BCSP	Board of Certified Safety Professionals
°C	Degrees Celsius
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Department of Industrial Relations, Division of Occupational Safety and Health
CCR	California Code of Regulations
CET	Certified Environmental Trainer
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CO	Contracting Officer
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
CRZ	Contamination Reduction Zone
dBA	Decibels, A-weighted
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
EFA-West	Engineering Field Activity - West
EKG	Electrocardiogram
EMR	Environmental Medicine Resources (Occupational Medicine Physician)
EPA	Environmental Protection Agency
EZ	Exclusion Zone
°F	Degrees Fahrenheit
FADL	Field Activity Daily Log
FID	Flame Ionization Detector
FM	Factory Mutual
FR	Federal Register
GFCI	Ground Fault Circuit Interrupter
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBV	Hepatitis B Virus
HDPE	High Density Polyethylene
HEPA	High Efficiency Particulate
HIV	Human Immunodeficiency Virus
HS	Health and Safety

List of Acronyms (Continued)

IDLH	Immediately Dangerous to Life and Health
IIPP	Injury and Illness Prevention Plan
IT	IT Corporation
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health
NOSC	Navy On-Scene Coordinator
NOSCDR	Navy On-Scene Commander
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
OVA	Organic Vapor Analyzer
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
ppm	Parts per Million by Weight
PS	Project Superintendent
ROICC	Resident officer in charge of construction
SEIR	Supervisor's Employee Injury Report
SHSO	Site Health and Safety Officer
SHSP	Site Health and Safety Plan
SIR	Safety Inspection Report
SSHO	Site Safety and Health Officer (Replaced by SHSO)
SSHP	Site Safety and Health Plan (Replaced by SHSP)
T8CCR	Title 8 California Code of Regulations
TSM	Tailgate Safety Meeting
UL	Underwriter's Laboratory
USA	Underground Services Alert
USACE	U.S. Army Corps of Engineers
USN	U.S. Navy
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WBG	Wet Bulb Globe Temperature

Disclaimer

The enclosed Site Health and Safety Plan (SHSP) has been designed for the methods presently contemplated by IT Corporation (IT) for execution of the proposed work. Therefore, the SHSP may not be appropriate if the work is not performed by or using the methods presently contemplated by IT.

In addition, as the work is performed, conditions different from those anticipated may be encountered and the SHSP may have to be modified. Therefore, IT makes no representations or warranties as to the adequacy of the SHSP, except for warranties specifically stated in the SHSP itself.

1.0 Introduction

1.1 Objective

The objective of this Site Health and Safety Plan (SHSP) is to ensure that safe working conditions exist during the remediation activities at Point Molate. The safety procedures outlined have been established based on preliminary analysis of potential hazards within the site. This SHSP describes the health and safety requirements and procedures to be used while conducting field work and includes:

- Responsibilities of persons on site;
- Training Program;
- Medical Surveillance Program;
- Activity Hazard Analysis;
- Hazard Control Program;
- Personal Control Program;
- Emergency Response Plan Spill Containment Program;
- Decontamination Procedures;
- Industrial Hygiene Monitoring Program; and
- Certain Specific Work Procedures.

This document, in combination with IT's Corporate Health and Safety Policy manual, also serves as the company's Injury and Illness Prevention Plan (IIPP) and Code of Safe Work Practices.

1.2 Site and Facility Description

The Naval Fuel Depot at Point Molate was a large petroleum storage facility on the shores of San Pablo Bay, near Richmond, California. Operations at the Depot have resulted in contamination of the soils in the area with petroleum products. This contamination threatens to spread to San Pablo Bay.

The scope of work for this project includes the design and installation of new storm water treatment equipment and the rehabilitation of existing storm water treatment ponds.

1.3 Policy Statement

It is the policy of IT Corporation (IT) to provide a safe and healthful work environment for all its employees and subcontractors. IT considers no phase of operation or administration to be of greater importance than injury or illness prevention. Safety takes precedence over expediency or shortcuts, and every reasonable step to reduce the possibility of injury, illness, or accident will be taken.

This Site Health and Safety Plan (SHSP) prescribes the procedures that must be followed during field work associated with the Point Molate project. Operational changes which could affect the health or safety of personnel, the community, or the environment will not be made without the prior approval of the IT Project Manager, and the Program Certified Industrial Hygienist (CIH).

The provisions of this SHSP are mandatory for all IT personnel and subcontractors assigned to the project. IT requires all visitors to the work site to abide by the requirements of this SHSP. The Program CIH will provide written addenda to this SHSP when changes warrant. No changes to the plan will be implemented without prior approval of the Program CIH or his authorized representative, and acceptance by the ROICC, the EFA-West Contracting Officer Representative.

1.4 References

This SHSP complies with Federal Occupational Safety and Health Administration (OSHA), California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA), United States Environmental Protection Agency (EPA), California Environmental Protection Agency (Cal/EPA), and California Department of Toxic Substances Control (DTSC), and U.S. Army Corps of Engineer (USACE) regulations. This SHSP follows the guidelines established in the following documents:

- Standard Operating Safety Guidelines (EPA, June 1992);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities National Institute of Occupational Health and Safety (NIOSH 86-116);
- Title 29 of the Code of Federal Regulations (CFR), Parts 1910 and 1926 including Part 1910.120/1926.65 (Hazardous Waste Operations and Emergency Response);

- Title 8 of the California Code of Regulations (CCR), (Cal/OSHA construction and General Industry Safety Orders) including Section 5192 (Hazardous Waste Operations and Emergency Response)
- U.S. Army Corps of Engineers Safety and Health Requirements Manual (USACE 385-1-1, 3 September 1996).
- IT Corporate Health and Safety Procedures

The contents of this SHSP are consistent with, or supplement the IT Corporate Health and Safety Policies and Procedures. All applicable provisions of the Corporate policies shall also be followed during this project. A copy of the Corporate Health and Safety Policy and Procedure Manual shall be maintained at the jobsite by the Site Health and Safety Officer (SHSO).

All IT employees and subcontractors must follow the Base's fire, safety and traffic regulations as well as all applicable federal, state and local safety regulations, as well as the USACE Safety and Health Requirements Manual (EM 385-1-1).

2.0 Responsibilities

2.1 All Personnel

Each person is responsible for his/her own health and safety, for completing tasks in a safe manner and for reporting any unsafe acts or conditions to his/her supervisor and the Project Superintendent (PS). All persons on-site are responsible for continuous adherence to health and safety procedures during the performance of any project work. In no case may work be performed in a manner which conflicts with the intent of, or the inherent safety precautions expressed in, this SHSP. After due warning, persons who violate procedure and work rules may be dismissed from the site, terminated, or have their contract revoked. Blatant disregard or repeated infractions of health and safety policies are grounds for disciplinary action up to, and including, dismissal, and/or removal from the work area.

All IT and subcontractor personnel are required to read and acknowledge their understanding of this SHSP. All project personnel are expected to abide by the requirements of this SHSP and cooperate with project management in ensuring a safe and healthful work site. Site personnel are required to immediately report any of the following to the PS:

- Accidents and injuries, no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Any signs or symptoms of chemical exposure;
- Any unsafe or malfunctioning equipment; and
- Any changes in site conditions which may affect the health and safety of project personnel.

2.2 Project Manager

The Project Manager (PM) has overall responsibility for the health and safety of all personnel on the project. The PM's responsibility with regard to health and safety is to maintain company policy and resolve health and safety issues with the assistance and guidance of the Program CIH. The PM will provide the Program CIH with the company name and representatives of those

contractors being considered for hire, as well as those hired, to allow required preliminary information to be collected in a timely manner.

The PM is responsible to:

- Notify the Program CIH when field operations begin so that field support can be scheduled;
- Ensure that the SHSP is read and signed by all field personnel on the project, including subcontractors. The SHSP must also be signed by the Program CIH and the PM;
- Ensure that all provisions of the SHSP are followed. Contact the Program CIH for any variances or modifications desired;
- Demonstrate a personal commitment to safety on the project;
- Ensure that tailgate safety meetings are conducted daily, signed by all field workers and reviewed by the PS and the PM. The PM must have completed the Hazardous Waste Supervisor Course;
- Ensure that Field Activity Daily Log (FADL) forms are completed for each day of operations, signed and dated by the author, and that all persons listed have signed the SHSP and tailgate form;
- Have supervisors inspect the project at least weekly, with inspections and corrective actions documented on FADL forms. The PM is to inspect the project for safety hazards periodically;
- Ensure correction of any reported or observed safety hazard;
- Report all near-miss, injury, illness and vehicle accident incidents to the Program CIH and Resident Officer in Charge of Construction (ROICC) within 24 hours and ensure that a Supervisor's Employee Injury Report (SEIR) form is initiated. Accidents resulting in a fatality or inpatient hospitalization of 3 or more employees must be reported within 8 hours. The ROICC will be notified using the contractor significant incident report (CSIR-1);
- Notify the Program CIH when field work lasts more than six months so that the SHSP can be reviewed and updated as needed;

- Immediately notify the Program CIH and the ROICC upon receiving notice of any regulatory agency inspection; and
- Ensure that the project files receive copies of:
 - all internal and external HS correspondence
 - all air sampling records (including “none-detected”)
 - all accident reports and Accident Review Board documentation
 - documentation of audits and corrective actions
 - air monitoring equipment calibration records
 - all FADLs.

The PM will lead at least one site safety audit team per month while field activities are conducted and will ensure that all accidents, incidents and/or near-misses are investigated in a timely manner. The PM will ensure that management performs an investigation of all incidents or accidents which had the potential to cause a lost-time or hospitalization incident or fatality within 24 hours of the incident.

The PM for this delivery order is Gary Elston.

2.3 Program Certified Industrial Hygienist (CIH)

The Program CIH is responsible for the preparation and modification (as necessary) of this SHSP. The Program CIH will approve changes and update the SHSP as warranted by altered site conditions and shall have the only authorization to effect such changes. The Program CIH will advise the PM on health and safety issues which may have an impact on project operations. In addition, the Program CIH is responsible to:

- **Oversee and review the work of the Site Health and Safety Officer (SHSO);**
- **Administer the general health and safety program;**
- **Provide technical assistance to the SPM and the PS;**
- **Investigate significant accidents, illnesses and near-misses. Recommend corrective actions as appropriate. Review all Accident/Incident Investigation Reports;**
- **Establish the required personal protective equipment for each work area;**

- Assist the PS and SHSO in establishing decontamination area locations;
- Evaluate and approve contractors regarding health and safety compliance both prior to accepting the contract and upon completion of the project, as appropriate; and
- Establish proper employee exposure monitoring and assess the appropriateness of protective measures.

The Program CIH is William Hetrick. Mr. Hetrick is certified by the American Board of Industrial Hygiene (ABIH).

2.4 Project Superintendent

The Project Superintendent (PS) reports to the PM and is responsible for field enforcement of the SHSP. This includes communicating project health and safety requirements to all on-site project personnel (both IT and subcontractor personnel), consulting with the Program CIH regarding changes to the SHSP, and conducting periodic health and safety inspections with the SHSO. The PS is responsible for informing the Program CIH and the PM of any changes to the work plan, prior to implementation, so that health and safety issues introduced by those changes may be properly addressed. The PS will be on-site during all project related activities or will delegate his responsibilities to qualified supervisory personnel [i.e., person(s) having 8-hours of hazardous waste operations supervisory training per 29 CFR 1910.120 (e) (4) 1926.65 (e) (4)], as appropriate.

Other responsibilities include:

- Reading and being familiar with the Project SHSP, as well as appropriate IT Policies and Procedures;
- Directing work so as to ensure personnel safety and protection of property and the environment;
- Presenting tailgate safety meetings (a shared responsibility by the PS);
- Providing all required safety supplies to work crews prior to each task;
- Demonstrating a personal commitment to safety on the project;
- Observing project personnel for signs of chemical or physical trauma;

- Conducting jobsite safety audits with the SHSO at least weekly;
- Immediately notifying the SPM and Program CIH upon receiving notice of any jobsite inspection by a regulatory agency;
- Correcting any hazards disclosed by project workers or the SHSO;
- Rendering appropriate disciplinary action to individuals who do not strictly adhere to the project SHSP;
- Immediately notifying the SPM and Program CIH of any illnesses, accidents, injuries, or near-misses related to the project, and submitting appropriate documentation to the Program CIH within 24 hours.
- Assist the Program CIH and/or SHSO in establishing appropriate site control zones.
- The PS must have completed the hazardous waste supervisor's course.

The Project Superintendent is John Fernandez. A qualified alternate supervisor will be available in case the PS is temporarily away from the jobsite (due to illness or other emergency). The qualified alternate PS that will be available on site in the absence of the PS will be Dan Brennan or Greg Tunstall (Project Engineer).

2.5 Site Health and Safety Officer

The Site Health and Safety Officer (SHSO) will represent the Program CIH on-site during field activities. As such, the SHSO will be responsible for providing independent surveillance of the routine implementation of the project SHSP. The SHSO may not, however, authorize changes to or variances from the SHSP. Any modifications of the project SHSP must be approved by the Program CIH, with written concurrence of the ROICC, the Contracting Officer's Representative.

Other duties of the SHSO include:

- Immediately stopping work if Immediately Dangerous to Life or Health (IDLH) or other extremely hazardous conditions are encountered.
- Verifying that all personnel have the necessary training and medical clearance prior to entering the site;

- Identifying all site personnel with medical restrictions to the PS;
- Determining that monitoring equipment is properly calibrated and used, and that results are properly recorded and filed;
- Informing the Program CIH of significant changes in either the environment or work procedures which may require modification of the SHSP;
- Observing work party members for symptoms of on-site exposure or stress;
- Overseeing implementation of the SHSP, reporting any deviations from the Plan, regardless of the potential to adversely impact the Health and Safety of employees, reports will be made to the PS and the Program CIH;
- Immediately notifying the PS of any unsafe conditions observed, and providing technical guidance to the PS for the correction of the condition;
- Recording daily maximum and minimum temperatures;
- Conducting employee exposure monitoring for workplace contaminants, noise and/or heat stress as outlined in Section 8;
- Monitoring the use of required protective clothing and safe work practices;
- Recording on FADL forms the names of all personnel who enter the EZ or CRZ;
- Determining and posting routes to capable medical facilities and emergency telephone numbers (including poison control facilities), and arranging emergency transportation to medical facilities;
- Notifying local public emergency officers of the nature of the operations, and posting of their telephone numbers in an appropriate location;
- Conducting and documenting required project specific training;
- Conducting job site safety audits at least daily;
- Ensuring that training and medical records are maintained on-site for all IT and subcontractors personnel;
- Monitoring project personnel to ensure ongoing compliance with the SHSP;
- Assisting the PS in establishing appropriate Work Zones;

- Presenting tailgate safety meetings (a shared responsibility by the PS) and maintaining attendance records;
- Monitoring that decontamination procedures are meeting established criteria;
- Acting as Project Hazard Communication Coordinator as required by 29 CFR 1910.1200;
- Responding to employee's/contractor's health and safety concerns; and
- Periodically auditing subcontractor qualifications to ensure only properly qualified personnel are allowed in the work area.
- Ensure employees are trained on the hazards of any hazardous substances used. MSDSs must be on-hand for all hazardous materials (other than wastes) and containers must be properly labeled;
- Ensure that project safety equipment is inspected regularly (monthly for fire extinguishers);
- The SHSO must have completed the Hazardous Waste Supervisor's Course.

The SHSO for this project will be Londell Allen. The qualified alternate SHSO that will be available on site in the absence of Mr. Allen will be Dan Brennen.

2.6 Subcontractor Management and Personnel

Subcontractor management is responsible for the compliance of their personnel with this Project SHSP. Since subcontractors are hired for their specific expertise, they must assume primary responsibility for the health and safety of their personnel. The subcontractor's Field Supervisor or Crew Leader will also be responsible for performing a weekly safety inspection of their operations. A copy of this inspection must be submitted to the PS each week. The subcontractor's Field Supervisor must have successfully completed 8 hours of Supervisory training per 29 CFR 1910.120 (e)(4)/1926.65 (e) (4), or in California T8CCR Section 5192 (e)(4) if the subcontractor personnel will be performing work within either the Exclusion Zone (EZ) or Contamination Zone (CRZ).

Subcontractors must also:

- Comply with all applicable Occupational Safety and Health Administration (OSHA) regulations as defined in Title 29 Code of Federal Regulations Parts 1910 and 1926 (29 CFR 1910 and 1926), as well as the United States Army Corps of Engineers "Safety and Health Requirements Manual" (EM 385-1-1).
- Perform all work in California in Compliance with applicable Cal/OSHA standards, found in Title 8 of the California Code of Regulations (T8CCR).
- For work in the EZ or CRZ, provide documentation for each on-site worker of successful completion of 40 hours training in health and safety practices for hazardous waste operations per 29 CFR 1910.120/1926.65. This must be received prior to the employee arriving on-site.
- Conduct all work in accordance with this SHSP.
- For work in the EZ or CRZ, provide documentation for each on-site worker of a doctor's approval for the worker to perform hazardous waste remediation work based on an annual medical exam and work history review prior to the worker arriving on site.
- Provide updated documentation as on-site individuals complete annual HAZWOPER refresher training and/or receive annual medical examinations for workers entering the EZ or CRZ. Such documentation must be provided prior to the expiration date of the previous year's training/physical examination.
- Provide their own personal protective equipment (including safety boots, safety glasses, hard hats, respirators, protective clothing and the like).
- Report all incidents/accidents/injuries/near-misses immediately to the PS. Provide input to IT's investigation of any mishap or near miss. Provide documentation to IT of the subcontractor's internal investigation of the mishap/near miss.
- Provide proof of additional (non-HAZWOPER) training upon request (e.g., documentation of forklift training).
- Submit to the Program CIH a task-specific hazard analysis for their anticipated work.
- Provide awareness level training to affected IT workers regarding any material, equipment or operation which may pose a hazard to the IT employees.

- Provide a Material Safety Data Sheet (MSDS) to IT for all materials used on the project which are regulated by the Hazard Communication Standard (29 CFR 1910.1200). MSDSs shall be approved by IT Corporation prior to the material being brought on site.
- Notify IT in writing prior to bringing any radioactive materials or devices (e.g., nuclear density gauges) onto the jobsite. Such notification must identify by name the subcontractor's Radiation Safety Officer and list the company's radioactive material license number. A federal licence or proof of reciprocity to work on a federal instillation must be provided.
- Provide own first aid kits and first aid trained individual.
- Submit personnel to "reasonable cause" drug and alcohol testing when directed to do so by the Project Manager (in accordance with IT Policy HS101). Results of such testing are to be provided to IT Corporation immediately upon receipt.
- Remove any worker from the project who tests positive for either drugs or alcohol.
- Have in place an active and effective Drug Free Workplace Program in compliance with the Federal Drug Free Workplace Act.
- Provide written notification to subcontractor's own employees of the results of any industrial hygiene monitoring conducted by IT on those employees.
- Immediately inform the IT Project Superintendent of the presence, or anticipated presence, of regulatory agency officials at the jobsite. Provide documentation to IT of any citations or notices of violation issued to the subcontractor for work on, or associated with the project. Such documentation shall include a copy of the written citation and a summary of the subcontractor's corrective action plan.

2.7 On-Site Personnel and Visitors

No visitor will be allowed within the Work Zones without authorization from the PM and the PS. Visitors requesting authorization to enter the Contamination Reduction Zones (CRZs) or Exclusion Zones (EZs) must meet the requirements established for Project Personnel, including appropriate medical exams and training. On-site Navy personnel will also be held to these requirements.

3.0 Project Hazard Analysis

3.1 Scope of Work

The project involves the completion of the design and installation of a treatment system to restore the storm water ponds at the Pt. Molate Naval Fuel Depot. The existing aeration system does not provide sufficient air supply or mixing to the ponds to promote biological degradation of fuel related organic constituents in the storm water. The new aeration system will provide for better mixing and increased air supply to the waste water.

3.2 Activity Hazard Analysis

The job hazard analysis identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community, and the environment. Because of the complexity and constant change of remediation projects, supervisors must continually inspect the work site to identify hazards which may harm site personnel, the community, or the environment. The PS must be aware of these changing conditions and discuss them with the PM and the Program CIH, and the SHSO. The Project PS will keep supervisors for subcontractors informed of the changing conditions. Changes to the hazard analysis may be originated by the SHSO, but must be approved by the Program CIH. Appendix D contains an Activity Hazard Analysis for each major task associated with this project and is supplemented by the following sections.

Tasks to be performed during this project include:

- Mobilization
- Site preparation
- Pipe and valve installation
- System operation test of groundwater treatment plant
- Demobilization
- Operation and maintenance of storm water treatment system.

3.2.1 Materials Handling

Loading and unloading materials such as visqueen, sampling supplies, and decontamination equipment present a variety of hazards. These include cuts and abrasions from sharp objects, back injuries from poor lifting techniques, as well as setting up and dismantling equipment,

pinch points, crushing injuries from falling or moving loads, and being struck by moving equipment or loads.

The following fundamentals address the proper lifting techniques that are essential in preventing back injuries:

- The size, shape, and weight of the object to be lifted must first be considered. No individual employee is permitted to lift any object that weights over 60 pounds. Multiple employees or the use of mechanical lifting devices are required for objects over the 60-pound limit.
- The anticipated path to be taken by the lifter should be inspected for the presence of slip, trip, and fall hazards.
- The feet will be placed far enough apart for good balance and stability (typically shoulder width). **THE FOOTING WILL BE SOLID.**
- The worker will get as close to the load as possible. The legs will be bent at the knees.
- The back will be kept as straight as possible and abdominal muscles should be tightened.
- To lift the object, the legs are straightened from their bending position.
- A worker will never carry a load that cannot be seen over or around.
- When placing an object down, the stance and position are identical to that for lifting. The legs are bent at the knees and the object lowered.

When two or more workers are required to handle the same object, coordination is essential to ensure that the load is lifted uniformly and that the weight is equally divided between the individuals carrying the load. When carrying the object, each worker, if possible, will face the direction in which the object is being carried. In handling bulky or heavy items, the following guidelines will be followed to avoid injury to the hands and fingers:

- A firm grip on the object is essential; leather gloves will be used if necessary.

- The hands and object will be free of oil, grease, and water which might prevent a firm grip, and the fingers will be kept away from any points that could cause them to be pinched or crushed, especially when setting the object down.
- The item will be inspected for metal slivers, jagged edges, burrs, and rough or slippery surfaces prior to being lifted.

Site operations shall be organized to minimize the amount of drum and container movement. All employees involved in the transfer of drums or containers shall be warned of the potential hazards associated with the contents of the drums or containers during tailgate safety meetings prior to beginning transfer operations. Tailgate safety meetings should also include information on safe handling techniques, including:

- Back injury prevention;
- Procedures and equipment used to minimize sources of ignition during transfer operations; and
- Positioning of drums and containers to minimize obstruction of the work site.

Employees are not to stand upon or work from drums or containers at any time.

U.S. Department of Transportation (DOT) specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and utilized in areas where spills, leaks or ruptures may occur. Drums or containers that cannot be moved without rupture, leakage or spillage shall be emptied into a sound container using a device classified for the material being transferred.

3.2.2 Compressed Gas Cylinder Handling

Damage to compressed gas cylinders can result in the release of toxic substances, rupture of the cylinder or rocket-like activity. All project workers should be informed of the proper storage and handling procedures for compressed gas cylinders, including:

- Cylinders are to be stored only in designated areas away from corrosives and heat.

- Stored cylinders should be segregated by type of material contained. Cylinders containing flammable substances should be separated from those containing oxidizers by a distance of at least 25 feet.
- All cylinders must be clearly labeled.
- Full cylinders shall be stored separately from empty cylinders, and should be arranged so that older stock is placed in the most accessible location(s).
- Cylinder caps will be in place at all times during storage and transport.
- Cylinders shall be stored and utilized in an upright position, and secured to prevent falling. The area around and above each cylinder should be clear of potential falling objects.
- Inspect cylinders and lines prior to use. Lines must be tested for leaks with soapy water.
- Do not use any cylinder that shows signs of damage, including rust, corrosion, deep dents or unusual sounds.
- Secure cylinders to the hand truck or other vehicle during transport.
- Remove cylinder caps by hand or with a friction wrench.

3.2.3 Vehicle Traffic

The project worksite is located within a closed military base. Traffic consists of construction vehicles and personal vehicles of the workers. Work in such areas presents a risk of being stuck by a vehicle. Collisions between vehicles are also possible unless safe driving practices are used.

All IT employees who will be driving restricted-visibility vehicles (e.g., trucks, vans and pick-ups) at the project site shall have successfully completed IT's Safe Driver Training Course. Vehicle operators will check carefully for nearby traffic before proceeding at a cautious pace on facility roadways. Unless otherwise marked, speeds should be held to 15 mph or less while on site.

Care should be taken to ensure that trucks, equipment and materials are placed in a manner that keeps obstruction of local traffic to a minimum. During work activities, it may become necessary to move equipment in order to accommodate traffic and site activities.

Workers on foot should not wander into the active roadways. If work in active traffic areas is required, workers will wear bright orange safety vests, and the work area will be marked with lighted barricades, cones or flags to warn traffic.

3.2.4 Chemical Hazards

The contaminants of concern on this project are petroleum fuel components. Most of the individual components are present in parts-per-billion (ppb) concentrations, and therefore pose only minimal hazard to project workers. However, pockets of higher concentrations may be contacted during the excavation.

Toluene

Toluene will cause local irritation to the skin, eyes, and respiratory tract and may cause defatting, drying and scaling of the skin. Acute systemic effects include headache, dizziness, nausea, loss of appetite, lassitude and eventual coma if exposure is prolonged. Toluene does not display the effects of the blood forming tissues seen with benzene and is not classified as a carcinogen in humans or animals. Chronic exposures can result in effects on the liver, kidneys and central nervous system.

Benzene

Benzene will cause local irritation to the skin, eyes, and respiratory tract and may cause redness, dryness and scaling of the skin due to defatting. Acute systemic effects include headache, dizziness, convulsions, coma and death may occur due to effects on the heart. Chronic exposures effects the blood-forming tissues primarily, resulting initially in increases in blood cell counts followed by aplastic anemia with an overactive or underactive bone marrow. Epidemiological studies have linked benzene with leukemia and it is classified as a suspected human carcinogen.

