

SITE-SPECIFIC HEALTH AND SAFETY PLAN
BORIT ASBESTOS SITE

USEPA REGION III
Emergency Response and Rapid Response Service

Field Office at
324 West Maple Street
Ambler, PA 19002

Prepared by:

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1.0 INTRODUCTION 1

1.1 PURPOSE, SCOPE AND APPLICABILITY OF THE SITE SPECIFIC HEALTH AND SAFETY PLAN..... 1

1.2 REVISIONS TO THE PLAN 1

1.3 VISITORS 1

2.0 KEY PERSONNEL AND RESPONSIBILITIES..... 2

2.1 KEY PERSONNEL 2

2.2 RESPONSIBILITIES 2

2.2.1 EPA ON-SCENE COORDINATOR..... 2

2.2.2 RESPONSE MANAGER..... 2

2.2.3 SITE SAFETY AND HEALTH SUPERVISOR (SSHS) (THE RM WILL SERVE AS THE SHSO)..... 3

2.2.4 WRS HEALTH AND SAFETY DIRECTOR (HSD) 4

2.2.5 FOREMAN, OPERATORS, AND TECHNICIANS 4

3.0 SITE AND PROJECT DESCRIPTION 4

3.1 SITE DESCRIPTION 4

3.2 PROJECT DESCRIPTION 5

4.0 HAZARD ANALYSIS..... 5

4.1 GENERAL HAZARD ANALYSIS 6

4.1.1 PHYSICAL HAZARDS 6

4.1.2 BIOLOGICAL HAZARDS 7

4.1.3 CHEMICAL HAZARDS 8

4.1.4 ASBESTOS EXPOSURE CONTROLS..... 8

5.0 PERSONNEL TRAINING REQUIREMENTS..... 8

5.1 GENERAL 8

5.2 PRE-ASSIGNMENT AND ANNUAL REFRESHER TRAINING 9

5.3 PROJECT SUPERVISORS TRAINING 9

5.4 HEALTH AND SAFETY PLAN REVIEW..... 9

5.5 DAILY SAFETY MEETINGS..... 9

5.6 ASBESTOS TRAINING..... 9

6.0 PERSONAL PROTECTIVE EQUIPMENT 10

6.1	SPECIFIC LEVELS OF PROTECTION PLANNED FOR THE PROJECT	10
6.2	PPE ENSEMBLE COMPONENTS	10
6.3	APPLICATION	11
6.4	INSPECTION	11
6.5	PERSONAL CLOTHING	11
7.0	<u>MEDICAL SURVILLANCE REQUIREMENTS</u>	11
7.1	GENERAL	11
7.2	SITE SPECIFIC MEDICAL MONITORING	12
7.3	SUBSTANCE ABUSE PREVENTION	12
8.0	<u>AIR SURVEILLANCE</u>	13
8.1	MONITORING	13
8.2	ACTION LIMITS	13
8.3	AIR SAMPLING FOR ASBESTOS	14
8.4	METEOROLOGICAL MONITORING	14
9.0	<u>SITE CONTROL MEASURES</u>	14
9.1	CONTROL ZONES	14
9.2	SITE COMMUNICATIONS PLAN	15
9.3	SANITATION FACILITIES	15
9.4	<u>SIGNS & LABELS</u>	17
10.0	<u>DECONTAMINATION PLAN</u>	17
10.1	LEVELS OF DECONTAMINATION PROTECTION REQUIRED FOR ASSISTING PERSONNEL	17
10.2	EQUIPMENT DECONTAMINATION	18
10.2.1	SAMPLING EQUIPMENT	18
10.2.2	HEAVY EQUIPMENT	18
10.3	PERSONNEL DECONTAMINATION	18
10.3.1	PROCEDURE	18
10.3.2	EQUIPMENT	18
10.4	DISPOSITION OF DECONTAMINATION WASTES	18
11.0	<u>EMERGENCY RESPONSE PLAN</u>	19

11.1 PRE-EMERGENCY PLANNING 19

11.2 PERSONNEL ROLES AND LINES OF AUTHORITY 19

11.3 EMERGENCY RECOGNITION/PREVENTION..... 19

11.4 EMERGENCY EQUIPMENT/FACILITIES 20

11.5 FIRE OR EXPLOSION..... 20

11.6 SPILL OR LEAKS 21

11.7 EMERGENCY CONTACT/NOTIFICATION SYSTEM..... 21

11.8 EVACUATION ROUTES/PROCEDURES..... 22

11.9 EMERGENCY MEDICAL TREATMENT PROCEDURES..... 22

APPENDICES

APPENDIX A HEALTH AND SAFETY FORMS

APPENDIX B WRS HEAT STRESS MANAGEMENT SOP

APPENDIX C WRS ASBESTOS REMOVAL SOP

APPENDIX D WRS COLD STRESS PPREVENTION SOP

**APPENDIX E NOTIFICATION PROCEDURES IN THE EVENT OF A SIGNIFICANT
RELEASE OF ASBESTOS**

**APPENDIX F EXAMPLE OF A WRITTEN
JOB SAFETY ANALYSIS**

1.0 INTRODUCTION

1.1 Purpose, Scope and Applicability of the Site Specific Health and Safety Plan

Purpose of this site specific Health and Safety Plan (HASP) is to identify anticipated hazards and the control measures to be implemented at the **BoRit asbestos site in Ambler PA**, hereafter referred to as "*The Site.*" The procedures presented in this HASP are based on the best available information at the time of the plan's preparation, and are intended only for the activities described in this plan.

The HASP extends to all WRS Infrastructure & Environment, Inc. (WRS) employees, subcontractor employees and visitors. All personnel prior to entering the exclusion zone or contamination reduction zone (decontamination zone) must review and sign this plan. All personnel on site shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the project tasks/operations. This HASP summarizes those hazards in **Section 4.0** and defines hazard control measures planned for the site.

The requirements and protocols cited in this plan were developed in consideration of current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources were consulted in developing this plan:

- OSHA 29 CFR 1910.120.
- EPA Standard Operating Safety Guides.
- NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines.
- NIOSH Pocket Guide to Chemical Hazards.

1.2 Revisions to the Plan

Revisions to this plan may be made based on conditions encountered during site activities. All revisions to this plan shall be documented on a *Field Procedures Change Authorization form* (Appendix A), approved by the WRS Response Manager, the USEPA On Scene Coordinator and the WRS Health and Safety Director.

1.3 Visitors

Visitors to the site will sign in at the Command Post. They will be given a visitor's safety orientation. Visitors are expected to wear PPE consistent with hazard exposure described in the orientation. Visitors will be escorted by a WRS, USEPA or START representative. Areas of the project site may not be accessible to visitors depending on site activities. In the event that a visitor does not adhere to safe procedures established for visitors, he/she will be requested to leave the work area

2.0 KEY PERSONNEL AND RESPONSIBILITIES

2.1 Key Personnel

The following personnel have principal responsibility for the implementation and maintenance of health and safety measures during site remediation activities.

Job Function	Name	Phone	Alternate Phone
USEPA On Scene Coordinator	Eduardo Rovira	215-654-5190	
USEPA On Scene Coordinator	Jack Kelly	215-654-5190	
USEPA On Scene Coordinator	Todd Richardson	215-654-5190	
WRS Response Mgr. & Site Safety Supervisor	Charlie Keegan	267-540-0048	609-304-2296
START	Mrinal Biswas	215-651-4021	
REAC	David Adams	609-865-9301	
WRS H&S Director	Doug Nelson CIH, CHMM	813-684-4400	813-267-7416

The site telephone number is 215-654-5191.

2.2 Responsibilities

2.2.1 EPA On-Scene Coordinator

The **EPA On-Scene Coordinator** is overall responsible for all activity on site. The EPA OSC can halt or stop any activity that appears to be unsafe. The OSC will perform periodic site inspections/audits.

2.2.2 Response Manager

The **Response Manager** is responsible for health and safety "performance" in the field. The Site Response Manager can temporarily halt work at any time if, in his/her opinion, it is necessary to protect the health and well being of site workers or the general public. Specific responsibilities of the Response Manager include:

- Directing site activities in accordance with the HASP.
- Being aware of and complying with all applicable federal, state, and local occupational health and safety regulatory requirements.
- Ensuring that resources called for in the HASP and Work Plan/Operations Plan are on site and operational.

- Verifying that all permits, supporting documentation and clearances for a given task (e.g., utility surveys, health and safety plan, confined space entry permits) are in place.
- Informing the appropriate site management and safety personnel of the activities to be performed each day.
- Providing technical advice during routine operations and emergencies.
- Handling field emergency response situations that may arise.
- Correcting unsafe acts and conditions.
- Participating in pre-job and daily safety meetings.

2.2.3 Site Safety and Health Officer (SSHO) (The RM will serve as the SHSO)

The **Site Safety and Health Officer (SHSO)** has responsibility for ensuring that provisions of each HASP are implemented in the field by all WRS employees and subcontractor employees. The SHSO must be trained to implement the requirements in the site specific HASP, including the correct use of monitoring instruments, health and safety criteria for the site, documentation of monitoring results, and actions to take if site conditions change.

The designated SSHO shall continuously evaluate the adequacy of prescribed health and safety procedures and levels of protection against the actual conditions encountered in the field. If an obvious discrepancy exists between the realized hazard(s) and the level of personal protective equipment (either too much or too little), the SHSO shall immediately bring the situation to the attention of the WRS Health and Safety Director (HSD). With the concurrence of the HSD and the Response Manager, the SHSO shall take appropriate corrective action. The SHSO has final on-site authority for all matters specifically related to worker health and safety, and emergency situations that require immediate action, including the authority to temporarily cease operations. Additional responsibilities of the SSHS include:

- Monitoring site activities for unsafe acts and conditions and initiating their correction.
- Monitoring project and site activities for conformance to the site specific HASP.
- Overseeing confined space entries and ensuring that all confined space entries are done in accordance with the requirements found in the WRSIE standard operating procedures (SOP's) for confined space entry.
- Coordinating on-site air monitoring and personal sampling as specified in the site specific HASP.
- Calibration of instruments.
- Maintenance of health and safety equipment and supplies.
- Ensuring that all work-related injuries and illnesses are properly treated and investigated.
- Conducting safety briefings and daily safety meetings.
- Maintaining documentation in support of the HASP.
- Participating in a pre-job safety briefing with project personnel to discuss anticipated hazards and their control measures.

2.2.4 WRS Health and Safety Director (HSD)

The **WRS Health and Safety Director (HSD)** shall be responsible for implementing an effective hazardous waste operations health and safety program. The HSD shall have the requisite authority to implement the procedures set forth in the WRS Health and Safety Manual for Hazardous Waste Site Activities, including the authority to temporarily halt work on a project if necessary, to protect employees' safety or health. The HSD may delegate certain duties to the SHSO or to other WRS personnel, but shall be ultimately responsible for the following:

- Overseeing the employee medical surveillance program and interacting with examining physicians as required
- Investigating site histories, performing site characterizations, and assessing site/task specific hazards.
- Developing or assessing task specific monitoring procedures, action levels, levels of personal protective equipment (PPE), and health and safety requirements for the site and the HASP.
- Performing periodic site inspections/audits.
- Following to resolution all deficiencies noted during site inspections. and,
- Resolve "level of care" conflicts that may arise during conduct of the project.

2.2.5 Foreman, Operators, and Technicians

All site personnel share responsibilities for health and safety. Specific duties include:

- Conducting work in accordance with the HASP.
- Participating in daily safety meetings/planning.
- Prompt reporting of all incidents and potential health and safety-related problems.

All site personnel have the authority to stop an operation they believe to be unsafe.

3.0 SITE AND PROJECT DESCRIPTION

3.1 Site Description

The site is ~32 acres of both wooded and grassy land adjacent to several streams. A reservoir also is located onsite. Asbestos containing materials (> 1%) have been disposed of here and the site requires stream bank stabilization measures, soil cover and drainage improvements to prevent exposure of buried materials. The ACM is transite. No Thermal System Insulation (TSI) (e.g. pipe insulation) or surfacing materials (e.g. fire proofing or acoustical plaster) have been detected on site.

The site address is:

6 West Maple Street
Ambler, Pa 19002

3.2 Project Description

Activities will include the following:

- Mobilization
- Delineate and Setup Site Zones
 - Support
 - CRZ
 - Road construction
 - Decon Pad
 - Construction entrance
 - Hot Zone
- Dust suppression
- Personal and area air monitoring
- Clear and Grub Vegetation along Wissahickon Creek bank and Rose Valley Creek Banks
- Stabilize creek bank
 - Cover exposed ACM with clean fill
- Grinding cut vegetation and trees
- Collect and containerize ACM
- Cover north bank of reservoir with top soil
- Install Erosion and sedimentation
 - Install turbidity barrier across creek at downstream dam
 - Install controls along toe of creek bank
- Grind tree stumps on bank
 - Collect wood chips on bank from grinding operations
- Transportation and disposal of ACM waste
- Place clean fill to shape creek bank slope
- Start installation of creek bank cap following approved design
 - Geotextile
 - Geoweb cells
 - Fill for geoweb cells
 - Placement of rip rap
- Remove excess material from site
- Decontaminate equipment which has had ACM contact
- Demobilization

4.0 HAZARD ANALYSIS

The evaluation of hazards is based upon the knowledge of project background information presented in Section 3, and anticipated risks posed by the specific tasks/operations to be performed. Section 4 presents a general description of project hazards. Sections 4.1.1, 4.1.2 and 4.2.3 outline hazards and their control measures.

Most task safety evaluation and analyses is discussed at daily site safety meetings. Should a new site activity arise where potential hazards might warrant a written Job/Task Safety Analysis, this document would be prepared at the site and reviewed by the HSD.

4.1 General Hazard Analysis

Potential/ Anticipated Hazards

CHEMICAL	NO	FALL TO DIFFERENT LEVEL	NO
ASBESTOS	YES	EXCAVATION	YES
FIRE/ EXPLOSION	NO	HEAVY EQUIPMENT/ VEHICULAR TRAFFIC	YES
HEAT STRESS	YES	OVERHEAD HAZARDS	YES
COLD STRESS	YES	ELECTRICAL/ UTILITY HAZARDS	YES
MACHINERY/ MECHANICAL EQUIPMENT	YES	FLORA/ FAUNA	YES
CUTTING & WELDING	NO	UNSTABLE/ UNEVEN TERRAIN	YES
FALL TO SAME LEVEL	YES	NOISE	YES

4.1.1 Physical Hazards

Noise – open cab heavy equipment (no cab glass) produces noise exposures in excess of the permissible exposure limit (90dBA). Operators of these pieces of equipment must wear hearing protection (plugs). Operators of chippers, compressors, pumps, and generators will also wear hearing protection when working within 15 ft. of the equipment for extended periods.

Ambient temperatures - capable of producing heat stress and cold stress are expected to impact the project. See Appendices for WRS SOP for Heat and Cold Stress Prevention.

Motor vehicles – obey local traffic laws, use qualified drivers in insured vehicles. Seatbelt use is mandatory.

