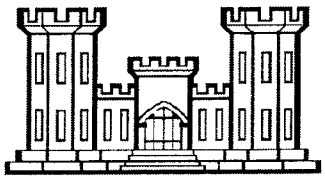
ADDENDUM TO SITE WIDE SAFETY AND HEALTH PLAN - FINAL

REMEDIAL INVESTIGATION, PART 1
ACID AREA 1
FORMER PLUM BROOK ORDNANCE WORKS
SANDUSKY, OHIO

Prepared for:



DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
NASHVILLE, TENNESSEE
CONTRACT DACW62-03-D-0004-0007

Prepared by:

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April, 2007

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1.0 INTRODUCTION

1.1 Scope and Applicability

No change

1.2 Site Description / Scope of Work

The activities being performed for this investigation will occur at Acid Area 1.

The field activities can be summarized as follows:

Site preparation – clearing and grubbing
Monitoring well installation – mud rotary and air rotary
Direct push soil boring and sampling
Monitoring well development
Groundwater sampling
Surface water and sediment sampling
Equipment decontamination
Investigative Derived Waste (IDW) management
Surveying

2.0 RESPONSIBILITIES

No change.

3.0 SAFETY PROGRAM AND PROCEDURES

No change.

4.0 HAZARD ANALYSIS

4.1 No change.

4.2 No change.

4.3 No change.

4.4 Chemical Hazards

The analytical results from previous investigations indicate the following contaminants may be present at the site. The contaminants listed were found at levels above risk based concentrations (RBC) and in most instances pose minimal potential for occupational exposure.

Information such as Immediately Dangerous to Life and Health (IDLH) Levels, and Ionization Potentials (IP) was obtained from the following sources: NIOSH Pocket Guide to Chemical Hazards, 2004; ACGIH TLVs for Chemical Substances and Physical Agents, 2006; Sax's Dangerous Properties of Industrial Chemicals, Tenth Edition; Patty's Industrial Hygiene, Volume 1, Part II; 29 CFR 1910.1000:

4.4.1 Metals

Risk based concentrations for metals were exceeded, however none were above site background concentrations.

Aluminum

Route of Entry:	Inhalation, skin and/or eye contact
Target Organs:	Eyes, skin, respiratory system
Hazard:	Combustible solid, low toxicity
PEL:	15 mg/m^3
TLV:	10 mg/m^3
IDLH:	not listed
IP	not listed

Silvery-white, malleable, ductile, odorless metal. Symptoms of exposure include irritation to eyes, skin and respiratory system.

Arsenic

Route of Entry:	Inhalation, skin absorption, skin and/or eye contact ingestion
Target Organs:	Liver, kidneys, skin, lungs, lymphatic system
Hazard:	Toxic, reactive with hydrogen gas to form highly toxic arsine
PEL:	0.002 mg/m^3
TLV:	0.01 mg/m^3
IDLH:	5.0 mg/m^3
IP	N/A

Silver-gray or tin-white, brittle, odorless solid. Symptoms of exposure include ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyper-pigmentation of skin, [potential occupational carcinogen].

Beryllium

Route of Entry:	Inhalation, skin and/or eye contact
Target Organs:	Eyes, skin, respiratory system
Hazard:	Toxic, known human carcinogen (ACGIH A1)
PEL:	0.002 mg/m^3
TLV:	0.002 mg/m^3
IDLH:	4.0 mg/m^3
IP	N/A

Hard, brittle, gray-white solid. Symptoms of exposure include berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen].

Iron

Route of Entry:	Inhalation
Target Organs:	Respiratory system
Hazard:	Low toxicity

PEL:	10 mg/m^3
TLV:	5 mg/m^3
IDLH:	2,500 mg/m^3
IP	

Reddish-brown solid. Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis).

Manganese

Route of Entry:	Inhalation, ingestion
Target Organs:	Respiratory system, central nervous system, blood, kidneys
Hazard:	Toxicity, combustible solid
PEL:	5.0 mg/m^3
TLV:	0.2 mg/m^3
IDLH:	500 mg/m^3
IP	N/A

Lustrous, brittle, silvery solid. Symptoms of exposure include Parkinson's; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage.

4.4.2 Semivolatile Organic Compounds

Aroclor 1260

Route of Entry:	Inhalation, skin absorption, ingestion, skin and/or eye contact
Target Organs:	Skin, eyes, liver, reproductive system
Hazard:	Toxic, potential human carcinogen
PEL:	0.5 mg/m^3
TLV:	0.5 mg/m^3
IDLH:	5.0 mg/m^3
IP	Unknown

Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor. Symptoms of exposure include irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

4.4.3 Others

Hydrogen Sulfide

Route of Entry:	Inhalation, skin, eyes
Target Organs:	Eyes, respiratory system, central nervous system
Hazard:	Chemical asphyxiant, olfactory fatigue
PEL:	20 ppm
TLV:	1 ppm
IDLH:	100 ppm
IP	10.5 eV

Colorless gas with a strong odor of rotten eggs. Note: Sense of smell becomes rapidly fatigued and can not be relied upon to warn of the continuous presence of H_2S. Symptoms of exposure include irritation to eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation.
Hydrogen sulfide is naturally occurring in Delaware limestone and can become liberated during intrusive activities such as drilling or during any activities involving boreholes and monitoring wells.

4.5 No change.

4.6 No change.

4.7 Task Hazard Analysis

An activity hazard analysis has been conducted for each activity listed in section 1.2 of this document. Refer to Appendix I for task specific Global Safe Plans of Action (SPA).

5.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment levels have not changed from the SWSHP, the following table provides specific types of PPE to be worn by field personnel when necessary. Task-specific requirements are outlined in the global SPAs.

Item	Type(s)
Hard hats	Type I, Class E minimum; ANSI Z89.1 approved
Safety glasses	Impact resistant, fixed side shields, ANSI Z.87 approved
Steel-toe boots	Leather or equivalent, ankle height minimum, ANSI Z41 approved
Work boots	Leather or equivalent, ankle height minimum
Chemical resistant boots	Chemical resistant overboots or chemical resistant steel-toe
Hearing protection	Minimum Noise Reduction Rating (NRR) of 25 dB, ANSI S3.19 approved
Face shields	Impact resistant, ANSI Z.87 approved
Gloves- general purpose	Leather or equivalent, work gloves
Gloves- chemical resistant	Inner: Form fitting nitrile Outer: Nitrile, 12" minimum
Cut resistant chaps	Chain-saw chaps, per U.S. Forest Service Spec. 6170-4E
Coveralls, chemical resistant	Dupont Pro-Shield 2 or equivalent
Respirator	Full-face air purifying respirator, NIOSH approved
Respirator cartridges	Organic vapor, acid gas, P-100 combination cartridge

6.0 SITE CONTROL

No change.