Diesel Fuel

Excessive inhalation of diesel fuel aerosol or mist can cause respiratory tract irritation, headache, dizziness, nausea, vomiting, and loss of coordination, depending on concentration and exposure time. When removed from exposure area, affected persons usually recover completely. Prolonged or repeated skin contact may irritate hair follicles and block sebaceous glands, producing a rash of acne pimples and spots, usually on arms and legs.

Petroleum Distillates

Petroleum distillates can affect the body if they are inhaled, come in contact with the eyes or skin, or are swallowed. Over exposure to petroleum distillates may cause dizziness, drowsiness, headache, and nausea. They may also cause irritation of the eyes, throat and skin.

Prolonged contact with petroleum hydrocarbons typically results in symptoms such as nausea and dizziness. These symptoms are generally associated with airborne concentrations well in excess of those anticipated during the Point Molate project. Chronic overexposure to these hydrocarbons can cause damage to the liver, kidneys, and central nervous system.

Personnel working on the site may also be exposed to diesel and gasoline exhaust from the trucks and machinery in use during project activities. As the area is outside and therefore well ventilated, exhaust levels should not reach concentrations capable of causing any adverse health effects. Symptoms of exposure to high levels of exhaust include nausea, headache, dizziness, coughing and irritation of the eyes and upper respiratory system.

3.3 Exposure Standards

Threshold Limit Values (TLVs) refer to airborne concentrations of substances which represent conditions that nearly all employees may be repeatedly exposed to day after day without adverse effect. These TLVs are prescribed by the ACGIH and are based upon the best available information obtained through industrial experience and animal or human studies. Because of the wide variation in individual susceptibility, a small percentage of workers may experience discomfort from some substances at concentrations below the recommended values. It has been policy to use these guidelines for good hygienic practices; however, whenever applicable, stricter guidelines may be utilized.

Currently, exposure guidelines to pesticides and other chemical substances are regulated by OSHA. These exposures are based upon the time-weighted average (TWA) concentration for a normal 8-hour workday and a 40-hour work week. Several chemical substances have short-term exposure limits (STEL) or ceiling values which allow a maximum concentration to which workers can be exposed continuously for a short period of time without suffering from irritation, chronic or irreversible tissue damage, narcosis of a sufficient degree to result in accidental injury, impaired self-rescue abilities, or substantially reduced work efficiency.

The STEL is defined by the ACGIH as a 15-minute TWA exposure which should not be exceeded at any time during a workday even if the 8-hour TWA is within the TLV-TWA. Exposure above the TLV-TWA up to the STEL should not be longer than 15 minutes and should not occur more than four times per day. There should be at least 60 minutes between successive exposures in this range. An averaging period other than 15 minutes may be recommended when this is warranted by observed biological effects. OSHA requires that a 15-minute "Ceiling" concentration never be exceeded for that chemical constituent. This notation appears as the letter "C" after the chemical name. Table 3-4 contains the exposure guidelines for identified health significant contaminants.

During on-site activities, all personnel will wear appropriate protective clothing whenever the possibility for contact with contaminated soil or groundwater exists (see Section 5.0). If respiratory protection is required, only NIOSH approved respirators may be worn. Disposable respirators are not permitted.

Material Safety Data Sheets (MSDSs) will be provided on-site for each hazardous material (other than waste) brought on-site. MSDSs are found in Appendix B

3.4 Pipe Handling

The following procedures shall be followed during pipe handling operations:

- Pipe must be loaded and unloaded, layer by layer, with the bottom layer pinned or blocked securely on all four corners. Each successive layer must be effectively blocked or chocked;
- Workers must not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock;
- Employees must be instructed never to try to stop rolling pipe or casing; they must be instructed to stand clear of rolling pipe;
- Slip handles must be used to lift and move slips. Employees must not be permitted to kick slips into position;
- When pipe is being hoisted, personnel must not stand where the bottom end of the pipe could whip and strike them; and

- Pipe stored in racks, catwalks or on flatbed trucks must be chocked to prevent rolling.

3.5 Trenching and Excavation Hazards

Although this project involves trenching, at no time will any worker be directed to enter a trench deeper than 4 feet. This eliminates the classical hazard from trench cave-in. However, other hazards are presented which must be addressed.

In the event that work in an excavation is required, an appropriate shoring plan will be developed and implemented. In addition, air monitoring will be performed in accordance with Section 8.1 prior to entrance into the excavation.

Excavation of soil will be accomplished using heavy earthmoving equipment. This introduces loud noise levels which may cause hearing loss. Such equipment also presents a risk of being struck by the machinery. Earthmoving equipment can also tip over if mishandled.

Falls can result from unbarricaded excavations. All excavations must be properly barricaded or covered to prevent falls.

Airborne contaminant concentrations may be elevated near trenches dug in contaminated soils. Air monitoring in accordance with Section 8.0 is required at regular intervals to assure proper worker protection around the excavation and spoils piles.

The following rules will be enforced for all excavations within the work site:

- Utilities will be identified and marked prior to commencing excavation activities.
- The PS will inspect the area for signs of weakness or structural defects at the start of each shift or when environmental or work conditions change.
- Personnel will be trained in the specific hazards associated with excavation and trenching prior to entering the work area when trenching is being performed.
- No one shall enter any trench deeper than 4 feet without first contacting the Program CIH for an addendum to this plan.

- Crossing directly over the trench shall be permitted only where approved walkways with handrails are provided. All other traffic is to be directed around the trench, at a safe distance from the trench edges.
- The spoil shall be removed at least two feet away from the edges of the trench. At least four feet is strongly recommended wherever possible.
- Boulders, stumps, or other materials that may slide or roll into the excavation shall be removed or made safe.
- Lighted barricades or barriers will be placed around the excavation site to prevent unauthorized entry and to warn equipment operators.
- The trench will be completely filled in upon completion of the work.

3.6 Use of Heavy Equipment

- Prior to use, all heavy equipment will be inspected, and this inspection documented on CESP 150-R.
- Heavy equipment not being used in the excavation and trenching operations shall be placed a sufficient distance from the trench so that their weight does not weaken the trench walls. Stop logs shall be installed where vehicles must approach the trench.
- Blades and buckets on the front ends of heavy equipment shall be lowered during transport and whenever the operator leaves the machine.
- Construction equipment shall be given the right-of-way during field activities.
- Heavy equipment shall have a reverse signal alarm that operates automatically with backward movement.
- The operator shall check the condition of equipment each day before operating. This check shall include brakes, clutches, steering mechanisms, hydraulic and electrical systems, and signs of abnormal wear.
- No worker shall operate a piece of equipment unless they have been trained and are familiar with its operation.
- Personnel are not allowed to work off machine implements or to use them as ladders or scaffolds.
- Unauthorized riding on equipment or riding parts of equipment not intended for occupancy by either operator or passenger is prohibited.

3.7 Maintenance/Troubleshooting

During an extended project, such as the work at Point Molate, equipment and machinery maintenance and troubleshooting work can expose project workers to contaminated materials and other hazards. Troubleshooting electrical and mechanical equipment can expose workers to shock hazards, and crushing or pinch hazards.

Whenever employees or subcontractors are working on equipment or in areas where the activation of the equipment or the charging of hazardous materials lines might endanger the worker's safety, lockout and tagout procedures (IT Policy HS315) are required. Should lockout/tagout be planned for more than seven calendar days, or when locking/tagging out specialized equipment having its own lockout requirements, the Program CIH shall be notified for an addendum to this SHSP.

General Lockout/Tagout Requirements

Lockout and tagout procedures are required during maintenance of powered tools or equipment, during valve changeouts and other work on hazardous waste or materials lines, and during confined space entries. Other tasks may also required lockout and tagout procedures if use of nearby equipment or material transfer lines could harm employees. The requirements of lockout and tagout include:

- Locks and tags are to be used when a machine, equipment or piping system is capable of being locked out. Tags alone are allowed only when the equipment will not accept locks.
- Authorized padlocks shall be assigned to each authorized employee. Each group's lock will be individually keyed and the PS shall maintain the master keys.
- All new equipment installed must be designed to accept a lockout device.
- Where multiple items must be locked out, a group lock box must be used.
- Where multiple locks must be placed on an item, a multiple lock hasp must be used.
- Only the protected employee may remove his/her personal lock. When the employee is no longer present and the lock must be removed, only that employee's immediate supervisor may remove the lock and tag, and only after ensuring that the employee is out of harm's way.

- All locks must be accompanied by a tag indicating the name of the employee applying the lock, the date the lock was applied, equipment name or number, the reason for the lockout and a warning against the potential hazard of activation.
- A legend must be displayed warning against activation and stating that the lock and tag may be removed only by authorized personnel.
- Tags must be single-use, hand-attachable, legible and designed to withstand the environment where they are in use. Tags must be self-locking and non-releasable with a minimum unlocking strength of 50 pounds.
- A "Lockout Log" (HS315 Attachment 3) shall be maintained by the PS as part of the SHSP.
- The PM or PS is responsible for informing the ROICC of the lockout/tagout procedure to be used at the jobsite. This must be documented on Field Activity Daily Logs (FADLs).
- Subcontractors are to use IT's lockout/tagout procedure. Their own procedure may be used only after it has been reviewed and approved by the Project CIH.
- If the client has their own lockout/tagout requirements, these shall be implemented only after IT's requirements have been met.
- The PM and PS shall assure that locks, hasps and other equipment and site specific training are provided.

Lockout/tagout procedures are not required when work is conducted on equipment where an employee has direct control over the cord(s) or plug(s) connected to the associated equipment.

Lockout/Tagout Checklist

Where lockout/tagout procedures are required, the following steps shall be followed:

- Check equipment file for specific lockout/tagout procedures.
- Determine the requirements for lockout. Document each energy source to the equipment.
- Conduct a survey to locate and identify all isolation devices that apply to the equipment.

- Use the equipment type-specific procedures if applicable (HS315 Attachments 4-7). Complete the “Lockout/Tagout Procedure for Specific Equipment” form (HS315 Attachment 8), logging all data, and return to supervisor.
- Shut off energy source(s) to affected equipment.
- Affix lock(s) and tag(s) to each energy source controlling the device.
- Identify work on process lines or vessels and determine isolation requirements.
- Blind, blank, disconnect or double-valve and vent all hazardous materials lines (including steam). Identify isolation points with tags.
- When a tag only is used because the equipment can't be locked out, complete the following:
 - Remove fuses, block machine, etcetera.
 - Complete HS315 Attachment 8 and give to site supervisor.
- Relieve all stored energy (e.g., capacitor banks, springs, compressed air, hydraulic and steam).
- Verify that isolation of energy has occurred by attempting to activate equipment at the on/off switch.
- Return the control switch to the off position before proceeding.

Before returning any equipment to service following lockout and tagout, the following procedures are required:

- Ensure that all nonessential items (e.g., tools and cleaning rags) are removed from the equipment.
- Ensure that equipment components are intact.
- Check work area to ensure that all employees are safely positioned or removed from the area.
- Notify all affected employees and site supervisor before re-energizing the equipment.
- Remove lockout/tagout device.

- Re-energize equipment or open valves and restore flow in process line; place back into service.

Where equipment must be locked out for longer than one work shift, the individual lock(s) of the outgoing shift working on equipment will be removed and replaced by the on-coming shift's individual lock(s). The authorized employees of the on-coming shift must inspect and "try" the system to ensure de-energization. The Project Superintendent shall re-audit the system as necessary.

3.8 Hand Tools

Use of hand tools may expose workers to cuts, lacerations or puncture wounds if inadequate hand protection is worn or tools are improperly stored. Damaged hand tools may also expose employees to injuries from shattered tools and flying debris.

The following safe work practices apply to the use of hand tools:

- Only use a tool for its designed use.
- Do not use damaged tools.
- Driving faces of hammers, chisels, drift pins, bars, and similar tools must be inspected to eliminate mushroomed heads, broken faces and other defects.
- Tools must be returned to their proper storage place.
- Sharp tools must not be carried in pockets.
- Wood handles must be sound and securely wedged or fastened to the tool. Tape must not be used to cover defects such as cracks.
- When hand tools are being used overhead, those working or standing below must be notified.
- Pipe wrenches must be inspected regularly. Replace the heel and jaw sections if found to be defective or worn out.
- Pipe wrenches must not be used to bend, raise or lift pipe.
- Always wear safety glasses to protect the eyes.

3.8.1 Power Tools

Power tools present many potential hazards, including shock and electrocution, injuries from accidental activation and injuries from using damaged or malfunctioning equipment.

When using power tools, the following precautions shall be followed:

- Power tools shall be inspected and the operation tested prior to being placed in operation.
- Eye protection (safety glasses or goggles) must be worn whenever operating power tools.
- Power tools must be grounded or of the double-insulated type.
- Power tools shall not be used in wet locations.
- All power tools must be protected by a Ground Fault Circuit Interrupter (GFCI).
- Splicing, cutting or “repairing” electrical wire by unauthorized personnel is prohibited.
- Plugs and cords must be protected from damage.
- Grounding plugs are never to be removed.
- Electrical tools are not to be used inside a confined space without prior approval by the SHSO or Program CIH.
- All electrical tools must be turned off before connecting or disconnecting the power supply.
- Extension cords must be visually inspected each time they are used. Cords must be disconnected from the power source before coiling for storage.
- Extension cords used with portable electric tools shall be of three-wire type and shall be rated for hard or extra-hard usage (Types S, ST, SO, STO, SJ, SJO, SJT, or SJTO).

3.8.2 Ladders

The use of ladders on the project can expose employees to injuries from falls and falling objects, in addition to electrocution hazards.

The following rules apply to all ladders used on the project.

Safe Ladder Design

- Rungs must be spaced 12 inches apart vertically.
- Width of ladder must not be less than 15 inches nor more than 20 inches.
- Step ladders must not exceed 20 feet in length. (Use of such ladders taller than 12 feet is not anticipated.)
- Cleat ladders must not exceed 30 feet in length. Double cleat ladders are required for two-way traffic or when used by 25 or more employees.
- Extension ladders shall not exceed 44 feet in length. (Such lengths are also not anticipated.)
- The overlapping section of extension ladders shall not be less than 10 percent of the working length.
- All ladders must have a warning sign prohibiting standing on the top step.

Safe Ladder Use

- Do not stand on the top 3 rungs of ladders unless you are protected by a safety belt.
- Broken or damaged ladders shall be immediately removed from use and removed from the jobsite.
- Do not place ladders where they can be accidentally struck or displaced.
- Secure ladders in use against displacement.
- Extend ladder side rails at least 3 feet above the landing, unless handholds are provided.

- Place ladders at approximately 75° pitch.
- Do not place planks on top (cap) of stepladders.
- Do not splice ladders together.
- Do not use metal ladders for electrical work or near live electrical parts.
- Mark portable metal ladders:

CAUTION - DO NOT USE AROUND ELECTRICAL EQUIPMENT

- Portable ladders must be inspected prior to each use for cracks, splits, loose rungs, etc.
- Portable metal or aluminum ladders must be equipped with non-skid feet.
- Wooden portable ladders must not be painted.
- Ladders must not be used in a horizontal position as a scaffold.
- Portable ladders must be secured in place. If not possible, the ladder must be held by another person.
- Heavy, bulky tools and material must be hoisted up separately. Light tools, equipment, etc., must be attached to one's person.
- Personnel must not reach beyond arm's length of the side rails of a ladders to gain better access. The ladder must be moved.
- Only one person is allowed on a ladder at any one time.

3.8.3 Work From Elevated Locations

Some of the activities conducted during this project (such as work on top of process tanks) may require working from elevated locations. The hazards associated with this type of work include falls, injuries from falling or dropped tools and materials and strains from overreaching.

The following work rules apply to any work performed from elevated locations:

- Openings in elevated working surfaces and open-sided floors or platforms six feet or more above adjacent floors or ground level shall be guarded by standard railings

and toeboards. Such railings shall be provided on all exposed/open sides, except at entrances to stairways, ramps, or fixed ladders. The provisions of 29 CFR 1926.500 include mandatory specifications for standard railings. All applicable provisions of 1926.500 shall be enforced for work at elevated locations.

- Portable ladders used to access an elevated work space must extend 3 feet beyond the working surface.
- Where guardrails are not provided for work at six feet or more above ground level, safety belts or harnesses must be used. Safety belts, harnesses and lifelines must be capable of supporting 5400 lbs. dead weight.
- All safety belts, harnesses and lanyards shall be labeled as meeting ANSI A10.14-1975.

3.8.4 Forklift Operations

Forklifts may be required for materials movement during project activities. Forklifts present the potential for damage to equipment or materials due to impaling or striking personnel or materials with the forklift. Additionally, forklifts may tip if they are incorrectly loaded, driven at excessive speeds or operated with the forks too high.

The following rules apply whenever a forklift is used on the project:

- The rated lifting capacity must be posted in a location readily visible to the operator.
- A forklift truck must not be used to elevate employees unless a platform with guardrails, a back guard, and a kill switch are provided on the vehicle. NOTE: When guardrails are not possible, safety belt protection is required.
- The PS must post and enforce a set of operating rules for forklift trucks.
- Only trained and authorized drivers must operate forklifts.
- Stunt driving and horseplay are prohibited.
- Employees must not ride on the forks.
- Employees must never be permitted under the forks (unless forks are blocked).

- The driver must inspect the forklift once a shift and document this inspection.
- The operator must look in the direction of travel and must not move the vehicle until all persons are clear of the vehicle.
- Forks must be carried as low as possible.
- The operator must lower the forks, shut off the engine, and set the brakes (or block the wheels) before leaving the forklift unattended (operator out of sight of, or 25 feet away from vehicle).
- Trucks must be blocked and have brakes set when forklifts are driven onto their beds.
- Extreme care must be taken when tilting elevated loads.
- Every forklift must have operable brakes capable of safely stopping it when fully loaded.
- Forklifts must have parking brakes and an operable horn.
- When the operator is exposed to possible falling objects, industrial trucks must be equipped with overhead protection (canopy).

3.8.5 Portable Electric Equipment

Various types of portable electric equipment (including portable generators, ground fault circuit interrupters and flexible cords) will be used during the course of the project. To minimize electric shock hazards, the following rules apply to these pieces of equipment.

Portable and Vehicle-Mounted Generators

All portable and vehicle-mounted generators must be grounded, except under the following conditions:

- (1) The non-current-carrying metal parts of equipment located on the vehicle and the equipment grounding conductor terminals of the receptacles are bonded to the generator or vehicle frame, and
- (2) The generator supplies only equipment located on the vehicle or the generator and/or cord - and plug - connected equipment through receptacles mounted on the vehicle or on the generator, and

- (3) The frame of a vehicle-mounted generator is bonded to the vehicle frame, or
- (4) The generator is single-phase, portable or vehicle-mounted, rated not more than 5 KW, and the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces.

Ground Fault Circuit Interrupters

Ground fault circuit interrupters shall be used on all electrical power lines used at the project site. The ground fault interrupter shall be placed as close to the power source as feasible in each case.

Flexible Cords

Flexible cords and cables shall be protected from accidental damage. Sharp corners and projections shall be avoided. When passing through doorways or other pinch points, protection shall be provided to avoid damage.

3.8.6 Cranes

Cranes will be utilized during project activities for moving materials and placing process tanks. The hazards associated with crane operations include falling loads due to damaged/improperly selected rigging or improperly secured loads, being struck by booms or swinging loads, crushing injuries due to incorrect loading techniques and traffic-related injuries or equipment damage.

Wind is of concern at the site with respect to crane operations. Wind speed and direction shall be monitored during all lifting operations. Whenever wind speed reaches 20 mph, the qualified person and the site safety officer shall determine the safety of the planned lift. This determination shall be made prior to commencing the actual lift. They shall stop the lift if in their opinion wind speed exceeds safe parameters. While 20 mph is set forth as a benchmark this is not meant to preclude stopping a lift at a lower wind speed if necessary or allowing a lift at higher wind speeds if safety is not compromised.

In accordance with U.S. Army Corps of Engineers EM385-1-1 crane operators shall work a maximum of 10 hours in any 24 hours in crane operations. Time before crane operations begin is authorized for the daily tailgate safety meeting and setup of the job for the day. In addition, time is authorized for an end of shift inspection of the crane.

The following rules apply whenever a crane is used on the project:

- Each crane must be certified annually by a qualified person.
- Prior to initial use on the project, all cranes shall be inspected to ensure compliance with IT Procedure HS822 "Mobil Crane Inspection." All provisions of this procedure shall apply to the use of mobile cranes. The documentation of this inspection will be recorded on Form CESP 150-R.
- Tag lines shall be attached to guide all lifted loads.
- Hooks must be equipped with safety latches.
- All cranes must be equipped with an audible warning device controllable by the operator.
- No crane shall be operated with wheels or tracks off the ground unless properly bearing on outriggers.
- Any wire rope removed from service due to defects shall be cut up.
- The swing radius of the rear of the rotating crane shall be barricaded to prevent an employee from being struck or crushed by the crane.
- A signal person shall be provided when the point of operation is not in full and direct view of the crane operator.

Mobile Hydraulic Cranes

- A load rating chart must be posted at a location readily visible to the operator.
- Each hydraulic crane shall have the following capabilities:
 - Outriggers must be used according to certifying agent requirements.
 - Boom angle indicator must be clearly visible from the operator's station.
 - Boom length indicator (telescopic booms) must be installed.
 - Boom hoist disconnect (boom stop) must be installed.
 - A boom stop is required.

Boom-Type Mobile Cranes

- This section applies to motor truck cranes.
- All mobile cranes (with booms over 200 feet long or capacity exceeding 50 tons) must be equipped with a load-indicating device (or equivalent) approved by Cal/OSHA.
- A readily visible boom angle or boom radius indicator is required for variable radius cranes, and cranes with a boom longer than 50 feet or a maximum rated capacity above 15 tons.
- A fire extinguisher of 10-BC rating shall be accessible to the operator's station.
- An operable boomstop is required on any crane which could fall over backwards.
- The operating station must be protected by a canopy-type guard or cab roof.
- Safe access (by steps and hand-holds) must be provided.
- The boom hoist must be capable of:
 - Raising the boom with a rated load.
 - Holding a rated load without operator attention.
 - Lowering a rated load only when coupled to the prime mover.
- The boom-hoist mechanism must have:
 - A device permitting immediate starting or stopping of the boom drum.
 - A self-setting safety brake.

Slings

- Slings and attachments must be inspected daily for damage or defects.
- Damaged/defective slings must be removed from service immediately.
- Chain or wire rope slings must not be shortened by knots, bolts, or other means.
- Sling legs must not be kinked.
- Slings must not be overloaded.

- Slings must be padded to protect against damage from sharp loads.
- Suspended loads must be kept clear of all obstructions.
- Wrought iron chains must be annealed every six months; alloy chains must not be annealed.
- Avoid operations that expose employees to overhead loads.
- Deformed or defective sling hooks and rings must not be used.

3.8.7 Use of Torches

During the course of this project, a torch may be used either to cut metal or to weld metal together. Personnel using torches may be exposed to metal fumes and burns from hot equipment or the torch itself. Operating torches increases the potential for fires and also presents an explosion hazard. Additionally, the use of torches exposes nearby personnel to potential eyesight damage.

To prevent injuries and fires, the following rules apply to the use of a cutting torch.

- Any use of a torch requires that an IT Hot Work Permit be completed in accordance with IT Procedure HS314 "Hot Work in Hazardous Locations" and posted in the immediate area. The Fire Department must also be contacted for any required Hot Work Permits.
- No hot work is allowed when combustible vapor concentrations exceed 10 percent LEL.
- All combustibles (including plastic sheeting) in the area must be removed or protected from sparks, flames and/or slag.
- A designated fire watch with a charged fire extinguisher rated 2A (minimum) must be in the immediate vicinity during all hot work. The fire watch must remain after hot work completion to check for flare-ups.
- Hot work is not allowed inside any confined space without prior approval of the PM and Program CIH.

- Torch operators must wear, at a minimum:
 - nonflammable gloves with gauntlets
 - steel-toed work boots
 - leather aprons and shirts with sleeves and collars
 - hard hats
 - properly shaded eye protection
 - respiratory protection (see Chapter 5.0)
 - hearing protection.
- Flash screens must be provided to protect the eyes of bystanders.
- Fuel gas and oxygen hoses must be distinguished from each other.
- Torches shall be lighted by friction lighter, not by match or from hot work.
- Defective torches will not be used at the site.
- Couplings must not disconnect by means of a straight-pull motion.
- Oil or grease must never come in contact with oxygen equipment.
- Never use leaking equipment.
- Never use oxygen from a system without a pressure regulation device.
- Gas cylinders must be protected against heat.
- Gas cylinders must not be placed where they might form a part of any electrical circuit.
- Backflow preventors must be used on all oxygen and fuel gas supply lines.
- Gas cylinders in service must be secured upright and placed so they will not fall or be knocked over.
- Gas cylinders must be handled in suitable cradles with valve caps installed; they must never be lifted by magnet, rope, or chain.
- Oxygen cylinders in storage must be separated from fuel gas cylinders a distance of 20 feet or by a noncombustible barrier 5 feet high.
- Valve stem wrenches must be left in place while cylinders are in use.

3.8.8 Confined Space Entry

A confined space is defined as an enclosure which is large enough for an employee to enter, but which has limited means of access and egress and is not designed for continuous employee occupancy.

A permit-required confined space is a confined space as defined above which also contains one or more health and/or safety hazards. This can include chemical, mechanical, electrical, or other hazards. All confined spaces shall be considered to be immediately dangerous to life or health until tested and proven otherwise. A survey of the project site will be made by the SHSO to identify any potential permit required confined spaces.

Access to any confined spaces identified by the SHSO and all work within IT must be conducted in accordance with IT Policy HS300, "Confined Spaces." Key provisions of this policy include:

- Combustible gas and oxygen levels shall be measured at the confined space opening and inside the confined space prior to entry and continuously during occupancy. The person conducting the monitoring must have completed IT's Entry Supervisor training.
- Oxygen levels must be at least 20 percent at all times during occupancy.
- Combustible gas readings must not exceed 10 percent of the LEL at any time during occupancy.
- A confined space entry permit must be completed, reviewed, and approved by the SHSO and posted outside the confined space entrance prior to entry.
- The entrant must have successfully completed Confined Space Entry training.
- At a minimum, modified Level D protection must be worn by all confined space entrants.
- An attendant trained in Confined Space Entry shall be posted outside the manhole entrance at all times during occupancy and shall remain in contact with the entrant. A second attendant must be nearby.
- Communications signals shall be established prior to entry. See Section 12.3.
- All confined space entry must be supervised by a an Entry Supervisor on site.

