Hull & associates, inc.

Health & Safety Plan

City of South Bend, Indiana
Board of Public Works

U.S. EPA
Brownfield Assessment Grant
Phase II Environmental Site Assessment
Former Sears Property

May 18, 2006

Hull Safety Policy

Hull & Associates, Inc. is committed to maintaining a culture that values the safety and health of the employees, clients, subcontractors, the public and the environment.

The organization maintains a constant awareness for safety and health at each site and location. All Hull employees are responsible and accountable for embracing a philosophy of continuous awareness and personal ownership for safety and health. Hull demonstrates its commitment to safety and health by emphasizing education, the use of high-quality equipment and timely support that reduces risk and fosters safe operations.

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1.0 ORGANIZATIONAL STRUCTURE AND ADMINISTRATION

1.1 Background Information

The Hull Health and Safety Plan (HASP) outlines Hull's safety systems, processes and policies. The goal of the HASP is to facilitate safe operations and promote the prevention of incidents that may result in injury, mishap or property damage. In addition, the HASP will assist Hull to identify, achieve, and maintain regulatory compliance with requirements of the Occupational Safety and Health Administration (OSHA) standards.

The diverse nature of environmental consulting requires employees to work on a variety of projects involving a wide array of potential risks. For this reason, the HASP is a tool that defines an organizational structure and operating practices so that employees can readily recognize and adapt operations to eliminate injuries and illnesses.

This HASP does not address every hazard that could arise and does not include controls and response guidelines in sufficient detail to handle all emergencies or other unusual site conditions. All questions regarding the HASP or other questions pertaining to health and safety issues not covered in this document, should be directed the site Project Manager, Unit Manager, Site Safety Officer, or the Safety and Health Consultant.

The HASP must be reviewed before conducting any site work. For each site, all on-site subcontractors, representatives, or visitors are required to review and understand the procedures in this HASP and sign the Signature Log, Appendix A.

1.2 Hull Safety System Overview

Hull's health and safety mission is to complete all work safely with no injuries, no property damage and no vehicle incidents. Hull's leadership is responsible for ensuring all employees are knowledgeable and capable of preventing injury and for providing the necessary tools and support. Employees are responsible for using good judgment, being knowledgeable in safe work practices and using procedures that result in safely and effective work.

Organizational Structure

The Hull organization utilizes a dynamic matrix style of management to organize and direct operations at client work locations. Within the Hull organization are Business Managers, Division or Practice Leaders, Project Managers and project support personnel. The organizational design supports the scope of work and level of Hull involvement. Each project is specifically defined in terms of organizational structure and job responsibilities.

Hull's corporate offices are located at 6397 Emerald Parkway, Dublin, Ohio 443016. Phone number is 614-793-8777. The Hull office having responsibility for this project is located at:

Location	Phone
6330 East 75th St. #176, Indianapolis IN	317-558-0558

Organization for this project.

	Name	Address	Phone
Client	City of South Bend Anna Kolata	227 West Jefferson Blvd. South Bend, IN 46601	574-235-9374 office 574-532-8914 mobile
Business Manager	Doug Stuart	6330 East 75th St. #176 Indianapolis, IN 46250	317-558-0558 office 317-517-6056 cell
Practice Leader	Lance Turley	4900 Parkway Dr., #100 Mason, OH 45040	513-459-9677 office 513-460-8632 cell
Project Manager	Lance Turley	4900 Parkway Dr., #100 Mason, OH 45040	513-459-9677 office 513-460-8633 cell
Site Safety Officer	Nivas Vijay	416 East Monroe St. South Bend, IN 46601	574-234-1475 office 574-360-0961 cell
Other Key Person(s)	Karla McDonald	1611 South Franklin Road Indianapolis, In 46239	317-351-4255 office 317 364-6926 cell

1.3 Roles and Responsibilities

All Hull Employees must fully participate in the safety system and are responsible for:

1. maintaining a keen awareness for safety & health at all times;
2. continuously observing work areas for risks and hazards and taking action to eliminate, control or mitigate occupational risk exposures;

3. initiating action to eliminate or reduce the probability and severity of injury or mishap in their work areas;
4. increasing their level of knowledge and their ability to maintain safe operations;
5. immediately reporting occupational injuries/illnesses, incidents not resulting in injury and risks that they are unable to cope with;
6. actively participating in all aspects of the safety system;
7. coaching, as the need arises, to help others prevent, or learn to prevent, injury or mishap; and
8. complying with the safety and health requirements as outlined in project-specific HASPs and as discussed in on-site health and safety briefings.

