EA Engineering, Science, and Technology

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12 October 2001

Mr. James L. Colter, RPM (Code 182/J. Colter)
Engineering Field Activity Northeast
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, Pennsylvania 19113-2090

RE: Letter Sampling and Analysis Plan
Addendum to the Site Safety, Health and Emergency Response Plan (SHERP)
Contract No. N62472-92-D-1296; CTO No. 0074
EA Project No. 29600.74

Dear Mr. Colter:

EA Engineering, Science, and Technology is pleased to submit 4 copies of this Draft Letter Sampling and Analysis Plan and SHERP Addendum to collect 12 surface soil samples in the vicinity of IR Site 10 - Navy Fuel Farm located at the Naval Air Station Joint Reserve Base (NASJRB) Willow Grove. This letter includes an addendum to the document entitled Site Safety, Health and Emergency Plan (SHERP), Navy Fuel Farm Facility, NASJRB, Willow Grove prepared for the Final Sampling Analysis Plan for Remedial Action to the Navy Fuel Farm (EA 1997) as an attachment. This addendum provides a site specific hazard analysis, health and safety monitoring requirements, and personal protective equipment to be used during the field activities.

SOIL SAMPLING-NAVY FUEL FARM LOCATED AT THE NAVAL AIR STATION JOINT RESERVE BASE (NASJRB) WILLOW GROVE.

USA Environmental of Trenton, New Jersey, under a separate contract, is demolishing a greenhouse at the Base Sewage Treatment Plant. This greenhouse was used as a sludge drying facility. USA Environmental will also remove 2 feet of soil below the footprint of the greenhouse. EA will collect soil samples to evaluate the quality of soil to be left in place.

The objective of the Sampling and Analysis Plan is to identify the procedures that will be followed to assess the presence or absence of surface soil contamination.

The Sampling and Analysis Plan is organized as follows:

1. Field Investigation: outlines the soil sampling methodologies to be used, analytical parameters, quality control samples, and utility location. This section also discusses the investigation of derived waste, decontamination procedures, and the SHERP Addendum.

2. Closeout Report Organization: discusses the data evaluation and Closeout Report.
3. Project Organization and Schedule: discusses the project team and schedule.

FIELD INVESTIGATION

Soil Sampling

Figure 1 presents the site location map. Sampling will be conducted after the demolition of the greenhouse used for drying sludge and the removal of 2 feet of soil. EA proposes to collect 12 surface soil samples at locations shown in Figure 2. This sampling will be conducted to characterize the soil for closure. The approximately 6,000 square foot area will be sampled using a combination of a hand auger and a hand-powered large bore soil sampler to an approximate average depth of 1 foot. Soil will be collected (grab) immediately for VOC analysis using Encore™ samplers. Soil will be field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). Remaining soil will be composited and extruded into glass jars and sealed with Teflon-lined caps.

Surface soil samples will be analyzed for target compound list (TCL) VOC using the Environmental Protection Agency (EPA) Method 8260, TCL semi-volatile organic compounds (SVOCs) using EPA Method 8270, TCL polychloronated biphenyls (PCBs) by EPA Method 8082, TCL pesticides by EPA Method 8081, and target analyte list (TAL) metals by EPA Method 6010/7471.

Additionally, quality control (QC) samples will include 2 duplicate samples, 1 matrix spike (MS), 1 matrix spike duplicate (MSD), 1 trip blank for VOC analyses only per cooler, 1 field blank per sampling event, and 1 rinsate blank per day according to *Navy Installation Restoration, Laboratory Quality Assurance Guide, February 1996, Navy Facility Engineering Service Center, Hurneme, California.* QC samples will be forwarded to the laboratory for analysis for the same parameters as described above. Form 1 laboratory results will be delivered electronically and/or by facsimile to EA for 48-hour turn around time (TAT), with hard copies of the laboratory results delivered within 3 weeks of sample receipt. EA assumes the analytical data will not be validated. Therefore, lab deliverable will include lab results and narrative without full laboratory backup documentation.

Utilities

Prior to the collection of surface soil samples, the location of existing utilities will be assessed and the proposed sampling locations will be clearly marked. EA assumes all utility clearances will be obtained by USA Environmental prior to demolition and no additional utility clearance will be needed.