- All appropriate lockout/tagout procedures must be implemented prior to entry and must remain in effect until operations inside the space have been completed.
- Additional requirements regarding confined space entry are found in IT Policy HS 300 and in the USACE Safety Manual. Copies of both of these documents must be maintained on-site and enforced by the SHSO.

3.8.9 Noise

Some of the equipment used on the project generates loud noise. Exposure to sound levels above 85 dBA can cause temporary impairment of hearing. Prolonged and repeated exposure to sound levels above 85 dBA can cause permanent hearing damage. The risk and severity of hearing loss increases with the intensity and duration of the exposure. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of incidents.

All on-site IT and subcontractor personnel shall wear hearing protection, with a Noise Reduction Rating (NRR) of at least 25, when noise levels exceed 85 dBA (or wherever voices must be raised in order to be understood at arms length). The SHSO will perform sound level monitoring or noise dosimetry on operations which require hearing protection. All site personnel who may be exposed to noise shall also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss, in accordance with IT Procedure HS402.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, wherever possible, barriers or increased distance will be used to minimize worker exposure to noise.

Blasting or use of explosives is not permitted without written permission from the Navy's Contracting Officer and the Program CIH, and then only during designated times.

3.9 Heat and Cold Stress

3.9.1 Heat Stress

Wearing personal protective equipment (PPE) can put site personnel at considerable risk of heat stress and heat related illnesses if proper precautions are not implemented. Heat related illnesses range from transient heat fatigue to heat stroke and death. Heat related illnesses are caused by a

number of interacting factors which include environmental conditions, clothing, work load, and characteristics of the individual worker.

Individuals vary in their susceptibility to heat stress. Factors that influence an individual's tolerance for heat include physical fitness, diet, alcohol/drug use, sleeping habits, acclimation, genetics, medical condition, age and weight.

The signs of heat stress disorders are given below.

Heat Cramps. Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet and abdomen.

Heat Exhaustion. Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include:

- Pale, cool, moist skin;
- Heavy sweating;
- Dizziness, nausea; and/or
- Fainting

Heat Stroke. Heat stroke is the most serious form of heat stress and must always be treated as a medical emergency. SUMMON MEDICAL HELP IMMEDIATELY! The body's temperature regulation system fails, and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Place the victim in a cool shower or cool bath, or use ice packs. Monitor for drowning potential if the victim is cooling down in a bath tub or any type of container with enough water to drown if unconsciousness develops (may be less than 1 inch). Do not give anything to drink in case the victim vomits. Signs and symptoms of heat stroke include:

- Red, hot unusually dry skin;
- Lack of, or reduced perspiration;

- Nausea;
- Dizziness and confusion;
- Strong, rapid pulse and/or
- Coma.

Prevention

Heat stress is a major hazard to personnel working in impermeable protective clothing.

Therefore, measures will be taken in preventing heat stress, including:

- Site workers will be encouraged to drink plenty of water throughout the day. Each worker should drink at least 16 oz of water before going on site regardless if they are thirsty or not.
- On-site drinking water will be kept cool to encourage personnel to drink frequently.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion and heat cramps.
- All employees shall be informed of the importance of adequate rest, acclimation and proper diet in the prevention of heat stress disorders.
- Work/rest schedules will be adjusted by the PS and SHSO to account for the acclimatization of workers upon first encountering heat stress conditions.
- Workers will be instructed to limit their intake of alcohol during hot weather, as alcohol inhibits the body's ability to handle heat by causing dehydration.

One or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measured immediately prior to rest period) in excess of 110 beats per minute:

- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- Cooling devices such as vortex tubes or cooling vests must be used when personnel must wear impermeable clothing in conditions of extreme heat.

- Employees will be instructed to monitor themselves and coworkers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks must take place in the shaded rest area.
- Employees shall not be assigned to other tasks during breaks.
- Employees shall remove impermeable garments during rest periods. This includes white Tyvek-type garments.

Sunburn. Operations will require IT and subcontractor employees to work outside during daylight hours, typically seven to nine hours per day. Under these conditions, workers are at great risk for developing sunburn on unprotected skin.

Sunburn is a burn to the skin caused by overexposure to ultra-violet light (sunshine). The symptoms of exposure are not usually apparent until two to four hours after the exposure ceases. Depending upon the severity of the exposure the symptoms can range from reddening of the skin accompanied by mild discomfort, to painful deep burns and blisters. Although light-haired, fair-skinned, blue-eyed personnel are at the greatest risk of sunburn, all complexion types can develop sunburn if the exposure is long and intense enough.

Sunscreen products with sun protection factor ratings of 15 or higher will be available to project personnel. Areas of primary concern include; nose, cheeks, ears and the back of the neck. Sunscreen will be applied as necessary and reapplied after each break.

Monitoring Program

For each day of field operations, the daily maximum and minimum temperatures on-site will be recorded. Additional heat stress monitoring shall be initiated by the SHSO whenever ambient temperatures on site exceed 85°F (or 78°F when workers are wearing impermeable clothing). At the discretion of the Program CIH, environmental and/or physiological monitoring will be carried out. Environmental monitoring shall consist of the determination of Wet Bulb Globe Temperatures (WBGTs) when ambient temperatures exceed the values listed above. Physiologic monitoring may consist of pulse rate and/or body temperature determinations. Monitoring and

interpretation of monitoring results will be in accordance with IT Procedure HS400, "Working in Hot Environments."

Reporting

Individuals experiencing the symptoms of heat stress shall notify the PS. The distressed individual shall immediately halt field activities and be treated for heat stress. Early detection and treatment of heat stress will prevent further serious illness or injury and lost work-time. Proper and effective heat stress treatment can prevent the onset of more serious heat stroke or exhaustion conditions. Individuals having progressed to heat exhaustion or stroke become more sensitive and predisposed to additional heat stress situations. Regardless of ambient temperature, physiological monitoring will be implemented if heat stress is experienced.

If symptoms of heat stress are observed, the following procedures will be implemented:

- Instruct the affected person to lie down in a cool, shaded area or air-conditioned room and elevate feet. Abbreviated decontamination procedures may be followed.
- Summon medical support, if appropriate. This is required in all cases of heat stroke or unconsciousness.

3.9.2 Cold Stress

Cold stress is not anticipated to be encountered during the execution of this project. However, workers should be aware that most cold-related worker fatalities have resulted from failure to escape low environmental air temperatures, or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a fall in the deep core temperature of the body.

In the event that the weather becomes unusually cold (temperatures below 45°F) project workers should be protected from exposure to cold so that the deep core temperature does not fall below 36 degrees Celsius (°C). Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

Because of the moderate climate at the job site, cold stress is not a serious concern; however, all personnel must be aware that prolonged exposure to cold without proper clothing may impair their ability to work safely. To prevent such occurrence, the following measures must be implemented:

- Project workers must be provided with warm clothing, such as mittens, heavy socks, etc., when the air temperature is below 45°F. Protective clothing, such as Tyvek or other disposable coveralls, may be used to shield employees from the wind.
- When the air temperature is below 35°F, clothing for warmth, in addition to chemical protective clothing, will be provided to employees. This should include:
 - Insulated suits, such as whole body thermal underwear
 - Wool socks or polypropylene socks to keep moisture off the feet
 - Insulated gloves
 - Insulated boots
 - Insulated head cover such as hard hat, winter liner, or knit cap
 - Insulated jacket, with wind and water resistant outer layer.
- At air temperatures below 35°F, the following work practices must be implemented:
 - If the clothing of a site worker might become wet on the job site, the outer layer of clothing must be water impermeable.
 - If a project worker's underclothing becomes wet in any way, the worker must change into dry clothing immediately. If the clothing becomes wet from sweating (and the employee is not uncomfortable), the employee may finish the task at hand prior to changing into dry clothing.
 - Project workers must be provided with a warm (65°F or above) break area.
 - Hot liquids such as soups or warm, sweet drinks shall be provided in the break area. The intake of coffee and tea should be limited, due to their circulatory and diuretic effects.
 - The buddy system shall be practiced at all times on site. Any site worker observed with severe shivering shall leave the work area immediately.
 - Project workers should dress in layers, with thinner lighter clothing worn next to the body.

- Project workers should avoid overdressing when going into warm areas or when performing strenuous activities.
- Employees handling liquids with a high vapor pressure, such as gasoline, methanol, or hexane, shall take special precautions to avoid soaking of gloves and clothing with those materials.

3.10 Fire Prevention

Fire prevention is of primary importance to this project. Every effort will be made to prevent the start of any fires. If a fire should occur, the Richmond Fire Department will be called, even if the fire has been extinguished.

During dry weather, the potential for fire exists in any unpaved grassy perimeter regions of the site. Where VOC levels are high, both a fire and explosion hazard exist. Sparks from operating equipment, or even contact with hot catalytic converters can cause ignition.

Smoking or open flames are prohibited except in designated smoking areas. Vehicles and equipment will not be left idling or parked in or around areas where catalytic converters may cause a fire. Equipment and vehicles should stay on the paved areas.

All flammable liquids will be stored in Underwriters Laboratory (UL) or Factory Mutual (FM) approved storage cabinets. Small quantities of most flammable liquids (five gallons or less) may be stored in work areas, or carried in vehicles, providing those materials will be used that day and will be contained in a safety can or other approved container. Class IA flammable liquids should be limited to two gallons in an approved safety can. Any flammable wastes will be stored or disposed of in metal containers, clearly marked as containing flammable materials. Storage of combustible materials, in work areas, will be kept to a minimum.

An IT Hot Work permit must be completed and posted prior to any hot work (such as welding or cutting) on site, including hot work performed by subcontractors. The base fire department must also be contracted to determine if other permits are required prior to hot work.

In order to provide fire protection, IT will provide and maintain portable fire extinguishers as listed in Table 3-6 in the following manner:

- Portable fire extinguishers will be provided, where needed, and inspected on a monthly basis. A visual inspection will be made to ensure that extinguishers are fully charged and in an operable condition. Hoses, nozzles, brackets, and supports will be inspected for deficiencies and corrected. Gauge pressure will be checked on pressurized units on a monthly basis to ensure units are fully charged and non-pressurized units will have their cartridges weighed on an annual basis. The chemical within dry chemical extinguishers will be inspected on an annual basis to ensure that it is powdery and in a free-running condition. An inspection tag will be attached to all extinguishers to designate that they have received an annual inspection.
- Fire extinguishers will be suitably placed, distinctly marked, and readily accessible.
- A fire extinguisher with a rating of not less than 10-B will be located within 50 feet wherever more than 5 gallons of flammable liquid is being used on the work site (this does not apply to integral fuel tanks of motor vehicles).
- A fire extinguisher with a rating of not less than 20-B will be located outside of and within 10 feet of the door opening into any room, building, or trailer used for storage of more than 60 gallons of flammable or combustible liquids.
- If flammable liquids are being stored in an outside location, at least one portable fire extinguisher with a rating of not less than 20-B will be located at least 25 feet from the storage area, but not more than 75 feet away.
- All tank trucks or vehicles used for transporting and/or dispensing flammable or combustible liquids will have a portable fire extinguisher with not less than a 20-BC rating.
- A portable fire extinguisher with a rating of not less than 20-BC will be placed within 50 feet of each service or fueling area.
- Fire extinguishers will be placed in storage areas so they are capable of extinguishing materials being stored.
- All fire extinguishers will be approved by a nationally recognized testing laboratory.
- A fire extinguisher with a rating of not less than 2-A will be provided where torches or open flames are in use.

- At least one dry chemical or carbon dioxide fire extinguisher, with a 5-BC rating minimum, will be available for placement on each unit of heavy equipment, and each site vehicle (excluding rental cars).
- At least one dry chemical fire extinguisher with a rating of 2A 10BC shall be provided in any trailer used as office or work area. If computers or other electronic equipment is in use, an additional CO₂ extinguisher of a 5BC rating may be advisable.

Fuel handling is another hazard which will be present during this task. Refueling of the mechanical equipment poses burn hazards. All refueling and fuel handling equipment must be Underwriters Laboratories (UL) listed and Factory Mutual (FM) approved. The refueling must be done in a designated area to prevent contamination from minor spills and to reduce the risk of fires. The following guidelines must be followed whenever personnel are dispensing flammable and combustible liquids:

- Flammable liquid dispensing systems will be electrically bonded and grounded. All tanks, hoses, and containers of 5 gallons or less will be kept in metallic contact while flammable liquids are being transferred; transfer of flammable liquids in containers in excess of 5 gallons will be done only when the containers are electrically bonded.
- Flammable or combustible liquids will be drawn from, or transferred into, vessels, containers, or tanks within a building or outside only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self closing valve. Transferring by means of air pressure on the container or portable tanks is prohibited.
- Areas in which flammable or combustible liquids are transferred in quantities greater than 5 gallons from one tank or container to another will be separated from other operations by at least 25 feet or a barrier having a fire resistance of at least 1 hour. Drainage or other means will be provided to control spills.
- Natural or mechanical ventilation will be provided to maintain the concentration of flammable vapor at or below 10% of the lower explosive level.
- Dispensing units will be protected against collision damage.
- Dispensing nozzles and devices for flammable liquids will be of an approved type.

- Lamps, lanterns, heating devices, and similar equipment will not be filled while hot: these devices will be filled only in well-ventilated rooms free of open flames or in open air and will not be filled in storage buildings.

In case of a fire on the site, the PS will assess the situation and direct fire fighting activities. IT personnel trained in the use of extinguisher may attempt to extinguish the fire with available extinguishers, if safe to do so.

3.10.1 Environmental Hazards

Poisonous or stinging insects, spiders and/or snakes may be a concern for project personnel during sampling and other site activities. Disease vectors, such as ticks, may also be present. Poison oak or other noxious flora may be present on or near the site, and can cause severe skin irritation on contact. Physical hazards are also posed by native vegetation in the area, including thistles and other thorny weeds.

Site workers should inspect protected areas (e.g., boreholes, pits and storage areas) prior to reaching into them or entering them in any way. Stinging insects and their nests shall be avoided wherever possible, and workers shall wear long pants and gloves if necessary to protect them from insect bites and sharp or irritating plants.

Ticks. Ticks are vectors of many different diseases including rocky mountain spotted fever, Q fever, tularemia, Colorado tick fever, and lyme disease. They attach to their host's skin and intravenously feed on its blood creating an opportunity for disease transmission. Covering exposed areas of the body and the use of tick repellent are two ways to prevent tick bites. Periodically during the workday, employees will inspect themselves for the presence of ticks. If a tick is discovered, the following procedure should be used to remove it:

- Do not try to detach a tick with your bare fingers; microorganisms from a crushed tick may be able to penetrate even unbroken skin. Fine-tipped tweezers should be used.
- Grip the tick as close to your skin as possible and gently pull it straight away from you until it releases its hold.
- Do not twist the tick as you pull and do not squeeze its bloated body. That may actually inject microorganisms into your skin.

- Thoroughly wash your hands and the bite area with soap and water. Then apply an antiseptic to the bite area.
- Save the tick in a small container with the date, the body location of the bite, and where you think the tick came from.
- Notify the SHSO of any tick bites as soon as possible.

Recently, lyme disease has been the most prevalent type of disease transmitted by ticks in the United States.

Poisonous Plants. Poison ivy, poison oak, and poison sumac are identified by three or five leaves radiating from a stem. Poison ivy is in the form of a vine while oak and sumac are bush-like. All produce a delayed allergic hypersensitivity. The plant tissues have an oleoresin, which is active in live, dead, and dried parts. The oleoresin may be carried through smoke, dust, contaminated articles, and the hair of animals. Symptoms usually occur 24 to 48 hours after exposure resulting in burning or stinging, and weeping and/or crusted blisters. Should exposure to any of these plants occur, wash the affected area with a mild soap and water, but do not scrub the area. The best antidote for poisonous plants is recognition and avoidance.

Snakes. There are various types of poisonous snakes indigenous to the western United States. The degree of toxicity resulting from snake bites depends on the potency of the venom, the amount of venom injected, and the size of the person bitten. Poisoning may occur from injection or absorption of venom through cuts or scratches.

The most effective way to prevent snake bites is to avoid snakes in the first place. Personnel should avoid walking at night or in high grass and underbrush. Visual inspection of work areas should be performed prior to activities taking place. The use of leather boots and long pants will be required, since more than half of all bites are on the lower part of the leg. No attempt at killing snakes should be made; many people are bitten in such an attempt.

If someone is bitten by a potentially poisonous snake, the following treatment should be initiated:

- Keep patient calm
- Notify emergency medical services

- Wash the wound and keep the affected body part immobile
- Apply direct pressure to site of bite if bleeding is extreme
- Keep the affected area lower than the heart
- Carry a victim who must be transported, or have him/her walk slowly
- Transport to closest medical facility.

Flying Insects. Flying insects such as mosquitos, wasps, hornets, and bees may be encountered while site activities occur. Table 3-4 discusses problems associated with them.

Bird Excrement. Accumulation of bird excrement can pose a biological threat to site workers and visitors. There is a group of pulmonary disease and disorders which result from exposure to infected bird droppings. The inhalation of dust from infected droppings can result in one of these pulmonary infections. All site activities that deal with the disturbance of bird excrement will be performed in Level C PPE using high efficiency particulate air (HEPA) respirator filters at a minimum.

Hantavirus. Rodents, such as deer mice, can potentially carry hantavirus. Deer mice usually live at higher elevations, like mesas, and can be distinguished from other rodents by their small size (2 to 4 inches long) and by their bi-colored tail. However, the Center for Disease Control believes that other rodents also have the potential to carry the virus, so precautions must be taken when dealing with any species of rodent. It is not possible to distinguish whether a rodent carries the hantavirus by observation.

Hantavirus affects the respiratory system in humans. The first symptoms of infection can occur at any time up to 45 days after exposure and include one or more of the following: fever, muscle aches, headache, or coughing. These symptoms progress rapidly into a severe lung disease that often requires intensive care treatment. Hantavirus can be transferred to humans, primarily from breathing infected rodent excreta particles that have become airborne or ingesting excreta particles that have clung to hands or clothing. It can also be contacted from rodent bites or transferred through broken skin. Though the illness caused by hantavirus is severe, it is a relatively rare illness that can be prevented by simple precautions and common sense.

The best way to avoid contact with hantavirus is to avoid contact with rodents and their excreta. Do not leave food or garbage where rodents have access to them; this includes leaving food items

and wrappers in vehicles. When possible, seal any opening greater than 1/4-inch diameter in vehicles or structure with steel wool to prevent rodent access.

Minor amounts of rodent excreta and rodents caught in mouse traps may be disposed of by personnel, provided precautions are taken. A suggested procedure is:

- When excreta or dead rodents are discovered in an enclosed area, ventilate the area for 30 minutes; the more air flow the better.
- Wear the proper PPE.
- Implement dust suppression techniques (such as use of a “bug” sprayer filled with water and a small amount of detergent to lightly spray the floor prior to entry) may have to be used.
- To dispose of wastes, place the rodent excreta or dead rodent in a plastic bag. Rinse gloved hands with bleach solution of 1 part bleach to 10 parts water, then doff any PPE in proper order, placing disposable items, such as boot covers and respirator cartridges in with the wastes. Place the waste, if any, into a plastic bag and mark the bag clearly as “POTENTIALLY INFECTIOUS.” Wet the wastes with the bleach solution, seal the plastic bag, place it into a second plastic bag, and seal this bag also. Spray the outside of the plastic bag with a commercial spray disinfectant. The waste may be disposed of as regular garbage.
- After the wastes are properly bagged, spray the surfaces where the wastes originally were found with disinfectant.
- Thoroughly wash hands, face, and forearms with soap and water.

When mouse traps are used to control rodents, the traps should be checked on a regular basis. Dead rodents should be disposed of immediately; the trap may be discarded along with the dead rodent.

3.10.2 Dust Control

Remediation and demolition activities can create airborne dust. Excessive generation of dust can limit visibility, cause irritation to workers and create airborne chemical contamination which spreads the overall extent of contamination and puts nearby unprotected personnel at risk of overexposure.

Project personnel will take all reasonable precautions to minimize the generation of dust at the worksite. Such precautions include operating vehicles in a slow and deliberate manner and working materials in a wet state whenever possible. Where dust generation is significant, the Program CIH will be contacted to establish an air monitoring program and dust reduction measures (up to and including misting of the dust cloud or ceasing operations) shall be implemented.

The most effective way to control dust is to minimize its initial generation. Preventative measures will be implemented by project personnel to maintain fugitive dust emissions at levels below action levels established in Table 8-1. The following list details methods and measures to be applied.

Methods and Measures

- Enforcement of speed limits on haul roads
- Use of dust suppressants during loading and hauling operations;
 - Suppressants may include water spraying of haul roads, stockpile(s) and loading equipment
- Use manufactured dust suppressants which are environmentally acceptable
- Schedule and stage operations to take advantage of prevailing winds
- Schedule hauling operations to minimize trips on dirt haul roads
- Covering of stockpiles for long term storage.
- Dry brooming and dry power brooming are prohibited. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming.
- Only wet cutting is permitted for cutting concrete blocks and concrete.
- Air blowing shall not be permitted for cleaning surfaces

3.11 Use of Nuclear Density Gauge

Soil density testing may be conducted using a nuclear density gauge. A nuclear density gauge is an electronic instrument which uses a small amount of radioactive material to measure the

density and moisture of construction materials. The Cesium-137 (Cs-137) source capsule is in a holder threaded and adhered in the base of the gauge. The Americium-241/Be (Am-241) source is within the gauge and cannot be reached without disassembly of the gauge.

The radioactive material used in the gauge is in a dual sealed source capsule. This means it is inside of a stainless steel capsule which is sealed by welding, and inside of a second stainless steel capsule which is sealed by welding. There is little possibility that the radioactive material will escape. Current source construction techniques are to deposit the Cesium-137 into a ceramic material and fire it. If a source constructed in this manner was breached, the radioactive material may break or chip, but it would not be in a dust form. The use of a ceramic binder would compromise the intimacy of the Americium-Beryllium mixture so the Am-241/Be is pressed into a pellet.

All use of nuclear density gauges by IT or subcontractor personnel must be performed in compliance with the following requirements:

- Only authorized users may operate the density gauge. An authorized user has been properly trained on the use of the device and the hazards of radiation, and who has been so designated by IT's California Radiation Safety Officer (RSO), or the Subcontractor RSO. Authorized users must carry a letter of designation from the RSO.
- The RSO shall be notified of the planned use of the gauge at least two weeks prior to gauge use so that state nuclear license reciprocity arrangement maybe made for use of the gauge on a federal facility.
- IT will make sure that the Radiological Health Branch of the State Department of Health Services is notified regarding the transfer of gauges, and will maintain all records as required by the license and the regulations.
- In the case of subcontractor use of a nuclear density gauge, IT will ensure that the subcontractor provide a copy of their license and that they can operate the nuclear density gage on federal property. This shall include proof of current reciprocity with the U.S. Nuclear Regulatory Commission (NRC).
- The SHSO will assure that gauges are stored and secured in an appropriate area.

- All use of the nuclear density gauge shall be in compliance with IT Corporation's Radiation Safety Plan, and each user shall have read and reviewed a copy of this plan.
- At no time is the operator to leave the equipment unattended while out of its storage case, or in the possession of an unauthorized person.
- Keep all unauthorized persons out of the immediate operating area (at least 5 feet away).
- The operator must verify that the gauge has had leak test measurements at the proper interval.
- When not being used for field measurements the gauge will be placed in the "SAFE" position and returned to its storage case.
- When using the gauge the operator will wear the personal monitoring device (radiation dosimeter) assigned. When the operator is not using the gauge, the monitoring device will be kept in a low background, low heat area.
- During transportation the gauge shall be fully secured in the transporting vehicle and located away from personnel. When transported in a closed vehicle (car or van), the case will be locked and the vehicle will be locked when the operator is not with the vehicle. When transported in an open bed vehicle (pickup truck), the case will be locked and the case securely fastened and locked to the truck bed when the operator is not with the vehicle. The gauge will only be transported in an approved DOT shipping container with all the required labels and marking. The authorized user will inspect the shipping case to assure that it is physically sound and that all closure devices (hinges, hasps, latches, etc.) are properly installed, secured and free of defects.
- No one shall attempt to repair, modify or open the sealed source under any circumstances.
- The operator shall examine the integrity of the shutter of the gauge prior to use. If shutter integrity is in question, do not operate the gauge and notify the RSO.
- When field testing is complete the gauge will be returned to its place of storage as soon as possible.
- At all times, operators will observe as low as reasonably achievable (ALARA) principles to minimize any dose received. This may include: being near the

equipment only when necessary, standing away from the equipment when possible during operation, always have base pointed away from body.

- The following documents will be with the equipment storage case at all times (except as required during transport of the gauge):
 - Copy of the License,
 - Copy of authorization letter/card from RSO,
 - Copy of the Gauge Operations Manual,
 - Copy of the current Leak Test Certificate,
 - Copy of the current Transit Case Certificate.

- All personnel using the gauges will be assigned a personal monitoring device (dosimeter). These will be either a film badge which is exchanged monthly, or a thermoluminescent dosimeter which is exchanged quarterly. The badge will be returned to the IT RSO or subcontractor's RSO at the designated time. Badge loss must be reported immediately and supported by a memo to the appropriate RSO which includes date of incident, persons involved, description of the incident, and measures taken to prevent a reoccurrence.

3.12 Slip, Trip and Fall Hazards

Poor housekeeping results in a workplace which is laden with slip, trip and fall hazards. Such accidents can cause serious injuries, including broken bones, contusions, and/or deep lacerations.

Much of the work we do involves working on wet visqueen. This can increase the chances of slip, trip and fall injuries

To minimize slip trip and fall hazards caused by poor housekeeping, the following measures shall be taken:

- Work areas shall be inspected daily for adequate housekeeping and findings recorded on daily inspection reports.

- All stairways, passageways, gangways, and access ways shall be kept free of materials, supplies, and obstructions at all times.

- Loose or light material shall not be stored or left on roofs or floors that are not closed in, unless safely secured.

- Tools, materials, extension cords, hoses, or debris shall not be placed where they may cause tripping or other hazards.
- Tools, materials, and equipment subject to displacement or falling shall be adequately secured.
- Empty bags having contained lime, cement, and other dust-producing material shall be removed and properly disposed of immediately.
- Scrap lumber and debris shall be cleared from work areas and access ways.
- Personnel will avoid working on visqueen when it is unnecessary.
- Field technicians will work together when repositioning sandbags pulling visqueen or moving bales of hay (wet haybales are extremely heavy).