Senior Managers must be active and visible in demonstrating their commitment to support the safety culture. Responsibilities include, but are not limited to:

1. providing input on safety and health policies, goals, and objectives;
2. reviewing audit reports;
3. authorizing funds for implementing and managing the Hull's safety and health system;
4. participating in incident reviews;
5. leading by example; and
6. participating in frequent discussions that focus on health and safety.

Safety Consulting Organization is responsible for helping to create and maintain a safety culture within the Hull organization by:

1. remaining current on all facets of safety and health management, leadership, communication and education concepts and methods;
2. establishing and maintaining Hull's basic HASP;
3. recognizing and evaluating occupational safety and health hazards;
4. facilitating compliance with relevant occupational safety and health standards and guidelines;
5. conducting site audits and preparing summary reports;
6. tracking the safety and health metrics;
7. providing or acquiring the necessary education and training resources;

8. helping the Hull organization to implement effective safety and health policies, processes and procedures;
9. coordinating the medical management process at each office location;
10. participating in/or leading incident analysis efforts to identify causation and remediation efforts to prevent repeated occurrences; and

Office Safety Coordinators (OSCs) are responsible for:

1. acting as a safety and health point person for the office;
2. tracking the safety system metrics for the office;
3. overseeing that the SAF TRAC spreadsheet;
4. collecting PEOPLE SAF communication comments and forwarding them to the Safety Consulting Organization;
5. working closely with the Safety Consulting Organization to schedule education and training sessions;
6. maintaining records associated with training and education;
7. maintaining the OSHA 300 log;
8. coordinating the medical management process for their office location;
9. maintaining office contingency plans;
10. maintaining the MSDS file for chemical hazards;
11. communicating safety and health information to office and field personnel; and
12. maintaining safety and first aid supplies for the office.

Project Manager, Unit Manager, and Supervisor responsibilities include:

1. seeing to it that a safety- and health-hazard evaluation is conducted for all projects;
2. working with the OSC and the Safety Consulting Organization to identify hazards and to develop site-specific HASPs
3. ensuring that on-site briefings are completed in a timely manner;
4. designating a Site Safety Officer (SSO) for each project , and
5. allocating project time, resources and funds to maintain the highest reasonable level of safety and health for all projects.

Site Safety Officer

A Site Safety Officer will be designated for all Hull field projects. The Site Safety Officer at this project is Mr. Nivas Vijay of Quality Environmental Professionals, Inc. (QEP) and assumes responsibility for providing leadership in safety and health matters for site operations by:

1. performing daily site-safety audits;
2. communicating safety and health information to those working at the site;
3. communicating and coordinating safety practices with contractors;
4. conducting daily "tool-box" safety discussions;
5. ensuring that emergency plans specific to the site have been established, discussed with personnel on site, and are understood;
6. ensuring that communications equipment is readily available on site;
7. checking that Hull employees, visitors and contractors read the HASP before entering or beginning work on the site;
8. ensuring that all minimum training and education requirements are met for on-site personnel; and
9. advising or seeking advice from the Project Manager and safety and health consultant on issues that may require attention and/or correction.
10. ensuring that electrical work is performed safely, i.e., de-energize all circuits, if feasible, when doing electrical work. If de-energizing is not feasible, adherence to NFPA 70E requirements is required.

1.4 Substance Abuse

Hull & Associates, Inc. is committed to providing a safe workplace for all employees. In keeping with this commitment, this Company Policy addresses the problem of substance use that negatively affects every workplace. The Company will not condone nor tolerate behaviors on the part of employees that relate to substance use in the workplace, such as:

1. Sale, purchase, transfer, use of or possession of any illegal drugs;
2. Misuse of alcohol;
3 Arrival or return to work under the influence of any prescription drug not used for its medical purpose or alcohol.