7.0 DECONTAMINATION

No change.

8.0 SITE MONITORING

8.1 Air Monitoring

The primary contaminants of concern at Acid Area 1 are nitroaromatics, metals, and Aroclor 1260. The nature of these contaminants makes it unlikely they would be present in the air in potentially harmful concentrations unless there was relatively large quantities of dust being generated by intrusive activities.

Measurements of airborne volatile organic compounds (VOCs) and total dusts will be performed in the breathing zone of employees in each work area. In addition, all boreholes shall be checked for oxygen, combustible gases and hydrogen sulfide during intrusive activities.

Monitoring will be conducted utilizing a photoionization detector with a minimum 10.2 electron volt lamp, a real time aerosol monitor, and a combustible gas indicator which must include a hydrogen sulfide sensor. Detector tubes may be necessary to quantify specific compounds present if sustained levels of VOCs are detected in the worker's breathing zone. All air monitoring activities shall be summarized and documented on the JE air monitoring log and will be provided to the site manager for inclusion in the daily reports.

8.1.1 Air Monitoring Frequency

Air monitoring will be conducted initially upon arriving at a site or work area, primarily as a means to establish background levels. Monitoring will then be performed during all intrusive activities. For drilling and other "down-hole" type activities such as ground water sampling, monitoring will be performed at least every thirty minutes until the location and activity are well characterized. For other intrusive activities, monitoring will be performed initially within the first foot of depth, then repeated every 5' of depth or as soil conditions change or other indicators make it apparent that monitoring should be conducted. During previous investigative activities at this site, no VOCs have exceeded RBC.

8.1.2 Monitoring Equipment Maintenance and Calibration

All monitoring equipment will be calibrated in accordance with manufacturer procedures. All direct reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. All air monitoring equipment calibrations, calibration checks and maintenance activities shall be documented on the instrument calibration log. A log will be maintained for each piece of equipment and included in appropriate project documentation files.

If an instrument is found to be inoperative or suspected of giving erroneous readings, it shall be immediately removed from service and replaced. The specific operation for which this equipment is essential shall cease until an appropriate replacement unit is obtained. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

8.1.3 Air Monitoring Action Levels

The following table summarizes specific actions to be taken in the event *sustained* breathing zone levels are detected above background.

Contaminant	Action Level	Action Required
VOC	1 ppm breathing zone	Suspend activity, contact HSM, identify contaminants with detector tubes if necessary
Total Dust	1 mg/m^3 breathing zone	Implement dust control measures until dust levels are below action levels
Hydrogen Sulfide (H_2S)	10 ppm bore hole	Continuously monitor work area, verify H_2S alarm is set for 10 ppm, suspend activity if sustained breathing zone levels exceed 5 ppm, contact HSM
Lower Explosive Limit (LEL)	10% LEL bore hole	Suspend activity, contact HSM
Oxygen	<19.5% bore hole	Verify adequate O_2 is present to provide proper LEL readings (usually >15% is needed for proper LEL function)

8.2 Other Hazardous Conditions

The SSHO will take appropriate action to limit exposures. If unknown chemicals or contamination are encountered, operations will cease until the situation is evaluated. The SSHO will contact the HSM to evaluate any potentially hazardous situations, or any situation with elevated contamination levels. Operations will only be resumed if they can be accomplished in a safe manner.

8.3 Noise Monitoring

Noise monitoring will not be conducted since previous noise monitoring during similar drilling operations has characterized noise levels greater than 85 dBA within a 5-foot radius around the rear end (motor side) of drill rigs. Hearing protection is mandatory for all employees when working near/adjacent to operating drill rigs. Other equipment requiring hearing protection will be identified on the global Safe Plans of Action which will be included in Appendix I.

8.4 Monitoring Records

The PM shall ensure that site monitoring records are complete and incorporated into the project file. Any personnel or area monitoring results will be incorporated into the JE HSE files.

8.5 Notification

Within 5 working days after receipt of integrated monitoring results for compliance sampling, the HSM will ensure that each employee is informed in writing of the results which represent that employee's exposure.

Whenever the results indicate that the representative employee exposure exceeds the 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.

JE will provide industrial hygiene monitoring results to subcontractor companies if the exposure of subcontractor employees to airborne contaminants is elevated. Notification of subcontractor personnel of industrial hygiene monitoring results is the responsibility of the subcontractor.

9.0 MEDICAL SURVEILLANCE

No change.

10.0 EMERGENCY SERVICES

No change.

11.0 APPROVALS

Al Hardesty, PG
Program Manager
Jacobs Engineering Group, Inc.

Date

Sean Healey, CIH, CSP
Health, Safety and Environment Manager
Jacobs Engineering Group, Inc.