Decontamination Procedures

Non-dedicated sampling equipment will be decontaminated between sample locations by a wash with an Alconox/water solution followed by a tap water rinse, nitric acid or methanol rinse, deionized water rinse, and allowed to air dry on a clean plastic surface.

Investigation of Derived Waste

Soil cuttings will be replaced to the boring hole following sampling. Decontamination water will be containerized, sampled, and analyzed for TCLP metals, TCLP VOC, TCLP Pesticides, TCLP PCB, TCLP SVOC, ignitability, corrosivity, and reactivity. Assuming the results indicate the decontamination water is non-hazardous, the decontamination water will be disposed via the NASJRB wastewater treatment plant (WWTP).

SHERP Addendum

All field activities will be completed according to the enclosed addendum to *the Site Safety, Health, and Emergency Response Plan (SHERP) prepared for the Final Sampling and Analysis Plan for Remedial Action to the Navy Fuel Farm, 20 August 1997.*

CLOSEOUT REPORT

EA will prepare a draft and final Closeout Report in letter format with laboratory results and laboratory narrative, and appropriate figures as appendices. The text portion of the letter report will include work performed, a brief statement describing the encountered soils, sampling rationale, number, depth, and locations of samples collected, recommendations based on findings of the investigation, and a discussion of any soils with detections above the screening criteria.

Laboratory results will be presented in tabular format with comparisons to the PA DEP Act II Medium Specific Concentrations (MSCs). The MSCs used will be "Direct Contact Numeric Values for Non-Residential, Surface Soil (0-2 feet)".

SCHEDULE

The schedule is dependent on USA Environmental's schedule for demolition of the greenhouse and removal of 2 feet of soil. USA Environmental estimated that demolition activities followed by removal activities will commence in mid November. Therefore the schedule below is estimated based on demolition beginning in mid November and is subject to change.

Completion of Field Work	29 November 2001
Receive Analytical Results	3 December 2001
Submit Draft Close-out Report to EFANE	09 January 2001
EFANE Review of Close-out Report Complete	30 January 2002
Submit Final Close-out Report to EFANE and PA DEP	06 February 2002

Please call me at 302-325-3560, if you have any questions.

Sincerely,

Katherine Sheedy
Project Manager

Sincerely,

Maria Magilton
Project Scientist

cc: K. Kilmer (EA Loveton)
J. Dale (EFANE)
J. Dugan (USA Environmental)
J. Fox (NASJRB, Willow Grove)
J. Edmond (NASJRB, Willow Grove)
File: 29600.74

SITE SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN ADDENDUM

Prepared for the

Final Sampling and Analysis Plan for Remedial Action to the Navy Fuel Farm, 20 August 1997

To be followed during the Additional Soil Sampling at

NASJRB Willow Grove

Prepared for:

Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, PA 19113-2090

Prepared by:

EA Engineering, Science, and Technology, Inc.
92 Read's Way, Suite 109
New Castle, Delaware 19720