Management is fully committed to the Company's Drug-Free Workplace and Substance Use Program, which establishes clear guidelines for acceptable and unacceptable employee behavior for all employees in the workplace.

The Company holds all employees accountable under the terms of this Policy and also supports providing assistance for employees. Employees who come forward voluntarily to identify that they have a substance use problem will receive company support and assistance.

The Hull Health & Safety professional, in conjunction with Human Resources employees, will be responsible for coordinating drug and alcohol testing, identifying resources that employees can turn to for help for themselves and/or their families, and arranging for qualified people to help with employee awareness education and with supervisor training.

Contractors and subcontractors are required to conform to the above philosophy and to put into place methods and practices that identify problems and help employees eliminate substance abuse.

2.0 COMPREHENSIVE WORK PLAN

2.1 Emergency Phone Numbers/Procedures

The following phone numbers are provided as a quick reference should an emergency arise. All numbers must be noted. Additional numbers may be added.

<table>
<tr><td>Location</td><td colspan="3">Address 1340 South Bend Ave., South Bend IN</td><td colspan="2">Phone NA</td></tr>
<tr><td rowspan="7">Contacts</td><td colspan="3">Office Manager Doug Stuart</td><td colspan="2">Phone 317-558-0558 w
317-517-6506 c</td></tr>
<tr><td colspan="3">Project Manager Lance Turley</td><td colspan="2">Phone 513-459-9677 w
513-460-8632 c</td></tr>
<tr><td colspan="2">After-Hours Numbers
Doug Stuart (513) 517-6506 c</td><td colspan="3">Lance Turley 513-460-8632 c</td></tr>
<tr><td colspan="3">Alt. Project Mgr Doug Stuart</td><td colspan="2">Phone 317-558-0558 w
317-517-6506 c</td></tr>
<tr><td colspan="2">After-Hours Numbers
Doug Stuart (513) 517-6506 c</td><td colspan="3">Lance Turley 513-460-8632 c</td></tr>
<tr><td colspan="3">Client Project Manager
Anna Kolata</td><td colspan="2">Phone
574-235-9374 w
574-532-8914 c</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>Emergency
911</td><td>Sheriff St. Joseph Co.
574-235-9611</td><td>Fire Department
911</td><td>Police
South Bend
Police Dept.
574-235-9201</td><td>Poison Control
800-222-1222</td></tr>
<tr><td>CHEMTREC
800-424-9300</td><td>State Hwy Patrol
Bremen District 24
574-546-4900
800-552-2959</td><td>USEPA Region V
Alan Baumann
312-886-3058</td><td>Hospital
St. Joseph
Regional Med.
574-237-7264
SEE MAP</td><td>Health Dept.
St. Joseph Co.
Health Dept.
574-235-9750</td></tr>
</table>

How will emergency notification and evacuation information be communicated at the site?

___**X**___Verbal Communication _____Public Address _____Siren _____ Other, Explain:

How will emergency services be summoned?

_____On-site Telephone ___**X**___Cell Phone

2.1.1 Emergency Procedures

The Project Manager or Site Safety Officer will assist employees, contactors and visitors understand the appropriate procedures to be followed in case of emergency. In the event of an emergency, the Office Manager, Project Manager or the Site Safety Officer should be

immediately notified, so that response efforts can be immediately initiated and the situation appropriately managed.

Emergency plans should generally include (1) immediate actions for those directly involved, (2) communication strategies and phone numbers, (3) the identification of who will be responsible for emergency response and their responsibilities, and (4) general follow-up activities.

2.2 Personal Injury

Hull personnel trained in first aid and cardiopulmonary resuscitation (CPR) will be available to provide first aid or CPR should an injury or illness occur. If professional medical treatment is necessary and the injury is not critical, the injured person should be transported by the site supervisor, Site Safety Officer or other employee at the site to the nearest emergency care facility. Should the nature of the injury be deemed severe, or there is a risk of shock, further injury, increased bleeding or other possible medical complications, the emergency squad will be called to respond.

When an employee is transported to a clinic or hospital, the site supervisor or Site Safety Officer should accompany the injured employee to the medical treatment facility to provide support for the injured employee, to confer with medical personnel and to communicate with other Hull employees, as necessary.