3.12.1 Sanitation

Break Area

A designated break area shall be established in the support zone. The break area shall contain drinking water and be arranged to provide shade to workers during hot weather (>85°F).

Potable Water

The following rules apply for all field operations:

- An adequate supply of potable water shall be provided;
- Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap;
- All containers used for drinking water shall be clearly marked and not used for any other purpose; and
- Disposable cups will be supplied; both a sanitary container for unused cups and a receptacle for disposing of used cups shall be provided.

Outlets for nonpotable water shall be identified to clearly indicate that the water is unsafe and is not to be used for drinking or washing. There shall be no cross connection (open or potential) between potable and nonpotable water systems. Nonpotable and potable water systems shall be physically separated so as to minimize confusion and possible cross contamination.

Toilet Facilities

A minimum of one separate toilet facility shall be provided for each 20 employees, or fraction thereof, of each sex. Such facilities may include both urinals and toilets, with the provision that the number of toilets is at least half of the minimum required number of facilities. Where there are less than five employees, separate toilet facilities for each sex are not required provided the toilet facilities can be locked from the inside and contain at least one toilet.

Toilet facilities on the site are to be kept clean, maintained in good working order and provided with an adequate supply of toilet paper.

Food Handling and Storage

There shall be no handling of food in the contaminated work areas of the work area. Food may be stored in refrigerators, however, those refrigerators may only be used for storage of foods, and beverages. Refrigerators used for sample or chemical storage should be clearly marked as such.

Trash Collection

Trash generated by project personnel will properly be disposed of in trash receptacles. These receptacles will be emptied regularly.

3.12.2 Other Safe Work Practices

- Horseplay is not permitted at anytime on the job.
- Workers shall not use equipment on which they have not been trained.
- Eating, drinking, smoking and applying cosmetics are allowed only in clean areas.

Table 3-1

Proposition 65 Warning and Notification

As required under the Safe Drinking Water and Toxic Enforcement Act of 1986 (also known as Proposition 65), on February 27, 1987, the Governor published a listing of those chemicals determined by the State of California to cause cancer, birth defects, or other reproductive harm. Proposition 65 requires that businesses that handle any of the listed chemicals notify people in the affected area of that fact. IT Corporation handles some of the listed chemicals at the Point Molate project in Richmond, California.

The chemicals present on site that have been determined to cause cancer include:

- benzene

The following contaminants on site have been determined by the State to cause reproductive harm:

- toluene

TABLE 3-2

HAZARDOUS AND TOXIC MATERIALS

CONTAMINANT (SYNONYM)	PHYSICAL DESCRIPTION	CHEMICAL & PHYSICAL PROPERTIES	INCOMPATIBILITIES	SOURCES & ANTICIPATED CONCENTRATION	TARGET ORGANS	SYMPTOMS OF EXPOSURE
Benzene	Colorless liquid with aromatic odor.	MW: 78 BP: 176°F MP: 42°F VP: 75 mm Hg Sol: 0.18% FP: 12°F LEL: 1.3% UEL: 7.1% IP: 9.25 eV	Chlorine, bromine with iron; strong oxidizers.	Contaminated groundwater, soil 7 ppb	Blood, bone marrow, eyes, skin, respiratory system, CNS.	Irritation of eyes, nose, respiratory system; headache, nausea, dizziness; fatigue, anorexia; dermatitis; abdominal pain, bone marrow depression.
Ethylbenzene	Colorless liquid with aromatic odor.	MW: 106 BP: 277°F MP: -139°F VP: 10 mm Hg Sol: 0.01% FP: 55°F LEL: 1.0% UEL: 6.7% IP: 8.76 eV	Strong oxidizers.	Contaminated groundwater, soil 2 ppb	Eyes, skin, upper respiratory system, CNS.	Irritation of eyes, mucous membranes; dermatitis; headache, narcosis, coma.
Ethyl chloride (chloroethane)	Colorless gas (or liquid below 54°F) with a pungent ether-like odor.	MW: 64.5 BP: 54°F MP: -218°F VP: >1 ATM Sol: 0.6% FP: NA (gas) LEL: 3.8% UEL: 15.4% IP: 10.97 eV	Chemical active metals such as sodium, potassium, calcium, powdered aluminum, zinc and magnesium; oxidizers; water or steam.	Contaminated groundwater, soil 4 ppb	Liver, kidneys, respiratory system, CVS	Incoordination, inebriate, abdominal cramps, cardiac arrhythmias, cardiac arrest, liver and kidney damage.
Gasoline	Clear liquid, may be yellow to red in color, with strong kerosene-like odor.	MW: Variable. BP: 74-430°F MP: N/A VP: 400 mm Hg Sol: Insoluble FP: -40°F LEL: 1.1% UEL: 7.6% IP: Not est.	Strong oxidizers.	Contaminated soil, groundwater 2,000 ppb	Skin, eyes, respiratory system, CNS.	Irritation of skin, eyes, respiratory system; headache, nausea, dizziness, coma, death; pulmonary edema, bronchitis.

Table 3-2

HAZARDOUS AND TOXIC MATERIAL CONTINUED

CONTAMINANT (SYNONYM)	PHYSICAL DESCRIPTION	CHEMICAL & PHYSICAL PROPERTIES	INCOMPATIBILITIES	SOURCES & ANTICIPATED CONCENTRATION	TARGET ORGANS	SYMPTOMS OF EXPOSURE
Toluene (Methyl benzene)	Colorless liquid with an aromatic odor like benzene.	MW: 92 BP: 231 F MP: -139 F VP: 22 mm Hg Sol: 0.05% FP: 40 F LEL: 1.3% UEL: 7.1% IP: 8.82 eV	Strong oxidizers.	Contaminated groundwater, soil 4 ppb	Skin, liver, kidneys, CNS.	Dermatitis; weakness, fatigue, dizziness; euphoria; dilated pupils, photophobia.
Xylenes	Colorless liquid with an aromatic odor.	MW: 106 BP: 281-292 F MP: -12-55 F VP: 7-9 mm Hg Sol: 0.00003% FP: 81-90 F LEL: 1-1.1% UEL: 6-7% IP: 8.44-8.56 eV	Strong oxidizers.	Contaminated groundwater, soil 11 ppb	Eyes, skin, gastrointestinal tract, blood, liver, kidneys, CNS.	Eye, nose and throat irritation; dermatitis; corneal lesions; dizziness, poor equilibrium; anorexia, vomiting, abdominal pain.

MW: Molecular weight.
 BP: Boiling point at 1 atmosphere pressure, in degrees Fahrenheit (F).
 MP: Melting point in °F.
 VP: Vapor pressure at 1 atmosphere pressure and 68°F.
 Sol: Solubility in water at 68°F, as percentage (%) by weight.
 FP: Flash point, closed cup method, in °F.
 LEL: Lower explosive limit in air, as % by volume.
 UEL: Upper explosive limit in air, as % by volume.
 IP: Ionization potential, in electron-volts (eV).
 CNS: Central nervous system.
 mm Hg: Millimeters of mercury.
 eV: Electron volts.
 °F: Degrees Fahrenheit.
 %: Percent.
 ppb: Parts per billion.
 mg/m³: Milligrams per cubic meter.
 µ/l: Micrograms per liter.
 >: Greater than.
 <: Less than.
 N/A: Not applicable.

TABLE 3-3

EXPOSURE GUIDELINES

CONTAMINANT (SYNONYMS)	OSHA PEL		ACGIH TLV		IDLH	WARNING PROPERTIES
	8-HR TWA	15-MIN STEL	8-HR TWA	15-MIN STEL		
Benzene	1 ppm	-	10 ppm	-	Suspected or confirmed human carcinogen	Odor Thresh: Not established Eye Irr Lvl: Not established
Ethylbenzene	100 ppm	125 ppm	100 ppm	125 ppm	2,000 ppm	Odor Thresh: 0.092-0.60 ppm Eye Irr Lvl: 200 ppm
Gasoline	300 ppm	500 ppm	300 ppm	500 ppm	Not established	Odor Thresh: Not established Eye Irr Lvl: Variable
Toluene	100 ppm	150 ppm	50 ppm	-	2,000 ppm	Odor Thresh: 10-15 ppm (OF) Eye Irr Lvl: 300-400 ppm
Xylenes	100 ppm	150 ppm	100 ppm	150 ppm	1,000 ppm	Odor Thresh: 200 ppm (OF) Eye Irr Lvl: 200 ppm

- OF: Olfactory fatigue occurs quickly after initial detection of odor.
- OSHA: Occupational Safety and Health Administration.
- ACGIH: American Conference of Government Industrial Hygienists.
- TLV: Threshold Limit Value.
- TWA: Time-weighted average.
- STEL: Short-term exposure limit.
- Hr: Hour.
- Min: Minute.
- f/cc: Fibers per cubic centimeter.
- mg/m3: Milligrams per cubic meter.
- PEL: Permissible Exposure Limit.
- ppm: Parts per million by volume.
- Odor Thresh: Odor threshold.
- Eye Irr Lvl: Eye irritant level.
- < : Less than.
- > : Greater than.
- ≈ : Approximately.

Table 3-4

FLYING INSECTS

Organism	Description	Habitat	Problem	Severity	Protection
Hornet	One inch long with some body hair. Abdomen is mostly black.	Round, paper-like nest hanging from trees, shrubs, or under eaves of buildings.	One nest may contain up to 100,000 hornets which will attack in force at the slightest provocation.	Severe pain, allergic reactions similar to bees.	Do not come near or disturb nest. If a hornet investigates you, do not move.
Mosquito	Small, dark, fragile body with transparent wings. From 1/8 to 1/4 inch long.	Where water is available for breeding.	Bites and sucks blood. Itching and swelling result.	Can transmit encephalitis and other diseases. Scratching causes secondary infections.	Use plenty of insect repellent and wear gloves.
Wasp	Very thin waist. Color can be black, yellow or orange with stripes.	Underground nest. Paper-like honeycomb nest in abandoned buildings hollow trees, etc.	Stings. Some species will attack if you get too close to the nest.	Severe pain, allergic reactions similar to bees. Can be fatal.	Avoid Nest. Do not swat at them.
Bee	Generally has yellow and black stripes and two pair of wings.	Hollow logs, underground nest, old buildings,	Stings when annoyed. Leaves venom sac in victim.	If person is allergic, nausea, shock, constriction of the airway can result. Death may result.	Be careful and watch where you walk. Cover exposed skin. Avoid areas where bees are swarming. Avoid wearing sweet fragrances and bright clothing. Move slowly or stand still when bees are swarming about you.

Table 3-5

Minimum Clearance from Energized Overhead Electric Lines

Nominal System Voltage	Minimum Required Clearance
0 - 50 kV	10 feet
51 - 100 kV	12 feet
101 - 200 kV	15 feet
201 - 300 kV	20 feet
301 - 500 kV	25 feet
501 - 750 kV	35 feet
751 - 1000 kV	45 feet

Table 3-6

Fire Extinguisher Requirements

Area	Rating	Location
Flammable liquids 5 gal or more used on worksite (not integral fuel tanks of motor vehicles.	10B	Within 50 feet.
Flammable or combustible liquids 60 gal or more. Stored inside a room, building or trailer.	20B	Outside of door of storage area and within 10 feet of the door.
Flammable liquids stored outside.	20-B	At least 25 feet but not more than 75 feet from storage area.
Tank trucks or vehicles used to transport or dispensing flammable or combustible liquids.	2A-20-BC	Mounted in or on vehicle.
Fueling area.	20-BC	Within 50 feet of service or fueling area.
Other storage areas.	2A-10-BC	Near exit no more than 75 feet unobstructed travel to extinguisher from anywhere in storage area.
Vehicle and heavy equipment.	1A-5-BC	Mounted in or on vehicle/ equipment.
Trailers/offices.	2A-10-BC	Mounted near exit not more than 75 unobstructed travel from anywhere in trailer/office.
Hot work activities	2A	Within 50 feet.

Note: These extinguisher ratings are the minimum acceptable for each listed application. Extinguishers with higher ratings may be substituted. For applications not listed contact program CIH for guidance.

4.0 Buddy System

Project staffing during hazardous waste operations shall meet the requirements and intent of the “buddy system,” which requires that at least two persons are required to be at the work area when work is conducted in the exclusion zone which might result in worker contamination.

The buddy system is a method of organizing employees into work groups and is designed to provide those employees with assistance when needed. Each employee in a work group is designated to be observed by at least one other person. Assignment of designated partners should take place during the Tailgate Safety Meeting (TSM).

The responsibility of the buddy is to:

- Provide assistance if needed;
- Maintain line of sight contact or verbal contact with workers in the EZ;
- Observe for signs of chemical or physical trauma or heat/cold stress such as:
 - changes in complexion and skin discoloration,
 - changes in coordination or demeanor,
 - excessive saliva and pupillary response,
 - changes in speech pattern;
- Periodically verify the integrity of all protective clothing; and
- Notify the SHSO if emergency help is needed.

Entry to or exit from the EZ under the conditions described earlier without a designated partner is prohibited.

The buddy system shall be used whenever workers enter the Exclusion Zones or whenever confined space entry or hot work is performed.

5.0 Personal Protective Equipment

5.1 Levels of Protection

The EPA's terminology for personal protective equipment (PPD) is used on this project (Levels A, B, C, and D). The levels of protection for each task has been assigned in accordance with Table 5-1. Based on the Job Hazard Analysis, project personnel will utilize Level D and modified Level D. Level C is not anticipated

At a minimum, four sets of appropriate PPE will be maintained at the site for Point Molate visitors. This does not include respiratory protection equipment which is to be supplied to non-IT personnel by their employer.

5.1.1 Level D Protection

Level D PPE will be used when:

- Work functions preclude significant splashes, immersions, or the potential for unexpected inhalation of, or contact with, hazardous concentrations of harmful chemicals.
- Atmospheric concentrations of contaminants are less than one-half the TLV/PEL.

Level D PPE at a minimum will consist of:

- Standard work uniform or coveralls, long pants, sleeved shirt
- Steel-toed work boots, ANSI approved
- Safety glasses, ANSI approved
- Hearing protection (if necessary) 25dBA or greater protection
- Splash shield (if necessary)
- Hard-hat, ANSI approved
- Leather palm gloves (if necessary).

Level D-modified PPE at a minimum will consist of:

- Standard work uniform or coveralls
- Steel-toed work boots, ANSI approved

- Steel-toed PVC* boots - if liquids encountered, ANSI approved
- Tyvek* coveralls with hoods and elastic wrists and ankles
- Leather-palmed gloves
- Latex gloves (inner) - if liquids encountered
- Nitrile gloves (outer) - if liquids encountered
- Hearing protection (if necessary) - 25dBA or greater protection
- Splash shield (if necessary)
- Hard-hat, ANSI approved
- Safety glasses, ANSI approved
- Rain gear or poly-coated Tyvek for pressure washing activities
- Metatarsal guards (pressure washing activities).

*Or other materials of construction as appropriate

5.1.2 Level C Protection

Level C protection will be used when:

- The types of air contaminants have been identified, concentrations have been measured, and an air-purifying respirator (APR) is available that can remove contaminants.
- Oxygen is at least 20%. The lower explosive limit (LEL) is less than 10%.
- The substance has adequate warning properties and all criteria for the use of an APR has been met.

Level C protective equipment at a minimum will consist of:

- Half-face APR with NIOSH/Mine Safety and Health Administration (MSHA)-approved cartridges (full face may be required if eye irritation is encountered.
- Combination filter/cartridge/organic vapor/acid gas/HEPA providing protection against:
 - Not more than 1,000 parts per million (ppm) organic vapors, chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide, and escape only from hydrogen sulfide

- Dusts, fumes, and mists having a TWA less than 0.05 milligrams per cubic meter (mg/m^3)
- Asbestos-containing dusts and mists
- Radio nuclides
- Cartridge approved for specific contaminants is cartridge above is not appropriate
- Surgical scrubs*
- Steel-toed PVC* boots - if liquids encountered, ANSI approved
- Tyvek coveralls with hoods and elastic wrists and ankles (poly-coated* when there is a potential for contaminated water contact)
- Leather-palmed gloves
- Latex gloves or Nitrile (inner) - if liquids encountered
- Nitrile* gloves (outer) - if liquids encountered
- Hearing protection (if necessary) - 25 dBA or greater protection
- Hard-hat, ANSI approved
- Safety glasses, ANSI approved
- Splash shield (if necessary)
- Duct tape openings (ankles, wrists, and respirator).

*Or other materials of construction as appropriate

5.1.3 Level B Protection

Level B Protection is required when airborne concentrations of hazardous materials exceed or are expected to exceed twice the OSHA permissible exposure limit (PEL) in confined spaces. Level B protection will not be used on this project without contacting the Program CIH for an addendum to this SHSP.

5.1.4 Level A Protection

Level A protection use is not anticipated during this project.

5.2 Respiratory Protection

Respiratory protective equipment will be NIOSH-approved and respirator use will conform to American National Standards Institute (ANSI) Z88.2, OSHA 29 CFR 1926.103, and 29 CFR 1910.134 requirements. IT Procedure HS601 further defines the respiratory protection program which details the selection, use, inspection, cleaning, maintenance, storage, and fit testing of respiratory protective equipment. This procedure complies with the requirements contained within 29 CFR 1926.103 and will be maintained in the SHSO's site office along with the rest of IT's Health and Safety Policies and Procedures. The basic requirements are as follows:

- All site personnel will have an assigned respirator face piece.
- Only properly cleaned, maintained, NIOSH-approved respirators are to be used on this site.
- Contact lenses are not to be worn when a respirator is required.
- All site personnel will be clean-shaven in facial areas which touch the sealing surface of the respirator.
- Respirators will be regularly inspected; a positive and negative pressure test will be performed prior to each use.
- When respirators are being used, they shall be cleaned at the end of the work shift using mild soap and warm water, and left to air dry. After drying, the respirator will be stored in a clean plastic bag.

All personnel (including visitors) performing on-site activities and using an air purifying respirator must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1926.103 within the last 12 months. Documentation of fit testing is the responsibility of each employer. Fit testing and any training related to respiratory protection for IT personnel will be documented on the IT Respiratory Training Completion Form.

5.3 Levels of Protection

The following is a brief description of the PPE which will be required during various phases of the project. The EPA terminology for protective equipment will be used; Levels A, B, C, and D. At a minimum, four sets of appropriate PPE will be maintained at the site for NAWs visitor usage.

5.4 Using Personal Protective Equipment

All persons entering the EZ will don the required PPE in accordance with the entries listed in Table 5-1. When leaving the EZ, PPE will be removed in accordance with the procedures listed, in order to minimize the spread of contamination.

5.4.1 Donning Procedures

These procedures are mandatory, only where Modified Level D or higher PPE is required for the project:

- Remove bulky outerwear.
- Put on the required chemical protective coveralls.
- Put on chemical protective boots.
- Tape the legs of the coveralls to the boots with duct tape.
- Put on chemical protective gloves.
- Tape the wrists of the protective coveralls to the gloves.
- Don respirator if required, and perform appropriate fit check.
- Put hood or head covering over head and respirator straps.
- Don remaining PPE, such as safety glasses or goggles and hard hat.

If these procedures are instituted, one person will remain outside the work area to ensure that each person entering has the proper protective equipment. No persons will be allowed to enter an EZ if they are not wearing the required PPE.

5.4.2 Doffing Procedures

Whenever a person leaves a work site requiring Modified Level D or higher PPE, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots.

- Clean reusable protective equipment.
- Remove protective garments, equipment, and respirator (if worn). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels.
- Wash face and hands immediately and shower as soon as possible.
- Proceed to clean area and dress in clean clothing.
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE will be bagged in plastic bags, and properly labeled for disposal.

The level of personal protection selected will be based upon real-time air monitoring of the work environment and an assessment by the Program CIH or SHSO of the potential for skin contact with contaminated materials. The PPE selection is given in Table 5-1.

5.5 Personal Protective Equipment for Visitors

An adequate supply of hard hats, safety glasses and other personal protective equipment will be maintained on-site for use by government personnel and other visitors, except other government contractors who must supply all of their own personal protective equipment. Visitors are not to be supplied with chemical protective clothing without prior approval by the SHSO, and proper training documentation. Respirators will not be issued to non-IT personnel.

5.6 Activity Specific Levels of Protection

The required level of protection is specific to the activity being conducted. At Point Molate the initial levels of PPE are listed in Table 5-1.

**Table 5-1
Activity/Level of Protection**

Task	Activity	Initial Levels of PPE
1	Mobilization	Level D
2	Site Preparation	Level D
3	Piping and Valve Installation	Level D, Modified Level D
4	Operation Test of Secondary Treatment System	Level D
5	Demobilization	Level D
6	Operation and Maintenance of Storm Water Treatment System	Level D

As site activities progress, levels of PPE are subject to change or to modification. Upgrading of PPE can occur when action levels are exceeded or whenever the need arises to protect the safety and health of site personnel. Levels of PPE will not be downgraded without prior approval from the CIH.

6.0 Site Control

The project area may be divided into three work zones: exclusion zone (EZ), a contamination reduction zone (CRZ), and a support zone depending on if contaminated materials are encountered. The PS and Program CIH or SHSO shall together be responsible for designation of the work zones.

The EZ will include any area where chemical contamination may be encountered and will be marked with barrier tape or other means to warn personnel of the hazards. This may include all active trenching areas and other areas where contaminated materials are handled or stored. The EZ will be large enough to prevent contamination from leaving the marked area.

Immediately adjacent to the EZ, a CRZ with a decontamination area for equipment and personnel will be established. This area will also be delineated with traffic cones and/or barrier tape. The CRZ will be large enough to provide a safety zone to prevent movement of contaminants from the EZ into the support zone.

The remainder of the IT project area will be designated as the support zone. No special markings or warning labels are required for this area.

Only personnel who have completed 40 hours of hazardous waste operations as defined under 29 CFR 1910.120/1926.65 or in California T8CCR5192, have completed their 40-hour training or refresher training within the past 12 months, have been certified as fit for hazardous waste operations by a physician within the past 12 months and are wearing the proper PPE shall be allowed within the EZ or CRZ. Personnel without such training may only enter the designated support zone. Only properly trained personnel will be allowed within the EZ or CRZ.

6.1 Hazard Briefing

No person will be allowed on the site during site operations without first being given a site hazard briefing. In general, the briefing will consist of a review of the tailgate safety meeting. All persons on the site, including visitors, must sign the Site-specific Tailgate Safety Meeting

Form and the Site Safety and Health Plan Acknowledgment Form. Tailgate safety meetings shall be held daily, involving all personnel on site.

6.2 Documentation of Certification

A subcontractor training and medical file will be established for the project and kept on site during all site operations. The 40-hour training, update, and specialty training (first-aid/cardiopulmonary resuscitation [CPR]) certificates, as well as the current annual medical clearance for all subcontractor personnel, will be maintained within that file. All IT and subcontractor personnel must provide their training and medical documentation to the SHSO prior to the start of field work. Documentation will be maintained at the project home office.

6.3 Entry Log

The SHSO at the site will maintain a site entry log with the names of all personnel who enter the EZ and CRZ. These logs shall be incorporated into the project file.

6.4 Emergency Entry and Exit

The exclusion zone, contamination reduction zones, evacuation routes, and emergency equipment locations will be included on a site map prior to the initiation of on-site activities. During an emergency, the evacuation routes noted on the site map should be followed. If conditions such as wind direction or physical hazards do not allow access to the prescribed evacuation routes, evacuate by the safest route available and decontaminate to the greatest extent possible. Additional emergency procedures can be found in Section 12.

6.5 Entry Requirements

In addition to the entry requirements listed above, no personnel will be allowed in any EZ or CRZ unless they are wearing the minimum PPE as described in Chapter 5.0.

7.0 Decontamination

In general, everything that enters an EZ at a site must either be decontaminated or properly discarded upon exit from an EZ. All personnel must enter and exit an EZ through a CRZ. Prior to movement from an EZ, contaminated equipment will be decontaminated and inspected by the SHSO before it is moved into the EZ. This inspection will be noted in the daily log.

7.1 Procedures for Equipment Decontamination

Any vehicles or equipment with detectable contamination will be decontaminated prior to leaving the CRZ. If the level of contamination is low, decontamination procedures will be limited to rinsing with water. A pressure washer will be on site so that any vehicles or equipment can be steam cleaned if the Program CIH or SHSO deem necessary. All pressure washing activities will be conducted in accordance with HS-303.

7.2 Personnel Decontamination

Personnel decontamination facilities will be established by IT on site to ensure that personnel maintain a high degree of personal hygiene and minimize the possibility of exposure to chemical hazards. These personnel hygiene facilities will conform to the requirements specified in 29 CFR 1926.65. A personnel decontamination area will be established immediately outside the EZ in the CRZ to facilitate contamination and PPE removal. All personnel exiting the EZ will pass through the decontamination area to remove gross contamination. Standard IT decontamination procedures are as follows:

Decontamination Procedures

- Step into first wash tub and wash PVC boots with soap solution and scrub brush.
- Step into second wash tub and rinse boots with clean water and scrub brush.
- Remove outer gloves (e.g., Nitrile) and dispose in the proper receptacle.
- Remove outer Tyvek coveralls and dispose in the proper receptacle.
- Remove PVC boots and place in boot rack.
- Remove respirator and place in container to be cleaned

- Remove inner gloves and dispose in the proper receptacle.
- Wash hands and face before eating, drinking, or smoking (break/end of shift).
- Redress in street clothes/leave site.

8.0 Site Monitoring

8.1 Air Monitoring

Air monitoring is essential to ensure that all field personnel are adequately protected from airborne contaminants. The levels of organic vapors in the work area will be monitored using a photoionization detector (PID) whenever work is performed that might generate organic vapors, dusts, fumes, mists or other airborne hazards:

- Mini Ram aerosol monitors will be used to measure respirable dust emissions.
- Combustible gas and oxygen reading will be conducted in the work area if flammable contaminants are anticipated.
- All air monitoring results will be documented in project logs.

Air monitoring will be used to determine the effectiveness of engineering control in keeping reading below the action levels as specified in Table 8-1.

The Program CIH may direct the SHSO to conduct integrated personal exposure monitoring. Integrated air samples will be analyzed through a laboratory accredited by the American Industrial Hygiene Association (AIHA).

8.1.1 Locations to be Monitored

All personal, integrated air monitoring samples and direct reading instrumentation readings taken for the purpose of determining appropriate health and safety precautions shall be collected/taken in the approximate "breathing zone" of site personnel. Locations for monitoring are found in Table 8-2.