DRAFT

Katherine Sheedy
Project Manager

Date

DRAFT

Maria J. Magilton
Project Scientist

Date

DRAFT

Kris Hoiem
CIH

Date

October 2001

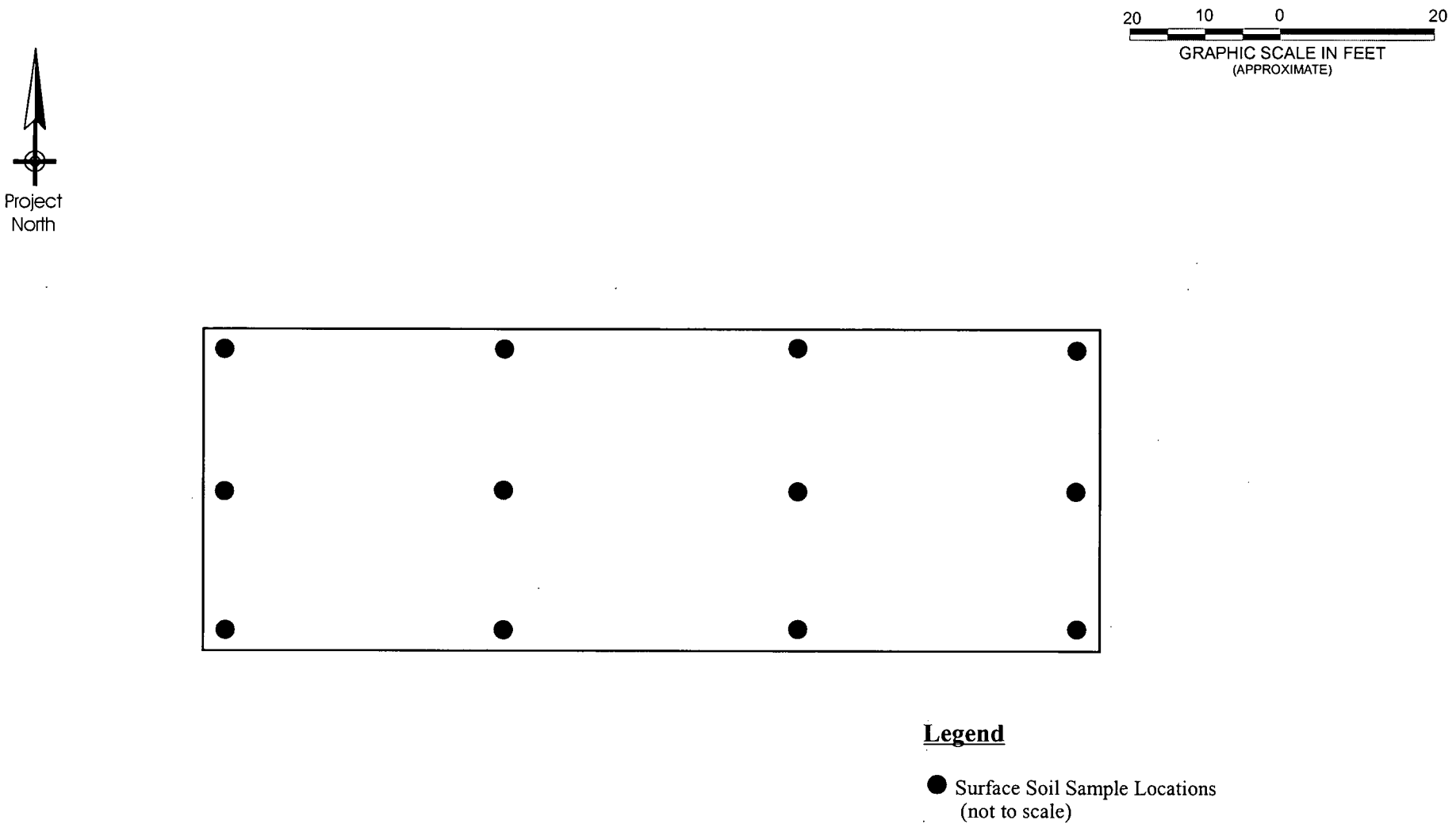
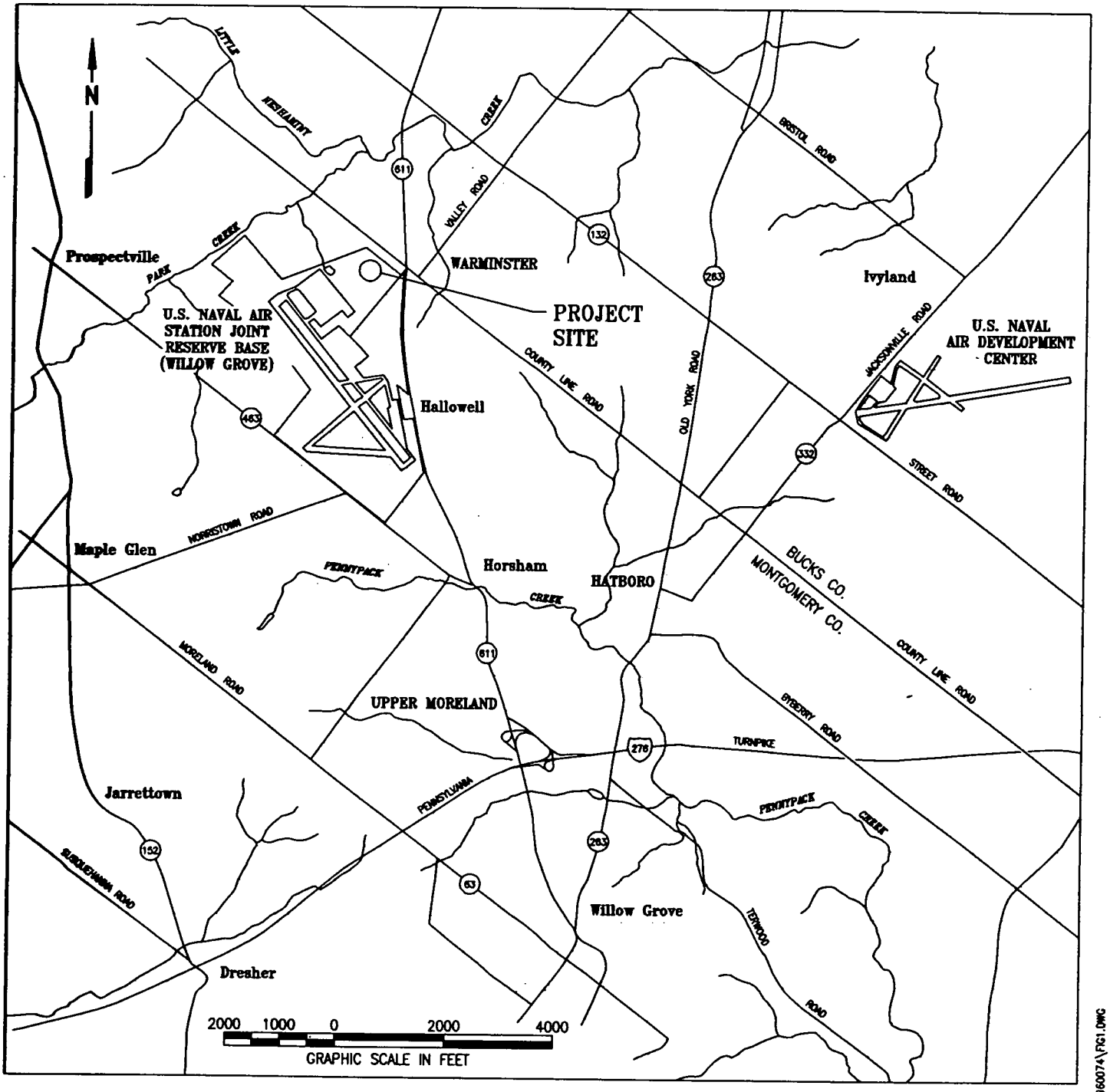