Heavy Equipment - Minimize the number of ground personnel working around heavy equipment. Workers shall maintain eye contact with operators. Only experienced equipment operators will be permitted to operate heavy equipment. Ground crew will stay out of pinch points created by heavy equipment. All machines must be supplied with a fire extinguisher and a back-up horn. Equipment will be inspected each morning, prior to use, to ensure all safety equipment and devices (e.g., back-up alarms, brakes, etc.) are fully operational. Operators will use a three-point machine mount and dismount facing the machine. Jumping off of machines is prohibited. Operators will wear seat belts in machines with Rollover Protection. Operators will make no lifts over ground personnel.

Electrical Hazards - Safe distances from overhead powerlines must be maintained in accordance with the table below. A ground crew member must be assigned as a spotter to any piece of heavy equipment which is working close enough to an overhead line so that a part of the machine may infringe on the safe distance listed below. Guy wires must be flagged and protected.

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

All crossings under power lines must be posted:

DANGER
OVERHEAD POWERLINE

Utility installed line insulators may be used to decrease the safe distances to the insulators rated protection distance.

Ground Fault Electrocution - Ground fault protection devices (GFCI) will be provided for all electric power tools and extension cords.

Eye Protection - Eye protection is mandatory in all areas of the project site at all times (ANSI Z87 approved safety glasses). Exceptions include when you are in a passenger vehicle (not heavy equipment) or a project office/ trailer.

Head Protection - WRS site safety rules require that hard hats be worn when at all times except when in the cab of heavy equipment with Rollover Protection, in a job site trailer or in a vehicle. WRS will supply all personnel with hard hats and enforce the wearing of same. Exceptions include when you are in a vehicle or a project office/ trailer.

Falling Vegetation – Clearing operations expose operators and ground crew to falling tree limbs and trees. Heavy equipment used for clearing will be equipped with Fall On Protection (FOPS) and ground crew will be kept out of areas being cleared.

Fire – Prevention of wildfires will be achieved by 1.) designating smoking areas and placing cigarette butts in butt cans. 2.) parking vehicles with catalytic converters on gravel and in areas where vegetation short. WRS crew members may fight incipient stage fires with portable fire extinguishers and then retreat. If egress is threatened, employees are to leave the area immediately.

4.1.2 Biological Hazards

Contact with biological hazards such as snakes, insects (i.e. ticks), and poison ivy is possible at this site. This potential danger will be mitigated by the use of heavy boots, gloves, protective clothing, and insect repellents while in work areas, with dense/ tall vegetation/ undergrowth.

Pre-exposure creams such as Ivy Block shall be worn if contact with poison ivy/ oak or sumac is anticipated. Don't place your hands anywhere you cannot see. Identify individuals with anaphylactic reactions to bee stings. Keep aerosolized pesticide on site for use on bee/ wasp nests. Wear DEET containing insect repellent to repel mosquitoes and ticks.

4.1.3 Chemical Hazards

Asbestos is present on site in concentrations in excess of 1%. The majority of material on site is non-friable.

TABLE 4.2
SUMMARY OF HEALTH HAZARDS FOR PROJECT CONTAMINANTS

SUBSTANCE	EXPOSURE LIMIT (PEL)	IDLH LEVEL	HEALTH EFFECTS	ROUTE OF ENTRY	FIRST AID By Route of Exposure
Asbestos	0.1 fibers/cc (8 hr TWA) 1.0 fibers/cc 30 minute excursion	NA	Asbestosis (with chronic exposure); eye irritation, carcinogen	Inhalation Ingestion Contact	Eye: irrigate immediately

4.1.4 Asbestos Exposure Controls

The work at the BoRit site is covered by OSHA's Asbestos standard for Construction Industry. It does not fall into any of the 4 OSHA classes. It is unclassified work. Fiber releases will be controlled with following measures:

- Do not drive through waste material. Cover waste materials with soil to avoid disturbing ACM
- Do not drag or drop vegetation through waste material
- Wet waste materials with water prior to disturbing
- Handle waste material once

See Appendix C for more control measures.

5.0 PERSONNEL TRAINING REQUIREMENTS

5.1 General

All project personnel are trained in accordance with OSHA's 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response Standard. At a minimum, all personnel are required to be trained to recognize the hazards on-project, the provisions of this HASP, and the personnel responsible for safety on the project.

5.2 Pre-Assignment and Annual Refresher Training

None required other than and orientation to the site including a walkthrough. All employees shall have their current 8-hr annual refresher training and be medically qualified to wear a respirator.

5.3 Project Supervisors Training

Consistent with OSHA 29 CFR 1910.120 paragraph (e)(4), individuals designated as Project Supervisors receive an additional 8 hours of training in addition to the 40 hr certification.

5.4 Health and Safety Plan Review

Prior to working on the project, each person will review the HASP and will have the opportunity to ask questions of the Project Health and Safety Officer about the plan's contents. After reviewing the HASP, WRS employees and subcontractor employees will sign the HASP Review Sign-Off (Safety Briefing form) located in *Appendix A*.

5.5 Daily Safety Meetings

Project safety meetings will be conducted daily. The meeting will cover:

- The work to be completed.
- Hazards associated with the work. and,
- Hazard control measures to be implemented.

WRS subcontractor employees and their supervisor(s) are required to attend.

5.6 Asbestos Training

Individuals picking up and bagging fallen asbestos materials or covering ACM with heavy equipment will have training sufficient to meet the requirements for unclassified work specified at 29 CFR 1926.1101 k(9)(vii), sometimes referred to as awareness training. The training can be completed on site by the Site Health and Safety Officer or Response Manager using the WRS Asbestos Awareness training program. Completion of training will be documented and forwarded to the WRS H&S Director prior to engaging in the work.

6.0 PERSONAL PROTECTIVE EQUIPMENT

This section describes the specific levels of protection required for each task to be conducted at the project. The general requirements of the EPA designated Levels of Protection (A-D) are described in the WRS Health and Safety Program Manual. The level of protection to be worn by field personnel will be monitored by the SHSO.

6.1 Specific Levels of Protection Planned for the Project

PPE selection is both task specific and responsive to air monitoring data. Table 6.1 on the following page lists task specific PPE levels. These levels are disqualified for use if air monitoring indicates that the upper action limit for the level of protection being used is exceeded.

TABLE 6.1: LEVELS OF PROTECTION		
Location	Job Function/Task	Level of Protection
Exclusion Zone	Any activity that disturbs friable acm	C
	Clearing vegetation	C
	Stump grinding	C
	Access road construction	D
	Covering ACM with soil	D
	Dust Control	D
Contamination Reduction Zone	Equipment Decon	C
Support Zone	Project Management Activities Materials Storage	D

6.2 PPE Ensemble Components

Level D

This is the basic work uniform and shall consist of the following items:

- Safety glasses
- Steel-toed boots
- Hearing protection (as applicable)
- Leather Gloves
- Hard hat

Level D+

- Safety glasses
- Steel-toed boots

- Hearing protection (as applicable)
- Leather Gloves
- Splash Shield
- Tyvek or equivalent
- Goggles
- Disposable (one use) Outer Gloves
- Hard hat

Level C

- Full Face Respirator APR with P100 Cartridges
- Tyvek Coveralls or equivalent
- Disposable (one use) Outer Gloves
- Latex or Nitrile Inner Gloves
- Boot Covers of PVC or Steel toe PVC boots
- Hard hat
- Steel toe boots

6.3 Application

Table 6.1 details the anticipated levels of protection for different tasks. However, project developments may prompt changes in the levels of PPE. Proper notification of the RM, OSC and HSD is required to ensure continued safe operations.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE KNOWLEDGE AND APPROVAL OF THE WRS HEALTH AND SAFETY DIRECTOR, WRS PROJECT HEALTH AND SAFETY OFFICER, AND THE WRS PROJECT MANAGER.

6.4 Inspection

Before protective equipment is worn within the project area, its user will properly inspect it.

6.5 Personal Clothing

Personnel working in a Regulated Area will wear no personal clothing under PPE.

7.0 MEDICAL SURVILLANCE REQUIREMENTS

7.1 General

WRS utilizes a Medical Monitoring Program designed to determine each employee's health status and fitness (including the ability to utilize respiratory protection) for working at hazardous waste sites. All WRS personnel involved in hazardous waste project activities are required to undergo baseline, annual, and project specific examinations. WRS utilizes the services of

physicians experienced in occupational medicine and the effects of toxic industrial substances. Medical surveillance records for WRS employees are retained for the length of employment plus 30 years. The WRS Medical Surveillance Program fulfills medical monitoring requirements specified at 29 CFR 1910.120 (HAZWOPER) and 1926.1101 (Asbestos).

7.2 Site Specific Medical Monitoring

Heat Stress Monitoring will be performed at this project when ambient temperatures exceed 70 degrees F and employees are wearing impermeable coveralls.

7.3 Substance Abuse Prevention

It is the policy of WRS to provide a workplace free from the debilitating effects of alcohol and drug abuse. The policy applies to all current and prospective WRS employees. The policy is designed to comply with applicable state and/ or federal laws and regulations, ensure the safety of WRS employees, client employees and the public, and protect the privacy of all covered employees.

Compliance with the policy is verified through pre-employment, annual, random, reasonable suspicion (including post accident) and return to duty/ follow-up substance abuse screening.

The following conduct is prohibited by this policy:

- The unlawful manufacture, distribution, dispensing, possession, use or presence in one's system of a controlled substance is prohibited in the WRS workplace and prohibited while on company business.
- On duty use of alcohol is prohibited
- A breath alcohol concentration in excess of the applicable federal or state statute or ≥ 0.08 whichever is lower, while on duty and/ or in the WRS workplace is prohibited

Failure to comply with the substance abuse policy will lead to disciplinary action up to and including termination of employment.

A confidential Employee Assistance Program is available to WRS employees via telephone 24 hours a day (Unum Work-life balance 800 999-3004). General information on substance abuse can be found on the web at <https://www.healthforums.com> or at www.lifebalance.com (user id and password are lifebalance).

Federal law also requires that an employee of WRS notify WRS in writing of a conviction under a criminal drug statute for a violation occurring during the performance of work under a covered federal procurement. This project is covered by this requirement. Such notifications must be made through the WRS Health and Safety Director.

8.0 AIR SURVEILLANCE

This section specifies the surveillance activities that will take place during the project. The air monitoring strategy will be directed towards those constituents that present the greatest potential health hazard.

Surveillance activities will achieve the following objectives:

- Characterize breathing zone (BZ) concentrations of site contaminants for comparison with published exposure limits;
- Determining the appropriateness of respiratory protective equipment; and,
- Monitoring the performance of emission control activities.

8.1 Monitoring

No real time monitoring for fibers will be conducted. Continuous respirable dust monitoring is being performed around the perimeter of the site during site activities. The USEPA's Emergency Response Team's (ERT) contractor is performing this monitoring. The action limit for respirable dust monitoring is 100 ug/m³. When this action level is reached, dust control measures (soil watering) are immediately upgraded and/or operations will cease and conditions evaluated before re-commencing.

8.2 Action Limits

Maximum fiber levels by respirator configuration are listed below.

Airborne concentration of asbestos or conditions of use	Required Respirator*
Not in excess of 1 f/cc (i.e., 10 X PEL) or otherwise as required independent of exposure	Half-mask air purifying respirator other than a disposable respirator, equipped w/ HEPA filters
Not in excess of 5 f/cc (50 X PEL)	Full facepiece air purifying respirator equipped w/ HEPA filters
Not in excess of 10 f/cc (100 X PEL)	Any PAPR w/ HEPA filters or any supplied air respirator operated in continuous flow mode
Not in excess of 100 f/cc (1,000 X PEL)	Full facepiece supplied air respirator, operated in pressure demand mode
Greater than 100 f/cc (1,000 X PEL) or unknown concentration	Full facepiece, supplied air respirator operated in pressure demand mode, equipped w/ an auxiliary positive pressure self contained breathing apparatus

** Respirators assigned for high environmental concentrations may be used at lower concentrations, or when required respirator use is independent of concentration.*

8.3 Air Sampling for Asbestos

Personnel and perimeter sampling is being performed by the contractor (called REAC) for EPA's Emergency Response Team (ERT). Breathing zone samples are collected from filters attached to employees working in asbestos-containing areas where the asbestos may be disturbed. The NIOSH Method 7400 analytical procedure, routinely used in the occupational setting, will be used for fiber counting (Phase Contrast Microscopy = PCM). PCM cannot distinguish among types of fibers (e.g. asbestos vs hair fibers vs glass fibers). Therefore, if the microscopist counts more than 5 total fibers in a sample during the PCM analysis, then NIOSH Method 7402 will be applied to that sample. Method 7402 (Transmission Electron Microscopy = TEM) can distinguish different fiber types. Based on typical volumes of air collected for worker samples, and calculations performed by the EPA and ATSDR toxicologists, even if all 5 fibers were found to be asbestos, the employees would not be exposed to asbestos fiber concentrations posing unacceptable risk. However, as a precautionary measure, the low value of 5 is being used to proceed to TEM analysis to check for asbestos fibers and determine asbestos fiber air concentrations. Because the employees are wearing respirators, in actuality there should be no asbestos inhalation exposure.

Employee breathing zone sampling commenced at the site once clearing and grubbing commenced and is planned to continue until operations cease. Sampling generally occurs at least one day a week and is augmented if new work tasks raise questions about the potential for fiber release near workers.

Samples are also collected at the site perimeter and/or downwind from work areas generally at the same time when personnel samples are collected. Samples are first analyzed by PCM and further analyzed by TCM if more than 5 fibers are counted. Similar to personnel sampling, perimeter and downwind sample frequencies may change based on the evaluation of ongoing sample results, weather conditions, start up of different worker activities, or other new information received.

8.4 Meteorological Monitoring

Wind speed and direction are being monitored with a wind sock.

9.0 SITE CONTROL MEASURES

9.1 Control Zones

Control boundaries will be established at the site. The exclusion zone, contamination reduction zone (decontamination zone) and support zone will be designated. Regulated Areas will need to be established within exclusion zones if PELs for asbestos are exceeded.

The Response Manager has been designated to coordinate access control on the work site. No unauthorized person shall be allowed beyond the contamination control line. During all activities in the exclusion zone, the implementation of a buddy system is mandatory.

Standing orders for the exclusion zone and contamination reduction zone are presented on the following page.

9.2 Site Communications Plan

Hand signals, radios, and mobile telephones are the modes of communication to be used at the site. The Response Manager will review hand signals with all site personnel prior to the start of the project and periodically at daily safety meetings. Standard hand signals include:

ACTION	MEANING
Hands around throat	- out of air/can't breathe
Thumbs up	- OK/yes
Thumbs down	- negative, no
Hands on top of head	- need assistance
Grip partner's wrist/waist	- leave area immediately

No one will be permitted to break visual contact while in the exclusion zone or contamination reduction zone. The buddy system will be strictly adhered to. When working in the exclusion zone, personnel will not be allowed to work alone. The buddy system will be in place to provide aid in case of an emergency.

A telephone will be available in the support zone. Emergency assistance telephone numbers will be posted by this telephone. The Response Manager is responsible for the management of communications during normal and emergency operations.

9.3 Sanitation Facilities

Sanitation facilities will be located within the support zone. They will include hand and face washing facilities (wet wipes and hand sanitizer) and chemical toilets. Potable drinking will be supplied in marked containers.