If entry into a confined space is deemed necessary, combustible gas, oxygen, and total organics readings will be collected and recorded from the top, middle, and bottom of the confined space prior to initial entry. Once the IT entry supervisor and/or SHSO has reviewed this information, determined the PPE necessary for entry, and the entry has been initiated, readings shall be taken in the approximate "breathing zone" of the IT employee(s) working within the confined space. Readings may also be taken in other locations to determine areas of localized contamination or

combustibility within the confined space. Work shall stop and all personnel shall exit the confined space when readings exceed acceptable values at any location within the space.

8.1.2 Frequency

Breathing zone air monitoring must be conducted periodically throughout the day while work is being performed in the EZ regardless of the level of protection being worn. Such readings must be documented on FADL forms even if contaminant concentrations are “nondetectable” or “no meter response.” Frequency requirements for air monitoring are found in table 8-2.

Hourly air monitoring is required during active excavation of contaminated soils and during confined space entry. The SHSO may reduce the frequency of this monitoring only after receiving approval from the Program CIH.

8.1.3 Monitoring Equipment Maintenance and Calibration

All air monitoring equipment (e.g. photo ionization detectors and aerosol monitors) will be maintained and calibrated in accordance with the specific manufacturers’ procedures. Calibration will occur before and after each period of use.

All personal sampling pumps will be calibrated in accordance with OSHA sampling protocols and NIOSH methods for the analyte of interest.

All direct reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. All air monitoring equipment calibrations and maintenance activities will be documented on the IT FADL, or equivalent.

When applicable, only manufacturer-trained and/or authorized IT personnel will be allowed to perform instrument repairs or preventive maintenance.

8.2 Noise Monitoring

Noise monitoring may be performed by the SHSO under the direction of the Program CIH if high noise levels are routinely encountered. High noise levels are considered to be noise levels which make normal conversation difficult to understand at arm's length. The PS is to contact the SHSO or Program CIH if this situation is routinely present.

8.3 Heat Stress

Heat stress monitoring shall be initiated whenever ambient temperatures on site exceed 85°F. At the discretion of the Program CIH, environmental and/or physiologic monitoring will be carried out. Environmental monitoring shall consist of the determination of Wet Bulb Globe Temperatures (WBGTs). Physiologic monitoring may consist of pulse rate and/or body temperature determinations.

8.4 Safety Reviews

Jobsite safety reviews (audits) shall be conducted by all levels of project management.

Specifically:

- The SHSO shall inspect the jobsite at least daily. Findings shall be documented on FADLs and communicated to the PS.
- The PS shall conduct a safety audit with the SHSO at least weekly. Findings shall be documented on FADLs and communicated to project workers, the PM and Program CIH.
- The PM shall conduct an on-site safety audit at least monthly. Findings shall be documented on Safety Inspection Report (SIR) forms and copied to the Program CIH. Whenever possible, the Program CIH shall be included in these audits.
- The Program CIH may conduct unannounced jobsite safety audits at anytime. Findings will be documented on SIRs and copied to the PM and Program Manager.

8.5 Monitoring Records

The SHSO shall ensure that site monitoring records are complete and incorporated into the project file. Any personnel or area air monitoring results will be incorporated into the host office health and safety files. The Program CIH will be responsible for establishing, maintaining, and forwarding to other IT offices (as necessary) all required monitoring information as described below for placement in individual employee files:

- Employee name, social security number, payroll number
- The date, time, pertinent task information, exposure information
- Description of the analytical methods, equipment used, and calibration data

- Type of PPE worn
- Engineering controls used to reduce exposure.

8.6 Notification

The Program CIH will ensure that each employee is informed in writing of the results which represent that employee's exposure. Monitoring results representative of an employee's exposure shall be reported in writing to the affected employee, with copies retained in the project file and the employee's medical file.

Whenever the results indicate that the representative employee exposure exceeds the Permissible Exposure Limit (PEL), the notification shall state that the PEL was exceeded, and shall provide a description of the corrective action taken to reduce exposure to a level below the PEL.

IT may conduct industrial hygiene monitoring on subcontractor employees. Notification of subcontractor personnel of industrial hygiene monitoring results is the responsibility of the subcontractor.

**Table 8-1
Action Levels**

When in Level D PPE

Analyte	Action Level ¹	Required Action ²
Dust Unknown VOCs	≥ .5 mg/m ³ above background > 5 ppm above background	Upgrade to Level C Detector tube for Benzene, continue work if no Benzene detected
Benzene	> 1 ppm ≤ 5 ppm > 5 ppm	Upgrade to Level C Stop work; contact CIH ³
O ₂	≥ 23.5% or ≤ 20%	Stop work; determine cause ³
LEL	≥ 10% of LEL	Stop work; determine cause ³

When in Level C PPE

Analyte	Action Level ¹	Required Action ²
Dust Unknown VOCs	≥ 5.0 mg/m ³ above background ≥ 50 ppm above background in breathing zone (BZ)	Stop work; initiate dust suppression ³ Stop work; detector tube for benzene; if no benzene continue in Level C ³
Benzene	> 5 ppm ≤ 50 ppm	Upgrade to Level B, contact CIH ³
O ₂	≥ 23.5% or ≤ 20%	Stop work; determine cause ³
LEL	≥ 10% of LEL	Stop work; determine cause ³

When in Level B PPE

Analyte	Action Level ¹	Required Action ²
Unknown VOCs	≥ 100 ppm above background in BZ	Stop work; detector tube for benzene; contact CIH ³
O ₂	≥ 23.5% or ≤ 20%	Stop work; determine cause ³
LEL	≥ 10% of LEL	Stop work; determine cause ³

¹ Five excursions above the action level in any 15 minute period or a sustained reading in excess of the action levels for 5 minutes will trigger a response.

² Frequency of air monitoring may be adjusted by the CIH after sufficient characterization of site contaminants has been completed, tasks are modified or site controls have proven effective.

³ Contact with the Program CIH must be made prior to continuance of work. The Program CIH may then initiate integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the Program CIH.

Table 8-2

Air Monitoring Frequency and Location

WORK ACTIVITY	INSTRUMENT	FREQUENCY¹	LOCATION
Task 1			
Mobilization	PID O2/LEL Miniram	N/A N/A N/A	N/A N/A N/A
Task 2			
Site Preparation	PID O2/LEL Miniram Drager pump (Benzene)	N/A N/A N/A N/A	N/A N/A N/A N/A
Task 3			
Pipe and valve installation	PID O2/LEL Miniram	periodically N/A N/A	BZ of the employees N/A N/A
Task 4			
Operation test of secondary treatments system	PID O2/LEL Miniram Drager pump (Benzene)	Periodically N/A N/A Periodically	BZ of the employees and leak check N/A N/A BZ of the employees and leak check
Task 5			
Demobilization	PID O2/LEL Miniram Drager pump (Benzene)	N/A N/A N/A N/A	N/A N/A N/A N/A
Task 6			
Operation and maintenance of storm water treatment system	PID O2/LEL Miniram	Periodically N/A N/A	BZ of samples N/A N/A

¹ Frequency of air monitoring may be adjusted by the CIH after sufficient characterization of site conditions has been completed.

9.0 Employee Training

9.1 General

All personnel entering the EZ or CRZ shall have completed at least 40 hours of hazardous waste operations-related training, as required by 29 CFR 1910.120/1926.65 or T8CCR 5192. All field employees must have received a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Those personnel who completed the 40-hour training more than 12 months prior to the start of the project shall have completed an 8-hour refresher course within the past 12 months. The PS, PM, Program CIH and SHSO shall have completed an additional 8 hours of relevant supervisory health and safety training. With the exception of subcontractor personnel who will be working only in the support zone, subcontractor personnel must meet the above training requirements, with subcontractor supervisors also required to have the 8-hour hazardous waste supervisor training.

A copy of each training certificate will be maintained at the project job site. Subcontractors must provide certificates of training for the project file for all employees assigned to the project, if they will be working in either the EZ or CRZ. Training certificates for both subcontractor and IT personnel shall be maintained on-site.

9.1.1 Tailgate Safety Meetings

Prior to the start of the project, all personnel will participate in an initial tailgate safety meeting. During the initial tailgate safety meeting, the SHSP will be discussed. The PS will ensure that the anticipated site hazards are summarized and explained to all personnel, and that those personnel are aware of the precautions they must take to minimize their exposure to those hazards. Tailgate safety meetings will be held at the start of each work shift. All new employees must attend the meeting and be familiar with this SHSP. The PS will not delegate all safety related training to the SHSO.

Attendance records and meeting notes shall be maintained with the project files.

9.2 Hazard Communication

All personnel performing field activities will receive basic hazard communication training which involves a review of the IT written hazard communication program (IT Health & Safety Procedure HS060), MSDSs, container labeling, and chemical health hazards. Personnel will be trained on the hazards of chemicals handled or used on site by reviewing the Chemical Hazards listed in Section 3.2 of the SHSP and the MSDSs in Appendix B. MSDSs will be obtained for all materials purchased for the site that require them.

9.2.1 Site-Specific Health and Safety Plan

The SHSO will present the SHSP (including all attached MSDSs) and discuss it with all personnel assigned to the project. All workers and visitors must read and sign the SHSP acknowledging acceptance of site rules and understanding of site hazards before the start of the site work.

9.3 Site Workers' Basic Course

Each site worker will have received training in basic 40-hour HAZWOPER course and be current in that training through an annual 8-hour refresher training as required, as well as site specific training prior to performing field work. The content of the 40-hour HAZWOPER training will consist of:

- General site safety
- Physical hazards (fall protection, noise, heat stress, cold stress)
- Names and titles of key personnel responsible for site health and safety
- Safety, health, and other hazards typically present at hazardous waste sites
- Use of PPE
- Work practices by which employees can minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards

- Worker right-to-know (Hazard Communication, 29 CFR 1910.1200)
- Routes of exposure to contaminants
- Engineering controls and safe work practices
- Components of the site health and safety program
- Decontamination practices for personnel and equipment
- Confined-space entry procedures
- Emergency response plan.

9.4 Supervisors' Course Content

Management and supervisors must receive an additional eight hours of training that includes:

- General site safety and health programs;
- PPE programs;
- Air monitoring techniques;
- Spill containment techniques.

9.5 Site-Specific Training

Site-specific training will be accomplished through an initial review of this SHSP by the SHSO and through the daily tailgate safety meetings. All such training shall include signatures of all attendees and shall be documented to the project files.

9.6 First Aid and Cardiopulmonary Resuscitation (CPR)

At least two employees current in first aid/CPR will be assigned to the project and at least one of these will be on the site whenever operations are ongoing. First aid trained personnel shall also be trained in bloodborne pathogens hazards and precautions. First aid and CPR training courses are offered to all IT employees. Refresher training in first aid and CPR is required to maintain the currency of the certificate. The SHSO shall be current in first aid/CPR training.

10.0 Medical Surveillance Program

IT will utilize the services of a Board-Certified Occupational Medicine physician for the medical surveillance requirements of this project. EMR, Inc. (below) will review all medical examinations and will be available for medical consultation on an "as-needed" basis.

EMR, Inc.
4360 Chamblee Dunwoody Road
Suite 202
Atlanta, GA 30341
1-800-229-3674

10.1 Medical Examination

As required by IT Policy and Procedure HS100, all personnel on site working within a CRZ or EZ will have successfully completed a preplacement or periodic/updated physical examination. The contents of this examination have been determined by EMR and are consistent with the medical surveillance requirements for hazardous waste operations.

10.1.1 Preplacement Examination

This examination has been designed to meet 29 CFR 1926.65 or in California T8CCR5192 requirements for hazardous waste site operations.

The IT medical surveillance program examination at a minimum consists of:

- Medical and occupational history questionnaire which includes information on past gastrointestinal, hematologic, renal cardiovascular, reproductive, immunological, and neurologic problems
- Physical examination
- Blood pressure measurements
- Complete blood count (CBC) and differential to include hemoglobin and hematocrit determinations, red cell indices, and smear of peripheral morphology
- Blood urea nitrogen and serum creatinine
- Sequential Multiple Analyzer Computer (SMAC'24)

- Pulmonary function test
- Audiogram
- Electrocardiogram (EKG) for employees over 35 years old or when other complications indicate the necessity
- Drug and alcohol screening
- Visual acuity.

The following information is, or has been, provided to the examining physician:

- Copy of 29 CFR 1926.65 and their Appendices
- Description of employee's duties
- Contaminants potentially exposed to
- Description of the PPE to be used
- Information from previous medical exams.

The medical surveillance provided to the employee includes a judgment by the medical examiner of the ability of the employee to use either positive- or negative-pressure respiratory equipment. Any employee found to have a medical condition which could directly or indirectly be aggravated by exposure to these chemical substances or by the use of respiratory equipment will not be employed for the project. A copy of the medical examination is provided at the employee's request.

The employee will be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites.

10.1.2 Annual Examination

All IT employees receive an annual update examination meeting the requirements of 29 CFR 1926.65. The results of these exams are compared to previous results and the baseline physical to determine if any effects due to exposure have occurred. Appropriate actions are taken as recommended by the physician should the results indicate an exposure; otherwise, employees are cleared for continued work.

10.1.3 Exit Examination

IT offers exit physical examinations for all employees involved in the medical surveillance program who are leaving the company for any reason to ensure they are in good health.

10.2 Subcontractor Requirements

Subcontractors will provide documentation that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations will meet the requirements of 29 CFR 1926.65 and 29 CFR 1926.103, Respiratory Protection. Subcontractors will provide this documentation by supplying copies of the medical examination certificate for each employee they have on site.

10.3 Medical Records

Medical and personal exposure monitoring records will be maintained according to the requirements of 29 CFR 1926.65 and will be kept for duration of employment plus a minimum of 30 years. Confidentiality of employee medical records will be maintained. The written medical opinion from the occupational physician will be made available upon request to the ROICC site representative for any site worker.

10.4 Medical Restrictions

When a medical care provider identifies a need to restrict work activity, the employee's home office will communicate the restriction to the employee, the PS, the SHSO, and the CIH. The terms of the restriction will be discussed with the employee and the PS. Every attempt will be made to keep the employee working, while not violating the terms of the medical restriction. Employees that experienced chemical overexposure will not return to the EZ until released by a medical provider.

10.5 First-Aid and Medical Treatment

All persons on site must report any near-miss incident, accident, injury, or illness to their immediate supervisor or the Field Supervisor. First aid will be provided by the designated site first aider. Injuries and illnesses requiring medical treatment will require an Authorization for Treatment Form. The employee's supervisor or the Field Supervisor will complete the Supervisor's Employee Injury Report and conduct an accident investigation as soon as emergency conditions no longer exist and first-aid and/or medical treatment has been rendered. The investigation should follow the Accident/Injury Investigation Report. These two reports

must be completed and submitted to the SHSO within 24 hours after the incident. The ROICC must also be notified of the accident (via submittal of NAVFAC (CSIR) within 24 hours.

First-aid kits are kept at the CRZ and in all IT vehicles. If treatment beyond first aid is required, the injured should be transported to the medical facility listed in Chapter 12.0 of this SHSP and the PS should immediately contact the Martinez Health and Safety Administration at 510-372-9100 for treatment authorization. The PS should describe to the H&S Department Administrator the circumstances leading to the injury or illness. The Health and Safety Administration will provide authorization for treatment and will contact EMR Case Management to follow-up on the treatment that the employee is receiving, the work restrictions, and the return to work authorization.

If the injured is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

11.0 Bloodborne Pathogen Exposure Control Plan

This section serves as a Bloodborne Pathogen Exposure Control Plan for IT workers who may serve as voluntary first aid and CPR care providers. At all times, at least one person on site will be adequately trained in first aid and CPR, in the requirements of the Bloodborne Pathogens Standard as listed in 29CFR 1910.1030 and 8 CCR 5193, IT Procedure HS512, and in the contents of this plan.

11.1 Definitions

Bloodborne Pathogens

Bloodborne pathogens are those agents (i.e., bacteria, virus, fungi) found in blood, blood components, certain body fluids, and other materials, objects, or surfaces that have had contact with blood that are capable of causing human disease or death to unprotected people who came into contact with blood or blood-affected items. Diseases caused by bloodborne pathogens include, but are not limited to, hepatitis B virus (HBV), human immunodeficiency virus (HIV), hepatitis C, malaria, and syphilis. The most significant and of greatest concern are HBV and HIV.

Hepatitis B

HBV is the major bloodborne pathogen hazard that first aid/CPR care providers are more likely to encounter. The HBV can remain infectious for up to 10 days even in dried blood. The virus adversely affects 8,000 to 10,000 workers annually resulting in approximately 200 deaths each year. Hepatitis means "inflammation of the liver" causing severe liver damage or cirrhosis. Exposure symptoms include fever, fatigue, nausea, vomiting, muscle aches, loss of appetite, and jaundice (yellowing of the eyes or skin). Hepatitis diagnosis is difficult because some symptoms are similar to the flu and may remain mild for an extended period of time. Presently, no cure exists for hepatitis, but it can be prevented with a vaccination.

Human Immunodeficiency Virus

HIV attacks and deteriorates the body's immune system and eventually weakens it to the point that infection sets in causing the disease Acquired Immune Deficiency Syndrome (AIDS). HIV is primarily transmitted through sexual contact, but may also be transmitted through contact with

blood and body fluids. HIV is not transmitted by touching or working with people who are HIV-positive.

Human Immunodeficiency Virus Exposure Symptoms

HIV leads to AIDS-related illnesses which eventually cause neurological problems, cancer, pneumonia, and death. People may carry the virus for many years of their lives without experiencing any symptoms. Upon development, symptoms may include weight loss, skin lesions, dry cough, fever, fatigue, diarrhea, or swelling of the lymph glands.

Presently, no cure exists for HIV or AIDS and no vaccination is currently available.

11.2 Exposure Determination

Persons in any job classifications at IT may be exposed to bloodborne pathogens when administering first aid or CPR, or during decontamination of equipment/surfaces contaminated by blood or other potentially infectious materials during an incident.

IT employees could be subject to bloodborne pathogens exposure due to:

- Punctures through the skin with a contaminated sharp object (i.e., scissors)
- Contact or absorption of blood or blood-contaminated objects through open or broken skin (i.e., cuts, scratches, rashes)
- Blood splashes to their eyes, nose, or mouth or other mucous membranes.

Workers can reduce their risk of contacting HBV or HIV by implementing the proper work practices (outlined in this plan) before, during, and after responding to emergency medical incidents involving personal injuries.

11.3 Measures for Prevention

The establishment of work practice controls is an integral part of an effective exposure control plan in preventing accidental infection of employees. These work practices are designed to protect employees from reasonably foreseeable occupational exposures to bloodborne pathogens from blood and other potentially infectious material. The work practice controls outlined in this

section are applicable to the administration of first aid in emergency situations and subsequent cleanup only.

Universal Precautions

Universal precautions is an approach to infection control which operates on the assumption that all human blood and bodily fluids are to be treated as if they are known to be contaminated with HIV, HBV, or other infectious diseases. Universal precautions shall be implemented whenever there exists a foreseeable potential for contact with blood or bodily fluids.

Engineering Controls

Due to the remote location of the worksite, the nature of work in outdoor locations with potential exposure to airborne chemical contaminants, and the potential for exposure being limited to emergency situations, the implementation of engineering controls is not feasible. Exposure control shall be accomplished through implementation of work practice controls and use of personal protective equipment.

Work Practice Controls

Work practice controls shall be instituted whenever foreseeable potential contact with, or exposure to, blood and bodily fluid exists. Examples of situations in which these controls are to be implemented include, but are not limited to, accidents or injuries in which administration of first aid is required, application of bandages to minor cuts and abrasions of another person, and contact with sores, wounds, or broken skin.

Following are specific work practice controls that shall be implemented:

- Open wounds or cuts will be promptly bandaged.
- Wash hands and face as soon as possible after administering first-aid or CPR. If wash facilities are not readily available, stock disposable one-time use towelettes.
- No eating, drinking, or smoking is allowed in any work area where a potential exists for occupational exposure to blood borne pathogens.
- Non-disposable equipment or materials that have or may have blood or infectious fluid contact must be washed immediately after their use. (A 1 to 10 solution of bleach and water is recommended proper decontamination.)

- Any clothing that becomes contacted with blood or infectious fluids shall be removed as soon as possible after administering first aid or CPR.
- No personal clothing that becomes contacted with blood or infectious fluids shall be laundered off-site.
- Ensure that first-aid kits on-site are equipped with a pair of surgical gloves and CPR mouth pieces.

Direct contact with blood and bodily fluids should be kept to an absolute minimum, as required in a particular situation. In situations where direct contact is likely, personal protective equipment shall be worn to help prevent infection.

Based upon professional judgment, an employee may choose to temporarily forego the use of PPE if he determines that the use of PPE will further jeopardize his well-being or that of the injured worker. This limited application must be carefully evaluated by the employee. If this does occur, IT is obligated to investigate and document the circumstances in an effort to provide alternative means to avoid further occurrence.

Personal Protective Equipment

The following are specific personal protective equipment items that shall be implemented:

- Always wear hand (i.e. latex or nitrile surgical gloves) and eye (i.e. safety glasses, goggles) protection to administer or apply first aid or CPR.
- Always use CPR mouthpieces or ventilation devices.
- Inspect PPE prior to use to ensure it is in good working order and without flaws.
- Do not reuse gloves once removed.
- After use, remove gloves from top to bottom inside-out, not allowing unprotected skin to contact the exterior of the gloves.

Waste Handling and Disposal

Disposable items that have or may have blood contact must be bagged separately from other trash. These wastes must be placed in leak proof containers or bags and labeled. A collection

container for contaminated articles will be available on-site. Wastes used in medical emergency treatment (i.e., gloves, towels, gauze) shall be disposed in the infectious waste container(s). The container will be replaced as needed and not be overfilled.

The waste will remain on site in approved container(s) until an approved disposal facility capable of receiving medical wastes is identified. If emergency medical teams who respond to an incident are unable to accept blood-contaminated waste, the Program CIH shall be contacted to arrange for proper disposal.

11.4 Medical Requirements

Hepatitis B Vaccination

All potentially exposed employees will have made available to them at no cost a Hepatitis B vaccination. The employee will also receive training as to the vaccine's efficacy, safety, benefits, and consequences prior to administration. The vaccination series shall be initiated within 24 hours of providing first aid/CPR in an incident and shall be administered under the supervision of a licensed physician. Employees may at their own discretion decline the vaccination, in which case documentation of declination will be completed and employees may be assigned immediately. If an employee covered by this exposure plan decides to accept the vaccination at a later date, the vaccination will be offered at that time at no cost to the employee.

Post-Exposure Procedures and Evaluation

Subsequent to all reported exposure incidents, a confidential medical evaluation and follow-up shall be made available to each employee exposed in the incidents.

Documentation Procedures

Documentation of the exposure incident shall be recorded as soon as possible, and include the route(s) of exposure, the circumstances surrounding the incident, and the identification of the source individual. Additionally, each incident shall be placed on the "first aid incident list" attached to the location OSHA Log of Occupational Injuries and Illnesses.

Blood Testing

As soon as feasible, the source individual in an exposure incident will be asked to consent to a blood test to determine HBV and HIV infectivity. Where applicable laws require employee

consent, documented consent shall be obtained prior to testing. If an employee refuses the blood test, documentation of the refusal will be made. Documentation of the test results shall be made available to the exposed employee(s). All results should be kept confidential, as criminal and civil penalties may be charged against persons negligently or wilfully releasing such information.

Exposed employees will be asked to consent to a blood test for HBV and HIV serological status. If consent to HIV testing is denied, the blood sample will be preserved for 90 days, within such time the employee may elect to consent to the HIV test.

Post-Exposure Medical Evaluations

Exposed employees shall receive a healthcare professional's written opinion for post-exposure evaluations. The written opinion shall include the results of the evaluation and any medical conditions resulting from the exposure incident which requires further medical treatment.

11.5 Bloodborne Pathogen Hazard Communication

- Containers used for disposal of blood contaminated supplies and waste will be labeled in accordance with the word "biohazard."
- Warning signs are not applicable, as there are no designated areas for medical treatment on site. In cases of potential exposure observers and non essential personnel should be verbally warned to keep a safe distance from injured personnel.
- All associates who are first aid/CPR trained and may provide assistance shall be trained in the requirements of HS512 and this SHSP.

11.6 Record keeping

Training Records

All employees on the project shall review this plan and sign it to document their review. All employees who are trained to provide first aid and/or CPR shall be trained in the bloodborne pathogen standard, and on IT Corporation's Bloodborne Pathogen Exposure Control Plan. All employees who attend Bloodborne Pathogen training shall sign the class Training Attendance Form. The training record will contain the date; training outline; name and qualifications of the trainer, and names and job titles of attendees. All participants must take and pass the training

quiz. The training records will be maintained by the IT Training Department for at least three years from the training date.

Medical Records

Medical records necessary for IT employees must include documentation on HBV vaccination status, medical follow-up, post-exposure testing, and a medical professional's written evaluation. The employee medical records will be forwarded to WOHA (see Chapter 12.0) for inclusions in the employee's medical file.

IT shall maintain the employee medical records for the duration of the employee's employment plus 30 years thereafter. If, for whatever reason, IT no longer does business and no successor exists, IT will notify the Director of NIOSH in writing three months prior to the disposal of records. If so directed, the records shall be transferred to the Director of NIOSH.

Incident Recording

An incident that occurs as a result of rendering emergency medical care will be recorded on the OSHA 200 log as OSHA defines work-related injuries and illnesses. All injuries involving the release of blood or other bodily fluids must be immediately reported to the Program CIH to ensure proper reporting and follow up.

12.0 Emergency Response Plan

Site personnel must be prepared to respond and act quickly in the event of an emergency or accidental contaminant release. Emergency preparedness and response procedures will aid in protecting site workers and the surrounding environment. Preplanning measures will include employee training, fire and explosion prevention and protection, chemical spill and discharge prevention and protection, and safe work practices to avoid personal injury or exposure.

12.1 Personnel Roles/Lines of Authority

The roles and responsibilities of IT personnel for response to emergencies at Pt. Molate will be clearly defined and coordinated with IT subcontractors, ROICC personnel, and the Richmond Fire Department emergency response team. The Richmond Fire Department will evaluate the emergency situation and make the determination whether to involve the HAZMAT Unit in the response. The responsibilities of specific project individuals and the coordination of the Richmond Fire Department are defined as follows.