Figure 2. Outline of former greenhouse showing approximate surface soil sample locations.



FILE: Q:\PROJECTS\29600074\FIG1.DWG

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

NAVY FUEL FARM
NAVAL AIR STATION JOINT RESERVE BASE
WILLOW GROVE, PENNSYLVANIA

SITE LOCATION MAP

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
KAS	MJD	WCM	CR	AS SHOWN	10-12-01	29600.74	1

ADDENDUM TO THE SHERP

This addendum includes a specific hazard analysis, health and safety monitoring requirements, and personal protective equipment to be used during field activities.

TASK-BY-TASK HAZARD ANALYSIS

HAZARD COMMUNICATION

Compliance with OSHA's Hazard Communication Standard is required at the work site. A MSDS for each chemical brought onsite during field activities will be kept onsite by the SSHO and be made readily accessible to site workers. Personnel shall receive training for safe use of these materials (as required by 29 CFR 1910.1200) during the site safety meeting. Field personnel shall be informed of the location of MSDSs. Chemicals brought onsite must be labeled in accordance with OSHA Hazard Communication Requirements, 29 CFR 1926.59.

The SSHO shall brief field personnel on the following information prior to commencement of field activities:

- The location of hazardous chemicals near specific work areas
- Methods used to detect the presence or release of hazardous chemicals in the work area
- The physical and chemical health hazards of the chemicals in the work area
- Protective measures such as safe work practices, emergency procedures, and PPE
- Details regarding the proper use of protective measures and MSDSs.