<i>Standing orders for the exclusion zone and contamination reduction zone are as follows:</i>	
•	No smoking, eating, or drinking in these zones. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of any material is prohibited in any area designated as a contamination reduction zone or exclusion zone.
•	No horse play.
•	Head phone use is not permitted on site unless they are used for communication with site co-workers.
•	No cell phone use while operating heavy equipment.
•	No matches or lighters in these zones.
•	Check-in on entrance to the contamination reduction zone. Check-out on exit from this zone. Entrance and exit locations shall be designated and emergency escape routes delineated. Warning signals for site evacuation have been established.
•	Implement the communications system. Communications using radios, hand signals, signs, or other means shall be maintained between work crew members at all times. Emergency communication shall be prearranged in case of radio failure, necessity for evacuation off site, or other reasons.
•	Maintain visual contact between exclusion zone entrants.
•	Wear the appropriate level of protection as defined in the site specific Health and Safety Plan.
•	Work will only be performed during daylight hours unless adequate lighting is available.
•	Contact with known or suspected contaminated surfaces should be avoided. Whenever possible, there will be no walking through puddles or discolored surfaces; kneeling on ground; or leaning, sitting or placing equipment on drums, containers, or the ground.
•	Prescribed drugs should not be taken by personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician.
•	All respirator wearers must be certified as being capable of wearing respiratory protection (physician's approval, fit tested) while performing their assigned tasks. All respirator wearers must have been fit tested, within the past 12 months, with the make and size respirator to be worn. No facial hair is allowed that would interfere with respirator fit.
•	Work areas for all operational activities shall be clearly established and clearly delineated in the site specific Health and Safety Plan.
•	Work areas and decontamination procedures shall be established based on expected site conditions and clearly delineated in the site specific Health and Safety Plan.

Personnel and equipment in the exclusion zone(s) will be minimized, consistent with effective site operations.

9.4 Signs & Labels

Regulated areas will be posted with the following sign:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY**

Regulated areas are work areas within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. In addition, where the use of respirators and protective clothing is required in the regulated area, the warning sign will include:

**RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN
THIS AREA**

Containers of asbestos will be labeled in the following manner:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE
HAZARD**

All containers of hazardous chemicals will be maintained with a label that identifies the contents along with a content hazard warning.

10.0 DECONTAMINATION PLAN

Decontamination of equipment and personnel will be performed to limit the potential migration of contaminants outside the exclusion zone. All equipment and personnel with potential asbestos contamination will be decontaminated prior to leaving the exclusion zone.

10.1 Levels of Decontamination Protection Required For Assisting Personnel

The level of protection required for personnel assisting with decontamination will be Level C. The SHSO is responsible for monitoring decontamination procedures and determining their effectiveness.

10.2 Equipment Decontamination

10.2.1 Sampling Equipment

Sampling equipment will be decontaminated using isopropyl alcohol followed by a distilled water wipe down. Decontamination fluids will be collected and disposed in an appropriate manner. A sampling equipment decontamination area will be established which will prevent the release of contaminated decontamination fluids.

10.2.2 Heavy Equipment

Heavy equipment with ACM contact will be decontaminated prior to leaving the site. Decontamination will include the use of hand tools to remove soils followed by pressure washing with water.

10.3 Personnel Decontamination

10.3.1 Procedure

All site personnel should minimize contact with contaminants in order to reduce the need for extensive decontamination. Personnel decontamination will be conducted in the decontamination zone.

For personnel who have had contact with ACM materials the following procedure used for decontamination:

- Step into boot wash and rinse
- Remove outer gloves
- Remove boot covers
- Remove coverall and dispose
- Remove respirator (wash and rinse)
- Remove inner gloves

10.3.2 Equipment

Personal decontamination equipment will consist of HEPA filtered vacuums, soap, towels, shower sanitizer, trash cans with liners (for disposable PPE), three, two-gallon containers (respirator wash, sanitize and rinse), water supply, and detergent. A trailer for personnel to perform personal hygiene out of the weather is planned for upcoming colder temperatures.

10.4 Disposition of Decontamination Wastes

All equipment used for decontamination (e.g., buckets, brushes, etc.) shall be decontaminated or disposed of properly. Water used to decontaminate personnel and equipment will be disposed directly onsite given the site's status as an asbestos landfill, and research suggesting minimal potential for asbestos fibers to migrate in groundwater. Clean soil will be placed over top of

areas where this water is discharged. All disposable PPE will be containerized and properly disposed.

ACM containing wastes that are going off site are hauled by a permitted asbestos hauler to permitted asbestos landfills.

11.0 EMERGENCY RESPONSE PLAN

This Emergency Response Plan has been prepared to define the responsibilities, resources and actions necessary to respond to uncontrolled releases of contaminated materials and injury to personnel. Additional response measures are described in Appendix E **Notification Procedures in the Event of a Significant Release of Asbestos**

11.1 Pre-Emergency Planning

This Emergency Response Plan will be reviewed and revised on a regular basis (if necessary) by the SHSO. This will ensure that the plan is adequate and consistent with prevailing project conditions. Personnel with current first aid/ cpr training will be on site during field activities.

Local emergency medical, fire, and police resources will be identified.

11.2 Personnel Roles and Lines of Authority

The Response Manager has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of project personnel and the public. The individual subcontractor organizations are responsible for assisting the Response Manager in his/her mission within the parameters of their scope of work.

11.3 Emergency Recognition/Prevention

Section 4.0 identifies the chemical and physical hazards on project. Additional hazards that may result from project activities are listed in Table 11.1. This table also lists prevention and control techniques/mechanisms. Personnel will be familiar with techniques of hazard recognition from pre-assignment training and project specific briefings. The SSHS is responsible for ensuring that prevention devices or equipment are available to personnel.

TABLE 11.1: EMERGENCY RECOGNITION/CONTROL MEASURES		
Potential Hazard	Prevention/Control	Location of Response Equipment
Fire	<ul style="list-style-type: none"> • Fire Extinguisher (15 lb. dry chemical) • Ignition source control • Hot Work Permit 	<ul style="list-style-type: none"> • Support zone • Response Manager’s Vehicle • Each piece of heavy equipment • Each site trailer
Chemical splash	<ul style="list-style-type: none"> • Safety glasses/ goggles • Eye wash 	<ul style="list-style-type: none"> • In support zone
Fiber release	<ul style="list-style-type: none"> • Amended water • Removal encapsulant • Soil 	<ul style="list-style-type: none"> • Applied to ACM/ PACM before, and during asbestos disturbing activities

11.4 Emergency Equipment/Facilities

- First aid kit
- Fire extinguishers
- Telephone
- Eye Wash

The following safety equipment and materials will be maintained on project.

Safety Equipment

Number	Item
1	Industrial First Aid Kit
Multiple	Fire Extinguishers ABC
1	Eyewash Station

11.5 Fire or Explosion

In the event of a fire or explosion, the local Fire Department will be summoned immediately. Upon their arrival, the Response Manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on project.

WRS employees may fight incipient stage fires using portable fire extinguishers unless there are containers of hazardous materials involved. If egress from the fire is in danger, WRS employees will not fight the fire.

The SHSO shall act as the designated project emergency coordinator and shall have final authority for initial response to on-project emergency situations. Upon arrival of the appropriate emergency response personnel, the SHSO shall defer all authority but shall remain on the scene to provide assistance, if necessary. At the earliest opportunity, the SHSO shall contact the Response Manager.

11.6 Spill or Leaks

In the event of a spill or a leak, site personnel will:

- Inform the Response Manager immediately
- Locate the source of the spillage and stop the flow if it can be done safely
- Begin containment and recovery of the spilled materials
- Report the incident to WRS management for further instructions

If a spill occurs and safe re-entry is possible, containment procedures will begin. Simultaneously, the source of the spill will be stopped if it is still releasing material. Once containment is complete, cleanup will begin. The priority for containment and cleanup will be the prevention of material reaching surface waters. The WRS Representative will be responsible for any reporting procedures that are required as a result of the spill.

11.7 Emergency Contact/Notification System

Spills of contaminated liquids or solids on site soils or waters will immediately be reported to the WRS Response Manager and the OSC. Spills which are potentially reportable include:

1.	Quantities sufficient to produce a sheen, discoloring, or potential contamination of site waters
2.	Liquid quantities which produce surface "pooling" or "puddling" effects
3.	Solids misplaced during handling or transport operations

Notification requirements may include the following:

1.	A site meeting with On Scene Coordinator
2.	A telephone call to the National Response Center in Washington, D.C. or to the appropriate State of Pennsylvania officials if the spill has the potential to affect the surrounding population.

If necessary, the WRS Site Representative will provide the following information to federal and state authorities:

1.	Name, address, and telephone number of person reporting
2.	Details regarding the party responsible for the incident
3.	Date and time the incident occurred or was discovered
4.	Specific location of the spill
5.	Name of material spilled or released
6.	Source of spilled material
7.	Estimated quantity spilled or discharged
8.	Cause of the release
9.	Weather conditions

10.	Number and type of injuries or fatalities (if applicable)
11.	Whether evacuations have occurred
12.	Estimated dollar amount of property damage
13.	Description of cleanup action taken and future plans

Federal and state laws require immediate notification upon discovery of a spill or following timely spill source control, containment, and countermeasures. However, spill source control and initiation of spill containment activities may at times take priority over notification of federal and state authorities.

Additional notification procedures are detailed in Appendix E **Notification Procedures in the Event of a Significant Release of Asbestos**

11.8 Evacuation Routes/Procedures

In the event of an emergency which necessitates an evacuation of the site, the following procedures will be implemented:

Evacuation alarm notification should be made using one long blast on the air horn. All personnel should evacuate upwind of any activities. A predetermined off-site location (rally point) has been identified for a personnel head count in case of an emergency.

Personnel will be expected to proceed to the closest exit with their buddy, and mobilize to the safe distance area associated with the evacuation route. Personnel will remain at that area until the Response Manager or SHSO provides further instructions.

Evacuation routes for the site and the immediate area will be depicted on posting in the Command Post. The figure will also indicate the rally point in the event of a major incident.

11.9 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the exclusion zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered.

In the event of an injury requiring more than minor first aid, or any employee reporting any sign or symptom of exposure to hazardous substances, immediately take the victim to a local emergency medical provider. In the event of life-threatening or traumatic injury, implement appropriate first aid and immediately call for emergency medical assistance.

If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First aid should be administered while awaiting an ambulance or paramedics.

When an individual(s) is being transported to a clinic or hospital for treatment, the Response Manager, or SHSO should ensure that information on the chemical(s) the individual(s) have been exposed to at the site is taken. This information; which is included in Section 4.0, could also be given to the hospital

during site set-up activities. Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

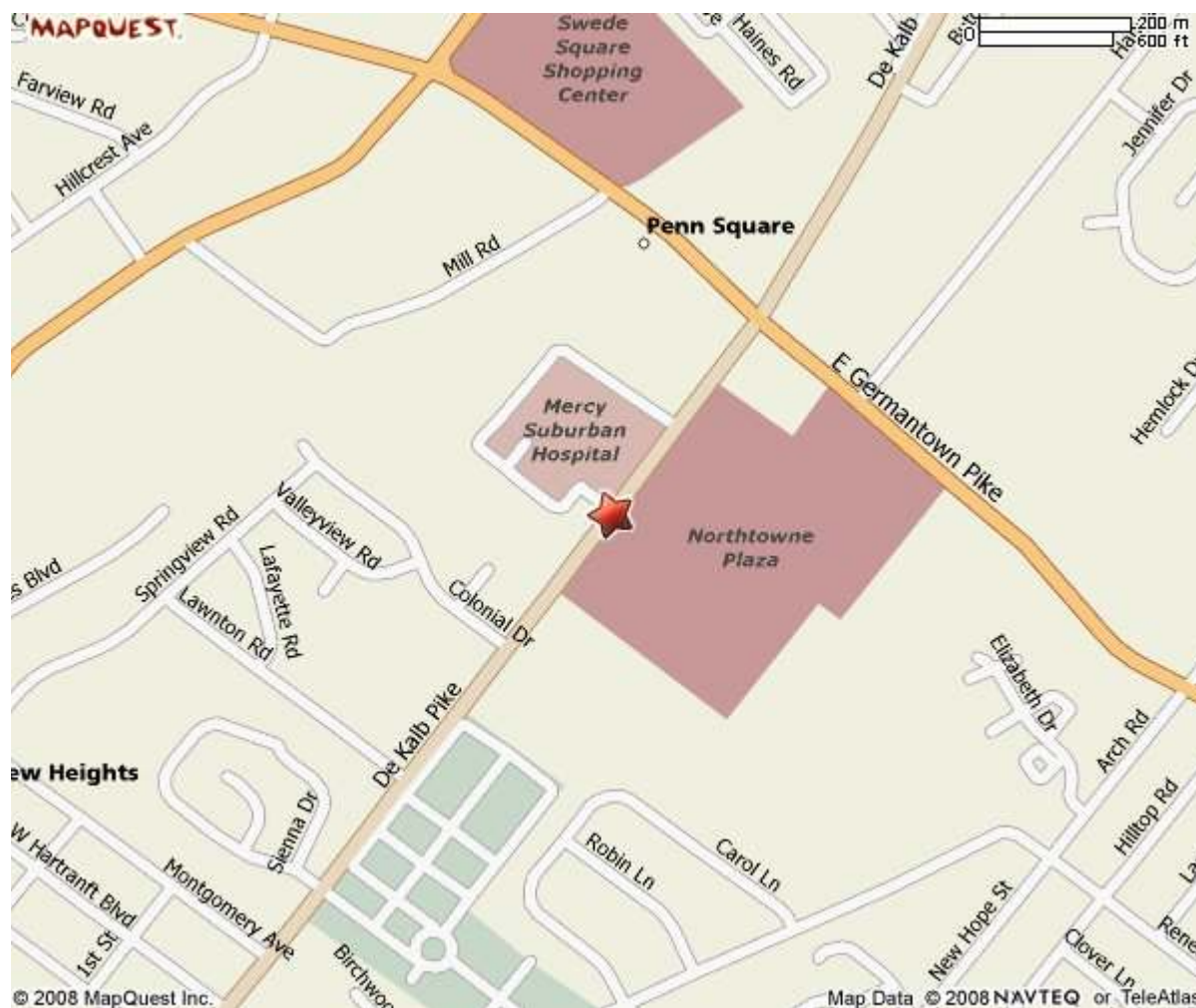




Figure 11-1 Route to Hospital

EMERGENCY ASSISTANCE TELEPHONE LIST	
EMERGENCY ASSISTANCE ORGANIZATION	TELEPHONE NUMBER
Mercy Suburban Hospital 2701 DeKalb Pike Norristown PA 19401	610-278-2000
AMBULANCE/RESCUE SQUAD	911
FIRE	911
LOCAL POLICE	911
WRS BRISTOL OFFICE	267-540-0048
WRS H&S Director	813-267-7416
Project Site Phone Number	215-654-5191
CHEMTREC (24 HOURS)	(800) 424-9300
U. S. COAST GUARD NATIONAL RESPONSE CENTER (NRC)	(800) 424-8802

APPENDIX A
HEALTH AND SAFETY FORMS

1. Accident/Incident Report
2. Daily Safety Meeting Form
3. Training Attendance Record
4. Qualitative Respirator Fit Test and Inspection Form
5. Daily Safety Report
6. SSHP Change Authorization
7. SSHP Sign-Off

WRS INFRASTRUCTURE & ENVIRONMENT, INC.