2.2.1 Fire/Explosion

Should a fire or explosion occur immediately notify emergency response personnel using 911. All personnel will proceed at once to the previously designated collection point. Collection points are safe locations previously identified, where an employee head count can be taken and coordination of activities will occur.

Hull employees will not attempt to fight a fire, unless they have been specifically trained to do so. Attempting to control or extinguish a fire will only be undertaken during the incipient stages of a fire.

2.3 Incident Reporting and Recording

All incidents (injuries, near injuries, property damage, vehicle collisions, releases, etc.) must be reported to supervision as soon as possible. Refer to the table in Section 2.1 above for contact

numbers. Report incidents directly by voice to someone in a leadership position. Use cell-phone numbers if office numbers fail to connect to the Project Manager, Unit Manager or Office Manager.

2.3.1 Post-Incident Procedures

1. As soon as possible, following each occupational injury, illness, or near incident, an Incident Analysis/Report Form will be completed by the supervisor or Project Manager and faxed to the Human Resources Manager, the Safety Consulting Organization and the Corporate Financial Officer. A copy of the Incident Analysis/Report Form is in Appendix B and is available on Hull's Intranet.
2. Each employee injured on the job or involved in a mishap resulting in vehicle damage will participate in a drug screen.
3. An injured employee should not be allowed to go home alone after medical treatment when danger of shock, loss of consciousness, or worsening of condition is likely.

2.4 OSHA Inspections

OSHA Compliance Safety and Health Officers (CSHOs) are permitted to enter Hull offices and job sites without undue delay and at reasonable times, to inspect work site safety practices. The CSHO must present his/her credentials to the senior Hull representative at the location. During the opening conference the CSHO must explain the purpose of the inspection and indicate the records desired for review. The Office Manager, OSC and the Safety Consulting Organization should be notified immediately upon arrival of an OSHA representative. If possible, a Project Manager or Office Manager should be present during the opening conference. The CHSO should be asked to wait (up to two hours) until a management representative is present.

It is important that all Hull employees act professionally and courteously when interacting with OSHA representatives.

The CSHO is authorized to question management and employees, review safety and health related records and talk with employees alone. However, it is acceptable for an employee to decline to talk to the OSHA representative, or to request that a member of management join the discussion.

2.4.1 Inspection Practices

1. A Hull member of management and a representative of the employees should accompany the inspector at all times during the inspection.
2. As matter of policy, Hull will duplicate all pictures, observations, and industrial hygiene samples.
3. Hull representatives are strongly discouraged from offering ideas/ suggestions/ solutions should the CSHO identify a violation of OSHA regulations.
4. Hull representatives are strongly encouraged to refrain from admitting a violation exists or that a condition represents a hazard.
5. Correct all obvious hazards or safety-related issues immediately.

2.5 Hazard Communication

The Hazard Communication program applies to all work operations where employees may be exposed to hazardous chemicals during normal working conditions and/or emergencies.

2.5.1 Responsibilities

The Hull Project Manager is responsible for implementing a Hazard Communication program specific to each project:

1. Compile and maintain a complete list of hazardous chemicals present in the associated building(s), and/or used in the field.
2. Acquire and compile all applicable Material Safety Data Sheets (MSDSs) to be kept in a readily accessible location.
3. Apply and maintain labels and other forms of warning to containers.
4. Ensure that employees are trained on the hazards of chemicals, labeling, signs and symptoms, protective measures, and where to obtain more information.

The Hazard Communication program information shall be readily accessible to all employees. MSDSs for projects will be kept either in the HASP or in conjunction with the HASP.

2.5.2 Employee Information and Training

Employees who are potentially exposed to hazardous chemicals will be provided information and training at the time of initial assignment and whenever new chemicals are introduced. Employees shall be informed of the following:

1. the requirements of the Hazard Communication standard;
2. any activity where hazardous chemicals are present;
3. the location and availability of Hazard Communication program information, including the required list(s) of hazardous chemicals and MSDSs.
4. methods to detect the presence or release of a hazardous chemical in the workplace;
5. physical and health hazards of the chemicals in the workplace;
6. measures employees can take to protect themselves against hazards (e.g., work practices, emergency procedures, use of PPE); and
7. details of the Hazard Communication program (e.g., labeling, MSDSs, and how to obtain and use appropriate hazard information).