Date

APPENDIX I

GLOBAL SAFE PLANS OF ACTION

SITE: PBOW

SAFE PLAN OF ACTION

PROJECT NO. _____

Site Preparation- Clearing and Grubbing

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Vehicle loading/unloading	Slippery surfaces on and around vehicle.	Slipping, falling while carrying or moving equipment.	Check loading area and vehicle surfaces for water, oil, etc. prior to moving equipment.	Brooms, adsorbent towels for petroleum
	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment, use hand trucks if available. Use trucks with lift gates whenever possible.	Lift gates, hand trucks
	Unsecured equipment	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
Travel to/from site	Unfamiliarity with location distracting driver	Vehicle accidents	Map out travel route and destination prior to departing, utilize a passenger to act as the navigator	Maps
	Difficult terrain	Vehicle getting damaged by trees, rocks, ruts etc.	Use proper vehicles for accessing work location.	Four wheel drive vehicles as necessary
	General traffic hazards	Vehicle accidents	Drive defensively, use seatbelts	Seat belts for all passengers
	Towing equipment	Vehicle accident, equipment damage	Utilize proper towing equipment and pins, connect safety chains	Towing equipment, safety chains
Setting up work area, preparing equipment	Uneven ground, fallen trees, brush	Slips, trips and falls	Be aware of footing and surroundings, do not carry running saws while walking through the woods, flag obvious trip hazards with caution tape	Caution tape
	Petroleum, Oil and Lubricant (POL) spills, fires	Environmental damage, contact dermatitis with repetitive skin exposure	Use proper mixing cans and gas cans with spouts appropriately sized to fill saws, maintain spill equipment in vehicle, avoid refilling hot equipment	Spill equipment, proper gas and mixing cans, 20 lb ABC fire extinguisher
	Sharp chains and blades	Hand lacerations, eye injury	Wear leather gloves when sharpening chains and saw blades, wear safety glasses even when sharpening manually	Leather gloves, safety glasses
Clearing brush	Noise, flying debris, rotating equipment on brush saws	Hearing loss, severe injury	Wear proper PPE any time operating brush saws or in the vicinity of anyone who is operating brush saws	Hearing protection, chip screens and safety glasses, steel toe boots
	Sharp branches, briars etc.	Hand lacerations	Wear leather gloves when removing cut brush	Leather work gloves
	Biological hazards: ticks, spiders, bees, wasps, poison ivy/oak/sumac, snakes	Allergic reaction, poisonous bites	Check area for obvious signs of poison ivy, oak, sumac Also be aware of areas that are likely to contain bees/wasp nests, or snakes, use DEET as necessary to prevent exposure to ticks, tape pant legs to boots if necessary and wear light colored clothing	DEET, duct tape, light colored clothing, ivy-bloc, leather boots
Felling trees	Noise, flying debris, rotating equipment on chain saws	Hearing loss, severe injury	Wear proper PPE any time operating chain saws or in the vicinity of anyone who is operating chain saws	Hearing protection, chip screens and safety glasses, steel toe boots, cut resistant chaps, properly maintained chainsaws

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
	Falling trees	Crushing injury	Trees should be felled in proper fashion by creating a directional cut wedge and a felling cut. A wedge and sledge hammer should be used in the felling cut if circumstances require one. Have adequate escape area to move if tree falls in an unexpected direction, be sure to move away from tree at 45 degree angle, never directly behind the tree, keep all other workers 1.5 tree lengths away from area and maintain stringent site control,	Caution tape, cones, markers
	Overhead hazards	Electrocution, injury	Check work area for overhead utilities prior to felling trees, avoid felling trees into areas where they are likely to become snagged or entangled by existing obstructions	
Limbing and bucking felled trees	Noise, flying debris, rotating equipment on chain saws	Hearing loss, severe injury	Wear proper PPE any time operating chain saws or in the vicinity of anyone who is operating chain saws	Hearing protection, chip screens and safety glasses, steel toe boots, cut resistant chaps, properly maintained chainsaws
	Falling tree limbs	Crushing injury	Use extreme caution when cutting limbs off trees, work slowly and deliberately, be aware the main trunk may rotate and shift as the limbs are removed, only one person should work on each tree, keep the saw from striking the ground when limbing or bucking (cutting up) the main tree, proceed in a manner that will prevent the saw from getting bound in the tree as it is cut	Caution tape, cones, markers
Chipping trees, limbs and brush	Moving heavy limbs and tree sections	Back and muscle strain, slips, trips and falls	Cut limbs in sizes that are easy to handle, use proper lifting technique, position wood chipper in an easily accessible area, be sure area around chipper is free of tripping hazards	Heavy equipment for moving large items
	Noise, flying debris, rotating equipment on wood chipper	Hearing loss, severe injury	Wear proper PPE any time operating wood chipper or in the vicinity of anyone who is operating wood chipper, position discharge chute so flying debris will not impact other personnel in the area, flag or mark discharge area so no one inadvertently walks through "danger zone", do not wear loose clothing around chipper, do not reach into chipper feed chute and be sure feed reverse bar is working properly	Hearing protection, chip screens and safety glasses, steel toe boots, properly maintained wood chipper
Stumping area, debris load-out	Working around heavy equipment	Crushing injury, being struck with bucket, being run over by equipment	Properly control work area and use a spotter for the equipment operator, make eye contact with equipment operator prior to walking into swing radius of backhoe/excavator	Caution tape, spotter
	Falling debris	Head injury, crushing injury	Stay away from trucks being loaded with stumps, do not stand on the blind side of a truck being loaded, do not walk into swing radius of equipment	Spotter

SITE: PBOW

SAFE PLAN OF ACTION
Monitoring Well Installation- Air Rotary

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Site mobilization	Loose equipment	Equipment shifting in/falling from vehicles	Secure equipment; Position equipment	Straps; bungee cords
Site set up / break down	Vehicle positioning	Hitting people, vehicles, trees, rocks, etc.;	Use spotters; Chock Tires	Vehicles; tire chocks
	Slips, trips, falls	Falling	Survey site; Mark hazards w/ caution tape; Establish and maintain exclusion zone	Caution tape
	Falling / shifting equipment	Suspended equipment falling on crew members: injury or death	Stand clear from equipment suspended from crane; Only approved personnel operate crane; crane must have current annual certification; Use proper hand signals when communicating to crane operator; Use tag lines	Certified crane; casing; generators; soil drums; crew members; hand signals; tag lines
	Overhead hazards	Electrocution; falling debris; injury; death	Wear hard hat, safety glasses, and steel toe boots; Survey overhead hazards before raising rig mast, and operating crane; Position rig no closer to "live" power lines than 1.5 mast lengths	Rig; crane; hard hat; safety glasses; safety boots
Drilling	Underground utilities	Electrocution; broken gas and water lines; injury	Utilize utility clearance service; Research site maps; Perform field recon prior to starting activity, hand auger top 7 feet	Clearance paperwork, hand auger; site maps, PBOW support staff
	Rig and generator noise	Loss of hearing	Wear ANSI-approved hearing protection	Ear plugs; ear muffs
	Rig and generator exhaust	Breathing rig/generator exhaust	Monitor Air Quality; Position Generators >20 feet downwind of Breathing zone (especially sampling port)	Photoionization Detector (PID) with 10.2 bulb; generator; vehicles
	Grinding, welding, oxy - acetylene cutting	Exposure to UV, welding fumes, eye and face hazards, fire	Utilize proper PPE, for welding and grinding Maintain a minimum 25 lb ABC extinguisher within 25' of welding activity, obtain hot work permits as required by local authorities, maintain a fire watch for at least 30 minutes after hot work is completed, properly store and secure oxy-acetylene cylinders, avoid breathing welding fumes when welding on stainless steel, galvanized metal or materials with coatings such as lead based paint	Welding helmet, safety glasses, clear face shield for grinding, 25 lb ABC extinguisher, hot work permits
	Cuttings discharge from rig / cyclone	Exposure to contaminated soil, flying debris, hose failure	Position cyclone and roll-off downwind of drill crew, minimize pressure buildup during drilling, install sheeting if necessary to prevent discharged cuttings from spraying crew or outside of exclusion zone, utilize whip-checks on all discharge hoses, secure hoses from excessive movement	Sheeting, whip checks
	Chemicals in soil (including naturally occurring)	Illness, irritation	Wear PPE; Monitor soil headspace	Modified Level D PPE, PID with 10.2 bulb, CGI with H_2S sensor. (Bedrock wells only)
Water and sampling	Handling samples w/ preservative (acids)	Acid burns	Wear PPE	Nitrile gloves; safety glasses
	Exposure to chemicals in groundwater: Exposure to gasoline, diesel, and motor oil	Skin and eye exposure to carcinogens	Wear PPE; Berm polyethylene under rig, water truck, generators, casing, etc.	Nitrile gloves; safety glasses; rig; water truck; generator; casing; poly