INJURY/ILLNESS/INCIDENT INVESTIGATION AND REPORT (OSHA 301 Form Equivalent)

Supervisor Complete Both Pages/Forward to Branch and WRS H&S Manager within 48 hrs./Supervisor's Manager Review for Completeness

Personal & Background Information

1. Case Number		2. Soc. Sec. No.		3. Name (Last name, first initial)			5. Date of Birth	
6. Gender <input type="checkbox"/> M <input type="checkbox"/> F		7. Date of Hire		8. Job or Site Name			9. Job Number	
11. Time of Accident		12. Time Employee Began Work		13. Date of Accident		14. Date Reported		15. Number of Others Involved in Accident
16. Occupation at Accident Time			17. Regular Occupation			18. Number of Others Injured in Accident		
19. Nature of Injuries (Bruise, Strain, etc.)					20. Injured Body Part (left index finger)			
21. Names of Others Involved in Accident					22. Names of Others Injured in Accident			
23. Chemicals Involved in Accident				24. Exact Location of Accident (Sketch on Back)			25. On WRS Premises? <input type="checkbox"/> Yes <input type="checkbox"/> No	
26. Activity Injured was doing at time of accident or illness (operating backhoe, unloading drums, etc.) --Try to Identify job in three words -- Use no more than 30 spaces								
27. What Occurred (Use single line descriptive sentences to tell the story of what occurred)								
28. Check Type of Accident (Check one)								
<input type="checkbox"/> a. Struck by <input type="checkbox"/> c. Contacted by <input type="checkbox"/> e. Trapped in <input type="checkbox"/> g. Caught between <input type="checkbox"/> i. Different level fall <input type="checkbox"/> k. Exposure <input type="checkbox"/> b. Struck against <input type="checkbox"/> d. Contact with <input type="checkbox"/> f. Caught on <input type="checkbox"/> h. Same level fall <input type="checkbox"/> j. Strain/overexertion <input type="checkbox"/> l. Other								
29. Accident Agent (Limit to 21 spaces)(i.e., equipment, machine, hand tool)					30. Contact Agent (Limit to 22 spaces)(i.e., machine part or material contacting)			
31. UNSAFE ACTIONS - What did employee do or fail to do that caused or contributed to accident? (Check no more than 2, give details on reverse)					32. UNSAFE CONDITIONS - What condition of tools, equipment or job site caused or contributed to accident? (Check no more than 2, give details on reverse)			
<input type="checkbox"/> a. Operating without authority <input type="checkbox"/> i. Failure to make inoperative <input type="checkbox"/> b. Failure to make secure <input type="checkbox"/> j. Riding hazardous equipment <input type="checkbox"/> c. Operating unsafe speed <input type="checkbox"/> k. Took unsafe position <input type="checkbox"/> d. Failure to warn/signal <input type="checkbox"/> l. Horseplay, distractive <input type="checkbox"/> e. Nullified safety device <input type="checkbox"/> m. No protective equip. worn <input type="checkbox"/> f. Used defective equipment <input type="checkbox"/> n. Unsafe job procedure <input type="checkbox"/> g. Used equipment unsafely <input type="checkbox"/> o. No unsafe action <input type="checkbox"/> h. Used wrong tool <input type="checkbox"/> p. Other					<input type="checkbox"/> a. Inadequate guard/Safety device <input type="checkbox"/> h. Close clearance/congestion <input type="checkbox"/> b. Hazardous personal attire <input type="checkbox"/> i. Hazardous arrange/storage <input type="checkbox"/> c. Inadequate warning system <input type="checkbox"/> j. Defective tools/equipment <input type="checkbox"/> d. Fire or Explosion hazard <input type="checkbox"/> k. Atmospheric condition <input type="checkbox"/> e. Unsecured against movement <input type="checkbox"/> l. Illumination/noise <input type="checkbox"/> f. Poor housekeeping <input type="checkbox"/> m. Other unsafe condition <input type="checkbox"/> g. Protruding object <input type="checkbox"/> n. No unsafe condition			
33. What caused or influenced unsafe actions you identified above? (Answer only if item 32 applies. Check no more than 2)					34. What caused or influenced unsafe condition you identified above? (Answer only if item 33 applies. Check no more than 2)			
<input type="checkbox"/> a. Unaware of job hazards <input type="checkbox"/> h. Influence of emotions <input type="checkbox"/> b. Inattention to hazard <input type="checkbox"/> i. Influence of fatigue <input type="checkbox"/> c. Unaware of safe method <input type="checkbox"/> j. Influence of intoxicant/drugs <input type="checkbox"/> d. Low level job skill <input type="checkbox"/> k. Defective vision <input type="checkbox"/> e. Tried to gain or save time <input type="checkbox"/> l. Influence of illness <input type="checkbox"/> f. Tried to avoid extra effort <input type="checkbox"/> m. Other personal factors <input type="checkbox"/> g. Tried to avoid discomfort <input type="checkbox"/> n. Unknown personal factors					<input type="checkbox"/> a. Caused by employee <input type="checkbox"/> h. Preventive maintenance failure <input type="checkbox"/> b. Defective from normal use <input type="checkbox"/> i. Defective tools/equipment <input type="checkbox"/> c. Defective via abuse/misuse <input type="checkbox"/> j. Exposure to corrosion <input type="checkbox"/> d. Safety inspection failure <input type="checkbox"/> k. Extreme temperature <input type="checkbox"/> e. Housekeeping/cleaning failure <input type="checkbox"/> l. Caused by other employees <input type="checkbox"/> f. Faulty design/construction <input type="checkbox"/> m. Other source cause <input type="checkbox"/> g. Inadequate illumination <input type="checkbox"/> n. Unknown source cause			
35. What action has been taken (Mark X box) or is planned (Mark P box) to prevent recurrence: (Mark no more than 5)								
<input checked="" type="checkbox"/> <input type="checkbox"/> a. Reinstruction of employee <input type="checkbox"/> <input type="checkbox"/> b. Reprimand/warning of employees involved <input type="checkbox"/> <input type="checkbox"/> c. Penalty discipline of employee involved <input type="checkbox"/> <input type="checkbox"/> d. Preventive instruction of others who do job <input type="checkbox"/> <input type="checkbox"/> e. Job reassignment of employee <input type="checkbox"/> <input type="checkbox"/> f. Improved inspection procedure <input type="checkbox"/> <input type="checkbox"/> g. Improved cleanup procedure			<input type="checkbox"/> <input type="checkbox"/> h. Action to improve enforcement <input type="checkbox"/> <input type="checkbox"/> i. Order JSA done on job <input type="checkbox"/> <input type="checkbox"/> j. Order JSA revision <input type="checkbox"/> <input type="checkbox"/> k. Install safety guard against <input type="checkbox"/> <input type="checkbox"/> l. Require protective equipment <input type="checkbox"/> <input type="checkbox"/> m. repair/replace equipment <input type="checkbox"/> <input type="checkbox"/> n. Improve storage/arrangement			<input type="checkbox"/> <input type="checkbox"/> o. Improve design/construction <input type="checkbox"/> <input type="checkbox"/> p. Eliminate congestion <input type="checkbox"/> <input type="checkbox"/> q. Use safer Materials/supplies <input type="checkbox"/> <input type="checkbox"/> r. Improve illumination/ventilation <input type="checkbox"/> <input type="checkbox"/> s. Mandatory pre-job instructions <input type="checkbox"/> <input type="checkbox"/> t. Correction other than above <input type="checkbox"/> <input type="checkbox"/> u. No action required		
36. Immediate Supervisor (Last name first, first initial)					37. Employee's Signature			
38. Investigated by (Names and positions)				Date	39. Reviewed and approved by (Name and position)			Date

INCIDENT/INJURED'S NAME: _____ DATE OF INCIDENT: _____
 Complete This Page For All Cases. All Sections Must Be Filled Out

Part 1. Accident Description and Direct Cause Analysis

1. What Occurred
 Describe in sequence (1) relevant background information if any, (2) employee's location and position relative to immediate surroundings, (3) how employee was doing job, (4) what occurred that precipitated the accident, (5) the type of accident and contact agent.

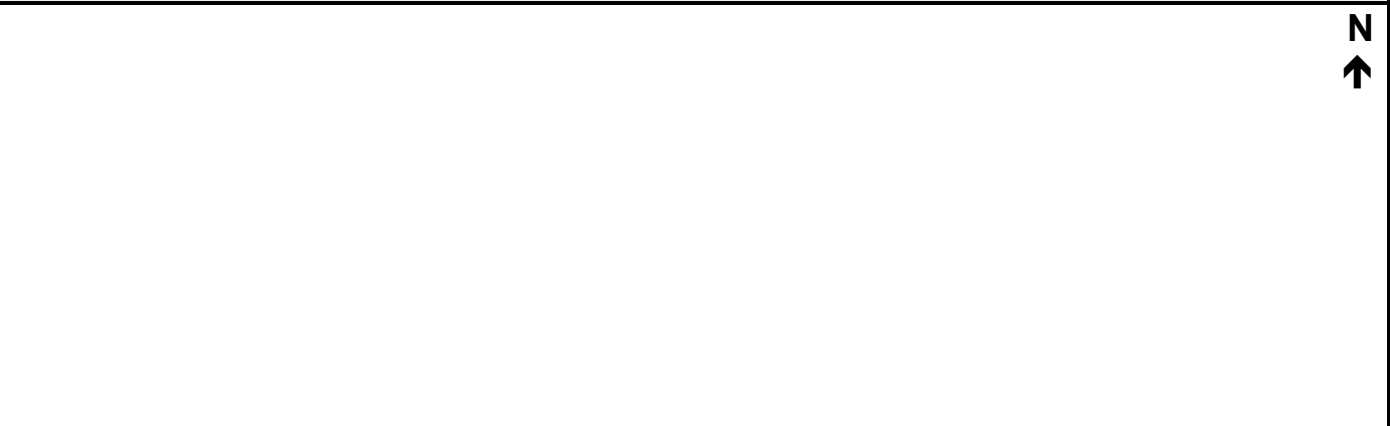
<p>2. Contributing "Unsafe" Action What did the injured (or other person) do or fail to do that contributed directly to accident? Be specific. <i>(Ex., Failed to use protective equipment, Failed to lock out machine)</i> <i>Don't report "Carelessness."</i></p>	<p>3. Contributing "Unsafe" Condition What defective or otherwise unsafe conditions of tools, equipment, machines, structures or work equipment contributed directly to accident? <i>(Ex., Oil on floor, Broken or missing machine guard, Poor housekeeping)</i></p>

Part 2. Corrective Action Must Be Taken

4. Required Corrections
 What corrective actions will be taken to prevent recurrence of accident? See Reverse Side, Item 35, for basic correction ideas.
(Ex., Job Safety Analysis (JSA), Training, Employee counseling, Machine Guarding)

Part 3. Witnesses:

Part 4. Accident Location Sketch



Part 5. Extent and Outcome of Injury/Illness

<p>Lost Time Case - Date Lost Time Began: ___/___/___ - Date Lost Time Ended: ___/___/___</p>	<p>Restricted Duty Case Date Restriction Began: ___/___/___ Date Restriction Ended: ___/___/___</p>	<p>Restrictions: _____</p>
--	--	----------------------------

Medical Treatment
 - Name of Hospital or Clinic: _____
 - Name of Physician: _____
 Describe Treatment: _____

Was employee treated in an Emergency Room? Yes No Was employee hospitalized overnight as an in-patient? Yes

WRSIE PROJECT SPECIFIC HEALTH AND SAFETY PLAN

BoRit Site _____

**WRS INFRASTRUCTURE & ENVIRONMENT, INC.
DAILY SAFETY MEETING**

Date: _____ Job Name: _____

1. Work to be completed: _____

2. Hazards Associated with this work: _____

3. Hazard control measures to be implemented: _____

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: _____

Chemical Hazards: _____

Physical Hazards: _____

Emergency Procedures: _____

<u>NAME PRINTED</u>	ATTENDEES	<u>SIGNATURE</u>
_____		_____
_____		_____
_____		_____
_____		_____

**WRS INFRASTRUCTURE &
ENVIRONMENT, INC.**

TRAINING ATTENDANCE RECORD

Class Title: _____

Class Content: _____

Class Instructor(s): _____

Date: _____

ATTENDED BY

NAMES (PRINTED)	SIGNATURES
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Instructor(s) Signature: _____

Date(s): _____

cc: Corporate File
Branch File

WRS INFRASTRUCTURE & ENVIRONMENT, INC.
RESPIRATOR FIT TESTING & INSPECTION

NAME _____ EMPLOYEE NO. _____ DATE _____

TITLE _____ SERVICE CENTER _____

HOOD/ ENCLOSURE MAY NOT BE USED WITH IRRITANT SMOKE.

IRRITANT SMOKE FIT TESTING:

<u>No. of Squeezes</u>	<u>Activity</u>	<u>Reaction</u>
_____	Initial	___ Yes ___ No
_____	Head/Neck Motion	___ Yes ___ No
_____	Motion/Talking	___ Yes ___ No
_____	Motion/Deep Breathing	___ Yes ___ No
_____	Total Squeezes	
Seal Obtained _____	Type of Cartridge used	_____
	Type of respirator	_____
	Size of respirator	_____

RESPIRATOR INSPECTION:

Head Straps ok / not ok Inhalation valves/stems/bodies ok / not ok

Face to Mask Sealing Surface ok / not ok Canister holder gasket/ threads ok / not ok

Exhalation valves/cover/stems/bodies ok / not ok Lens ok / not ok

Action Taken to Correct Deficiencies: _____

Fit Test/ Inspection performed by: _____ Date _____

Employee signature: _____ Date _____

WRS INFRASTRUCTURE & ENVIRONMENT, INC.
Daily Safety Report

Project:		
Contract No.:	WRS Project No.:	Date:
SHSO:	PM:	Supervisor:
Site Conditions (weather, temp., soil conditons, etc.): _____		

Task/ Personnel/ PPE Matrix		
Task/Area	Personnel	PPE Level

Corrective Actions	
Unsafe Act/ Condition	Corrective Action

Signature: _____ Date: _____
SHSO
Attachments: ! Air Surveillance Log ! Accident Report ! Daily Safety Meeting ! Other ! None

**WRS Infrastructure & Environment, Inc.
H&S Plan Change Authorization**

Project Name: _____

Date: _____

Project Number: _____

Description of Change:

Reason for Change:

Person requesting Change:

Signature

Date

Approved By
(WRS Health and Safety Director)

Signature

Date

Attach sheets if necessary

SAFETY BRIEFING

Project Name: _____ Date: _____

The following personnel were present at the pre-job safety briefing and having read the Health and Safety Plan, are familiar with its provisions, and will abide by the procedures set forth in this plan:

Name

Signature

Printed name of Site Supervisor or Site Health and Safety Officer

Signature

Date

Health and Safety Plan Sign-off

By signing below, I am indicating that I have read and agree to comply with the contents of the Site Specific Health and Safety Plan prepared for the BoRit Project.