2.5.3 Non-Hull Employees

Non-Hull employees (visitors, contractors, government representatives) at worksites shall be informed of the physical and health hazards of hazardous chemicals that might be encountered during their work activities. In addition, non-Hull employees will have access to MSDSs.

3.0 SITE-SPECIFIC HEALTH AND SAFETY PLAN

The HASP details the applicable engineering, administrative, and protective provisions that will be followed to provide for the health and safety of the site personnel, surrounding community, and visitors are maintained. It also conforms to the applicable regulations and requirements mandated by the Occupational Safety and Health Administration (OSHA), U.S. EPA, and Ohio EPA.

3.1 Scope of Work

The general scope of work is intrusive investigation of a former landfill. The following table describes anticipated tasks to be performed at the Former Sears Property.

TASK #	TASK	ANTICIPATED DURATION	DESCRIPTION
1	Direct Push Drilling Soil Sampling	1 week Spring/Summer 2006	Advance soil borings for collection and analysis of soil samples in potential landfill material.
2	Direct Push Drilling Groundwater Sampling	1 week Spring/Summer 2006	Advance soil borings for collection and analysis of groundwater samples in potential landfill material.
3	Auger Drilling/Temp Well	1 week Spring/Summer 2006	Advance soil borings and install temporary well screen if groundwater encountered
4	Groundwater Sampling	1 week Spring/Summer 2006	Collect groundwater samples from temporary monitoring wells

3.2 Hazard Assessment

Chemical, physical, electrical and biologic hazards at each site must be identified and the appropriate health and safety procedures developed, and precautions taken before formal site work begins. Occupational Safety & Health Administration's (OSHA), American Conference of Governmental Industrial Hygienists' (ACGIH) and the National Institute of Safety and Health (NIOSH) exposure requirements and recommendations will be utilized to identify safe chemical exposure levels.

Exposure to the chemicals and electrical hazards is to be eliminated or minimized using specific engineering practices and administrative controls. If necessary, appropriate personal protective equipment (PPE) will be worn when contact with contaminated material or chemicals are possible. Generally, airborne contaminant monitoring will not be conducted during typical site

operations. However, to document exposures for assurance purposes, or if it is suspected that employees could be exposed to unhealthful concentrations of chemicals, exposure monitoring will be conducted.

3.3 Job Hazard Analysis (JHA)

Job hazard analysis techniques are useful in developing safe operating practices and providing safety and health information. A JHA accomplishes two things:

1. **Identifies potential hazards posed by each task.**
2. **Identifies solutions to eliminate or control risk of injury or incident.**

Project Managers are encouraged to use a job hazard analysis in preparing for each project. The Project Health and Safety Briefing form should also be used to in combination with the JHA process to define, document and communicate job risks. Risks/hazards and appropriate controls must be identified in the HASP and communicated during health and safety briefings.

3.4 Chemical, Physical, Environmental and Biologic Hazards Assessment

Chemical Hazards (Mark all that apply)

⇨ **Risk**	Ignitable	X	Toxic	X	Reactive		Corrosive	
⇨ **Form**	Vapor	X	Dust	X	Mist		Fume	
⇨ **Route**	Inhalation	X	Absorption		Ingestion		Injection	

Physical Hazards (Mark all that apply)

Heavy equipment or vehicular traffic	X	Rough terrain		Bodies of water	
Slips, trips, and falls	X	Flying debris		Noise exceeding 85 dBA	X
Moving equipment and rotating parts	X	Other		Confined spaces	
Ergonomic stresses		Hot work		Contact with electricity	
Trenches and/or excavations		Hoisting and rigging	X	Caught in, under or between	
Striking an object	X	Fall from an elevated level		Fall at the same level	
Underground utilities	X	Water hazards		Power tools	

Energy Sources (lockout/tagout)		Other		Other	

Environmental Hazards (Mark all that apply)

Heat stress	X	Thermal burns		Ultraviolet radiation	X
Cold stress		Inclement weather	X	Other	

Biologic Hazards Mark all that apply)