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
	Exposure to chemicals in soil	Illness	Wear PPE; Monitor soil borehole and breathing zone	Nitrile gloves; safety glasses; aluminum foil; glass jars; PID with 10.2 bulb
Decontamination	Water slip hazard	Falling	Walk slowly and deliberately; Use sump if water accumulates	Sump, footwear appropriate for the conditions
	Exposure to groundwater contaminants, gasoline; diesel; motor oil	Skin and eye exposure to carcinogens	Wear PPE	Modified Level D PPE, PID with 10.2 bulb
	Falling equipment	Suspended equipment falling on crew members: injury or death	Stand clear from equipment suspended from crane; Operate crane only w/ crane operators license; Use proper hand signals when communicating to crane operator; Use tag lines	Crane; casing; hard hat; safety glasses; steel toe boots; tag Lines
	Pressurized spray water	Eye damage, lacerations, equipment damage	Utilize proper spray nozzles on equipment, wear appropriate PPE, control work area during decontamination	Spray nozzles, face shield, safety glasses.

SITE: PBOW

SAFE PLAN OF ACTION
Direct-Push Soil Boring and Sampling

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Site mobilization	Loose equipment	Equipment shifting in/falling from vehicles	Secure equipment; Position equipment	Straps; bungee cords
Site set up / break down	Vehicle positioning	Hitting people, vehicles, trees, rocks, etc.;	Use spotters; chock tires	Vehicles; tire chocks
	Slips, trips, falls	Falling	Survey site; Mark hazards w/ caution tape; Establish and maintain exclusion zone	Caution Tape
	Falling/shifting equipment	Suspended equipment falling on crew members: injury or death	Stand clear from suspended equipment, Use tag lines	Generators; tag lines; augers
	Overhead hazards	Electrocution; falling debris; injury; death	Wear hard hat, safety glasses, and steel toe boots; Survey overhead hazards before raising equipment or pipe; Position equipment no closer to "live" power lines than 20 feet	Rig; hard hat; safety glasses; safety boots
Rig operation	Underground utilities	Electrocution; broken gas and water lines; injury	Utilize utility clearance service; Research site maps; Perform field recon prior to starting activity, hand auger top 7 feet	Clearance paperwork, hand auger; site maps, PBOW support staff
	Rig and generator noise	Loss of hearing	Wear ANSI-approved hearing protection	Ear plugs; ear muffs
	Rig and generator exhaust	Breathing exhaust	Monitor air quality; position generators >20 feet downwind of Breathing zone (especially sampling port)	PID with 10.2 bulb; generator; vehicles
	Rotating equipment	Becoming entangled in machinery; Injury	Do not wear loose clothing around machinery; know where emergency shut-off switches are located	Emergency shut off switches
Soil and water sampling	Handling samples w/ preservative (acids)	Acid burns	Wear PPE	Nitrile gloves; safety glasses
	Exposure to chemicals in soil	Illness, skin/respiratory irritation	Wear modified Level D PPE; monitor breathing zone, upgrade to level C if action levels are exceeded	Modified Level D PPE, PID with 10.2 bulb
Decontamination	Water slip hazard	Falling	Walk slowly and deliberately; use sump if water accumulates	Sump
	Exposure to chemicals in soil/water; gasoline; diesel; motor oil	Skin and eye exposure to chemical contaminants	Wear modified level D PPE; monitor breathing zone, upgrade to level C if action levels are exceeded	Modified Level D PPE, PID with 10.2 bulb
	Falling equipment	Suspended equipment falling on crew members: injury or death	Stand clear from equipment suspended from hoisting line; use tag lines	Hard hat; safety glasses; steel toe boots; tag lines; hoisting lines; augers

SITE: PBOW

SAFE PLAN OF ACTION
Monitoring Well Development

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Vehicle loading / unloading	Slippery surfaces on and around vehicle.	Slipping, falling while carrying or moving equipment.	Check loading area and vehicle surfaces for water, oil, etc. prior to moving equipment.	Brooms, adsorbent towels for petroleum
	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment, use hand trucks if available. Use trucks with lift gates whenever possible.	Lift gates, hand trucks
	Unsecured equipment	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
Travel to/from site	Unfamiliarity with location distracting driver	Vehicle accidents	Map out travel route and destination prior to departing, utilize a passenger to act as the navigator	Maps
	Difficult terrain	Vehicle getting damaged by trees, rocks, ruts etc.	Use proper vehicles for accessing sample location.	Four wheel drive vehicles as necessary
	General traffic hazards	Vehicle accidents	Drive defensively, use seatbelts	Seat belts for all passengers
Setting up site/exclusion zone	Uneven ground, holes, stumps, extension cords	Slips, trips and falls	Recon site, flag potential trip hazards, organize site to minimize walking areas	Flagging, cones
	Site visitors/unauthorized site entrants	Chemical exposure to unaware, unprotected personnel, distraction to authorized personnel	Establish suitable exclusion zone and exercise control over work area	Caution tape, rope
	Electrical hazards	Shock/electrocution from generator	Use Ground Fault Circuit Interrupter (GFCI) and grounding rods if necessary	GFCI, grounding rod
	Generator: noise hazard, POL spill hazard	Hearing loss, environmental damage from POL, sample compromise from POL	Place generator at extension cord length distance down wind of site and place generator on bermed poly sheeting	Extension cord, poly sheeting
Water level measurement	Winding of meter/repetitive motion, probe recoiling too quickly striking personnel, hunching over well	Ergonomic injury, cuts/contusions from water meter probe	Share physical aspects of job with partner, recoil meter slowly as the probe reaches meter	Partner
Water parameter measurement	Chemical contaminants in ground water (including naturally occurring)	Inhalation, contact hazards from contaminants in water.	Conduct monitoring at least every 30 minutes. Wear appropriate PPE, avoid skin contact with water.	Modified Level D PPE, PID with 10.2 bulb, CGI with H_2S sensor
Material handling, drum movement	Moving drums and other heavy equipment	Pinch points, muscle strain	Use appropriate equipment when moving drums, set up site to minimize any material handling requirements.	Drum dollies, lift gate, extra personnel, leather gloves