<u>Name</u>	<u>Signature</u>	<u>Company</u>	<u>Date</u>

APPENDIX B
WRS HEAT STRESS MANAGEMENT SOP

CONTENTS

1.0 PURPOSE

2.0 SCOPE

3.0 DEFINITIONS

4.0 RESPONSIBILITIES

5.0 PROCEDURE

6.0 REFERENCES

7.0 ATTACHMENTS

8.0 RECORD KEEPING

9.0 EQUIPMENT

1.0 PURPOSE

The Heat Stress Management SOP describes the bodies responses to heat that are known collectively as heat stress, environmental conditions that produce these responses and measures which will reduce the probability of workers experiencing a heat related disorder.

2.0 SCOPE

The Heat Stress Management SOP is applicable to all WRS project sites. Its implementation is mandatory when workers wearing impermeable personal protective equipment are exposed to ambient air temperatures above 70°F.

3.0 DEFINITIONS

Conduction is the transfer of heat between materials that contact each other. Heat passes from the warmer material to the cooler material. For example, a worker's skin can transfer heat to a contacting surface if that surface is cooler, and vice versa.

Convection is the transfer of heat in a moving fluid. Air flowing past the body can cool the body if the air temperature is cool. On the other hand, air that exceeds 35°C (95°F) can increase the heat load on the body.

Evaporative cooling takes place when sweat evaporates from the skin. High humidity reduces the rate of evaporation and thus reduces the effectiveness of the body's primary cooling mechanism.

Radiation is the transfer of heat energy through space. A worker whose body temperature is greater than the temperature of the surrounding surfaces radiates heat to these surfaces. Hot surfaces and infrared light sources radiate heat that can increase the body's heat load sometimes referred to as radiant heat load.

Metabolic heat is a by-product of the body's activity.

Heat Stress usually is a result of protective clothing decreasing natural body ventilation, although it may occur at any time work is being performed at elevated temperatures. Four environmental factors affect the amount of stress a worker faces in a hot work area: temperature, humidity, radiant heat (such as from the sun or a furnace) and air velocity. Perhaps most important to the level of stress an individual faces are personal characteristics such as age, weight, fitness, medical condition and acclimatization to the heat. The body reacts to high external temperature by circulating blood to the skin which increases skin temperature and allows the body to give off its excess heat through the skin. However, if the muscles are being used for physical labor, less blood is available to flow to the skin and release the heat. Sweating is another means the body uses to maintain a stable internal body temperature in the face of heat. However, sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are adequately replaced.

When the body cannot dispose of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the individual begins to lose concentration and has difficulty focusing on a task, may become irritable or sick and often loses the desire to drink. The next stage is most often fainting and death is possible if the person is not removed from the heat stress.

4.0 RESPONSIBILITIES

The Project Manager/ Supervisor is responsible for directing work in accordance with this procedure when implementation conditions are met. The PM is also responsible for providing resources necessary for implementation of the procedure.

The Site Health and Safety Officer is responsible for monitoring and facilitating employee compliance with the procedure. The SHSO is responsible for instructing employees in the recognition and control of heat related illnesses.

5.0 PROCEDURE

5.1 **Symptom Recognition and Treatment**

A large portion of heat stress control lies in the ability of an individual to recognize heat stress symptoms in themselves and co-workers. Early recognition and treatment of heat stress symptoms can prevent the development of more serious, debilitating and even life threatening conditions.

5.1.1 Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the heat regulating mechanisms of the body. The individual's temperature control system that causes sweating stops working correctly. Body temperature rises so high that brain damage and death will result if the person is not cooled quickly. Heat stroke requires medical attention.

- a. Symptoms - Red, hot dry skin, although person may have been sweating earlier. Nausea, dizziness, confusion, extremely high body temperature, rapid respiratory and pulse rate, convulsions, unconsciousness, or coma.
- b. Treatment - Cool the victim quickly. If the body temperature is not brought down fast, permanent brain damage or death will result. Soak the victim in cool, but not cold, water; sponge the body with cool water; or pour water on the body to reduce the temperature to a safe level (102°F). Observe the victim and obtain medical help. Do not give coffee, tea, or alcoholic beverages. Do give fluids by mouth if victim is in and out of consciousness

5.1.2 Heat Exhaustion

Heat exhaustion is a state of very definite weakness or exhaustion caused by the loss of fluids from the body. This condition is much less dangerous than heat stroke, but it nonetheless must be treated.

- a. Symptoms - Pale, clammy moist skin, profuse perspiration and extreme weakness. Body temperature is normal, pulse is weak and rapid, breathing is shallow. The person may have a headache, may vomit, and may be dizzy.
- b. Treatment - Remove the person to a cool, air-conditioned place, loosen clothing, place in a head-low position, and provide bed rest. Consult a physician, especially in severe cases. The normal thirst mechanism is not sensitive enough to ensure body fluid replacement. Have the patient drink one to two cups of water immediately and every 20 minutes thereafter until symptoms subside. Total water consumption should be about one to two gallons per day.

5.1.3 Heat Cramps

Heat cramps are caused by perspiration that is not balanced by adequate fluid intake. Heat cramps are often the first sign of a condition that can lead to heat stroke.

- a. Symptoms - Acute painful spasms of voluntary muscles: e.g., abdomen and extremities.
- b. Treatment - Remove the victim to a cool area and loosen clothing. Have the patient drink one to two cups of water immediately and every 20 minutes thereafter until the symptoms subside. Total water consumption should be one to two gallons per day. Consult your physician.

5.1.4 Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by chafing cloths. The condition decreases the ability to tolerate heat.

- a. Symptoms - Mild red rash, especially in areas of body in contact with protective gear.
- b. Treatment - Decrease the amount of time in protective gear and provide powder to help absorb moisture and decrease chafing.

5.2 Heat Stress Prevention Measures

What follows is a list of heat stress prevention measures which reduce the risk of an employee experiencing a heat related disorder. They are in no particular order. Successful heat stress prevention will require the implementation of all the control measures listed to varying degrees. No single control measure will prove to be either effective nor efficient for a given project site.

5.2.1 Fluid Replacement

Have workers drink 16 ounces of water before beginning work, such as in the morning or after lunch. Provide disposable, four ounce cups and water that is maintained at 50 to 60°F. Urge workers to drink one to two gallons per day. To assist employees track their own fluid replacement, provide individual water coolers/ containers, fill the containers each day, and check consumption at the end of the day. The use of paper cups and a single cooler for the entire job site are difficult for both supervisors and employees to track. Provide cool, preferably air-conditioned, area for rest breaks. Discourage the use of alcohol in nonworking hours and discourage the intake of coffee during working hours. Monitor for signs of heat stress.

Use of electrolyte containing fluids (e.g., Gatorade) is more important for unacclimatized workers than acclimatized workers.

5.2.2 Acclimate Crew Members

Acclimatization is the process by which the body adapts to heat stress. Changes include increased sweating efficiency (earlier onset of sweating, increased sweat production, lower electrolyte loss) and stabilized blood circulation (less likelihood of blackout, dizziness, spots, etc.) It occurs with brief (~100 minutes) daily exposures to heat in 5 -7 days. Benefits of acclimatization are typically lost with no heat exposure for a week or more.

5.2.3 Reduce Heat Load (both environmental and metabolic)

Provide cooling devices to aid body cooling (i.e., Cool Vests). These devices, however, add weight, and their use should be balanced against worker efficiency.

Evaporative cooling is aided by clothing which wicks away perspiration from the skin.

Install mobile showers and/or hose-down facilities to reduce body temperature and cool protective clothing.

In hot weather, conduct field activities in the early morning or evening.

Reduce metabolic heat load by designing tasks such that employee exertion is kept to a minimum

Reduce environmental heat loads by reducing radiant heat exposure (sunshine). Working in shaded areas and taking breaks in shaded areas will reduce heat loads due to radiant heat.

5.2.4 Employee Rotation

In hot weather, rotate shifts of workers wearing impervious clothing. On project sites with large crews, stagger heat stress breaks so that tasks are not completely shut down. On sites with small crew sizes this may not be possible due to the “buddy system” rule.

5.2.5 Dry Clothing and Personal Hygiene

Good hygienic standards must be maintained by frequent changes of clothing and showering. Wet clothing in a heat stress inducing environment acts as an insulator and causes a person to retain heat. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

5.2.6 Avoid Diuretics and Stimulants

Avoid consuming alcoholic beverages which cause loss of body fluid water by urination. Avoid consumption of stimulants such as some cold medicines and caffeine which increase heart rates.

5.2.7 Heat Stress Monitoring and Work/ Rest Cycle Management

For strenuous field activities that are part of on-going work activities in hot weather, the following procedures shall be used to monitor the body's physiological response to heat and to manage the work/ rest cycle. These procedures are to be instituted when ambient temperatures exceed 70°F and employees are wearing impervious (i.e., does not allow perspiration to evaporate) clothing (e.g., Tyvek, Saranex, PE Coated Tyvek, etc., coveralls).

- a. Measure Heart Rate (HR) - The heart rate should be measured by the radial pulse at the wrist for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%. The procedure is continued until the rate is maintained below 110 beats per minute.
- b. Measure Body Temperature - Body temperature should be measured orally or aurally by a clinical thermometer as early as possible in the resting period. The temperature (OT) at the beginning of the rest period should not exceed 99.6°F, if it does, the next work period should be shortened by 33% while the length of the rest period stays the same. If the OT exceeds 99.6°F at the beginning of the next period, the following work cycle should be further shortened by 33%. The procedure is continued until the body temperature is maintained below 99.6°F. Do not consume fluids immediately prior to temperature measurement. Doing so will give false, low readings. No one will continue to be exposed to hot conditions with an oral/ aural temperature in excess of 100.6°F.

- c. Rest Areas - Rest areas should be air conditioned if possible. The heart rates of workers who recover in air conditioned areas will be reduced faster and to lower rates than those that recover in non-air conditioned areas.
- d. Work/Rest Schedule for Unacclimatized Employees - The following work/rest schedule shall be used as a guideline for unacclimatized employees:

Adjusted Air Temperature	Active Work Time Using Impermeable Gear
75 or less	50 minutes
80	40
85	30
90	20
95	10
100	0

To calculate the adjusted temperature:

$$T(\text{adjusted}) = T(\text{actual}) + (13 \times \text{fraction sunshine})$$

Measure the air temperature with a standard thermometer. Estimate the fraction of sunshine by judging what percent the sun is out: 100% sunshine = no cloud cover = 1.0, 50% sunshine = 50% cloud cover = 0.5, and 0% sunshine = full cloud cover = 0.0.

Reduce or increase the work cycle according to the guidelines under heart rate and body temperature.

6.0 REFERENCES

- Occupational Safety and Health and Guidance Manual for Hazardous Waste Site Activities
- Patty's Industrial Hygiene and Toxicology, Fourth Edition
- OSHA Web Site <http://www.osha.gov/SLTC/heatstress/index.html>

7.0 ATTACHMENTS

Heat Stress Monitoring log

8.0 RECORD KEEPING

Records which facilitate the tracking of employee fluid consumption and work/ rest cycles will be generated.

9.0 EQUIPMENT

- Oral thermometers and hygienic slip covers or aural thermometers with hygienic slip covers
- Thermometer to measure air temperature
- Cool water and/ or electrolyte containing fluids (e.g., Gatorade)
- Ice cooled vests
- Materials to create shaded work areas

WRS Infrastructure & Environment, Inc. Heat Stress Monitoring Log

PROJECT NAME: _____ DATE: _____

EMPLOYEE NAME: _____

WEATHER CONDITIONS:

Ambient Temp. Start of Shift: _____	Check One: % Sunshine: Overcast <input type="checkbox"/>
Ambient Temp. Noon: _____	% Sunshine: Partly Cloudy <input type="checkbox"/>
Ambient Temp. End of Shift: _____	% Sunshine: Full <input type="checkbox"/>
% Relative Humidity: _____	

EMPLOYEE HEAT STRESS DATA:

Time	Heart Rate	Oral/ Aural Temp.	Time

APPENDIX C
WRS ASBESTOS REMOVAL SOP

Table of Contents

1.0	PURPOSE
2.0	SCOPE
3.0	DEFINITIONS
4.0	RESPONSIBILITIES
5.0	PROCEDURE
5.1	HAZARD DESCRIPTION
5.2	EXPOSURE ASSESSMENT
5.3	MEDICAL SURVEILLANCE
5.4	INFORMATION TRAINING and WORKPLACE POSTINGS
5.5	EXPOSURE CONTROL MEASURES
6.0	REFERENCES
7.0	ATTACHMENTS
8.0	RECORD KEEPING
9.0	EQUIPMENT

1.0 PURPOSE

This Standard Operating Procedure for the control of asbestos exposures, outlines the hazards and hazard control measures for minimizing employee and public exposures to asbestos during the conduct of WRS work. The SOP is designed to ensure WRS compliance with OSHA's Construction Industry Standard for Asbestos: 29 CFR 1926.1101.

2.0 SCOPE

The SOP for asbestos exposure control applies to all WRS personnel involved in:

- the demolition or salvage of structures where asbestos is present;
- the removal or encapsulation of materials containing asbestos;
- construction, alteration, repair, maintenance or renovation of structures, substrates, or portions thereof, that contain asbestos;
- installation of products containing asbestos;
- asbestos spill/ emergency cleanup;
- transportation, disposal, storage, containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed;

3.0 DEFINITIONS

Aggressive method - removal or disturbance of building material by sanding, grinding or other method that breaks, crumbles or disintegrates intact asbestos containing material (ACM).

Amended water - water to which a surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

Asbestos - includes chrysotile, amosite, crocidolite, tremolite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/ or altered.

Asbestos Containing Material (ACM) - means any material containing more than one percent (> 1.0%) asbestos

Authorized person - any person authorized by WRS and required by work duties to be present in regulated areas.

Class I Asbestos Work - activities involving the removal of thermal system insulation (TSI) and surfacing ACM and PACM.

Class II Asbestos Work - activities involving the removal of ACM which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

Class III Asbestos Work - repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM is likely to be disturbed.

Class IV Asbestos Work - maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.

Clean Room - an uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

Competent Person - one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them. In addition, for Class I and Class II work, the Competent Person must have successfully completed supervisor training and for Class III and Class IV work, must have completed training required for maintenance and custodial work. (See Section 5.4.6 for an explanation of training requirements)

Critical Barrier - one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

Decontamination Area - an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - wrecking or taking out any load supporting structural member and any related razing, removing or stripping of asbestos products.

Disturbance - activities that disturb the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

Employee Exposure - that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

Equipment Room - means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Glovebag - means not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos containing material, with glove-like appendages through which material and tools may be handled.

High-Efficiency Particulate Air (HEPA) Filter - a filter capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter.

Homogenous Area - an area of surfacing material or thermal system insulation that is uniform in color and texture.

Intact - ACM that has not been crumbled, been pulverized or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Permissible Exposure Limits - (1) Eight hour Time Weighted Average: 0.1 fiber per cubic centimeter of air; (2) 30 minute Time Weighted Average, Excursion Limit: 1.0 fiber per cubic centimeter of air

Presumed Asbestos Containing Material - means thermal system insulation and surfacing material found in buildings constructed no later than 1980. Sampling and analysis procedures may be used to rebut the presumption.

Regulated Area - an area established by the employer to demarcate areas where Class I, II and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit (>0.1 fibers/ cc).

Removal - all operations where ACM and/ or PACM is taken out or stripped from structures or substrates and includes demolition operations.