Project Superintendent. At all times during scheduled work activities, a designated PS will be present on site. This individual will be responsible for implementing these procedures and determining appropriate response actions. Depending upon the circumstances and time permitting, the PS will review proposed response actions with the SHSO, and the ROICC site representative. Specific responsibilities for the PS include:

- Evaluating and assessing emergency incidents or situations
- Assigning personnel and coordinating response activities on site
- Assuring that field personnel are aware of the potential hazards associated with the site
- Summoning the local emergency response team
- Notifying the Project Manager or, in his absence, the Program Manager of an emergency situation
- Coordinating response to an incident with the ROICC site representative

- Assuring that all IT emergency equipment is routinely inspected and functional
- Working with the SHSO regarding the correction of any work practices or conditions that may result in injury to personnel or exposure to hazardous substances
- Assuring that appropriate emergency response agencies are aware of the provisions made herein
- Evaluating the safety of site personnel in the event of an emergency, and providing evacuation coordination if necessary
- Maintaining site facilities and assisting site personnel in accessing those facilities
- Complete the appropriate form or forms and submit them to the program CIH within one business day of the incident.

The PS will direct all emergency response activities conducted or managed by IT and is responsible for field implementation and enforcement of health and safety policies and procedures. The PS will be fully trained in health and safety procedures and maintain current certification in standard first aid and CPR. Other responsibilities include overall supervision and management of field activities.

Site Health and Safety Officer. The SHSO is responsible for implementing, communicating, and enforcing health and safety policies and procedures during the course of the project. The SHSO will review the fitness and training records of all field personnel for compliance with the established requirements and will assist in arranging proper training and medical examinations. He will also assist in evaluating health and safety concerns with respect to environmental releases and emergency response actions. In the event of an injury, contact the Martinez Health and Safety Department for notification of EMR medical incident reporting case manager.

Project Manager. The PM will provide support to emergency responders and dedicate appropriate project resources to the response effort. If required, the PM will mobilize additional personnel and equipment to the site. The PM will notify and provide the ROICC site representative with recommendations concerning any additional action(s) to be taken. This will be accomplished by completing a NAVFAC (CSIR-1) Contractor Significant Incident Report.

This will be accomplished by completing a NAVFAC (CSIR-1) Contractor Significant Incident Report.

12.2 List of Emergency Contacts and Notification

The PS and SHSO will be notified immediately in the event of an emergency. The PS will immediately evaluate the incident and, if necessary, notify the ROICC and the Richmond Fire Department emergency support services. If not previously notified, the PM, ROICC site representative, and designated environmental contact will be advised of the situation. Telephone numbers for emergency contact personnel are listed in Table 12-1. The list will be maintained with current contacts, and telephone numbers will be posted along with other emergency phone numbers at all telephone locations at the site.

The information provided to the notified person should include the nature of the incident and the exact location and suspected contaminants or material involved. Information regarding the incident that should be reported to the emergency operator includes the following:

- Name and telephone number of the individual reporting the incident
- Location and type of incident
- Nature of the incident (fire, explosion, spill, or release) and substances involved
- Number and nature of medical injuries
- Movement or direction of spill/vapor/smoke
- Response actions currently in progress
- Estimate of quantity of any released materials
- Status of incident
- Other pertinent information.

A complete incident report will be completed by the SHSO and provided to the ROICC representative, once the urgency of the emergency incident has been resolved.

12.3 Medical Emergency Response

Prior to field work, the SHSO will contact all potential emergency organizations and coordinate any expected response in the event of a medical emergency. In the event of severe physical or chemical injury, emergency response personnel will be summoned for emergency medical treatment and ambulance service. Their response time is estimated to be between 5 and 10

minutes upon initial notification. The emergency medical responders will be utilized to provide care to severely injured personnel. In serious cases, the normal decontamination procedures may be abbreviated or bypassed. Care must be taken to prevent exposure to the emergency medical responders. Once an initial assessment is made by the emergency medical technicians, the decision on using ground or air transportation for the victims will be made. Minor injuries will be treated on site by qualified first-aid/CPR providers. These less serious injuries may only be treated after the employee has been decontaminated. If additional treatment beyond first aid is required, the injured personnel will be transported to the Brookside Hospital, which can provide 24-hour emergency medical care along with the services of a critical care center.

All employee injuries must be promptly reported to the PS.

Transportation routes and maps will be posted in the project office and in each site vehicle prior to the initiation of on-site activities. A copy of this map has been provided in Appendix A.

12.4 Personal Exposure or Injury

Every precaution will be taken to aid in the prevention of injuries and/or exposure to contaminants. These precautions are detailed in this SHSP and generally consist of the following measures:

- Personnel will be properly trained for their work duties
- Site personnel will wear appropriate PPE for each specific task or work assignment
- Site personnel will follow the proper field safety protocols as defined
- Site controls will be enforced so that only authorized personnel are able to access the work zones
- Site personnel will be made aware of potential environmental and chemical hazards
- Real-time air monitoring will be performed to evaluate the effectiveness of engineering controls and levels of personal protection
- Proper decontamination procedures will be followed for personnel and equipment.

In the event of personal exposure to contaminants, the following general guidelines will be adhered to:

- **Contact/Absorption** - Copious amounts of potable water will be used to flush, for at least 20 minutes, contaminants from the skin. This activity will occur in the on-site shower trailer. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. The condition of the individual will be assessed and transport to a medical center arranged if necessary. Do not transport victim unless the recommended flushing period is completed or flushing can be continued during transport.
- **Inhalation** - The victim will be moved immediately to an area providing fresh air. Decontamination of the victim and artificial respiration will be provided if necessary. The condition of the individual will be assessed and transport to a medical center arranged if necessary.
- **Ingestion** - Immediately contact local poison control center. The victim will be decontaminated, if necessary, and transported to a medical facility.

12.5 Fire Control

In the event of a fire or explosion, or imminent danger of fire or explosion, all activities will halt, and the Richmond Fire Department will be notified immediately. If it is safe to do so, site personnel may use fire-fighting equipment available on site to remove and isolate flammable or other hazardous materials which may contribute to the fire.

Upon arrival of the Fire Department emergency responders, the PS will advise the fire chief or lead representative of the location, nature, and identification of the hazardous materials on site. Prior to intrusive activities at the site, a tour conducted by the SHSO will be given to the Richmond Fire Department and HAZMAT Unit personnel. Specific hazards inherent with the site will be conveyed at that time.

The following measures will be implemented during site field activities to minimize the risk of fire and/or explosion:

- Smoking is permitted on site only in the designated smoke area
- Good housekeeping procedures will be required on site

- Material storage methods will be in accordance with manufacturers' recommendations
- Flammable liquids will be stored in approved containers and cabinets only
- All storage, handling, or use of flammable and combustible materials will be conducted by trained personnel
- Entry and exit pathways will be kept clear of debris or obstacles
- Work areas will be cleared of excess vegetation and obstructions.

12.6 Spills or Leaks

IT will maintain the following equipment and materials in the CRZ for use during spill response activities:

- Absorbent pads
- Granular absorbent material (noncombustible)
- Polyethylene sheeting
- 55-gallon drums
- Shovels and assorted hand tools.

If a hazardous waste spill or material release to the air, soil, or water at the site is observed, IT will immediately notify the ROICC site representative and HAZMAT Unit. An assessment will be made of the magnitude and potential impact of the release. If it is safe to do so, site personnel will attempt to locate the source of the release, prevent further release, and contain the spilled and/or affected materials as follows:

- The spill or release area will be approached cautiously. Real-time air monitoring will be continuously performed in the spill vicinity.
- Hazards will be identified based on available information from witnesses or material identification documents (placards, MSDSs, logs). The potential hazards will be evaluated to determine the proper personal protection levels, methods, and equipment necessary for response.
- If necessary, the release area will be evacuated, isolated, and secured.

- If possible, spill containment will initially be made without entering the immediate hazard area.
- Entry to the release area will be made with the PPE, personnel, methods, and equipment necessary to perform the work. Hazardous spill containment and collection will be performed in four steps as follows:
 - Contain the spill with absorbent socks, booms, granules, or construction of temporary dikes.
 - Control the spill at the source by plugging leaks, uprighting containers, over packing containers, or transferring contents of a leaking container.
 - Collect the spilled material with shovels or heavy equipment as necessary.
 - Store the spilled material for further treatment or disposal. Treatment and/or disposal options of the material will depend on the amount and type of material.

If site personnel cannot safely and sufficiently respond to an environmental release, evacuation of the area may be warranted. The decision to evacuate will depend upon the risk of exposure to EZ personnel and the severity of the release. The Richmond Fire Department will be notified in the event of a significant spill. Upon their arrival at the site, the PS will brief them on the current situation at hand and any potential hazards the team may be faced with.

12.7 Site Evacuation Procedures

The authority to order personnel to evacuate the area rests with the PS and SHSO. In the event that site evacuation is required, a continuous, uninterrupted air horn will be sounded for approximately ten seconds. Air horns will be located in the support zone area. Radio communication will also be used to keep continuous communication between the site and the main office.

Personnel working in the EZ or CRZ will immediately make their way to the decon pad for a "head count." Depending on the severity of the event and allowable time, personnel exiting the EZ and CRZ may be instructed to forgo or modify decontamination procedures.

Personnel in the support zone will immediately report to the field office for a "head count" and further instructions. The PS and the SHSO will remain in contact to ensure that evacuation

procedures are properly executed. If the field office is inaccessible, personnel will evacuate to an upwind location as determined by the windsock and perform a "head count."

Situations requiring evacuation may include unusually severe weather conditions, fires, or significant chemical spills or releases. In the event of project evacuation, the ROICC site representative, and the Richmond Fire Department will be notified immediately. A site emergency map that delineates evacuation routes, emergency air horn locations, first-aid kit locations, rally point, and site contamination control zone perimeters will be developed once an on-site evaluation of conditions and topography is complete.

12.8 Emergency Decontamination Procedures

Treatment of illnesses or injuries to personnel working within the contaminated areas of the site may be more difficult because of protective clothing requirements and the potential for exposure to the contaminants. The SHSO or Emergency Medical Care Provider must quickly assess the extent of the injury or illness of the victim. A determination will be made if lifesaving medical treatment is critical and if personal decontamination procedures will create additional injuries or aggravate the existing condition. Life-threatening injuries must receive immediate medical attention. Decontamination procedures may be modified, simplified, or eliminated completely under such circumstances.

The following guidelines are established for responding to minor emergencies where an individual may have been injured or overcome by exposure to a hazardous substance at the site. If a truly serious injury exists, only portions of these guidelines may be appropriate to ensure prompt medical treatment.

- Notify supervisory and safety personnel.
- Select an emergency decontamination location upwind and/or uphill from any spills, and determine most effective pathway for emergency vehicles.
- Field decontamination should be performed in two stages: washing with soapy water, followed by a clear water rinse.
- Upon arrival at the injured party, stabilize any life-threatening problems, such as spills or fires, and remove (i.e., brush or blot with absorbency pads) visible, gross contamination. If possible, prevent coming in contact with any contamination

present at the scene. However, do not delay with this task, and be prepared to transport immediately to the decontamination area.

- Have support personnel perform real-time air monitoring.
- Determine type, nature, and extent of exposure or injury based on mechanism.
- Quickly cut or tear first layer of protective clothing (outer suit) off of the injured party and discard. If cutting, always cut away from the body toward the extremities to avoid inflicting further injury.
- Without delay, efficiently move the injured away from the accident scene, possible contamination, or any hazardous substances. Relocate to a nearby “clean” area to expedite removal of respiratory protection and establish communication.
- If the individual is unconscious, evaluate if an adequate airway exists and breathing and circulation are present (ABCs). If absent, commence rescue breathing or CPR without delay.
- Move the injured to the decontamination area and transfer responsibilities to support personnel.
- Using soapy solution, support personnel should carefully wash outer garments as needed and rinse.
- Spray outer protective clothing with clear water.
- Quickly remove tape from the injured’s wrists and ankles—assume the individual is injured until an assessment indicates otherwise.
- Carefully, but quickly, cut second layer of protective clothing (inner suit, boots, and gloves) off injured party. Always cut away from the body toward the extremities to avoid inflicting further injury.
- Be prepared to turn emergency care over to Emergency Medical Service personnel. Otherwise, administer appropriate standard first aid to injuries.
- Following stabilization of any injuries, monitor and be on the alert for shock, wrap the injured in a warm blanket or other items to conserve body heat, and be prepared for vomiting.
- Cover any contact surfaces of transport equipment with a protective sheet or plastic.

- Inform all arriving personnel and transport crew of nature and extent of injuries and any potential hazards present.

12.9 Adverse Weather Conditions/Natural Disasters

Adverse weather and natural disasters can take many forms. Thunder and lightning storms, hail, high winds, tornados and earthquakes are a few examples. Sudden changes in the weather, extreme weather conditions, and natural disasters can create a number of subsequent hazards. Generally, poor working conditions arise, and slip, trip and fall hazards exist. Natural disasters can create many secondary hazards such as release of hazardous materials to the environment, structure failure and fires.

Routinely monitoring weather conditions and reports may help reduce the impact of severe weather and natural disasters. It may be necessary to halt certain hazardous operations or stop work altogether to allow the situation to pass. The SHSO must decide what operations, if any, are safe to perform based on existing conditions and anticipated conditions.

The best protection against most severe weather episodes and natural disasters is to avoid them. This means seeking shelter before the storm hits. Stay away from pipes and electrical equipment should lightning be a threat and watch for damage caused by lightning strikes nearby.

Earthquakes. The following general guidelines will be adhered to in the event of an earthquake:

- If you are indoors, duck or drop down to the floor. Take cover under a sturdy desk, table or other furniture. Hold on to it and be prepared to move with it. Hold the position until the ground stops shaking and it is safe to move. Stay clear of windows, fireplaces, and heavy furniture or appliances. Do not rush outside. You may be injured by falling glass or building parts. Do not try using the stairs or elevators while the building is shaking or while there is danger of being hit by falling glass or debris.
- If you are outside, get into the open, away from buildings and power lines.
- If you are driving - stop if it is safe - but stay inside. Do not stop on or under a bridge, overpass or tunnel. Move your car as far out of the normal traffic pattern as possible. Do not stop under trees, light posts, electrical power lines or signs.

12.10 Critique and Follow-Up of Emergency Procedures

The ROICC site representative will be verbally notified immediately and receive a written notification via the NAVFAC (CSIR-1) within 24 hours of all accidents or incidents including releases of toxic chemicals, fires, or explosions. The report will include the following items:

- Name, organization, telephone number, and location of the Contractor
- Name and title of the person(s) reporting
- Date and time of accident/incident
- Location of accident/incident (i.e., site location, facility name)
- Brief summary of accident/incident including pertinent details such as type of operation ongoing at time of accident
- Cause of accident/incident, if known
- Casualties (fatalities, disabling injuries)
- Details of any existing chemical hazard or contamination
- Estimated property damage, if applicable
- Nature of damage, effect on contract schedule
- Action taken by Contractor to ensure safety and security
- Other damage or injuries sustained (public or private).

The PS and the SHSO will investigate the cause of the incident to prevent its reoccurrence. The investigation should begin as soon as practical after the incident is under control, but not later than the first work day after the incident. Investigations will follow the procedures described below:

- Interview witnesses and participants as soon as possible or practical.
- Determine the chronological sequence of events (opinions as to cause should not be solicited at this time).

- Note the location, movement, displacement, liquid levels, sounds, noises, or other sensory perceptions experienced by the participants or witnesses.
- Obtain weather data.
- Ascertain the location and position of all switches, controls, etc.
- Verify the condition of all safeguards.

After the facts have been collected, causal factors should be identified. Two causal factors typically exist, apparent and contributing; and there may be several of each. Apparent factors are those which are self-evident or readily deduced. Contributing factors usually become apparent by questioning why the apparent causal factor was allowed to exist.

Table 12-1

EMERGENCY PHONE NUMBERS

Public Agencies

Fire	911
Ambulance	911
Police	911
Cal/OSHA	(415) 573-3864

Key Project and IT Personnel

IT Program Manager:	Valerie Crooks	(510) 372-9100
Program CIH	William Hetrick, CIH	(510) 372-9100
	Pager:	(510) 988-5979
Occupational Physician Environmental Medicine Resources	Elayne Theriault, M.D.	(800) 229-3674 (770) 455-0818
Medical Incident Reporting Environmental Medicine Resources	Shelli Wolfe, MSN, ANP Case Manager	(888) 679-2273
Navy Contact ROICC	Marcus Chan - Oakland ROICC	(415) 302-3367
Project Manager	Gary Elston	(510) 372-9100
Project Superintendent	John Fernandez	
Site Health and Safety Officer	Londell Allen	(510) 372-9100
Agency for Toxic Substance and Disease Registry (ATSDR)		(404) 639-0615
Local Emergency Planning Committee (LEPC)		(510) 646-5908
Regional Poison Control Center		(800) 523-2222

Medical Care Facilities:

Hospital Name:
Hospital Address:
Hospital Telephone:

Brookside Hospital
2000 Vale Road, San Pablo
(510) 235-7000

Directions to Brookside Hospital

Take Western Drive to 580 West,
580 West to Cutting Blvd.,
Cutting Blvd. to San Pablo Avenue,
San Pablo Avenue to Vale Road.
Make a left on Vale Road.
Brookside Hospital is on the left.

13.0 Summary and Checklist

Proper record keeping and data management are essential in the implementation of this SHSP. The forms associated with the record keeping and data management requirements must be completed in an accurate, timely fashion and filed with the appropriate entities. It is the responsibility of the PS to ensure that the forms are properly completed. Completed forms will be kept and maintained by IT. These records will be maintained for a five-year period. Subcontractors will also be responsible for keeping a copy of the forms pertaining to their personnel.

13.1 Logs

The SHSO will maintain and complete a daily log for each day's work. The daily log will document chronologically each day's health and safety activities in sufficient detail for future reference as needed. Other relevant data and field information will be recorded on separate log forms for air monitoring, sampling, equipment calibration inspections, and incident reporting.

An EZ sign-in log will be maintained that will provide a project record of the following information for confined space entry activities:

- Worker's name
- Work area
- Duties performed
- Level of protection
- Time in/time out

All personnel will be required to log in and out of the EZ.

A visitors sign-in log will be maintained in the project office and administration area. Visitors requesting access to hazardous field activities must have appropriate project approval, be medically qualified, and have the health and safety training prerequisites for hazardous waste operations.

An OSHA 2203 Job Safety and Health Protection poster will be clearly displayed in the site administration trailer.

13.2 Safety Inspections

IT's accident prevention program is centered around the following key procedures:

- Project reporting, investigation, and review of all near misses, incidents, and accidents
- Management reviews of all incident/accident reports, corrective action, and project safety concerns
- Review of project, operations, and construction activities by health and safety professionals.

Safety reviews and inspections are conducted by all tiers of the management structure and are documented. A list of all corrective action items is required to be maintained showing the corrective action, responsible person, and the date action is to be completed. Follow-up inspections are conducted by health and safety personnel to ensure that corrective actions or measures have been implemented.

The PS will inspect the site weekly and interview one or two site workers regarding areas of safety concerns or ideas for safety improvement. Site supervisory personnel will inspect site conditions and activities daily to identify changing conditions or potential hazards. Identified safety and occupational health deficiencies and suggested corrective measures will be brought to the attention of the PS and SHSO. Safety review inspections will be recorded and filed for reference by project management and ROICC personnel.

13.3 Accident Reporting and Investigation

All project personnel are required to report all near misses, injuries, illnesses, and accidents to their immediate supervisor. The SHSO will immediately arrange appropriate medical care as required. Once immediate medical care for the injured personnel has been accomplished, the SHSO will complete and submit the appropriate report forms within 24 hours. The appropriate form(s) to be completed may include:

- IT Supervisor's Employee Injury Report
- IT Vehicle Accident Report
- IT General Liability, Property Damage, and Loss Report
- NAVFAC Contractor Significant Incident Report (CSIR-1)

Copies of the IT forms listed in Appendix C of this SHSP, have been sent to the SHSO in a separate postings, permits and forms package.

Identified safety and occupational health deficiencies and corrective measures will be documented and filed on site for reference by the ROICC or designated representative.

All near misses, injuries, illnesses, and accidents will be investigated by on-site management personnel. The PS and SHSO will investigate the conditions which led to the accident. They will document how the accident occurred and identify unsafe acts or conditions that occurred or existed at the time of the accident. Corrective actions will be determined and implemented to prevent recurrence of the accident, and responsibility for implementation of corrective actions will be assigned. The investigation will be started immediately, and all information will be collected as soon as possible after the occurrence. The final report and required forms will be submitted to the ROICC and other appropriate personnel.

13.4 Summary and Checklist

13.4.1 Summary

This project involves the installation of a packaged water treatment system. The work will be performed in EPA Level C and D PPE.

- First aid kits (one per vehicle and facility)
- Fire extinguishers (one per vehicle and facility)
- Safety glasses or goggles, ANSI approved
- Hard hats, ANSI approved
- Ear plugs
- Noise dosimeters/sound level meter
- Impermeable gloves
- Work gloves
- Steel toed work boots, ANSI approved
- Steel toed impermeable boots, ANSI approved
- Tyvek suits
- PVC raingear
- Duct tape
- Trash bags
- Pressurized eyewash
- Portable toilet
- Drinking water and disposable cups
- Full face air purifying respirators
- Organic vapor/HEPA cartridges, NIOSH approved
- Photo ionization Detector (PID)
- Benzene colorimetric detector tubes and pump
- Methane and isobutylene calibration gases
- Tedlar calibration gas bags
- Lighted barricades and barricade tape
- Traffic cones

Proposition 65 Warning and Notification

As required under the Safe Drinking Water and Toxic Enforcement Act of 1986 (also known as Proposition 65), on February 27, 1987, the Governor published a listing of those chemicals determined by the State of California to cause cancer, birth defects, or other reproductive harm. Proposition 65 requires that businesses that handle any of the listed chemicals notify people in the affected area of that fact. IT Corporation handles some of the listed chemicals at the Point Molate project in Richmond, California.

The chemicals present on site that have been determined to cause cancer include:

- benzene.

The following contaminants on site have been determined by the State to cause reproductive harm:

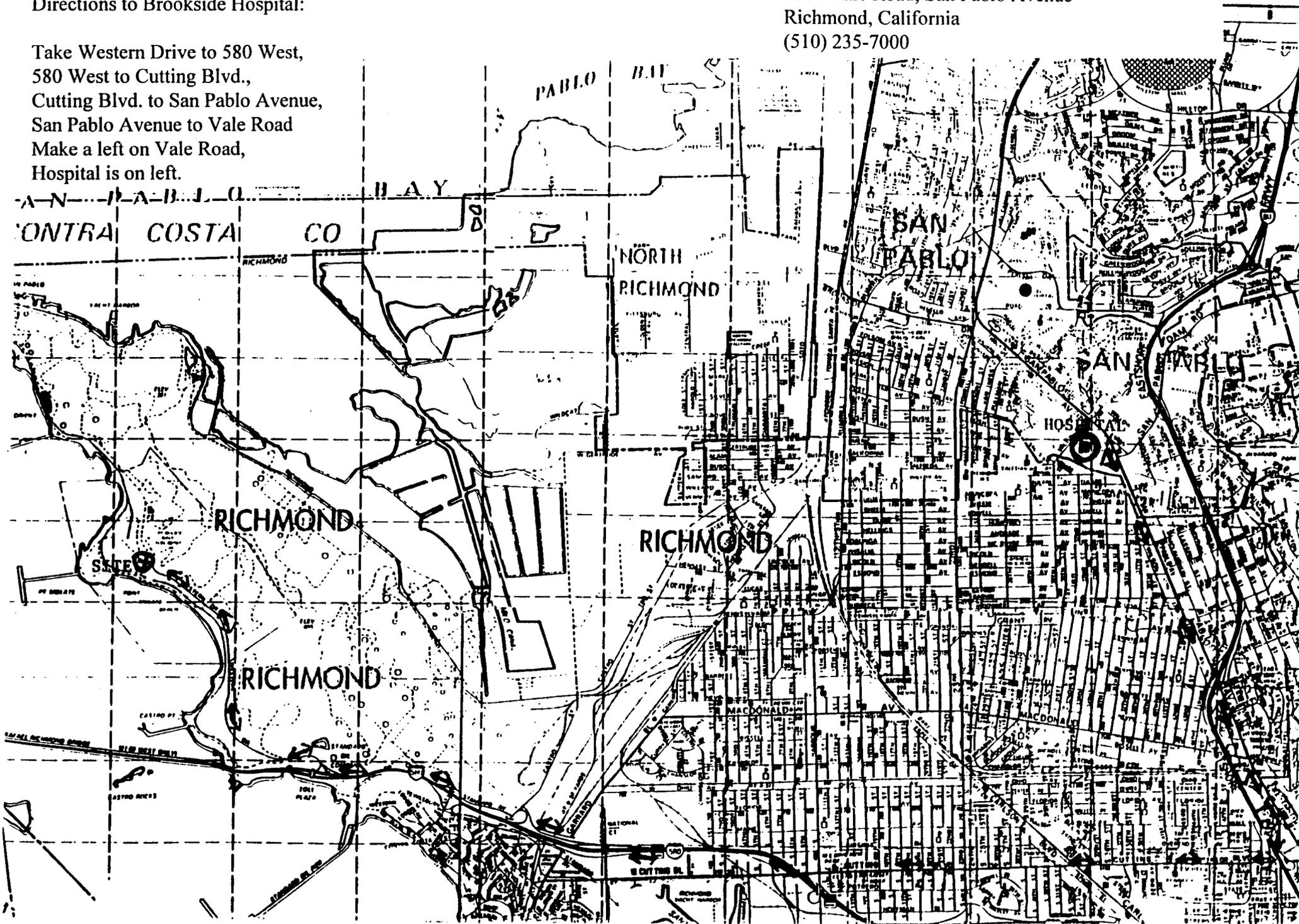
- toluene.

Appendix A
Site and Hospital Location Maps

Directions to Brookside Hospital:

Take Western Drive to 580 West,
580 West to Cutting Blvd.,
Cutting Blvd. to San Pablo Avenue,
San Pablo Avenue to Vale Road
Make a left on Vale Road,
Hospital is on left.