CHEMICAL HAZARDS

Chemical hazards are not expected to be encountered in the subject area, however chemical hazards may be present in nearby sites within the Naval Air Station Joint Reserve Base. Petroleum hydrocarbons, volatile organic compounds and other solvents may be present in the surrounding area.

PHYSICAL HAZARDS

Many physical hazards will potentially be present at the site during field activities. These physical hazards may include, but may not be limited to:

- General safety
- Fire/explosion
- Electrical
- Utilities
- Weather
- Cold stress
- Biological

Sites will be visually inspected for the presence of general safety hazards (e.g. trip/slip hazards, unstable surfaces or steep grades, sharp objects) prior to beginning work. If hazards are present, these hazards will be recorded and precautionary measures will be taken to prevent injury. During intrusive activities, site workers will also avoid materials that could potentially contain contaminants.

Fire/Explosion Hazards

The potential for fire and/or explosion emergencies is always present. Employees will always be alert for unexpected events, such as ignition of chemicals or sudden release of materials under pressure, and prepared to act in these emergencies.

Field vehicles will be equipped with a fire extinguisher. Employees will be trained in the proper use of fire suppression equipment. However, professionals will handle large fires that cannot be controlled with fire extinguishers. The proper authorities will be notified in these instances. Emergency numbers are located at the end of this addendum.

Electrical Hazards

Overhead power lines, electrical wiring, electrical equipment, and buried cables pose risks to workers of electric shock, burns, muscle twitches, heart fibrillation, and other physical injuries, as well as fire and explosion hazards. Workers will take appropriate protective measures when working near live electrical parts, including inspection of work area to identify potential spark sources, maintenance of a safe distance, proper illumination of work areas, provision of barriers to prevent inadvertent contact, and use of nonconductive equipment. If overhead lines cannot be de-energized prior to the start of work, a 10-ft distance will be maintained between overhead energized power lines with a voltage of 50 kV and elevated equipment

parts. This distance will be increased 4 in. for every 10 kV greater than 50 kV. For example, workers will maintain a distance of 11.7 ft from energized power lines with a voltage of 100 kV.

Utilities

Underground utilities pose hazards to workers involved in invasive operations. These hazards include electrical hazards, explosion, and asphyxiation, soil contamination as well as costly and annoying hazards associated with damaging communication, sewer, and water lines. Prior to commencement of invasive operations, underground utilities, including buried wires, pipes, tanks, etc., will be visibly marked with flags or marking paint to alert workers of unsafe areas. Personnel should be aware that although an area may be cleared, it does not mean that unanticipated hazards will not appear.

Weather Hazards

Weather conditions will always be taken into consideration. Heavy rains, electrical storms, high winds, and extreme temperatures, for example, may create extremely dangerous situations for employees. Equipment performance may also be impaired because of inclement weather.

Wind direction will be observed. If exposure to organic vapors is anticipated, workers will locate upwind of excavation. Wind direction often changes abruptly and without warning, so personnel should always be prepared to reposition, if necessary.

Cold Stress

The projected timing of field activities during the fall and/or winter months may be an issue for cold stress. Working in cold conditions could cause cold stress, if proper precautions are not taken. Proper fitting clothing and gloves shall be worn. Cold exposure becomes an issue at low temperatures or when the wind chill factor is low. Table 1 summarizes the threshold limit values work/warm-up schedule for a four-hour shift.

Table 2 summarizes the cooling power of wind on exposed flesh as expressed as equivalent temperature (under calm conditions). Moisture increases the susceptibility to cold exposure. Hazards associated with cold weather include:

Hypothermia - A decrease in body temperature to 95°F or below.
Factors that promote hypothermia include:

- Drug use
- Alcohol

- Wetting
- Wind

Most cases of hypothermia occur at temperatures between 45 and 50°F

Frostbite - Actual freezing of body tissue
Factors that promote frostbite include:

- Duration of exposure
- Low air temperature
- Strong wind (wind chill factor)
- Contact with metal
- Improper clothing
- Previous cold injury
- Smoking

Biological Hazards

Insect Bites/Stings

Protective outer clothing such as gloves, hard hats, and coveralls can reduce the potential for insect bites and stings. Insect bite symptoms may include redness, rash, swelling, chills, fever, diarrhea, and vomiting. Any worker who has been bitten or stung and shows symptoms of a severe reaction will seek medical assistance immediately. Workers who know of their allergies to insects will advise their employer prior to field activities and will carry an antidote kit, if necessary.