Poison, ivy, oak, sumac	X	Animals (e.g., dogs, rats, fox, skunk, raccoon, and snakes)	X	Insects (e.g., bees, wasps, mosquitoes, ticks, and spiders)	X
Bloodborne pathogens (e.g., HIV and Hepatitis B virus)		Other			

Physical state of the hazardous materials at the site (Mark all that apply)

Gas or Vapor	X	Sludge	
Liquid	X	Solid or Particulate	X

Class of Compounds (Anticipated or actual) (Mark all that apply)

Asbestos	X	Inorganic	
BTEX	X	Pesticides	
Chlorinated Solvents	X	Petroleum Products	X
Heavy Metals	X	PCB	X
Methane	X	Other	
Other		Other	

Impacted Environments (Indicates all media in which contamination is expected)

Air	X	Groundwater	X
Soil	X	Sediment	
Surface Water		Other	
Other		Other	

Chemicals of Concern (Expected to be encountered by on-site personnel)

Work Activity	Chemical(s)	Concentration(s)
TASK 1 - Direct Push Drilling Soil Sampling	Potential VOCs; SVOCs; PCBs; metals; and methane	Unknown
TASK 2 – Direct Push Drilling Groundwater Sampling	Potential VOCs; SVOCs; PCBs; metals; and methane	Unknown
TASK 3 - Auger Drilling/Temp Well	Potential VOCs; SVOCs; PCBs; metals; and methane	Unknown
TASK 4 - Groundwater Sampling	Potential VOCs; SVOCs; PCBs; metals; and methane	Unknown

Other site safety concerns expected to be present on this site:

Concern	Mitigation
Site is a landfill, so there is a potential for methane production	Field precautions (Sec. 3.14). Use of LEL/methane meter to monitor methane (Sec. 6.2).

Material Safety Data Sheets are available: _X_ Yes, or _____ No. If available, MSDSs are located: __Appendix C – Because actual COCs are unknown in potential landfill material, MSDSs for asbestos containing material, PCBs and methane, and toxicity drivers benzene, benzo(a)pyrene, and arsenic are provided in Appendix C.

3.5 Permit-Required Confined Spaces

Most projects do not require entrance into confined spaces, such as manholes, sewers, tanks, excavations, etc. Hull employees are **NOT** to enter confined spaces during projects unless specifically authorized by the Site Safety Officer or the project leader. **No confined space entry is anticipated at the Former Sears Property. This section is provided to allow personnel to IDENTIFY AND AVOID confined spaced.**

Hull will use contractors trained in confined-space entry procedures for entry purposes. If during a project it is apparent that entry into a confined space or permit-required confined space is

necessary, entry procedures will conform to OSHA confined-space procedures, including an entry permit system, training requirements and attendant procedures in accordance with 29 CFR 1910.146. A **confined space** is a space that meets all of the following requirements:

1. is large enough and so configured that an employee can bodily enter and perform assigned work;
2. has limited or restricted means for entry or exit; and
3. is not designed for continuous employee occupancy.

A **permit-required confined space** requires an entry and permit system. A permit-required confined space is one that meets one of the following requirements:

1. contains or has the potential to contain a hazardous atmosphere;
2. contains or could contain a material that has the potential for engulfing an entrant;
3. has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor which slopes downward and tapers to a smaller cross-section; or
4. contains any other recognized serious safety or health hazard.

All confined spaces must be tested for a hazardous atmosphere: (1) oxygen deficiency, (2) explosive atmosphere and (3) toxic atmosphere, before they can be deemed non-permit-required confined spaces.

3.6 Vehicle Safe Practices and Care

3.6.1 Responsibilities

When driving on company business:

1. Before a vehicle is driven, drivers must conduct a vehicle safety inspection: tires, lights, body, fluid levels, brakes, steering, horn, wipers and other systems. Damage and problems should be immediately reported to the manager. Document inspections on the appropriate recordkeeping form.
2. After use, drivers are responsible for cleaning the vehicle (washing, if necessary) and removing equipment and trash from inside the vehicle.

3. Drivers must immediately report safety and mechanical problems, such as vibrations, difficult start-up, or damaged body panels to the manager.