Renovation - means the modifying of any existing structure, or portion thereof

Repair - overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Surfacing Material - material that is sprayed, trowelled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes.)

Surfacing ACM - means surfacing material which contains more than 1% asbestos.

Thermal System Insulation - ACM applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Thermal System Insulation ACM - thermal system insulation which contains more than 1% asbestos.

Unclassified Work – work with ACM, covered by the asbestos standard that does not fall into one of the 4 OSHA classes.

4.0 RESPONSIBILITY

The individual who prepares the Site Specific Health and Safety Plan (SSHSP) is responsible for identifying the need to implement this SOP. The SSHSP will include this SOP and an Emergency Response Plan. The individual selected to prepare the SSHSP will possess the hazard recognition and hazard control skills required of a Competent Person. Persons providing project details (e.g., site conditions, past processes, work activities, site histories, etc.) to the author of the SSHSP are responsible for providing information in detail adequate for making an accurate determination.

Building/ Facility owners are obligated by the OSHA Standard to determine the presence, location and quantity of ACM and/ or PACM at the work sites in their buildings and facilities. Building/ Facility Owners must relay this information to WRS either verbally or in writing.

The Project Manager/ Supervisor is responsible for directing work in accordance with this procedure when invoked and providing the necessary resources.

For sites which require a Competent Person, he/ she shall fulfill the following responsibilities:

- Frequent and regular inspections of the job site, materials and equipment;
- For Class I jobs, on-site inspections shall be made at least once during each work shift and following an employee request;
- For Class II, III and IV jobs, on site inspections shall be made at an interval sufficient to assess whether conditions have changed and following an employee request;
- On all worksites where WRS employees are engaged in Class I or II asbestos work, or WRS subcontractor employees are engaged in Class I or II work, the competent person shall perform or supervise the following duties, as applicable:
 - Set up the regulated area, enclosure, or other containment;
 - Ensure (by on-site inspection) the integrity of the enclosure or containment;
 - Set up procedures to control entry to and exit from the enclosure and/or area;
 - Supervise all employee exposure monitoring required by this section and ensure that it is conducted as required by under Section 5.2 of this SOP;
 - Ensure that employees working within the enclosure and/or using glove bags wear respirators and protective clothing;
 - Ensure through on-site supervision, that employees set up, use and remove engineering controls, use work practices and personal protective equipment in compliance with all requirements;
 - Ensure that employees use the hygiene facilities and observe decontamination procedures
 - Ensure through on-site inspection, that engineering controls are functioning properly and employees are using proper work practices; and,
 - Ensure that notification requirements in Section 5.2.4 of this SOP are met.

The Competent person may be a WRS employee when WRS employees are conducting the covered work, or the Competent person may be a WRS subcontract employee. When WRS subcontracts work that requires a Competent Person, WRS must ensure that a Competent Person fulfills the above listed responsibilities. It is advisable to have Subcontractors with employees conducting the covered work, provide their own Competent Person.

5.0 PROCEDURE

5.1 HAZARD DESCRIPTION

Asbestos exposures by inhalation may produce disabling respiratory illness. Inhalation and ingestion of asbestos can produce various cancers of the respiratory and gastrointestinal tract.. There are no known acute illnesses associated with asbestos exposure. A complete description of illnesses associated with excessive exposures to asbestos can be found at *29 CFR 1926.1101 Appendix H - Substance Technical Information for Asbestos*.

5.2 EXPOSURE ASSESSMENT AND MONITORING

WRS will conduct employee exposure assessments as outlined below to determine airborne asbestos exposure concentrations. Breathing zone samples that are representative of each employee's eight hour time weighted average and 30 minute short-term exposure will be conducted.

Each work area will be characterized with both eight hour samples and 30 minute breathing zone samples. The 30 minute samples will represent operations likely to produce exposures above the excursion limit.

Air samples will be collected and analyzed using OSHA Method ID-160 or the most current version of NIOSH Method 7400. Individuals performing the analysis (e.g., fiber counting) must have taken the NIOSH course for sampling and evaluating airborne asbestos fibers or an equivalent course. Further QA/QC requirements for sample analysis specified at Appendix A of the OSHA Standard shall be adhered to.

5.2.1 Initial Exposure Assessment - A Competent Person will conduct an initial exposure assessment before or at the initiation of an operation covered by this SOP. For Class I work, exposures will be assumed to be in excess of the TWA and the excursion limit until exposure monitoring proves otherwise. A negative exposure assessment is one in which air sampling results for both eight hour and thirty minute exposures for tasks likely to produce exposures above the limits are in fact shown to be below those limits.

5.2.2 Periodic Monitoring - Air sampling for employees conducting Class I and II work shall be conducted daily unless a negative exposure assessment has been made. Periodic monitoring will be conducted for unclassified and Class III and IV work where exposures are expected to exceed exposure limits. Samples will be collected at a frequency sufficient to validate the exposure prediction.

Exception - daily monitoring is not required when employees in the regulated area performing Class I and II activities are using supplied air respirators. However, employees performing Class I work using a control method not specified at Section 5.5.1 B, 1 of this SOP must be monitored daily regardless of the type of respiratory protection used.

5.2.3 Termination of Monitoring - When periodic monitoring shows exposures to be below the PEL and the excursion limit, monitoring for employees represented by such data may be terminated. When changes in process, control equipment, personnel or work practices occur that may result in new or additional exposures above the exposure limits, additional monitoring will be conducted.

5.2.4 Employee Notification of Monitoring Results - WRS will notify affected employees of the results of monitoring as soon as possible following receipt of results. Results will be communicated to employees in writing either individually or at a centrally located place that is accessible to affected employees.

5.2.5 Observation of Monitoring - WRS shall provide affected employees or their representative the opportunity to observe any monitoring of employee exposure to asbestos. WRS will provide clothing and equipment necessary to observe monitoring safely.

5.3 MEDICAL SURVEILLANCE

5.3.1 WRS Medical Surveillance Program - WRS employees who work on projects to which the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) applies are participants in a medical monitoring program which includes pre-employment physical exams, annual exams, and employment termination exams. See Section III Medical Monitoring Program of the WRS "Health and Safety Manual for Hazardous Waste Site Activities for a complete description of exam components. The HAZWOPER exams include exam components required by the Asbestos Standard:

- Asbestos questionnaire's both initial and periodic;
- Chest x-rays (interpreted and classified in accordance with Appendix E of the OSHA Standard)
- Pulmonary Function Tests

Employees conducting asbestos work covered by the medical surveillance section of the asbestos standard will be included in the HAZWOPER medical surveillance program. Employees are provided with complete copies of their exam results including the physician's written opinion.

All exams are conducted by a licensed physician at no cost to employees.

5.4 INFORMATION, TRAINING AND WORKPLACE POSTINGS

Employees exposed to asbestos in excess of an exposure limit and employees conducting Class I through Class IV operations will participate in a training program. Training will be provided at no cost to employees prior to or at the time of initial assignment.

5.4.1 Class I Operations and Class II Operations Involving the use of Critical Barriers and/ or Negative Pressure Enclosures - Employees will receive training equivalent to EPA Model Accreditation Plan (MAP) asbestos abatement workers training (minimum of 4 days).

5.4.2 Other Class II Operations - Work with asbestos containing roofing materials, flooring materials, siding materials, ceiling tiles or transite panels will require a minimum of eight hours training. Training will include hands-on sessions and will be specific to the category of material that the employee removes and each removal method that the employee uses.

5.4.3 Class III Operations - employees conducting Class III operations will receive at least 16 hours of training consistent with training required of local education agency maintenance staff as set forth at 40 CFR 763.92(a)(2). If the Competent Person determines this training is not adequate for a particular activity, alternative training that addresses these needs is specified by the OSHA Standard. Contact the H&S Manager for further details or see paragraph (k)(9)(v) of the OSHA Standard.

5.4.4 Class IV Operations - employees conducting Class IV activities will receive a minimum of two hours of training consistent with 40 CFR 763.93(a)(1).

5.4.5 Other Training Conducted for Employees not Listed Above Who are Likely to be Exposed Above the PEL or Unclassified Work that is likely to produce exposures above the PEL - The OSHA Standard requires that these employees be trained. There is no minimum training period specified. Contact the H&S

Director for further details or see paragraph (k)(9)(vii) under 29 CFR 1926.1101. Asbestos awareness training is conducted by the Competent Person for these employees.

5.4.6 Competent Person - individuals serving as Competent Persons will receive training which meets the EPAs Model Accreditation Plan (40 CFR part 763) requirements for supervisor training (5 days) for Class I and II work, and will receive training consistent with EPA requirements for training of local education agency maintenance and custodial staff for Class III and IV work.

5.4.7 Availability of Training Materials - WRS will make written materials relating to the employee training program, including the OSHA Standard, available without cost to all employees.

5.4.8 Smoking Cessation Information - WRS will inform all employees of the availability of self-help smoking cessation information.

5.4.9 Signage - The following sign will be posted at each regulated work area. The sign must be posted at such a distance from the regulated area that an employee may read the sign and take necessary protective steps before entering the regulated area.

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY**

In addition, where the use of respirators and protective clothing is required in the regulated area, the warning sign will include:

**RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN
THIS AREA**

Containers of asbestos waste shall have the following label:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE
HAZARD**

5.5 EXPOSURE CONTROL MEASURES

5.5.1 Engineering and Work Practice Controls - Where feasible, engineering and work practice controls will be used to reduce employee exposures to asbestos below the permissible exposure limit.

A. General - The following control measures will be applied to all asbestos work regardless of exposure levels:

- vacuums cleaners with HEPA filters will be used to collect all debris and dust containing ACM/PACM;
- wet methods or wetting agents will be used to control employee exposures during asbestos handling, mixing, removal, cutting, application, and clean-up, except where the use of such procedures is not feasible such as when a shock hazard is created;
- prompt clean-up and disposal of wastes and debris contaminated with asbestos in leak tight containers;

In addition, to ensure that exposures are below the asbestos exposure levels, the following control measures will be instituted:

- local exhaust ventilation equipped with HEPA filter dust collection systems;
- enclosure or isolation of processes producing asbestos dust;
- ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter; and,
- wherever feasible engineering controls have been implemented, but do not reduce exposures below the exposure limits, they will be supplemented by the use of respirators.

B. Class Specific Work Procedures

1.) Class I Work Procedures

- all Class I work activities will be supervised by a competent person;
- to ensure that airborne asbestos does not migrate from the regulated area:
 - a. during the removal of 25 linear or 10 square feet of TSI or surfacing material; or,
 - b. during any other Class I work for which a negative exposure assessment has not been produced; or,
 - c. where employees are working adjacent to the regulated area while Class I work is being performedone of the following control methods must be used:
 - i.) critical barriers will be erected over all openings to the regulated area, except where activities are conducted outdoors; or
 - ii.) some other method with verified effectiveness (verified via air sampling).
- when working within a building which will not be demolished following asbestos removal, isolate HVAC system with double layer, 6 mil plastic or equivalent;
- place impermeable dropcloths over surfaces beneath a removal activity
- cover all objects within the regulated area, secure covering with duct tape or equivalent;
- when exposures exceed the exposure limits, the regulated area will be ventilated to move contaminated air away from the breathing zone of employees toward a HEPA filtered collection device;
- Negative Pressure Enclosures (NPE) may be used where the configuration of the work area does not make its erection infeasible:
 - a.) at least 4 air changes per hour will be maintained in the NPE;
 - b.) a minimum of -0.02 column inches of water pressure differential relative to outside pressure will be maintained for the NPE as measured by a manometer;
 - c.) the NPE will be kept under negative pressure throughout the period of its use;
 - d.) air movement within the NPE will be configured so that contaminated air is directed away from the breathing zones of employees working in the NPE;
 - e.) before beginning work in an NPE and at the beginning of each shift, the NPE will be inspected for breaches and smoke tested, leaks/ breaches will be repaired before work begins;

- f.) electrical circuits within the NPE will be de-energized unless equipped with GFCI;
- Glovebag systems may be used to remove ACM/ PACM from straight runs of piping, elbows and other connections with following work practices:
 - a.) glovebags will be made of 6 mil plastic and be seamless at the bottom;
 - b.) glovebags used on elbows and other connections must be designed for that purpose without modification;
 - c.) the glovebag will be installed so that covers the entire circumference of the pipe or other structure;
 - d.) glovebags will be smoke tested for leaks and leaks will be sealed prior to use;
 - e.) glovebags may be used only once and may not be moved;
 - f.) glovebags will not be used on surfaces with temperatures above 150°F
 - g.) prior to disposal glovebags will be collapsed using a HEPA vacuum;
 - h.) before beginning a glovebag operation, loose and friable material adjacent to the glovebag will be wrapped and sealed in two layers of 6 mil plastic or otherwise rendered intact;
 - i.) when using an attached waste collection bag, the attached bag will be connected to the glovebag by means of a hose or other material which is substantial enough to withstand the weight of waste/ water generated during the removal
 - j.) a sliding valve or other device will be used to separate the waste bag from the connecting hose to ensure there is no exposure when the waste bag is disconnected; and,
 - k.) at least two persons will be used to perform a Class I glovebag operation.
 - Other control methods such as a Negative Pressure Glovebag, Negative Pressure Glovebox, Water Spray Process System, and Mini-Enclosures are discussed in the OSHA Standard, but have been omitted here for brevity. Alternative methods for Class I work, i.e., those not specified in the Standard, may be used when a project designer who is a PE or CIH approves the method in writing.