To prevent contact with disease-carrying ticks, workers will wear long-sleeved shirts, long pants, and steel toe safety boots that extend above the ankle with socks pulled over pants cuffs. Workers will thoroughly check clothing, skin, and hair for the presence of ticks at the end of each workday. If a tick attaches to the body, it should be removed by gently tugging with tweezers where the mouth parts enter the skin. The tick should not be killed prior to removal.

HEALTH AND SAFETY MONITORING REQUIREMENTS

Incidents or concerns will be logged in the field book provided, along with the corrective action/protective measure taken.

Work site monitoring will be conducted during site activities to evaluate the potential for personal exposure to chemical, physical, or biological hazards. Monitoring of these hazards will assist in the following:

1. Evaluating site conditions prior to initiation of site activities;

2. Determining the effectiveness of engineering control measures, work areas, and safe work practices;

3. Evaluating the threat posed by contamination to site workers, the environment, and the general public;

4. Assessing the need for upgrading or downgrading PPE requirements.

Various real-time and near real-time (NRT) direct reading instruments will be utilized whenever possible during site operations which have the potential for causing personal exposure to chemical or physical hazards.

The SSHO will be responsible for monitoring environmental conditions and will monitor those workers likely to have the highest exposure. The SSHO will be familiar with the use, calibration, and regular maintenance of monitoring instruments. It shall be the responsibility of EA Engineering to acquire, inspect, calibrate, maintain, and ensure proper operation of all monitoring and sampling equipment to be used for the evaluation of all applicable chemical and physical hazards, which may be encountered during site activities.

HAZARD ANALYSIS

Organic vapor readings will be taken in the breathing zone during intrusive activities with a photoionization detector (PID). PID readings will be taken in the breathing zone. Potential explosive conditions or low oxygen levels will also be monitored in the work zone during intrusive activities using a Combustible Gas/Oxygen Analyzer (CGI/O2) meter. CGI/O2 readings will be taken at the bore hole/ground interface. Calibration instructions for the PID and CGi/O2 will be available prior to the commencement of field activities. Frequency, location, action levels, and required response are as follows:

Task	Instrument	Frequency and Location	Action Levels	Response
Surface Soil Sampling	Photoionization Detector (PID)	Initially and at least at every boring location and every thirty minutes thereafter in the breathing zone	>0.5 ppm above background	• work will stop • contact the Corporate Health and Safety Officer and Project Manager • Assess the situation
Surface Soil Sampling	Combustible Gas/Oxygen Analyzer (CGI/O2)	Initially and at least at every boring location and every thirty minutes thereafter at the bore hole/ground interface	0-10% of LEL 10-20 % of LEL >20% of LEL	• continue monitoring • monitor continuously, prepare to shut down • shut down immediately, evacuate

SITE WORKER TRAINING AND PHYSICAL EXAMINATION RECORD

Name	HAZWOPER 40-Hour Initial	HAZWOPER 8-Hour Annual	First Aid	CPR	Supervisor Training	Last Medical Exam
Jeff Smith	**1993**	**2001**	**----**	**----**	**2000**	**8/2001**
Maria Magilton	**1999**	**2001**	**----**	**----**	**----**	**2001**
Vicky Miller	**1996**	**2001**	**2001**	**2001**	**2001**	**2001**

Note:

- **No employees other than those listed below are permitted to work onsite without prior written approval by the Project Manager or Site Safety and Health Officer**
- **At a minimum, the Site Manager must have had Supervisor's Training**

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Based on evaluation of the potential safety and health hazards, the required initial levels of personal protective equipment (PPE) is Level D for each work task. This will consist of steel-toed work boots, shirts, long pants, and latex gloves. Nitrile or neoprene outer gloves and poly-coated tyvek coveralls will be used if required to protect against contact with contaminated media.