SITE: PBOW

SAFE PLAN OF ACTION

Groundwater Sampling

PROJECT NO. _____

WORK AREA: Acid Areas 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Vehicle loading/unloading	Slippery surfaces on and around vehicle.	Slipping, falling while carrying or moving equipment.	Check loading area and vehicle surfaces for water, oil, etc. prior to moving equipment.	Brooms, adsorbent towels for petroleum
	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment, use hand trucks if available. Use trucks with lift gates .	Lift gates, hand trucks
	Unsecured equipment	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
Travel to/from site	Unfamiliarity with location distracting driver	Vehicle accidents	Map out travel route and destination prior to departing, utilize a passenger to act as the navigator	Maps
	Difficult terrain	Vehicle getting damaged by trees, rocks, ruts etc.	Use proper vehicles for accessing sample location.	Four wheel drive vehicles as necessary
	General traffic hazards	Vehicle accidents	Drive defensively, use seatbelts	Seat belts for all passengers
Accessing and opening well	Biological hazards: ticks, spiders, bees, wasps, poison ivy/oak/sumac, snakes	Allergic reaction, poisonous bites	Check area for obvious signs of poison ivy, oak, sumac Also be aware of areas that are likely to contain bees/wasp nests, or snakes, use DEET as necessary to prevent exposure to ticks, tape pant legs to boots if necessary and wear light colored clothing	DEET, duct tape, light colored clothing, ivy-bloc, leather boots
	PID readings > 1 ppm	Exposure to chemical contaminants, possibly carcinogens	Allow well to vent, if readings continue over 1 ppm then recap and reevaluate.	Direct reading instruments such as PID with a 10.2 bulb
	Contact with potentially contaminated water, inhalation exposure to contaminants (including naturally occurring).	Exposure to chemical contaminants, possibly carcinogens	Wear appropriate PPE	Nitrile gloves, PID with 10.2 bulb CGI with H_2S sensor
Setting up site/exclusion zone	Uneven ground, holes, stumps, extension cords	Slips, trips and falls	Recon site, flag potential trip hazards, organize site to minimize walking areas	Flagging, cones
	Site visitors/unauthorized site entrants	Chemical exposure to unaware, unprotected personnel, distraction to authorized personnel	Establish suitable exclusion zone and exercise control over work area	Caution tape, rope
	Electrical hazards	Shock/electrocution from generator	Always use GFCI and grounding rods	GFCI, grounding rod
	Generator: noise hazard, POL spill hazard	Hearing loss, environmental damage from POL, sample compromise from POL	Place generator at extension cord length distance down wind of site and place generator on bermed sheeting	Extension cord, poly sheeting
Water level measurement	Winding of meter/repetitive motion, probe recoiling too quickly striking personnel, hunching over well	Ergonomic injury, cuts/contusions from water meter probe	Share physical aspects of job with partner, recoil meter slowly as the probe reaches meter	Partner
Sample collection	Placing or removing pump from well	Pinch points, muscle strain	Be aware of hands as pump is lowered and recoiled, don't allow pump head to fly out of well	Nitrile gloves
	Sample preservatives splashing on skin	Corrosive burns	Hold sample containers away from face when filling and wear proper PPE	Portable eyewash, nitrile gloves, safety glasses
Site breakdown	Moving drums of purge water	Pinch points, muscle strain	Use partner and lift gate to move drums	Partner, lift gate

SITE: PBOW

SAFE PLAN OF ACTION

Surface Water and Sediment Sampling

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Vehicle loading/unloading	Slippery surfaces on and around vehicle.	Slipping, falling while carrying or moving equipment.	Check loading area and vehicle surfaces for water, oil, ice, frost etc. prior to moving equipment.	Brooms, adsorbent towels for petroleum
	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment, use hand trucks if available. Use trucks with lift gates whenever possible.	Lift gates, hand trucks
	Unsecured equipment	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
Travel to/from site	Unfamiliarity with location distracting driver	Vehicle accidents	Map out travel route and destination prior to departing, utilize a passenger to act as the navigator	Maps
	Difficult terrain	Vehicle getting damaged by trees, rocks, ruts etc.	Use proper vehicles for accessing sample location.	Four wheel drive vehicles as necessary
	General traffic hazards	Vehicle accidents	Drive defensively, use seatbelts	Seat belts for all passengers
Sample collection	Biological hazards: ticks, spiders, bees, wasps, poison ivy/oak/sumac, snakes	Allergic reaction, poisonous bites	Check area for obvious signs of poison ivy, oak, sumac Also be aware of areas that are likely to contain bees/wasp nests, or snakes, use DEET as necessary to prevent exposure to ticks, tape pant legs to boots if necessary and wear light colored clothing	DEET, duct tape, light colored clothing, ivy-bloc, leather boots
	Site visitors/unauthorized site entrants	Worker distraction	Establish suitable exclusion zone.	Caution tape, rope
	Sample preservatives splashing on skin	Corrosive burns	Hold sample containers away from face when filling and wear proper PPE	Portable eyewash, nitrile gloves, safety glasses
	Chemical contaminants in soil	Exposure to site chemicals	Avoid direct contact with soil and water, Wear nitrile gloves when handling sampled material.	Nitrile gloves
Site breakdown	Moving drums of purge water	Pinch points, muscle strain	Use partner and lift gate to move drums from ground to truck bed	Partner, lift gate