2.) Class II Work Procedures

- all Class II work activities will be supervised by a competent person;
- when conducting Class II work indoors, where we have not produced a negative exposure assessment, where exposures may exceed an exposure limit, or when it is not possible to remove ACM in a substantially intact state, the following methods will be used to ensure that airborne asbestos does not migrate from the regulated area:
 - a.) place critical barriers over all openings to the regulated area; or
 - b.) use some other barrier or isolation method and verify its effectiveness with air sampling; and,
 - c.) place impermeable dropcloths over surfaces beneath a removal activity;
- Procedures for removing ACM/ PACM containing vinyl or asphalt flooring:
 - a.) flooring and its backing will not be sanded;
 - b.) HEPA vacuums with no brushes will be used to clean floors;
 - c.) resilient sheeting will be removed by cutting, the snip point will be wetted and the sheeting will be wetted when delaminated, resilient sheeting will not be ripped up;
 - d.) scraping of residual adhesive will be performed using wet methods;
 - e.) dry sweeping is prohibited;
 - f.) mechanical chipping is prohibited unless performed in a negative pressure enclosure;
 - g.) floor tiles will be removed intact, unless intact removal is not possible;
 - h.) when tiles are heated and can be removed intact, wetting is not necessary;
- Procedures for removing ACM containing roofing material:

- a.) roofing material will be removed as intact as is possible;
 - b.) wet methods will be used to remove roofing materials which are not intact or that will be rendered not intact during removal, unless wet methods are not possible or create safety hazards;
 - c.) cutting machines will be continuously misted unless the competent person determines that misting decreases worker safety;
 - d.) when using a powered roof cutter, to remove built up roofing which has an aggregate surface, all dust from the operation will be collected by a HEPA dust collector or HEPA vacuuming along the cut line
 - e.) when using a powered roof cutter to remove built up roofing with a smooth surface (i.e., no aggregate), dust resulting from the operation will be collected by either HEPA dust collector or HEPA vacuuming along the cut line or by gently sweeping and then carefully/ completely wiping up the still wet dust and debris left along the cut line. The dust and debris will then be immediately bagged or placed in covered containers.
 - f.) ACM that has been removed from a roof will be lowered to the ground by crane, hoist or covered chute. It must not be thrown to the ground;
 - g.) All ACM removed from the roof system will be removed from the roof by the end of the shift unless kept wet, placed in impermeable bags or wrapped in plastic sheeting;
 - h.) After ACM roofing materials are lowered to the ground, they will be stored in a closed receptacle to prevent the dispersion of dust;
 - i.) an exception from wetting and HEPA vacuuming exists for roof areas of less than 25 square feet, see the OSHA Standard for details.
- Procedures for removing cementitious asbestos-containing siding and shingles or transite panels containing ACM on building exteriors (other than roofs)
 - a.) cutting, breaking or abrading will be avoided unless infeasible;
 - b.) each panel or shingle will be sprayed with amended water prior to removal;
 - c.) unwrapped/ unbagged panels/ shingles will be lowered to the ground immediately by crane, hoist or covered chute or, they must be wrapped or bagged and lowered to the ground by the end of the work shift. They must not be dropped to the ground; and,
 - d.) nails will be cut with flat, sharp instruments.
 - Procedures for ACM gasket removal:
 - a.) glovebag technique will be used if the gasket is visibly deteriorated and unlikely to be removed intact;
 - b.) the gasket will be placed immediately into a disposal container
 - c.) all scraping to remove residue will be performed wet

3.) Class III Work Procedures

- work will be performed using wet procedures;
- to the extent possible, the work will be performed using HEPA filtered, local exhaust ventilation;
- where disturbance involves drilling, cutting, abrading, sanding, chipping, breaking or sawing of TSI or surfacing material, impermeable dropcloths will be placed beneath the operation, and the operation will be isolated with a mini-enclosure or glovebag system;
- for any Class III work for which there is no negative exposure assessment or air sampling reveals an exposure above an exposure limit, the work will be underlain with impermeable dropcloths and isolated with plastic barriers, glovebag or mini-enclosure;

4.) Class IV Work Procedures and Unclassified Work

- the general work procedures under Section 5.5.1 (A) apply to Class IV and unclassified work;
- when cleaning up areas where friable TSI or surfacing materials are accessible, waste and debris in these areas will be assumed to contain asbestos.

5.5.2 *Respiratory Protective Equipment* - Respiratory protective equipment will be used in accordance with the WRS Respiratory Protection Program.

A. *Application of Respiratory Protective Equipment* - Respiratory protective equipment will be used when employee exposures exceed exposure limits and in the following situations:

1. During all Class I asbestos jobs;
2. During all Class II work where the ACM is not removed in a substantially intact state;
3. During all Class II and III work which is not performed using wet methods (exception: removal of ACM from sloped roofs when a negative exposure assessment has been made and the ACM is removed in an intact state);
4. During all Class II and III asbestos jobs where a negative exposure assessment has not been produced;
5. During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed;
6. During all Class IV work performed within a regulated areas where employees performing other work are required to wear respirators;
7. During emergencies.

B. *Selection of Respiratory Protective Equipment* -

Respirator selection will be made from the list of NIOSH/MSHA respirators approved for use by WRS employees in accordance with Table I. (See the WRS Respiratory Protection Program) The choice of respirator is in most cases a function of asbestos fiber concentration as listed in Table I.

Table I
Respiratory Protection for Asbestos Fibers

Airborne concentration of asbestos or conditions of use	Required Respirator*
Not in excess of 1 f/cc (i.e., 10 X PEL) or otherwise as required independent of exposure	Half-mask air purifying respirator other than a disposable respirator, equipped w/ HEPA filters
Not in excess of 5 f/cc (50 X PEL)	Full facepiece air purifying respirator equipped w/ HEPA filters
Not in excess of 10 f/cc (100 X PEL)	Any PAPR w/ HEPA filters or any supplied air respirator operated in continuous flow mode
Not in excess of 100 f/cc (1,000 X PEL)	Full facepiece supplied air respirator, operated in pressure demand mode
Greater than 100 f/cc (1,000 X PEL) or unknown concentration	Full facepiece, supplied air respirator operated in pressure demand mode, equipped w/ an auxiliary positive pressure self contained breathing apparatus

** Respirators assigned for high environmental concentrations may be used at lower concentrations, or when required respirator use is independent of concentration.*

Conditions under which respirator selection is not a function of asbestos concentration include:

- when an employee requests a PAPR and the PAPR provides adequate protection, WRS is required by OSHA to provide a PAPR;
- during Class II and III asbestos jobs where we do not have a negative exposure assessment, we will provide at least a half-mask APR w/ HEPA filters; and,
- Class III jobs where TSI or surfacing ACM or PACM is being disturbed, we will provide at least a half-mask APR w/ HEPA filters.
- all employees within a regulated area where Class I work is being performed, and a negative exposure assessment has not been produced and exposures will not exceed 1 f/cc as an 8 hour time weighted average will be provided with a tight fitting, PAPR equipped w/HEPA filters or a full facepiece, supplied air respirator operated in the pressure demand mode equipped w/HEPA egress cartridges or an auxiliary positive pressure self contained breathing apparatus;
- all employees within a regulated area where Class I work is being performed and the exposure assessment indicates exposure levels above 1 f/cc as an 8 hour time weighted average will be equipped with a full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self contained breathing apparatus.

C. Fit testing of negative pressure respirators - will be performed upon initial assignment of a respirator and every six months thereafter. Qualitative fit testing can be performed for half mask, negative pressure respirators. Qualitative fit testing can be used for full facepiece respirators when they are worn at levels at which half mask APRs are permitted. (After 10/98 fit testing interval will be once per year and both positive and negative pressure respirators will be fit tested.)

5.5.3 Protective Work Clothing and Decontamination - At a minimum, WRS provides protective work clothing to those employees working on tasks which pose exposures in excess of the permissible exposure limit (PEL) or for which there is no negative exposure assessment. In addition, all employees performing Class I work which involves the removal of over 25 linear or 10 square feet of TSI or surfacing ACM/ PACM will be provided with protective clothing.

Protective clothing includes disposable coveralls with hoods (e.g. tyvek for dry materials, saranex/ pvc for wet materials), and disposable gloves. Hard hats, face/ eye protection and overboots are also provided. Disposable PPE and on site decontamination methods are utilized to eliminate the risks of exposure to offsite personnel (e.g. laundry service employees, employee family members). No offsite laundering of contaminated clothing will be permitted.

When contaminated clothing is removed, it will be placed in sealed impermeable bags, or other closed impermeable container and be labeled in accordance with Section 5.4.9 of this SOP.

5.5.4 Housekeeping - All surfaces on WRS jobsites will be maintained as free as practicable of accumulations of asbestos. Housekeeping methods will be selected so that they do not contribute to airborne asbestos concentrations. Vacuuming will be conducted with units which have HEPA filtered exhaust. Compressed air will not be used for removing asbestos from any surface unless a ventilation system is used to capture airborne dust created by the compressed air.

5.5.5 Decontamination Facilities and Practices for Personnel -

A. Class I asbestos work involving over 25 linear or 10 square feet of TSI or surfacing ACM/ PACM:

- a decontamination area will be established adjacent and connected to the regulated area for the decontamination of employees. The decontamination area will include an equipment room, shower area, and clean room in series. Employees will enter and exit the regulated area through the decontamination area;
- the equipment room will be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective equipment;
- shower facilities will provide for one shower per ten employees of each sex, showers will be equipped with soap, hot/ cold water to a common discharge line and individual clean towels. The showers will be adjacent to the equipment room and clean room unless it is not feasible. When not feasible two options exist: 1.) remove asbestos from worksuits with HEPA vacuum before proceeding to a shower that is not adjacent to the work area, or 2.) remove contaminated worksuits in the equipment room, then don clean worksuits and proceed to a shower that is not adjacent to the work area.
- the clean change room will provide for the storage of each employee's personal effects. When it is not possible to locate the change area next to the work area, employees engaged in Class I work may HEPA-vacuum their worksuits in the regulated work area. Employees will then shower and change into street clothes in a change area.
- the decontamination area will be entered through the clean room, employees will remove and store street clothing and don all PPE before exiting the clean area. Employees will pass through the equipment room before entering the regulated area.
- employees will remove all gross contamination and debris from their PPE before exiting the regulated area
- employees will remove their protective clothing in the equipment room and deposit it in labeled impermeable bags or containers. Employees will not remove their respirators in the equipment room. Employees will shower before entering the clean room. After showering, employees will enter the clean room before changing into street clothes.

B. Class I asbestos work involving less than 25 linear or 10 square feet of TSI or surfacing ACM/ PACM, and Class II and III asbestos work operations where exposures exceed a PEL or where there is no negative exposure assessment produced before the operation.

- an equipment room or area will established next to the regulated area for the decontamination of employees and their equipment
- the area will be covered by an impermeable drop cloth on the floor or horizontal working surface. The area will be sufficient in size to accommodate cleaning of equipment and removal of PPE without spreading contamination beyond the area (as determined by visible accumulations)
- work clothing will be cleaned with a HEPA vacuum before it is removed. All equipment and surfaces of containers filled with ACM will be cleaned prior to removing them from the equipment room/ area.

- the regulated area will be entered and exited via the equipment room/ area

C. Class IV work

Employees conducting Class IV work in regulated areas comply with the same hygiene practice of those employees performing work of a higher classification within that regulated area. Otherwise employees conducting Class IV work comply with procedures under Section 5.5.5, B.

D. Unclassified Work

Employees conducting Unclassified Work in regulated areas comply with the hygiene practice specified under Section 5.5.5, B.

Decontamination facilities and practices for unclassified work in non-regulated areas will be described in the Site Specific Health and Safety Plan.

5.6 PROHIBITED ACTIVITIES

Eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics are prohibited while in a regulated area and are restricted to a Site's support zone.

The following work practices will not be used for work related to asbestos or for work which disturbs ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

- use of high speed abrasive saws that are not equipped with point of cut ventilation or enclosure with HEPA filtered exhaust air
- compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
- dry sweeping, shoveling or other dry clean-up of dust/debris containing ACM or PACM
- employee rotation as a means of reducing employee exposure to asbestos.

6.0 REFERENCES

- 29 CFR 1926.1101 Asbestos <http://www.osha-slc.gov/SLTC/asbestos/index.html>
- 40 CFR 763.92 Training and Periodic Surveillance
- 40 CFR Part 763, Appendix C to Subpart E Asbestos Model Accreditation Plan
- WRS Infrastructure & Environment, Inc. "Health and Safety Manual for Hazardous Waste Site Activities"

7.0 ATTACHMENTS

None

8.0 RECORD KEEPING

8.1 Objective Data - When WRS uses objective data to select exposure control measures instead of actually monitoring exposures, the following information concerning the objective data must be maintained: product qualifying for the exemption from monitoring; source of objective data; the testing protocol, results, of testing, and/ or analysis of the material for the release of asbestos; a description of the operation exempted and how the data support the exemption; and, any other data which supports the exemption. Objective data records will be maintained for the duration of our reliance on the objective data.

8.2 Exposure Measurements - Exposure monitoring data collected during exposure assessments is maintained in project files and employee medical files. Forward all asbestos exposure assessment data to the WRS H&S Manager for long term storage. The record includes the date of the measurement, operation involving exposure to asbestos that is being monitored, sampling and analytical methods used and evidence of their accuracy, number/ duration / results of samples taken, and the name/ social security no./ and exposure of the employees whose exposures are represented. These records will be maintained for the duration of employment plus thirty years

8.3 Medical Record - Medical surveillance records include the name and social security number of the employee, written physician's opinions, employee complaints related to asbestos exposure, and all physical exam results. Medical records will be maintained for the duration of an individual's employment plus thirty years.

8.4 Training Records - All training records related to the asbestos Standard will be maintained at least one year beyond the termination of an individual's employment.

8.5 Availability of Records - WRS makes all records required by the asbestos Standard available to employees, former employees and their designated representatives. Records are maintained at the WRS H&S Headquarters location:

WRS Infrastructure & Environment, Inc.
221 Hobbs St Suite 108
Tampa, FL 33619

9.0 EQUIPMENT

No equipment unique to this SOP is required.

APPENDIX D
WRS SOP COLD STRESS PREVENTION

CONTENTS

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 DEFINITIONS
- 4.0 RESPONSIBILITIES
- 5.0 PROCEDURES
 - 5.1 INTRODUCTION
 - 5.2 FROSTBITE
 - 5.3 HYPOTHERMIA
 - 5.4 EMERGENCY
 - 5.5 WORK-PLACE MONITORING
 - 5.6 WORK-WARMING REGIMEN
 - 5.7 SPECIAL MEDICAL CONSIDERATIONS
 - 5.8 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS
- 6.0 REFERENCES
- 7.0 ATTACHMENTS
 - Windchill Index Table
 - Work/ Warming Regimen

1.0. PURPOSE

To establish procedures for the implementation, operation, and monitoring of a cold stress prevention, evaluation, and response program.

To describe signs and symptoms which characterize excessive exposure hazard of waste site personnel to cold environments. Recognition of these signs and symptoms necessitates prompt corrective action to prevent permanent injury or death.

2.0 SCOPE

Applies to all WRS activities where personnel may be exposed to environments with an ambient temperature of 30°F or less.

3.0 DEFINITIONS

Frostbite - Local tissue damage caused by exposure to low temperature environmental conditions. Severe frostbite may lead to deep tissue damage, gangrene and loss of the affected parts.

Hypothermia - Lowering of the body core temperature due to exposure to cold. Severe hypothermia may result in death of the victim.

Equivalent Chill Temperature (ECT) - An index describing the effect of the cooling power of moving air on exposed flesh. The effect of wind velocity at a certain temperature is expressed as the equivalent cooling effect of a lower temperature with still air.

ACGIH TLV - Cold Stress Threshold Limit Values (TLVs) are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body core temperature from falling below 36°C (96.8°F) and to prevent cold injury to body extremities. Deep body temperature is the core temperature of the body as determined by rectal temperature measurements. For a single, occasional exposure to a cold environment a drop in core temperature of no lower than 35°C (95°F) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury. Cold stress TLV's are currently tentative.

4.0 RESPONSIBILITIES

All Site Personnel - All site personnel shall be alert to signs of development of excessive cold stress in those working with them and shall be aware of emergency action described in first aid texts.

Site Health and Safety Officer (SHSO) - The SHSO is responsible for implementing a cold stress monitoring according to this guideline.

5.0 PROCEDURES

5.1 INTRODUCTION

Persons working outdoors in temperatures at or below freezing may experience frostbite. Extreme cold for a short time may cause severe injury to the surface of the body. Areas of the body that have a high surface area to volume ratio, such as fingers, toes, and ears, are the most susceptible.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10^oF with a wind of 15 mph is equivalent in chilling effect to still air at -18^oF.

As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is soaked with perspiration.

5.2 FROSTBITE

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

1. Frost nip or incipient frostbite - the condition is characterized by sudden blanching or whitening of skin.
2. Superficial frostbite - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
3. Deep frostbite - tissues are cold, pale, and solid; extremely serious injury.