The SSHO will review appropriate procedures for donning and doffing PPE prior to the start of work tasks. PPE will be inspected by site workers prior to use and regularly during use. If a site worker experiences a failure or alteration of PPE that affects the level of protection offered, that person will immediately leave the Exclusion Zone. Re-entry will not be permitted until the equipment has been repaired or replaced.

UPGRADE ACTION LEVELS

Work will stop if the following action levels are exceeded and can not be mitigated by engineering controls such as, but not limited to: dust suppression, work stoppage to allow dust to dissipate, or ventilating problem areas. Rotation of workers to minimize exposure duration shall not be considered an acceptable engineering control.

ACTION LEVEL FOR DUST

Sustained (exceeding 5 minutes) visible dust in the breathing zone shall require dust suppression or work cessation.

EMERGENCY INFORMATION

The following list of emergency telephone numbers will be placed in the glove compartment of field vehicles.

Onsite Emergency Contacts

Nearest Telephone: Mobile phone in EA vehicle

Other site communication equipment: None

Onsite Emergency: 215-443-1911

Onsite Clinic: 215-443-6360

Onsite Fire Department: 215-443-6198

Hospital:

Abington Hospital

1200 Old York Road (Route 611)

Abington, PA 19001

(215) 481-2000

Warminster Hospital

225 Newtown Road

Warminster, PA 18974

(215) 441-6775

Note: Initial medical treatment will be provided by the NAS Clinic located near the main entrance gate. Should additional treatment be required, the NAS ambulance will transfer injured personnel to Abington Hospital or Warminster General Hospital

OFFSITE EMERGENCY CONTACTS

EA Project Manager: Katherine Sheedy (302-325-3560)

Program Health and Safety Officer: Kris Hoiem (410-771-4950)

Site Manager: Jeff Smith or Alternative (410-771-4950)

Site Safety and Health Officer: Maria Magilton or Alternative (302-325-3560)

In case of spill, contact Katherine Sheedy (302-325-3560)

Give the following information when reporting an emergency:

1. Name and location of person reporting
2. Location of accident/incident
3. Name and affiliation of injured party
4. Description of injuries, fire, spill, or explosion
5. Status of medical aid and/or other emergency control efforts
6. Details of chemicals involved
7. Summary of accident, including suspected cause and time it occurred
8. Temporary control measures taken to minimize further risk.

This information is not to be released under any circumstances to parties other than those listed in this section and emergency response team members. Once emergency response agencies have been notified, the Project Manager and Site Safety and Health Manager will be notified immediately.

TABLE 1 THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT*

Air Temperature - Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph wind		20 mph Wind	
° C (approx.)	° F (approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26 to -28	-15 to -19	(Norm. Breaks)	1	(Norm. Breaks)	1	75 min	2	55 min	3	40 min	4
-29 to -31	-20 to -24	(Norm. Breaks)	1	75 min	2	55 min	3	40 min	4	30 min	5
-32 to -34	-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35 to -37	-30 to -34	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38 to -39	-35 to -39	40 min	4	30 min	5	Non-emergency work should cease					
-40 to -42	-40 to -44	30 min	5	Non-emergency work should cease							
-43 & below	-45 & below	Non-emergency work should cease									

Notes:

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-periods in a warm location and with extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For Light-to- Moderate Work (limited physical movement): apply the schedule one step lower. For example, at -35 C (-30 F) with no noticeable with 4 breaks in a 4-hour period (Step 5).
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available:
   5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: 1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 W/m^2; 2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m^2. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder ranges, since windy conditions rarely prevail at extremely low temperatures.
4. TLVs apply only for workers in dry clothing.

* Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labour.

TABLE 2 COOLING POWER OF WIND ON EXPOSED FLESH AS EXPRESSED AS EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	***LITTLE DANGER*** In < hr with dry skin. Maximum danger of false sense of security				***INCREASING DANGER*** Danger from freezing of exposed flesh within one minute.				***GREAT DANGER*** Flesh may freeze within 30 seconds.			
	Trenchfoot and immersion foot may occur at any point on this chart.											

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

Highlighted areas show equivalent chill temperature requiring dry clothing to maintain core body temperature above 36 °C (96.8 °F) per cold stress TLV.