SITE: PBOW

SAFE PLAN OF ACTION
Equipment Decontamination

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Vehicle loading/unloading, equipment movement	Slippery surfaces on and around vehicle.	Slipping, falling while carrying or moving equipment.	Check loading area and vehicle surfaces for water, oil, etc. prior to moving equipment.	Adsorbent towels for petroleum
	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment. Use trucks with lift gates whenever possible, use hand trucks.	Lift gates, hand trucks
	Unsecured equipment or drums	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
Travel to/from site	Unfamiliarity with location distracting driver	Vehicle accidents	Map out travel route and destination prior to departing, utilize a passenger to act as the navigator	Maps
	Difficult terrain	Vehicle getting damaged by trees, rocks, ruts etc.	Use proper vehicles for accessing sample location, use a spotter when driving/backing in tight areas.	Four wheel drive vehicles as necessary, spotter
	General traffic hazards	Vehicle accidents	Drive defensively, use seatbelts	Seat belts for all passengers
Equipment decon	Using electrical equipment in wet environments	Electrocution, equipment damage	Keep all cords out of water and be sure cords have three prong plugs and in are good condition, use outlets with GFCI, test GFCI prior to using	Three prong extension cords, outlets with GFCIs
	Contact with potentially contaminated water	Exposure to contaminants via inhalation, absorption and ingestion	Conduct air monitoring as necessary, wear PPE appropriate for specific contaminants	Modified Level D PPE, PID with 10.2 bulb
	Contact with decon solvents and solutions	Exposure to solutions via inhalation, absorption and ingestion, contact dermatitis from strong soaps	Conduct air monitoring as necessary, wear PPE appropriate for specific contaminants	Modified Level D PPE, PID with 10.2 bulb
	Pressurized spray water	Eye damage, lacerations, equipment damage	Utilize proper spray nozzles on equipment, wear appropriate PPE, control work area during decontamination	Spray nozzles, face shield, safety glasses.

SITE: PBOW

SAFE PLAN OF ACTION
IDW Management

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Identify work area	Slippery surfaces on and around work area.	Slipping, falling while carrying or moving equipment or materials.	Check work area and intended path for water, oil, ice, frost etc. prior to handling or moving equipment/materials.	Brooms, adsorbent towels for petroleum
	Inadequate space	Pinched/crushed fingers, damaged equipment	Be sure intended pathways are adequate to accommodate material being moved, utilize alternate routes if necessary, wear hand protection	Leather gloves
	Blind corners	Running into other personnel with hand trucks or while carrying loads	Be sure all personnel working in immediate area are aware of activity, mark blind corners or announce your presence as blind corners are approached	Hazard markings such as temporary signs
Material movement	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment, use hand trucks if available. Use trucks with lift gates whenever possible. Use proper lifting technique.	Lift gates, hand trucks, leather gloves
	Unsecured equipment	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
	Falling loads, sliding, rolling material	Crushing injury	Properly secure loose material, properly block and crib all stockpiled material. Do not stack material too high.	Cribbing, blocking
	Repetitive movement	Ergonomic injury, strains	Be aware of personal movement, even with light loads. Avoid repetitive tasks, alter activities whenever possible	Adequate number of personnel, equipment to minimize ergonomic stress

SITE: PBOW

SAFE PLAN OF ACTION
Surveying

PROJECT NO. _____

WORK AREA: Acid Area 1

DATE: _____

Steps of Task	Hazard	Reaction to Failure	Safe Plan	Resources
Vehicle loading/unloading	Slippery surfaces on and around vehicle.	Slipping, falling while carrying or moving equipment.	Check loading area and vehicle surfaces for water, oil, etc. prior to moving equipment.	Adsorbent towels for petroleum
	Moving heavy or awkward equipment.	Muscle strains, back injuries.	Utilize adequate number of personnel to move equipment, use hand trucks if available. Use trucks with lift gates whenever possible.	Lift gates, hand trucks
	Unsecured equipment	Equipment flying out of vehicle, sliding forward in pick-up truck beds or bouncing around inside enclosed vehicles	Properly secure all equipment with rope and anchor points on trucks. Load heaviest equipment farthest forward in vehicle.	Rope, anchor points
Travel to/from Site	Unfamiliarity with location distracting driver	Vehicle accidents	Map out travel route and destination prior to departing, utilize a passenger to act as the navigator	Maps
	Difficult terrain	Vehicle getting damaged by trees, rocks, ruts etc.	Use proper vehicles for accessing work locations.	Four wheel drive vehicles as necessary
	General traffic hazards	Vehicle accidents	Drive defensively, use seatbelts	Seat belts for all passengers
Control point location, general surveying	Biological hazards: ticks, spiders, bees, wasps, poison ivy/oak/sumac, snakes	Allergic reaction, poisonous bites	Check area for obvious signs of poison ivy, oak, sumac Also be aware of areas that are likely to contain bees/wasp nests, or snakes, use DEET as necessary to prevent exposure to ticks, tape pant legs to boots if necessary and wear light colored clothing	DEET, duct tape, light colored clothing, ivy-bloc, leather boots
	Motor vehicle traffic	Pedestrian being struck by vehicle	Access vehicle and equipment from passenger side, not road side of vehicle. Wear reflective vests, set up traffic warnings as appropriate, particularly on blind corners and hills.	Reflective vests, traffic markers
	Overhead and eye hazards	Eye punctures, head lacerations, bumps	Avoid walking through wooded areas. Whenever possible, stay out of active work areas such as drill sites and areas where heavy equipment is operating. Wear hard hats and eye protection.	Hard hats, eye protection.

SPA Sign-Off Sheet

INSTRUCTIONS:
1. Prior to beginning work each day, review the global safe plan of action.
2. Conduct a walk-through survey of the proposed work area.
3. Verify potential hazards which have been identified in the global SPA are applicable, adjust accordingly.
4. Verify controls and resources are appropriate and available, adjust accordingly
5. Ask each team member, who helped review and develop this SPA, to sign in the spaces provided.

NOTE: Work shall stop when conditions change, the job changes, or a deficiency in the plan is discovered, and the current SPA will be modified or a new SPA created.

TEAM MEMBERS' SIGNATURES

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

The signature of the supervisor confirms the completion of the hazard assessment and Safe Plan of Action by the crew.

Supervisors Signature: _____ Date_____

APPENDIX II

FIELD FORMS

Orientation, SWSHP and Site Specific Addendum Acknowledgement

Orientation/Training

I have been given a health and safety orientation for work to be performed during the project activities. I understand and hereby agree to abide by the general policies and procedures discussed during the orientation received. Furthermore, I understand that failure to comply with the policies and procedures described may resu in disciplinary action up to and including termination of employment or removal from the site.

Date: _____

Printed Name: _____

Signature: _____

Employee Certification

By my signature, I certify that I have been briefed, understand and will abide by the SWSHP and Site Spec Addendum for the PBOW Acid Area 1 Site.

Date: _____

Printed Name: _____

Signature: _____

Daily Tailgate Form

FACILITY

DATE TIME:

CLIENT Job Number:

SPECIFIC LOCATIONS

TYPE OF WORK

SAFETY TOPICS PRESENTED

P.P.E.