Brookside Hospital
2000 Vale Road, San Pablo Avenue
Richmond, California
(510) 235-7000



Appendix B

Material Safety Data Sheets and Occupational Health Guidelines



Genium Publishing Corporation

1145 Catalyn Street

Schenectady, NY 12303-1836 USA

(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 470

Diesel Fuel Oil No. 2-D

Issued: 10/81

Revision: A, 11/90

33

Section 1. Material Identification

Diesel Fuel Oil No. 2-D Description: Diesel fuel is obtained from the middle distillate in petroleum separation; a distillate oil of low sulfur content. It is composed chiefly of unbranched paraffins. Diesel fuel is available in various grades, one of which is synonymous with fuel oil No. 2-D. This diesel fuel oil requires a minimum Cetane No. (efficiency rating for diesel fuel comparable to octane number ratings for gasoline) of 40 (ASTM D613). Used as a fuel for trucks, ships, and other automotive engines; as mosquito control (loading on breeding waters); and for drilling muds. Other Designations: CAS No. 68334-30-3, diesel fuel. Manufacturer: Contact your supplier or distributor. Consult the latest Chemicalweek Buyers' Guide for a suppliers list.

R 1 NFPA
I - 2
S 2
K 2
HMIS
H 0
F 2
R 0
PPG
* See 8

Cautious: Diesel fuel oil No. 2-D is a skin irritant and central nervous depressant with high mist concentrations. It is an environmental hazard and moderate fire risk.

Section 2. Ingredients and Occupational Exposure Limits

Diesel fuel oil No. 2 D*

Table with 4 columns: 1989 OSHA PEL, 1990-91 ACGIH TLV, 1988 NIOSH REL, 1985-86 Toxicity Data. Values include: None established, Mineral Oil Mist, None established, Rat. oral, LD50: 9 g/kg produces gastrointestinal (hypermotility, diarrhea) effects.

* Diesel fuel No. 2-D tends to be low in aromatics and high in paraffins. This fuel oil is complex mixture of: 1) >95% paraffinic, olefinic, naphthenic, and aromatic hydrocarbons, 2) sulfur (<0.5%), and 3) benzene (<100 ppm). (A low benzene level reduces carcinogenic risk. Fuel oils can be exempted under the benzene standard (29 CFR 1910.1028)). Although low in the fuel itself, benzene concentrations are likely to be much higher in processing areas.

† As sampled by non-vapor-collecting method.
‡ Monitor NIOSH, RTECS (H71200000), for future toxicity data.

Section 3. Physical Data

Boiling Point Range: 340 to 675 °F (171 to 358 °C)
Viscosity: 1.9 to 4.1 centistokes at 104 °F (40 °C)
Appearance and Odor: Brown, slightly viscous liquid.
Specific Gravity: <0.86
Water Solubility: Insoluble

Section 4. Fire and Explosion Data

Flash Point: 125 °F (52 °C) min.
Autoignition Temperature: >500 °F (932 °C)
LEL: 0.6% v/v
UEL: 7.3% v/v
Extinguishing Media: Use dry chemical, carbon dioxide, or foam to fight fire. Use a water spray to cool fire exposed containers. Do not use a forced water spray directly on burning oil since this will scatter the fire. Use a smothering technique for extinguishing fire.
Unusual Fire or Explosion Hazards: Diesel fuel oil No. 2-D is a OSHA Class II combustible liquid. Its volatility is similar to that of gas oil. Vapors may travel to a source of ignition and flash back.
Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode and full protective clothing. If feasible, remove containers from fire. Be aware of runoff from fire control methods. Do not release to sewers or waterways due to pollution and fire or explosion hazard.

Section 5. Reactivity Data

Stability/Polymerization: Diesel fuel oil No. 2-D is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.
Chemical Incompatibilities: It is incompatible with strong oxidizing agents; heating greatly increases the fire hazard.
Conditions to Avoid: Avoid heat and ignition sources.
Hazardous Products of Decomposition: Thermal oxidative decomposition of diesel fuel oil No. 2 D can produce various hydrocarbons and hydrocarbon derivatives, and other partial oxidation products such as carbon dioxide, carbon monoxide, and sulfur dioxide.

Section 6. Health Hazard Data

Carcinogenicity: Although the IARC has not assigned an overall evaluation to diesel fuels as a group, it has evaluated occupational exposures in petroleum refining as an IARC probable human carcinogen (Group 2A). It has evaluated distillate (light) diesel oils as not classifiable as human carcinogens (Group 3).

Summary of Risks: Although diesel fuel's toxicologic effects should resemble kerosine's, they are somewhat more pronounced due to additives such as sulfurized esters. Excessive inhalation of aerosol or mist can cause respiratory tract irritation, headache, dizziness, nausea, vomiting, and loss of coordination, depending on concentration and exposure time. When removed from exposure area, affected persons usually recover completely. If vomiting occurs after ingestion and if oil is aspirated into the lungs, hemorrhaging and pulmonary edema, progressing to renal involvement and chemical pneumonitis, may result. A comparative ratio of oral to aspirated lethal doses may be 1 pt vs. 3 ml. Aspiration may also result in transient CNS depression or excitement. Secondary effects may include hypoxia (insufficient oxygen in body cells), infection, pneumonia, cilia formation, and chronic lung dysfunction. Inhalation may result in euphoria, cardiac dysrhythmias, respiratory arrest, and CNS toxicity. Prolonged or repeated skin contact may irritate hair follicles and block sebaceous glands, producing a rash of acne pimples and spots, usually on arms and legs.

Medical Conditions Aggravated by Long-Term Exposure: None reported.

Target Organs: Central nervous system, skin, and mucous membranes

Primary Entry Routes: Inhalation, ingestion.

Acute Effects: Systemic effects from ingestion include gastrointestinal irritation, vomiting, diarrhea, and in severe cases central nervous system depression, progressing to coma or death. Inhalation of aerosols or mists may result in increased rate of respiration, tachycardia (excessively rapid heart beat), and cyanosis (dark purplish discoloration of the skin and mucous membranes caused by deficient blood oxygenation).

Chronic Effects: Repeated contact with the skin causes dermatitis.

FIRST AID

Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.

Skin: Quickly remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. If large areas of the body have been exposed or if irritation persists, get medical help immediately. Wash affected area with soap and water.

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, do not induce vomiting due to aspiration hazard.

Contact a physician immediately. Position to avoid aspiration.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Gastric lavage is contraindicated due to aspiration hazard. Preferred antidotes are charcoal and milk. In cases of severe aspiration pneumonitis, consider monitoring arterial blood gases to ensure adequate ventilation. Observe the patient for 6 hr. If vital signs become abnormal or symptoms develop, obtain a chest x-ray.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, evacuate area for large spills, remove all heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Clean up spills promptly to reduce fire or vapor hazards. Use a noncombustible absorbent material to pick up small spills or residues. For large spills, dike far ahead to contain. Pick up liquid for reclamation or disposal. Do not release to sewers or waterways due to health and fire and/or explosion hazard. Follow applicable OSHA regulations (29 CFR 1910.120). Diesel fuel oil No. 2-D spills may be environmental hazards. Report large spills.

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations

RCRA Hazardous Waste (40 CFR 261.21): Ignitable waste

CERCLA Hazardous Substance (40 CFR 302.4): Not listed

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

SARA Toxic Chemical (40 CFR 372.65): Not listed

OSHA Designations

Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use a NIOSH-approved respirator with a mist filter and organic vapor cartridge. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*

Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.

Ventilation: Provide general and local explosion-proof ventilation systems to maintain airborne concentrations that promote worker safety and productivity. Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.⁽¹⁰⁾

Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

Contaminated Equipment: Never wear contact lenses in the work area; soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Use and storage conditions should be suitable for a OSHA Class II combustible liquid. Store in closed containers in a well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations. Use nonsparking tools and explosion-proof electrical equipment. No smoking in storage or use areas.

Engineering Controls: Avoid vapor or mist inhalation and prolonged skin contact. Wear protective rubber gloves and chemical safety glasses where contact with liquid or high mist concentration may occur. Additional suitable protective clothing may be required depending on working conditions. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Practice good personal hygiene and housekeeping procedures. Do not wear oil contaminated clothing. At least weekly laundering of work clothes is recommended. Do not put oily rags in pockets. When working with this material, wear gloves or use barrier cream.

Transportation Data (49 CFR 172.101)

DOT Shipping Name: Fuel oil

DOT Hazard Class: Combustible liquid

ID No.: NA1293

DOT Label: None

DOT Packaging Exceptions: 173.118a

DOT Packaging Requirements: None

MSDS Collection References: 1, 6, 7, 12, 73, 84, 101, 103, 126, 137, 132, 133, 136, 143, 146

Prepared by: NJ Allison, BS; Industrial Hygiene Review: DJ Wilcox, CH; Medical Review: AC Darrington, MD; Edited by: JR Stuart, MS

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MATERIAL SAFETY DATA SHEET

Diablo Petroleum, Inc.
3930 Pacheco Blvd.
Martinez, CA 94553

Emergency # - (415) 228-2222
Transport Emergency # -
CHEMTREC (800) 424-9300

AUTOMOTIVE GASOLINE

***** PRODUCT IDENTIFICATION *****

SUPPLIERS: Diablo Petroleum, Inc. DOT HAZARDOUS MATERIALS PROPER SHIPPING NAME:
CHEMICAL NAMES AND SYNONYMS: Hydrocarbon Gasoline
& Additives DOT HAZARDOUS CLASSIFICATION: Flammable Liqu
USE OR DESCRIPTION: Motor Fuel UN/NA IDENTIFICATION # - UN 1203

***** TYPICAL CHEMICAL AND PHYSICAL PROPERTIES *****

APPEARANCE: Clear to Orange VISCOSITY: At 100 F, SUS At 40 C, CST
ODOR: Hydrocarbon 30.0 1.0
RELATIVE DENSITY: 15/4 C BOILING RANGE: 75-430 F SOLUBILITY IN WATER:
0.7-0.76 FLASH POINT: F(C) Method Negligible
-40(-40) (ASTM D-56) VAPOR PRESSURE: 400.0
MM HG 20C
(REID VAPOR PRESSURE: 7-15 PS

***** INGREDIENTS *****

HAZARDOUS INGREDIENTS:	WT PCT (APPROX)	EXPOSURE LIMITS (TWA): MG/M3	EXPOSURE LIMIT PPM	EXPOSURE LIMIT SOURCE
GASOLINE	100	900	300	ACGIH-TLV
FOR REGULAR GASOLINE ONLY:				
Lead Alkyl Compounds	0.1	0.1 (Note: As Pb-Skin)		ACGIH-TLV

NOTE: Exposure limits shown are for guidance only. Follow Applicable Regulations.

***** FIRE AND EXPLOSION HAZARD DATA *****

FLASH POINT: F(C) (Method) FLAMMABLE LIMITS: NFPA CODES:
-40(-40) (ASTM D-56) LEL: 1.1 UEL; 7.6 Health 1
EXTINGUISHING MEDIA: Flammability 3
CO2, Foam, Dry Chemical or Water Fog Reactivity 0

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters must use self-contained breathing apparatus. Cool storage drums with water spray. Evacuate area. Prevent runoff from fire control or dilution from entering streams or drinking water supply.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Extremely Flammable Liquid. Vapor accumulation could flash and/or explode if in contact with open flame.

***** HEALTH HAZARD SUMMARY *****

THRESHOLD LIMIT VALUE (if established): 300 PPM
EFFECTS OF OVEREXPOSURE: Moderate Skin Irritation. Slight eye irritation. Respiratory irritation, dizziness, nausea, loss of consciousness.

AUTOMOTIVE GASOLINE

***** EMERGENCY AND FIRST AID PROCEDURES *****

EYE CONTACT: Flush with Water
SKIN CONTACT: Wash contact areas with soap and water. Launder contaminated clothing before reuse.
INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, use mouth to mouth resuscitation
INGESTION: Do not induce vomiting. Administer vegetable oil. Get medical assistance.
(NOTE TO PHYSICIAN: Material if aspirated into the lungs may cause chemical pneumonitis. Treat appropriately).

***** REACTIVITY DATA *****

STABILITY: Stable CONDITIONS TO AVOID: Heat, Sparks, Flame, and Build Up of Static Electricity
INCOMPATIBILITY (MATERIALS TO AVOID): Halogens, Strong Acids, Alkalines, and Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide (CO) from incomplete combustion.
HAZARDOUS POLYMERIZATION: Will not occur CONDITIONS TO AVOID: NA

***** SPILL OR LEAK PROCEDURES *****

ENVIRONMENTAL IMPACT:
Report spills as required to appropriate authorities. In case of accident or road spill notify CHEMTREC (800) 424-9300. U. S. Coast Guard regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Coast Guard Toll Free Number (800) 424-8802.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
Eliminate all ignition sources. Remove leaking containers to safe area. Absorb on fire retardant treated sawdust, diatomaceous earth, etc. Shovel up and dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulations, and product characteristics at time of disposal. Runoff may create fire or explosion hazard in sewer systems
WASTE MANAGEMENT:

Dispose of waste by supervised incineration in compliance with applicable laws and regulations.

***** SPECIAL PROTECTION INFORMATION *****

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
SKIN PROTECTION: If prolonged or repeated skin contact is likely, impervious gloves should be worn.
GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.
RESPIRATORY PROTECTION: Approved respiratory equipment must be used when vapor or mist concentrations are unknown or exceed the TLV.
VENTILATION: Ventilation required and equipment must be explosion proof. Use away from all ignition sources. Use in well ventilated area with local exhaust ventilation.
OTHER: Avoid prolonged repeated skin contact and breathing mists/vapors.

AUTOMOTIVE GASOLINES

***** TOXICOLOGICAL DATA *****

ACUTE

ORAL TOXICITY: (Rats)
LD50:5 G/KG. Considered to be no more than slightly toxic based on single dose level testing at 5 G/KG.
DERMAL TOXICITY: (Rabbits)
LD50:2 G/KG. Considered to be no more than slightly toxic based on single dose level testing at 2 G/KG.
INHALATION TOXICITY: (Rats)
Toxic (estimated) - Based on testing of similar products and/or the components.
EYE IRRITATION: (Rabbits)
May cause slight irritation -- Based on testing of similar products and/or the components.
SKIN IRRITATION: (Rabbits)
Moderately irritating to rabbits. May cause moderate irritation on prolonged or repeated contact.

SUBACUTE AND MUTAGENICITY (Summary)

NO INFORMATION AVAILABLE

CHRONIC OR SPECIALIZED (Summary)

Recent studies with laboratory animals have shown that Gasoline vapors when administered in high concentrations over a prolonged period of time, cause kidney damage and kidney cancer in rats and liver cancer in mice. As far as scientists know, low level or infrequent exposure to Gasoline vapors is unlikely to be associated with cancer or other serious diseases in humans. Regular Leaded Gasoline contains lead compounds. Lead can be a cumulative poison.

OTHER DATA

Gasoline consists of a complex blend of petroleum/processing derived paraffinic, olefinic, naphthenic and aromatic hydrocarbons which may contain up to 5 percent benzene and dosages of multifunctional additives. May contain lead antiknock compounds. The lead content may vary in compliance with EPA and State Regulations.

***** SPECIAL PRECAUTIONS *****

HANDLING: Avoid contact with skin. Avoid inhalation of vapors or mists.
Use in well ventilated area away from all ignition sources.
STORAGE: Ground and bond all transfer and storage equipment; use non-sparking tools and equipment. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters. Store away from all ignition sources in a cool area equipped with an automatic sprinkling system. Outside or detached storage preferred.
STORED MATERIALS MUST BE LABELED AS: Extremely Flammable. Vapor harmful.

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

Appendix C

Jobsite Postings, Permits, and Forms

Jobsite postings, permits and forms, as listed below, are being provided to the SHSO only for use on the job site:

Postings:

- CALOSHA Poster
Safety & Health Protection on
the Job
- Operating Rules for Industrial
Trucks
- Notice - On-The-Job Injuries
- Access to Medical & Exposure
Records
- Emergency Phone Numbers
- Workers Compensation
Instructions
- Confirmation of Registration of
Carcinogens

Human Resource Postings:

- IT affirmative action program
Handicapped Individuals and
Veterans of the Vietnam Era
- Discrimination in Employment
is Prohibited by Law
- Minimum Wage
- EDD Notice to Employees
- Notice: Employee Polygraph
Protection Act
- Notice to All Employees
Working on Federal Or
Federally Financed
Construction Projects
- Notice to Employees Working
on Government Contracts
- Your Rights Under the Family
and Medical Leave Act of 1993
- Payday Notice

Permits:

- Trench/Excavation
Annual Permit 1996
- Notification Form
- DOSH Address

Forms:

- Tailgate Safety Meeting
- Safety Inspection Reports
(5 pages)
- Supervisor's Employee
Injury Report
- Vehicle Accident Report
Accident Diagram
- Accident/Injury
Investigation
- General Liability,
Property Damage and
Loss Report
- Accident Review Board
- Contractor Significant
Incident Report (8 pages)
- Safety Inspection Check
List for Construction
Equipment (CESPD
Form 150-R)
- Photoionization Detector
Calibration Log
- Colormetric Detector
Tube Log
- Combustible Gas/Oxygen
Meter Calibration Log
- Integrated Air Sampling
Log
- Real Time Aerosol
Monitoring Log
- Hot Work Permit
- Confined Space Entry
Permit
- Underground and
Overhead Utility
Checklist

Appendix D

Activity Hazard Analysis

- 1. Mobilization***
- 2. Site Preparation***
- 3. Pipe and Valve Installation***
- 4. Operation Test of Secondary Treatment System***
- 5. Demobilization***
- 6. Operation and Maintenance of Storm Water Treatment System***

**ACTIVITY HAZARD ANALYSIS
MOBILIZATION**

Principal Steps	Potential Hazards	Recommended Controls
Installation of office and support structures	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift. Recommend wearing a back support if possible.
	Noise	Hearing protection is mandatory above 85 dBA.
	Falling objects	Hardhat, stay alert and clear of materials suspended overhead, steel-toed boots.
	Flying debris, dirt, dust etc.	Safety glasses/eye wash.
	Pinch points	Keep hands and feet clear of moving/suspended materials and equipment.
		Stay alert at all times!
		Beware of contact points.
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
		Fire lanes providing access to all areas shall be established and maintained free of obstruction (the minimum space between one-story non-fire-resistant buildings shall be 20 feet). Initial survey of the suitability and effectiveness of fire prevention and protection measures and facilities at each installation shall be made by competent persons.
	High winds	Mobile/portable facilities shall be anchored to withstand high winds.
	Hot work	Refer to H&S Policy HS 314.
	Vehicle traffic	Pay attention at all times.
		Make sure that operators of vehicles know that you are near their equipment.
		A spotter will aid in the backing of all vehicles with poor rear visibility.

Principal Steps	Potential Hazards	Recommended Controls
Installation of office and support structures	Contact With Utilities	Above and underground utilities shall be located. A qualified person shall install required utilities in compliance with national, state, and local codes.
	Slip, trip, and fall hazards	Determine best access route before transporting equipment.
		Good housekeeping, keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
		Look before you step, ensure safe and secure footing.
	Cut hazards	Wear adequate hand protection.
	Biological hazards	Inspect work area carefully and avoid placing hands or feet into concealed areas.
		Be alert for bees, spiders, ticks, and snakes.
	Hazardous plants (poison oak prevalent), insects, snakes, etc. (biological)	Remove vegetation, identify hazardous plants, insects, etc.
	Flood potentials	Check meteorology/climatology of area; history of flooding
	Toilets (sanitary)	Chemical toilets provided in accordance with SHSP.
	Heat stress	Refer to Section 3.2 of SHSP.
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
		Fuel will be transported and stored in approved containers.
	Contact with moving equipment/vehicles	Work area will be barricaded/demarcated.
	Hazard communications	Label all containers as to contents (fuel cans, etc.)
		Obtain Material Safety Data Sheets for materials brought on site.
	Cross contamination and contact with potentially contaminated materials	No Exclusion Zone activities are associated with this task.
	Strains and sprains	Use the proper tool for the job being performed.

Principal Steps	Potential Hazards	Recommended Controls
Installation of office and support structures		Get assistance if needed.
	Strains and sprains	Avoid twisting/turning while pulling on tools, materials, etc.
	Unattended worker	"Buddy system" visual contact will be maintained between personnel site activities.
Mobilization of trailers	Driving over soft ground	Make initial visual check. Level ground with loader and spread gravel.
		Apply gravel if needed to prevent mud of standing water. Loader (if used for spreading or grading) must meet all safety requirements.
	Level/Blocking trailer, driving stakes (stabilization) anchoring	Use caution when jacking and placing blocks or cribbing. If ground is soft, add stone to secure footing.
	Setting steps in place.	Steps must be OSHA-approved (with proper handrails, midrail, steps, with a platform in front of door; Refer to USACE (Section 21.E 02, 05, 07, 08)
		Lighting for work and means of egress; electrical hookup to trailers to be made by qualified electrician. GFCIs required on all circuits.
	Clearing hazards	If clearing is necessary, tree cutting will comply with chainsaw safety standards.
	Ventilation	Trailer ventilation shall not bring in exhaust from vehicles, etc.
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> •Hand tools •PPE •Heavy equipment •Vendor trucks 	<ul style="list-style-type: none"> •Pre-postmaintenance •Visual prior to use 	<ul style="list-style-type: none"> •Tailgate Safety Meeting •Site specific orientation •Hazard communication

**ACTIVITY HAZARD ANALYSIS
SITE PREPARATION**

Activity	Potential Hazards	Recommended Controls
Placement/unloading of construction materials	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Strains and sprains	Use proper lifting techniques, lifts greater than 60 lbs. require assistance or mechanical equipment. Size up the lift. Recommend wearing a back support if possible.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		All lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.

Activity	Potential Hazards	Recommended Controls
Placement/unloading of construction materials		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
	Heavy equipment operations	Machinery or equipment requiring an operator shall not be permitted to run unattended.
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
	Ropes, slings, chains and hooks	The use of ropes, slings and chains shall be in accordance with the safe recommendations of their manufacturer.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.
		Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.

Activity	Potential Hazards	Recommended Controls
Placement/unloading of construction materials		Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during it use to insure that it is safe. Defective rigging equipment shall be removed from service.
	Ropes, slings, chains and hooks	Rigging equipment, when not in use, shall be removed from the immediate work area and properly stored so as not to present a hazard.
		Taglines shall be used to control the loads being handled by hoisting equipment.
	Hoisting equipment	All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
Placement of building materials	Hoisting equipment	At no time shall the hoisting equipment be loaded in excess of the manufacturers rating.
		While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.
Support Area Construction	Knife cuts	Cutting strokes will always be away from the body.
		Leather gloves will be worn when cutting.
		Place knife in sheath on holder when not in use.
		Unused knives will never be left with cutting edges exposed.
		Never use a knife that is defective or has a broken blade or handle.
		Never use a knife as a prybar or screwdriver.

Activity	Potential Hazards	Recommended Controls
Support Area Construction		Don't use a dull blade; replace or have sharpened prior to use.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Flying debris	Wear safety glasses at all times.
	Fire	A dry chemical fire extinguisher with a minimum UL rating of 1A5BC will be readily available.
		No smoking or open flames within 50 ft. of the work area. (Work area will be posted)
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
		All hoses, couplings, fixtures, etc. shall be properly bonded and grounded.
		IT Corporation's HS314 "Hot Work in Hazardous Locations" Policy and Procedure shall be adhered to at all times.
	Fueling	Only UL/FM approved safety cans shall be used to store fuel.
		Do not refuel equipment while it is operating.
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.

Activity	Potential Hazards	Recommended Controls
Support Area Construction	Electrical hand tools/electrocution	Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Ground fault circuit interrupters inspect extension cords, hand tool inspection, lockout-tagout procedure.
	Contact with glues, solvents, etc.	Be familiar with the materials you are working with (MSDSs)
	Noise	If noise levels exceed 85 dBA wear hearing protection.
	Heavy lifting	Safe lifting procedures. Loads over 60 lbs require assistance or mechanical lifting device.
	Slip, trip and fall hazards	Good housekeeping
	Confined spaces	Follow policy and procedures for confined spaces.
	Excavation and trenching	Follow policy and procedures for safe trench excavation.
	Hot work	Hot work permits.
		Climbing of braces is prohibited.
Welding and Cutting	U.V. light and fire	Utilize appropriate eye protection. Provide fire watch. Obtain hot work permit. Torches must have anti-flashback device.
	Pressurized cylinders	Properly store and secure compressed gas cylinders.
Handling sharp objects	Cuts	Wear appropriate hand protection.
Grinding/sawing	Flying particles	Proper eye protection.
Working on elevated heights	Falls	Lanyards, lifelines, and ladder/scaffolding safety.
	Falling objects	Overhead protection hardhats.
Material storage	Flammable and combustible liquids	Store in NO SMOKING AREA and 50 ft. from combustible construction materials.
		Fire extinguisher readily available.

Activity	Potential Hazards	Recommended Controls
Material Storage		Properly grounded and bonded.
	Round stock	Secure from rolling, work from the top of the stack.
	Slip, trip and fall hazards	Good housekeeping
	Sprains and strains	Safe lifting procedures
	Pinch points/cuts	Adequate hand protection and observation of contact points.
	Hazard communication	Proper labeling/MSDSs.
Application of sealants	Pinch points	Beware of contact points.
		Keep hands, fingers, and feet clear of moving parts.
		Stay alert at all times!
	Cut hazards	Wear adequate hand protection.
	Noise	Noise levels above 85 dBA mandate hearing protection.
	Heavy lifting	Any lifting over 60 lbs. requires assistance or the use of a mechanical lifting device.
	Moving equipment	Signal person will assist in positioning equipment.
		Signal person will wear a reflective vest for high visibility.
	Contact with sealants	Personnel will wear adequate protective clothing and equipment to protect themselves against contact with sealant.
		MSDS's of all sealant materials will be obtained and reviewed with applicable personnel.
Material Hauling	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.
		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.

Activity	Potential Hazards	Recommended Controls
Material Hauling		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
	Dump truck operations	Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
		All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.
		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.
		Trip handles for tailgates will be arranged to keep the operator in the clear.
Clearing brush and debris	Slip, trip and fall hazards	Individuals must survey the terrain and look before stepping.
	Sharp objects	Individuals must be alert to sharp objects that may be lying under brush. Metal inserts may be used inside boots to make them puncture resistant.
	Poisonous plants, snakes and insects (poison oak prevalent)	Individuals must be aware of the potential for these hazards to be present. Precautionary measures to be taken will be addressed in daily tailgate safety meetings.
	Use of machetes.	Keep other personnel clear of swing area. Use extreme caution when using.
	Heavy lifting.	Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size up the lift. Recommend wearing a back support if possible.
	Pinch points	Keep hands, fingers and feet clear of moving/suspended materials and equipment.