5.3 HYPOTHERMIA

Authorities agree that there are degrees of hypothermia which are characterized as "moderate" and "severe." A victim of moderate hypothermia may exhibit the first seven signs listed below, is still conscious but often confused. Severe hypothermia is determined by extreme skin coldness, loss of consciousness, faint pulse and shallow, infrequent or apparently absent respiration. Death is the ultimate result .

Signs of Hypothermia:

1. Severe shivering
2. Abnormal behavior
3. Slowing
4. Stumbling
5. Weakness
6. Repeated falling
7. Inability to walk

8. Collapse
9. Stupor
10. Unconsciousness

5.4 EMERGENCY ACTION

1. Remove the victim from the hypothermia/frostbite producing environment.
2. Seek expert medical help immediately.
3. Reduce handling to minimum. Do not rub or massage the victim.
4. Prevent further body heat loss by covering the victim lightly with blankets. Plastic may be used for further insulation. Do not cover the victim's face.
5. If the victim is still conscious administer hot drinks; encourage activity, such as walking while wrapped in a blanket; do not administer any form of sedative, tranquilizer or analgesic (pain reliever), because these may facilitate further heat loss and convert moderate hypothermia into a severe case.

5.5 WORK-PLACE MONITORING

Work-place monitoring is required as follows:

1. A thermometer accurate to 1°F shall be assigned to any work place where the environmental temperature is known or expected to be below 60°F to enable overall compliance with the requirements of this policy.
2. Whenever the air temperature at a work place falls to 30°F or below, the dry-bulb temperature and wind speed shall be measured and recorded at least every 4 hours.
3. The equivalent chill temperature shall be obtained in all cases where air movement measurements are required, and shall be recorded with the other data in the site log together with a record of the length of time spent working and resting.

5.6 WORK-WARMING REGIMEN

If work is performed continuously in the cold at an ECT of 20°F or below, heated warming shelters shall be made available for use by employees during warm-up breaks. A work-warming regimen will be established. (A work/ warming regimen is located at the end of this SOP) Assumes that all workers are properly clothed for periods of work at temperatures below freezing.

When entering the heated shelter, the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation or a change of dry work clothing provided. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee is not advisable because of its diuretic and circulatory effects.

For work practices at or below 10°F ECT , the following shall apply:

1. The worker shall be under constant protective observation (buddy system or other direct supervision).

2. The work rate should not be so high as to cause sweating that will result in wet clothing; if heavy work must be done, all rest periods must be taken in heated shelters and the opportunity for changing into dry clothing shall be provided.
3. Provisions shall be made to make sure employees shall become accustomed to the working conditions and required protective clothing.
4. The weight and bulkiness of clothing shall be included in estimating the required work performance and weights to be lifted by the worker.
5. The work shall be arranged in such a way that sitting still or standing for long periods is minimized. Unprotected metal chair seats shall not be used. The worker should be protected from drafts to the greatest extent possible.
6. The workers shall be instructed in cold weather procedures. The training program shall include as a minimum instruction in:
 - a. Proper rewarming procedures and appropriate first aid treatment.
 - b. Proper clothing practices.
 - c. Proper eating and drinking habits.
 - d. Recognition of impending frostbite.
 - e. Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
 - f. Safe work practices.

5.7 SPECIAL MEDICAL CONSIDERATIONS

Employees shall be excluded from work in cold at 30°F or below if they are suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -10°F with wind speeds less than 5 miles per hour, or air temperature below 0°F with wind speeds less than 5 miles per hour should be medically certified as suitable for such exposures.

Trauma sustained in freezing or subzero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment.

For exposed skin, continuous exposure will not be permitted when ECT of -25°F is anticipated.

At air temperatures of 36°F or less, any worker who becomes immersed in water or whose clothing becomes wet will be immediately provided a change of clothing and be treated for hypothermia.

5.8 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Since prolonged exposure to cold air, or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided as follows:

- Adequate insulating clothing to maintain core temperatures above 97°F must be provided to workers if work is performed in air temperatures below 40°F. Wind chill or the cooling power of the air is a critical factor. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required. The equivalent chill temperature must be used

when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.

- Older workers or workers with circulatory problems require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions which shall be considered. The precautionary actions to be taken will depend upon the physical condition of the work and shall be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.
- Special protection of the hands is required to maintain manual dexterity as follows:
 - If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 60°F, special provisions shall be established for keeping the worker's hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars shall be covered by thermal insulating material at temperatures below 30°F.
 - If the air temperature falls below 60°F for sedentary, 40°F for light, or 20°F for moderate work and fine manual dexterity is not required, then gloves shall be used by the workers.
- To prevent contact frostbite, the workers must wear anti-contact gloves and follow the provisions shown below:
 - When cold surfaces below 20°F are within reach, a warning should be given to each worker by his supervisor to prevent inadvertent contact by bare skin.
 - If the air temperature is 0°F or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.
- Provisions for additional total body protection is required if work is performed in an environment at or below 40°F. The workers shall wear cold protective clothing appropriate for the level of cold and physical activity:
 - If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind shall be reduced by shielding the work area, or by wearing an easily removable outer windbreak garment.
 - If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use shall be of a type impermeable to water. The outer garments must include provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If work is done at normal temperatures or in a hot environment before entering the cold area, the employee shall make sure that his clothing is not wet as a consequence of sweating. If his clothing is wet, the employee shall change into dry clothes before entering the cold area. The workers shall change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots. The optimal frequency of change shall be determined empirically and will vary individually and according to the type of shoe worn and how much the individual's feet sweat.
 - If extremities, ears, toes, and nose cannot be protected sufficiently to prevent sensation of excessive cold or frostbite by handwear, footwear, and face masks, these protective items shall be supplied in auxiliary heated versions.

- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work shall be modified or suspended until adequate clothing is made available or until weather conditions improve.
- Workers handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F shall take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of "cryogenic fluids" or those liquids with a boiling point just above ambient temperatures.

6.0 REFERENCES

ACGIH TLV Booklet, 1996.
USACE EM 385-1-1 (9/96) Section 06.J
<http://www.usace.army.mil/inet/usace-docs/eng-manuals/em385-1-1/toc.htm>

7.0 ATTACHMENTS

Windchill Index Table
Work/ Warm-up Schedule

Wind Chill Index Values

Wind speed in mph	Actual Thermometer Reading (F)									
	50	40	30	20	10	0	-10	-20	-30	-40
	Equivalent Temperature (F)									
calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Over 40 mph (little added effect)	Little Danger (for properly clothed person)				Increasing Danger			Great Danger (Danger from freezing of exposed flesh)		

The human body senses "cold" as a result of both air temperature and wind velocity. Cooling of exposed flesh increases rapidly as the wind velocity goes up. Frostbite can occur at relatively mild temperatures if wind penetrates the body insulation. For example, when the actual air temperature of the wind is 40 F and its velocity is 30 mph, the exposed skin would perceive this situation as an equivalent still air temperature of 13 F.

Work/ Warm-Up Schedule

Air Temperature - Sunny Sky °F	No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
	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
-15 ⁰ to -19 ⁰	Normal Breaks	1	Normal Breaks	1	75 min.	2	55 min.	3	40 min.	4
-29 ⁰ to -24 ⁰	Normal Breaks	1	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-25 ⁰ to -29 ⁰	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-30 ⁰ to -34 ⁰	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-35 ⁰ to -39 ⁰	40 min.	4	30 min.	5	Non-emergency work should cease		Non-emergency work should cease			
-40 ⁰ to -44 ⁰	30 min.	5	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease			
≤ -45 ⁰	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease	

Notes:

- 1.) Schedule applies to any four hour work period with moderate to heavy work activity, with warm-up periods of 10 minutes in a warm location and with an extended break (e.g., lunch) at the end of the four hour period in a warm location.
- 2.) Applies only to workers in dry clothing.

From: ACGIH TLVs and BEIs

APPENDIX E
Notification Procedures in the Event of a Significant Release of Asbestos

BORIT ASBESTOS SITE
AMBLER, MONTGOMERY COUNTY, PA

Notification Procedures in the Event of a Significant Release of Asbestos

Background

The BoRit Asbestos Site (“Site”) consists of three adjacent properties used as a asbestos containing material (“ACM”) disposal area. Based on data from previous site assessments, asbestos is the only contaminant of concern at the site. ACM is visible in specific locations throughout the Site. ACM on the surface of the pile property and on some areas of the reservoir bank appear to be in a more friable state than in other locations (reservoir and park properties) where ACM is found in a non-friable condition usually in the form of transite, piping, tiles, and other asbestos-cement products.

Regulation

The National Emissions Standards for Hazardous Air Pollutants (“NESHAP”) regulates asbestos emissions. Asbestos was one of the first hazardous air pollutants regulated under Section 112 of the Clean Air Act. The Asbestos NESHAP (40 CFR 61, Subpart M) addresses milling, manufacturing and fabricating operations, demolition and renovation activities, waste disposal issues, active and inactive waste disposal sites and asbestos conversion processes.

Removal Action

The primary objective of the Removal Action at the BoRit Site is to stabilize the stream banks of the adjacent bodies of water (Tannery Run, Wissahickon and Rose Valley Creeks) to prevent ACM migration from the soil into the air, prevent lateral migration of asbestos into the streams, and prevent possible direct contact to exposed ACM. To accomplish the primary objective, the following field activities will take place:

1. Clearing and grubbing

The majority of the Site is overgrown with high grass, bushes, shrubs and tall trees. Before any construction activity begins, much of the vegetation needs to be cleared in order to build staging areas and access roads and allow for a contiguous, workable surface along the stream banks to ensure an effective stabilization remedy. During clearing activities, no sudden significant release of asbestos is anticipated. There will be no digging or excavating. Trees will be cut flush with the ground surface. Engineering measures (dust suppression) are in place. (If, in the rare case, a stump must be removed, dust suppression and containment will be utilized.) Also, soil and mulch are available on-site to cover any exposed areas, and undisturbed exposed areas have not been shown to result in air releases of concern to date.

2. Stream bank stabilization implementation/construction

A combination of rip rap stone and geocells, will be used to stabilize the stream banks. No sudden release of significant amounts of asbestos fibers or ACM to the creeks is anticipated during construction activities. Measures will be implemented (e.g. oil boom or other “catching” device) to contain any floatable ACM. Areas may be exposed briefly while crews work on the banks. As mentioned above, engineering controls (dust suppression) are in place and soil and mulch are available on-site to cover any exposed areas. Workers will wear respiratory PPE if determined necessary.

Air monitoring/sampling

1. Daily air monitoring stations are set up in the work area documenting how much dust in the air. The station instruments run continuously during daily operations recording dust levels (one minute average). A remote monitoring system is located at EPA’s command post to view these recorded results.
2. Weekly or twice-weekly air sampling for asbestos is conducted. All samples are sent to the lab for analysis and results are routinely available within 72 hours and then posted on the EPA website.

Emergency Notification Procedures

EPA believes it is highly unlikely that a significant, health-threatening asbestos release will occur at the BoRit Site during construction activities, in light of historical air results, the nature and type of contamination at the site and precautionary

BORIT Asbestos Site
Notification Procedures in the Event of a Significant Release of Asbestos

measures that are being and will continue to be implemented. Nevertheless, this notification plan has been prepared as a precautionary measure in the unlikely event of a significant or potentially significant release of asbestos to the air or surface waters of adjoining streams. “Significant” means a release that is at such a concentration and can travel to such a distance that it might pose an inhalation threat to the community. Although the nearest drinking water source is miles away in Philadelphia (and it is improbable that a water release will affect the drinking water supply), and asbestos is generally not considered a threat to aquatic life, the plan will also address visible asbestos or ACM that might migrate downstream during construction activities.

Given the nature of the construction activities and the proximity of asbestos to the ground surface, minor releases of asbestos fibers may still occur on occasion. Monitoring and sampling measures are in place to document and assess these occurrences (e.g. daily dust monitoring, weekly air sampling, visual observation), in addition to the previously mentioned engineering controls.

Determination of what constitutes a significant or potentially significant release of asbestos will require some subjectivity on the part of EPA and especially its contractors who are consistently in the field and likely would first identify a release problem. The following is an example of what might constitute a significant release or situations where EPA will make notifications:

1. A sustained, persistent dust cloud beyond the site perimeter.
2. “Whitish”, powdery material floating downstream from the site.

Should all precautionary measures fail and an accidental, significant release of asbestos fibers occur, the following steps should be followed:

1. Field personnel will immediately stop work.
2. Radio back to the office (all field personnel carry a two-way radio).
3. EPA personnel will immediately inspect the area and/or assess the incoming information in order to determine if notification is needed.
4. EPA personnel will contact those individuals or organizations most threatened by the release and/or responsible for informing the public of emergency situations.

For example, if a sustained dust cloud is migrating towards the residential neighborhood, EPA will go door-to-door to recommend closing windows and staying indoors. If a significant release of ACM or asbestos fibers migrates downstream, EPA will notify the Wissahickon Watershed Association and any downstream fisherman or boaters. In all cases, the following organizations will be notified, not necessarily in the order in which they are listed:

1. Borough of Ambler (215.646.1000)
2. Whitpain Township (610.277.2400)
3. Upper Dublin Township (215.643.1600)
4. Agency for Toxic Substances and Disease Registry (215.814.3141)
5. Pennsylvania Department of Environmental Protection (484.250.5900)

If need be, EPA will also call the National Response Center (“NRC”) at 1.800.424.8802. The NRC is the Federal Government’s national call center for all pollution or release notifications. The NRC will contact all the appropriate parties in any particular location throughout the nation. Following such a release, EPA will notify the CAG by email and update the EPA website with information about the event.

For procedures during a different emergency (e.g., medical, chemical) see the site’s health and safety plan.

APPENDIX F
Example of a Written Job Safety Analysis

WRscompass Job Safety Analysis

Task Analyzed: Tree Felling with Chain Saw	
Date of Preparation:	Project Name:
Prepared By:	Page <u>2</u> of <u>2</u>

TASK	POTENTIAL HAZARD	PRECAUTIONS
PPE: Hard hats, Safety glasses, steel toe boots, Kevlar chaps, hearing protection	Falling limbs	<ul style="list-style-type: none"> inspect tree for dead limbs/ trunk prior to cutting use alternate felling procedure if dead limb/ trunk are present
	Falling tree	<ul style="list-style-type: none"> notify co-workers of felling direction/ area keep foot path of retreat clear do not cut trees with potential for damaging utilities/ buildings
	Chain saw kickback	<ul style="list-style-type: none"> use saws equipped with bar tip guards and chain breaks do not contact material with tip of bar keep chain sharpened turn the saw off when not cutting make cuts below shoulder height wear Kevlar chaps and steel toe boots
	Strain overexertion	<ul style="list-style-type: none"> do not pull on limbs/ vines use a timber jack to manipulate logs
	Noise	<ul style="list-style-type: none"> wear hearing protection while cutting
	Cuts and lacerations to hands	<ul style="list-style-type: none"> wear gloves
	Eye hazards	<ul style="list-style-type: none"> wear safety glasses

BORIT Asbestos Site
Notification Procedures in the Event of a Significant Release of Asbestos

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
saw	Inspect prior to each use	Correct use of Hearing Protection Devices Instructions for proper use of chain saw