ADDITIONAL P.P.E.

CHEMICALS USED

CHEMICAL HAZARDS /SITE

EMER. PROCEDURES **Contact Site Manager or JE HSO, contact Communications Center**

HOSPITAL/CLINIC **Dial (419) 621-3222 for emergency services**

GENERAL HAZARDS:

WEATHER

SITE SPECIFIC HAZARDS

MEETING CONDUCTED BY:

MANAGER REVIEW:

Name Printed	Signature	Time Reviewed	Company

Safety Observation Report

Date: Time: Supervisor of Observer:

Observation:

Was immediate corrective action taken? Yes ☐ No ☐

Describe Immediate Corrective Action:

Describe Action to Prevent Recurrence:

Describe Indirect Cause:

Lack of Training ☐ Lack of Belief ☐ Lack of Resources ☐

Describe Suggested/Recommended Corrective Action For Indirect Cause:

Observers

Name Printed: Signature:

Name Printed: Signature:

Name Printed: Signature:

Description and Verification of Corrective Action Taken To Address Indirect Cause:

Supervisor/Manager

Name Printed: Signature: Date Completed:

APPENDIX III

EMERGENCY INFORMATION

Emergency Numbers

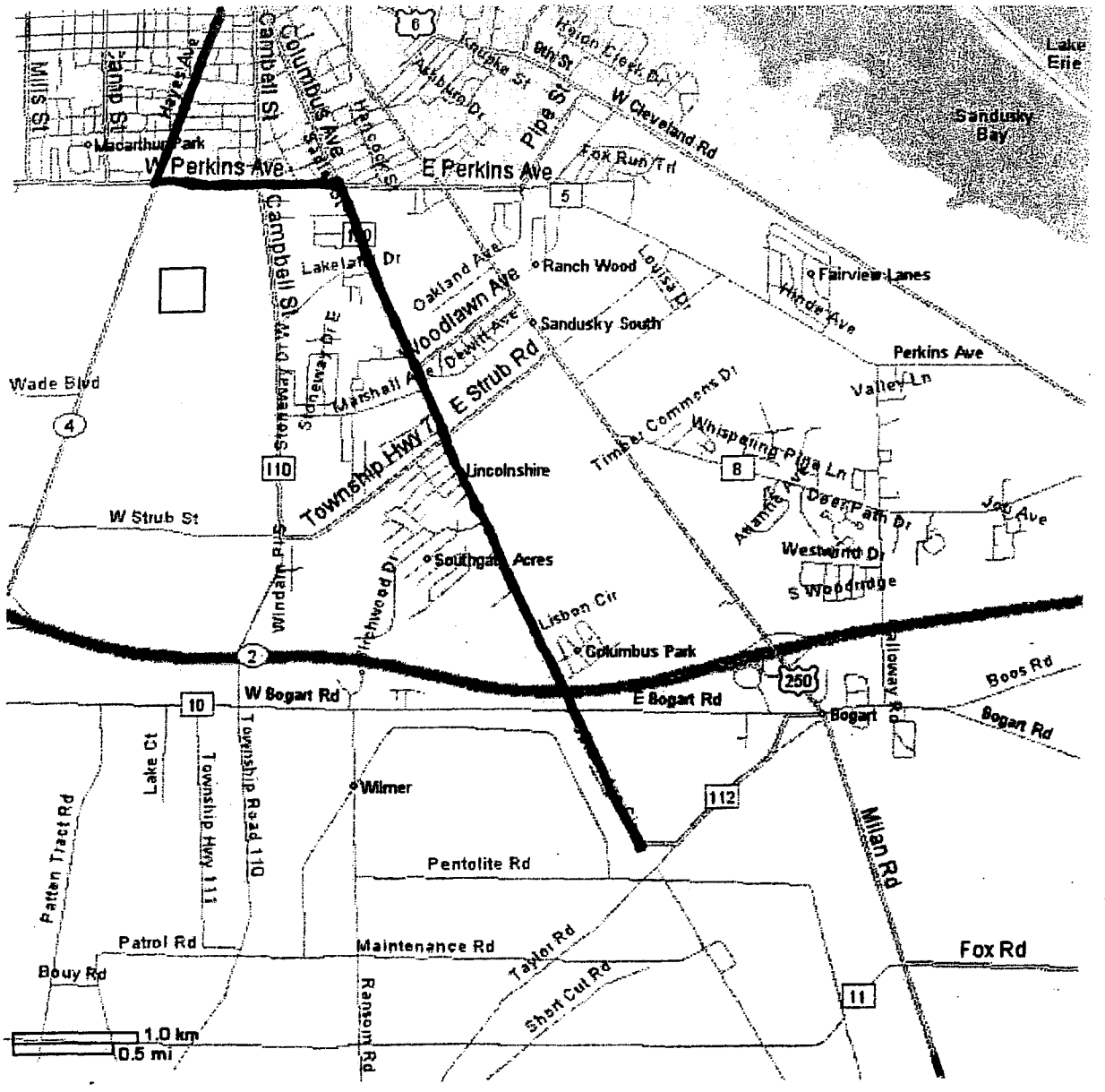
Communications Center Emergency		(419) 621-3222
NASA Guard Station		(419) 621-3226
Police Department		(419) 627-5863
Fire Department		(419) 627-5837
Hospital (Emergency Center)		(419) 626-7455
National Response Center		(800) 424-8802
Poison Control Center		(419) 626-7423
Ohio EPA Emergency Response		(614) 644-2924
Project Manager	Al Hardesty	(865) 220-6043
HSE Manager	Sean Healey	(865) 220-4923

Route to hospital:

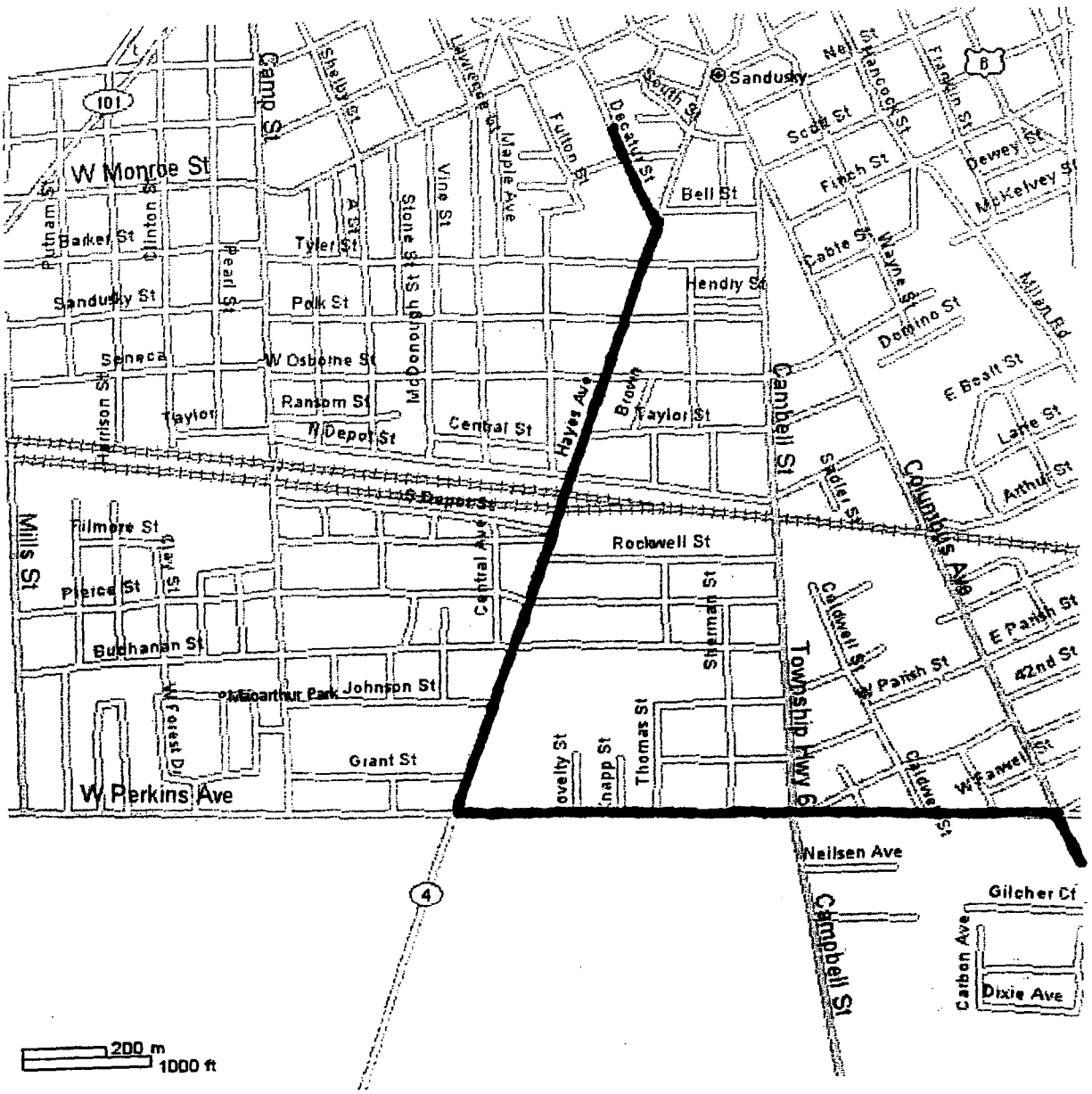
Firelands Regional Medical Center
1101 Decatur Street
Sandusky, Ohio 44870

Exit from the main gate of Plum Brook Station to Taylor Road
Turn left onto Columbus Avenue
Turn left onto Perkins Avenue
Turn right (west) onto Hayes Avenue
Travel north on Hayes Avenue to Decatur
The Firelands Regional Medical Center will be on the left side.

Map from PBOW to Firelands Regional Medical Center



Map from Columbus Ave to Firelands Regional Medical Center



APPENDIX IV

USACE FORM 3394

(For Safety Staff only)	REPORT NO.	EROC CODE	**UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT** *(For Use of this Form See Help Menu and USACE Suppl to AR 385-40)*	**REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)**

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC	☐ FATAL ☐ OTHER		☐	

2. PERSONAL DATA

a. Name *(Last, First, MI)*	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER *(Specify)*

3. GENERAL INFORMATION

a. DATE OF ACCIDENT *(month/day/year)*	b. TIME OF ACCIDENT *(Military time)* hrs	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME: (2) SUBCONTRACTOR:

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE ACTIVITY
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER *(Specify)*	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER *(Specify)*	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER *(Specify)*

4. CONSTRUCTION ACTIVITIES ONLY *(Fill in line and corresponding code number in box from list - see help menu)*

a. CONSTRUCTION ACTIVITY	(CODE) #	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE) #

5. INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see help menu)*

a. SEVERITY OF ILLNESS/INJURY	(CODE) #	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY

e. BODY PART AFFECTED	(CODE) #	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE) #
PRIMARY		TYPE	
SECONDARY		SOURCE	
f. NATURE OF ILLNESS/INJURY			

6. PUBLIC FATALITY *(Fill in line and correspondence code number in box - see help menu)*

a. ACTIVITY AT TIME OF ACCIDENT	(CODE) #	b. PERSONAL FLOATATION DEVICE USED?
		☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER *(Specify)*	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER *(Specify)*	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT *(Fill in line and correspondence code number in box from list - see help menu)*

a. TYPE OF VESSEL/FLOATING PLANT	(CODE) #	b. TYPE OF COLLISION/MISHAP	(CODE) #

10. ACCIDENT DESCRIPTION *(Use additional paper, if necessary)*

11. **CAUSAL FACTOR(S)** *(Read Instruction Before Completing)*

a. (Explain YES answers in item 13)	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. *(CONTINUED)*	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. **TRAINING**

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAINING.
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	(Month) (Day) (Year)

13. **FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES** *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a. DIRECT CAUSE

b. INDIRECT CAUSE(S)

14. **ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).**

DESCRIBE FULLY:

15. **DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.**

a. BEGINNING (Month/Day/Year)	b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT CORPS _____ CONTRACTOR _____	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*	f. OFFICE SYMBOL

16. **MANAGEMENT REVIEW** *(1st)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. **MANAGEMENT REVIEW** *(2nd - Chief Operations, Construction, Engineering, etc.)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. **SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW**

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE

19. **COMMAND APPROVAL**

COMMENTS

COMMANDER SIGNATURE	DATE

*U.S. GOVERNMENT PRINTING OFFICE: 1993-0-791-757

10. ACCIDENT DESCRIPTION *(Continuation)*

13a. DIRECT CAUSE *(Continuation)*

13b.	INDIRECT CAUSES *(Continuation)*

14.	ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S) *(Continuation)*