Activity	Potential Hazards	Recommended Controls
Clearing brush and debris	Falling objects	Hardhat, stay alert and clear of materials suspended overhead; steel-toed boots.
	Flying debris, dirt, dust, etc.	Safety glasses/eye wash.
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> •Heavy equipment •Liner material •Fencing •PPE •Dump trucks •Hand tools 	<ul style="list-style-type: none"> •Pre-postmaintenance •Visual prior to use 	<ul style="list-style-type: none"> •Tailgate Safety Meeting •Site specific orientation •Hazardous waste operations •Hazard communication

**ACTIVITY HAZARD ANALYSIS
SURVEYING**

Principal Steps	Potential Hazards	Recommended Controls
Surveying	Slips, Trips, Falls	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work areas for slip, trip, and fall hazards.
		When working on uneven surfaces, take care when stepping. Watch where you walk.
	Moving vehicles	The wearing of high visibility vests is required in areas where vehicle traffic may be encountered.
		Flaggers and traffic control devices such as cones and barricades may be needed when working in traffic.
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> •Survey Equipment •PPE 	None	<ul style="list-style-type: none"> •Tailgate safety meeting •Site specific orientation •Hazard communications

**ACTIVITY HAZARD ANALYSIS
UTILITY CLEARANCE**

Principal Steps	Potential Hazards	Recommended Controls
Utility clearance	Slips, Trips, Falls	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work areas for slip, trip, and fall hazards.
		When working on uneven surfaces, take care when stepping. Watch where you walk.
	Moving vehicles	The wearing of high visibility vests is required in areas where vehicle traffic may be encountered.
		Flaggers and traffic control devices such as cones and barricades may be needed when working in traffic.
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> •Survey Equipment •PPE 	None	<ul style="list-style-type: none"> •Tailgate safety meeting •Site specific orientation •Hazard communications

**ACTIVITY HAZARD ANALYSIS
PIPE AND VALVE INSTALLATION**

Principal Steps	Potential Hazards	Recommended Controls
Installation of Pipe and Valves	Staging equipment	Signal person will assist in positioning equipment.
	Uneven terrain and poor ground support	Inspections or determinations of road conditions and structure shall be made in advance to assure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.
	Hoisting equipment	Ensure that the crane is level and, where necessary, blocked.
		Ensure that the load is secured and balanced in the sling or lifting device before lift.
		Ensure that the lift and swing path is clear of obstructions and adequate clearance is maintained from electrical sources.
		Ensure that all persons are clear of the swing radius of the counter weight.
		At no time shall the hoisting equipment be loaded in excess of the manufacturers rating.
		While hoisting equipment is in operations, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.

Principal Steps	Potential Hazards	Recommended Controls
Installation of Pipe and Valves	Contact with overhead power lines	See minimal clearances located in Table 3.5.
	Ropes, slings, chains and hooks	Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to insure that it is safe. Defective rigging equipment shall be removed from service.
		Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of ropes, slings and chains shall be in accordance with the safe recommendations of their manufacturers.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.
		Rigging equipment, when not in use, shall be removed from the immediate work area and properly stored so as not to present a hazard.
		Taglines shall be used to control the loads being handled by hoisting equipment.
	Falling objects	Remove unsecured tools and materials before operating equipment.
		Stay clear of materials suspended overhead.

Principal Steps	Potential Hazards	Recommended Controls
Installation of Pipe and Valves	Pinch Points	Keep feet and hands clear of moving/suspended materials and equipment
		Beware of contact points.
		Stay alert at all times!
	Cut hazards	Wear adequate hand protection
	Strains and sprains/heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs. requires assistance or mechanical equipment; size up the lift.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work areas for slip, trip and fall hazards.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Underground utilities	all underground utilities will be located prior to excavating.
	Open excavations	IT Policy and Procedure HS 307- "Confined Spaces" will be adhered to at all times.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.

Principal Steps	Potential Hazards	Recommended Controls
Installation of Pipe and Valves	Heavy equipment operations	Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting of or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
	Contact with overhead power lines	See minimal clearances in Table 3-5
	Heavy equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, endloader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
		all self-propelled construction equipment shall be equipped with a back-up alarm.
	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC.

Principal Steps	Potential Hazards	Recommended Controls
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> •Heavy equipment •Crane •Rigging 	<ul style="list-style-type: none"> •CESPD Form 150-R •IT Procedure HS 822 “Mobile Crane Inspection” •Pre and post maintenance prior to use 	<ul style="list-style-type: none"> •Tailgate safety meeting •Site specific orientation •Hazardous waste operations •Hazard communications •Crane operations

**ACTIVITY HAZARD ANALYSIS
TRENCHING/EXCAVATION OF CONTAMINATED MATERIALS**

Activity	Potential Hazards	Recommended Controls
Excavation	Underground utilities	All underground utilities will be located prior to excavating.
	Open excavations	IT Policy and Procedure HS307 - "Excavation and Trenching" will be adhered to at all times.
	Confined spaces	IT Policy and Procedure HS 300 - "Confined Spaces" will be adhered to at all times.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
Excavation	Heavy equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.

Activity	Potential Hazards	Recommended Controls
Excavation		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
		All self-propelled construction equipment shall be equipped with a back-up alarm.
	Contact with overhead power lines	See overhead clearances, Table 3-5
	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC
	Contact with potentially contaminated materials	Real-time air monitoring will take place. Proper personal protective clothing and equipment will be utilized.
		Good housekeeping will be stressed to safe guard against cross contamination of surrounding areas and eliminate safety hazards.
		All site personnel will practice good personal hygiene.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location.
		Refer to SHSP for chemical hazard discussion.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.

Activity	Potential Hazards	Recommended Controls
Excavation	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Strains and sprains Heavy lifting	Use proper lifting techniques, lifts greater than 60 lbs. requires assistance or mechanical equipment; size up the lift. Recommend wearing a back support if possible.
	Cut hazards	Wear adequate hand protection.
	Traffic	Work area will be barricaded off.
		Personnel will wear reflective vests for high visibility.
Material hauling	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.
		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.
		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
		Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
		All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.
		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.

Activity	Potential Hazards	Recommended Controls
Material hauling	Dump truck operations	Trip handles for tailgates will be arranged to keep the operator in the clear.
	Hazard communication	Obtain MSDSs for materials used on site. Label all containers as to contents.
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> • Hand tools • PPE • Heavy equipment • Dump trucks 	<ul style="list-style-type: none"> • Pre-postmaintenance • Visual prior to use • CESP 150-R 	<ul style="list-style-type: none"> • Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

**ACTIVITY HAZARD ANALYSIS
CONSTRUCTION OF GROUNDWATER TREATMENT PLANT**

Activity	Potential Hazards	Recommended Controls
Placement of building materials	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Strains and sprains	Use proper lifting techniques, lifts greater than 60 lbs. requires assistance or mechanical equipment; size up the lift. Recommend wearing a back support if possible.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
	Heavy equipment operations	Preventive maintenance procedures recommended by the manufacturer shall be followed.
		All lockout - tagout procedures shall be used for equipment found to be faulty or undergoing maintenance.
	Heavy equipment operations	Machinery and mechanized equipment shall be operated only by designated personnel.

Activity	Potential Hazards	Recommended Controls
Placement of building materials		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
	Ropes, slings, chains and hooks	The use of ropes, slings and chains shall be in accordance with the safe recommendations of their manufacturer.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.
		Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.
	Ropes, slings, chains and hooks	Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to insure that it is safe. Defective rigging equipment shall be removed from service.

Activity	Potential Hazards	Recommended Controls
Placement of building materials		Rigging equipment, when not in use, shall be removed from the immediate work area and properly stored so as not to present a hazard.
		Taglines shall be used to control the loads being handled by hoisting equipment.
	Hoisting equipment	All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
		At no time shall the hoisting equipment be loaded in excess of the manufacturers rating.
		While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.
GWTP Construction	Knife cuts	Cutting strokes will always be away from the body.
		Leather gloves will be worn when cutting.
		Place knife in sheath on holder when not in use.
		Unused knives will never be left with cutting edges exposed.
		Never use knife that is defective or has a broken blade or handle.
		Never use a knife as a prybar or screwdriver.
		Don't use a dull blade; replace or have sharpened prior to use.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Flying debris	Wear safety glasses at all times.

Activity	Potential Hazards	Recommended Controls
GWTP Construction	Fire	A dry chemical fire extinguisher with a minimum UL rating of 1A5BC will be readily available.
		No smoking or open flames within 50 ft of the work area. (Work area will be posted)
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
		All hoses, couplings, fixtures, etc. shall be properly bonded and grounded.
		IT Corporation's HS314 "hot Work in Hazardous Locations" Policy and Procedure shall be adhered to at all times.
	Fueling	Only UL/FM approved safety cans shall be used to store fuel.
		Do not refuel equipment while it is operating.
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
	Faulty or damaged equipment	A lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	Electrical hand tools/electrocution	Ground fault circuit interrupters, inspect extension cords, hand tool inspection, lockout-tagout procedure.

Activity	Potential Hazards	Recommended Controls
GWTP Construction	Contact with glues, solvents, etc.	Be familiar with the materials you are working with (MSDSs).
	Noise	If noise levels exceed 85 dBA wear hearing protection.
	Heavy lifting	Safe lifting procedures. Loads over 60 lbs require assistance or mechanical lifting device.
	Slip, trip and fall hazards	Good housekeeping.
	Confined spaces	Follow policy and procedures for confined spaces.
	Excavation and trenching	Follow policy and procedures for safe trench excavation.
	Hot work	Hot work permits.
	Scaffolding	IT Policy and Procedure HS308 "Scaffolding" will be adhered to at all times.
		Scaffolds and their components will be capable of supporting without failure at least 4 times the maximum anticipated load.
		Scaffolds will be plumb and level.
		Scaffolds will bear on base plates upon sills of other adequate foundation.
		Working levels of work platforms will be fully planked or decked.
		All planking of platforms will be either overlapped a minimum of 12 inches or secured from movement.
		Scaffold planks will extend over their end supports not less than 6 inches nor more than 18 inches.
	Scaffolding	Planking on scaffolds will extend from the toeboard to not more than 14 inches from the face of the structure unless standard guardrails are installed or personal fall protection systems are used.
		Planking will be supported or braced to prevent excessive spring or deflection; secured and supported to prevent loosening, tipping, or displacement.

Activity	Potential Hazards	Recommended Controls
GWTP Construction		Work platforms will be securely fastened to the scaffold.
		An access ladder or equivalent safe access will be provided.
		Climbing of braces is prohibited.
		When the scaffold height exceeds 4 times the minimum scaffold base dimension (including the width added by outriggers) the scaffold will be secured to the structure.
		Sections of metal scaffold will be securely connected and all braces will be securely fastened.
		Scaffolds will be properly braced by cross, horizontal, or diagonal braces or a combination of these braces, so that vertical members are securely together laterally and the cross braces will be of such a length so that they will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid.
		Frames will be placed one on top of the other with coupling or stacking pins to provide vertical alignment of the legs.
		If uplift may occur, panels will be locked together vertically by pins or equivalent means.
Welding and cutting	U.V. light and fire	Utilize appropriate eye protection. Provide fire watch. Obtain hot work permit. Torches must have anti-flashback device.
	Pressurized cylinders	Properly store and secure compressed gas cylinders.
Handling sharp objects	Cuts	Wear appropriate hand protection.
Grinding/sawing	Flying particles	Proper eye protection.
Working on elevated heights	Falls	Lanyards, lifelines, and ladder/scaffolding safety.
	Falling objects	Overhead protection, hard hats.
Material storage	Flammable and combustible liquids	Store in NO SMOKING AREA and 50 ft from combustible construction materials.

Activity	Potential Hazards	Recommended Controls
Material storage		Fire extinguisher readily available.
		Properly grounded and bonded.
	Round stock	Secure from rolling, work from the top of the stack.
	Slip, trip and fall hazards	Good housekeeping
	Sprains and strains	Safe lifting procedure
	Pinch points/cuts	Adequate hand protection and observation of contact points.
	Hazard communication	Proper labeling/MSDSs
Form work/pouring concrete	Pinch points	Beware of contact points.
		Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Cut hazards	Wear adequate hand protection.
	Noise	Noise levels above 85 dBA mandate hearing protection.
	Heavy lifting	Any lifting over 60 lbs require assistance or use of a mechanical lifting device.
	Moving equipment	Signal person will assist in positioning concrete trucks.
		Signal person will wear reflective vest for high visibility.
	Contact with wet concrete	Personnel will wear adequate protective clothing and equipment to protect themselves against chemical burns caused by contact with wet concrete.
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> • Scaffolding • Hand Tools • Heavy Equipment 	<ul style="list-style-type: none"> • Pre-post maintenance • Visual prior to use • CESP 150-R 	<ul style="list-style-type: none"> • Tailgate safety meeting • Site specific orientation • Hazardous waste operations • Hazard communication

**ACTIVITY HAZARD ANALYSIS
OPERATION TEST OF SECONDARY TREATMENT SYSTEM**

Activity	Potential Hazards	Recommended Controls
Test Operation of Sand Filter Backwash and Organoclay Adsorption System	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs, require assistance or mechanical equipment; size-up lift. Recommend wearing a back support if possible.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Fueling	Only UL/FM approved safety cans shall be used to store fuel.
		Do not refuel equipment while it is operating.
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition. All piping will be hydrostatically tested at 40 psi for at least one hour. Any leaks will be repaired or defects corrected at once.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	Unqualified operators	Machinery and mechanized equipment shall be operated only by designated personnel.

Activity	Potential Hazards	Recommended Controls
Operation of Filter System	Out of control equipment	Machinery or equipment requiring an operator shall not be permitted to run unattended.
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	Sound levels above 85 dBA mandates hearing protection.
	Activation during repairs	All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Falling objects	Hardhats, remove unsecured tools and materials before operating equipment.
		Stay alert and clear of materials suspended overhead.
	Flying debris	Safety goggles/splash shield will be used.
	Contact with potentially contaminated materials	Appropriate PPE will be utilized.
	Confined space	IT Policy and Procedure HS300 "Confined Spaces, Industrial" will be adhered to at all times as applicable.
	Hot work	IT Policy and Procedure HS314 "Hot Work in Hazardous Locations" will be adhered to at all times during any operations involving hot work.
General Maintenance and Repair	Equipment Operations	All lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.

Activity	Potential Hazards	Recommended Controls
General Maintenance and Repair	Equipment Operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		All self-propelled equipment shall be equipped with a back-up alarm.
	Contact with process chemicals	Proper protective clothing and equipment will be used.
	Contact with potentially contaminated materials	Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.
		Good housekeeping will be stressed to safeguard against cross-contamination of surrounding areas and eliminate safety hazards.
	Contact with potentially contaminated materials	All site personnel will practice good personal hygiene.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards:
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

Activity	Potential Hazards	Recommended Controls
General Maintenance and Repair	Strains and sprains	Use proper lifting techniques. Lifts greater than 60 lbs requires assistance or mechanical equipment. Size up the lift. Recommend wearing a back support if possible.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Equipment Operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
	Ropes, slings, chains and hooks	The use of ropes, slings and chains shall be in accordance with the safe recommendations of their manufacturer.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.
		Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.
		Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to insure that it is safe. Defective rigging equipment shall be removed from service.
	Ropes, slings, chains and hooks	Rigging equipment, when not in use, shall be removed from the immediate work area and properly stored so as not to present a hazard.

Activity	Potential Hazards	Recommended Controls
Ground Maintenance and Repair		Taglines shall be used to control the loads being handled by hoisting equipment.
	Hoisting equipment	All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
		At no time shall the hoisting equipment be loaded in excess of the manufacturers rating except during performance tests.
		While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.
	Pinch points/cuts	Adequate hand protection and observe contact points.
	Electrical hand tools/electrocution	Ground fault circuit interrupters, inspect extension cords, hand tool inspection, lockout-tagout procedures.
	Contact with glues, solvents, etc.	Be familiar with the materials you are working with (MSDSs)
	Noise	If noise levels exceed 85 dBA wear hearing protection.
	Heavy lifting	Safe lifting procedures. Loads over 60 lbs require assistance or mechanical lifting device.
	Slip, trip, and fall hazards	Good housekeeping
	Confined spaces	Follow policy and procedures for confined spaces.
	Excavation and trenching	Follow policy and procedures for safe trench excavation.
	Hot work	Hot work permits.
Welding and Cutting	U.V. light and fire	Utilize appropriate eye protection. Provide fire watch. Obtain hot work permit. Torches must have anti-flashback device.
	Pressurized cylinders	Properly store and secure compressed gas cylinders.

Activity	Potential Hazards	Recommended Controls
Handling sharp objects	Cuts	Wear appropriate hand protection.
Grinding/sawing	Flying particles	Proper eye protection.
Working on elevated heights	Falls	Lanyards, lifelines, and ladders/scaffolding safety.
	Falling objects.	Overhead protection hardhats
Material storage	Flammable and combustible liquids	Store in NO SMOKING AREA and 50 ft from combustible construction materials.
		Fire extinguisher readily available.
		Properly grounded and bonded.
	Round stock	Secure from rolling, work from the top of the stack.
	Slip, trip and fall hazards	Good housekeeping
	Sprains and strains	Safe lifting procedures
	Pinch points/cuts	Adequate hand protection and observation of contact points.
	Hazard communication	Proper labeling/MSDSs
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> • Hand tools • PPE 	<ul style="list-style-type: none"> • Pre-postmaintenance • Visual prior to use 	<ul style="list-style-type: none"> • Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

**ACTIVITY HAZARD ANALYSIS
BACKFILLING AND SITE RESTORATION**

Activity	Potential Hazards	Recommended Controls
Backfilling and site restoration	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
	Areas on or adjacent to contaminated material	Implement appropriate level of protection.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.

Activity	Potential Hazards	Recommended Controls
Backfilling and site restoration	Areas on or adjacent to contaminated material	Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
		All self-propelled construction equipment shall be equipped with a back-up alarm.
	Overhead power lines	See distances
	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC.
	Open excavations	IT Policy and Procedure HS307 "Excavation and Trenching" will be adhered to at all times.
		Excavations will be backfilled as soon as possible.
	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.
		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.
		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
		Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
	Dump truck operations	All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.

Activity	Potential Hazards	Recommended Controls
Backfilling and site restoration		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.
		Trip handles for tailgates will be arranged to keep the operator in the clear.
	Contact with moving equipment	Ground personnel shall wear reflective vests.
	Noise	Noise levels above 85 dBA mandates the use of hearing protection.
Backfill with existing clear materials or borrow material	Confined space hazards and trenching	Excavation and trenching will comply with 29 CFR 1926, USACE (Subpart P and Section 06.1 and 25A)
Final grading	Contaminated borrow material	Check historical and analytical data on borrow material
	Noise hazards	Administer hearing protection
	Heavy equipment, travel	Use qualified operators
	Mechanical moving parts, pinch, paint, etc.	Have all grounding in place
		Use lockout/tagout for maintenance
		Assure all emergency stop switches are working
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> • Hand tools • PPE • Heavy equipment 	<ul style="list-style-type: none"> • Pre-postmaintenance • Visual prior to use 	<ul style="list-style-type: none"> • Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

**ACTIVITY HAZARD ANALYSIS
DEMobilIZATION**

Principal Steps	Potential Hazards	Recommended Controls
Removal of office and support structures	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift. Recommend wearing a back support if possible.
	Noise	Hearing protection is mandatory above 85 dBA.
	Falling objects	Hardhat, stay alert and clear of materials suspended overhead, steel-toed boots.
	Flying debris, dirt, dust etc.	Safety glasses/eye wash.
	Pinch points	Keep hands and feet clear of moving/suspended materials and equipment.
		Stay alert at all times!
		Beware of contact points.
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hot work	Refer to H&S Policy HS 314.
	Vehicle traffic	Pay attention at all times.
		Make sure that operators of vehicles know that you are near their equipment.
		A spotter will aid in the backing of all vehicles with poor rear visibility.
	Contact With Utilities	Above and underground utilities shall be located. A qualified person shall install required utilities in compliance with national, state, and local codes.
	Slip, trip, and fall hazards	Determine best access route before transporting equipment.
		Good housekeeping, keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
		Look before you step, ensure safe and secure footing.

Principal Steps	Potential Hazards	Recommended Controls
Removal of office and support structures	Cut hazards	Wear adequate hand protection.
	Biological hazards	Inspect work area carefully and avoid placing hands or feet into concealed areas.
		Be alert for bees, spiders, ticks, and snakes.
	Hazardous plants (poison oak prevalent), insects, snakes, etc. (biological)	Remove vegetation, identify hazardous plants, insects, etc.
	Toilets (sanitary)	Chemical toilets provided in accordance with SSHP.
	Heat stress	Refer to Section 3.2 of SHSP.
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
		Fuel will be transported and stored in approved containers.
	Contact with moving equipment/vehicles	Work area will be barricaded/demarcated.
	Cross contamination and contact with potentially contaminated materials	No Exclusion Zone activities are associated with this task.
	Strains and sprains	Use the proper tool for the job being performed.
		Get assistance if needed.
	Strains and sprains	Avoid twisting/turning while pulling on tools, materials, etc.
	Unattended worker	"Buddy system" visual contact will be maintained between personnel site activities.
Demobilization of trailers	Driving over soft ground	Make initial visual check. Level ground with loader and spread gravel.
		Apply gravel if needed to prevent mud of standing water. Loader (if used for spreading or grading) must meet all safety requirements.
	Removing/Blocking trailer, stakes and anchoring	Use caution when jacking and removing blocks or cribbing. If ground is soft, add stone to secure footing.

Principal Steps	Potential Hazards	Recommended Controls
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none">•Hand tools•PPE•Heavy equipment•Vendor trucks	<ul style="list-style-type: none">•Pre-postmaintenance•Visual prior to use	<ul style="list-style-type: none">•Tailgate Safety Meeting•Site specific orientation•Hazard communication

**ACTIVITY HAZARD ANALYSIS
OPERATION AND MAINTENANCE OF
STORM WATER TREATMENT PLANT SYSTEM**

Activity	Potential Hazards	Recommended Controls
Operation of Treatment System	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs, require assistance or mechanical equipment; size-up lift. Recommend wearing a back support if possible.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Fueling	Only UL/FM approved safety cans shall be used to store fuel.
		Do not refuel equipment while it is operating.
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	Unqualified operators	Machinery and mechanized equipment shall be operated only by designated personnel.
	Out of control equipment	Machinery or equipment requiring an operator shall not be permitted to run unattended.

Activity	Potential Hazards	Recommended Controls
Operation of Treatment System		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	Sound levels above 85 dBA mandates hearing protection.
	Activation during repairs	All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Falling objects	Hardhats, remove unsecured tools and materials before operating equipment.
		Stay alert and clear of materials suspended overhead.
	Flying debris	Safety goggles/splash shield will be used.
	Contact with potentially contaminated materials	Appropriate PPE will be utilized.
	Confined space	IT Policy and Procedure HS300 "Confined Spaces, Industrial" will be adhered to at all times.
	Hot work	IT Policy and Procedure HS314 "Hot Work in Hazardous Locations" will be adhered to at all times during any operations involving hot work.
General Maintenance and Repair	Equipment Operations	All lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.

Activity	Potential Hazards	Recommended Controls
General Maintenance and Repair	Equipment Operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		All self-propelled equipment shall be equipped with a back-up alarm.
	Confined Space	Policy and procedures for confined spaces will be adhered to at all times.
	Contact with process chemicals	Proper protective clothing and equipment will be used.
	Contact with potentially contaminated materials	Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.
		Good housekeeping will be stressed to safeguard against cross-contamination of surrounding areas and eliminate safety hazards.
	Contact with potentially contaminated materials	All site personnel will practice good personal hygiene.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!

Activity	Potential Hazards	Recommended Controls
General Maintenance and Repair	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Strains and sprains	Use proper lifting techniques. Lifts greater than 60 lbs requires assistance or mechanical equipment. Size up the lift. Recommend wearing a back support if possible.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Equipment Operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
	Ropes, slings, chains and hooks	The use of ropes, slings and chains shall be in accordance with the safe recommendations of their manufacturer.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.
		Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.
		Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to insure that it is safe. Defective rigging equipment shall be removed from service.

Activity	Potential Hazards	Recommended Controls
Ground Maintenance and Repair	Ropes, slings, chains and hooks	Rigging equipment, when not in use, shall be removed from the immediate work area and properly stored so as not to present a hazard.
		Taglines shall be used to control the loads being handled by hoisting equipment.
	Hoisting equipment	All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
		At no time shall the hoisting equipment be loaded in excess of the manufacturers rating except during performance tests.
		While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.
	Pinch points/cuts	Adequate hand protection and observe contact points.
	Electrical hand tools/electrocution	Ground fault circuit interrupters, inspect extension cords, hand tool inspection, lockout-tagout procedures.
	Contact with glues, solvents, etc.	Be familiar with the materials you are working with (MSDSs)
	Noise	If noise levels exceed 85 dBA wear hearing protection.
	Heavy lifting	Safe lifting procedures. Loads over 60 lbs require assistance or mechanical lifting device.
	Slip, trip, and fall hazards	Good housekeeping
	Confined spaces	Follow policy and procedures for confined spaces.
	Excavation and trenching	Follow policy and procedures for safe trench excavation.
	Hot work	Hot work permits.

Activity	Potential Hazards	Recommended Controls
Welding and Cutting	U.V. light and fire	Utilize appropriate eye protection. Provide fire watch. Obtain hot work permit. Torches must have anti-flashback device.
	Pressurized cylinders	Properly store and secure compressed gas cylinders.
Handling sharp objects	Cuts	Wear appropriate hand protection.
Grinding/sawing	Flying particles	Proper eye protection.
Working on elevated heights	Falls	Lanyards, lifelines, and ladders/scaffolding safety.
	Falling objects.	Overhead protection hardhats
Material storage	Flammable and combustible liquids	Store in NO SMOKING AREA and 50 ft from combustible construction materials.
		Fire extinguisher readily available.
		Properly grounded and bonded.
	Round stock	Secure from rolling, work from the top of the stack.
	Slip, trip and fall hazards	Good housekeeping
	Sprains and strains	Safe lifting procedures
	Pinch points/cuts	Adequate hand protection and observation of contact points.
	Hazard communication	Proper labeling/MSDSs
Equipment to be Used	Inspection Requirements	Training Requirements
<ul style="list-style-type: none"> •Hand •tools •PPE 	<ul style="list-style-type: none"> •Pre-postmaintenance •Visual prior to use 	<ul style="list-style-type: none"> •Tailgate Safety Meeting •Site specific orientation •Hazardous waste operations •Hazard communication