3.6.2 Vehicle Operation Guidelines

1. The driver and all passengers will use seat belts at all times.
2. Only Hull employees may operate Hull & Associates, Inc. owned/rented/leased vehicles.
3. Drivers must observe all operating instructions and driving laws.
4. Drivers and passengers are asked to be courteous to other drivers.
5. Drivers must immediately notify the police and their Office Manager should they be involved in a motor vehicle incident.
6. Riding on the outside of any motor-driven piece of equipment is prohibited.
7. Drivers shall make sure that the areas in front of and behind vehicles are clear before starting the vehicle. In congested areas, it is wise to use another person to assure that vehicle clearance exists.
8. Secure tools and equipment to insure that equipment will not shift or become a projectile, should the vehicle be involved in a collision.
9. Each office shall check to see that employees driving commercial vehicles covered by the State's Department of Transportation rules are trained and licensed in accordance with that state's requirements.

3.6.3 Incident Reporting

Report vehicle incidents to the supervisor and Office Manager immediately. All incidents resulting in damage to company vehicles require completion of a Hull Incident Report and Analysis Form. In the case of an incident on a public street and involving another vehicle, the local authorities should be contacted and a police report completed, even if the damage appears minor.

3.7 Environmental Conditions

3.7.1 Heat Stress

Heat stress results when the body is unable to cool itself through normal physiologic mechanisms, such as sweating. Protective clothing tends to interfere with the body's ability to

cool itself, thus increasing the potential for heat stress. Dehydration, profuse sweating, and strenuous work contribute to heat stress.

Consult Appendix D for guidance.

3.8 Work Area Protection

Safe guarding employees while working on projects is a critical consideration and the variety of potential risks must be a critical factor in protecting employees from injury or personal threat.

3.8.1 Traffic control

Appropriate traffic control procedures will be utilized when work activities are performed in high-traffic areas on private property or in public rights-of-way. Consult with state DOT traffic control regulations, local traffic engineers or public service department for requirements (e.g., signs, number and distance of cones, time of day for street closure, etc.).

3.8.2 Signs and Warning

Legible traffic signs must be posted at points of hazard. When operations are such that signs, signals, and barricades do not provide the necessary protection on or adjacent to a highway or street, employ flaggers or other appropriate traffic controls. Signaling directions by flaggers should conform to ANSI D6.1-1971. Flaggers should use red flags at least 18 inches square or sign paddles, and in periods of low light or darkness, red lights are necessary. Flaggers and others, who work in the vicinity of traffic, must wear orange or green/yellow warning garments. Warning garments must be of a reflectorized material.

If possible, schedule work when traffic volumes are lowest. When it is necessary to work in the street, strategically place barricades and warning signs in accordance with State Department of Transportation Rules.

Prevent contact with energized electrical circuits or contacts. When feasible, electrical circuits should be de-energized before work begins. Follow lockout/tag out procedures (Appendix F). When contact with energized electrical equipment and circuits is possible, use warning signs and barricades to alert others of the hazard. Refer to Appendix K for specific electrical safety practices.

3.8.3 Site Security and Work Area Controls

Working in areas, like abandoned buildings, neighborhoods known to have high crime rates and in areas secluded or hidden from public view pose a threat to employee safety and security. Concern for security may necessitate that several employees be assigned to work as a team to increase the level of safety. Discontinue work and contact the Project Manager or Site Safety Officer any time personal safety is questionable. Under special circumstances, the Project Manager could consider use of a private security company or off-duty police officer at the site to assure employee safety.

The HASP must contain details pertaining to the risk of working alone, or working in areas where security is questionable.

3.9 Personal Protective Equipment

Whenever feasible and practical, engineering controls and/or administrative procedures shall be instituted to prevent/reduce exposures to physical, electrical, chemical, environmental, or biological hazards. Where this is not feasible, personal protective equipment (PPE) will be used, including, but not limited to hard hats, safety glasses with sideshields, faceshields, hearing protection, safety shoes, gloves, hearing protection, chemical resistant clothing, reflective traffic vests, and respiratory protection equipment. The Site Safety Officer and/or the Project Manager will define PPE needs after performing a job hazard analysis.

Employees must dress to prevent injury when at job sites. Steel toe shoes or boots, long pants, and full-length and long-sleeved shirts (when temperatures/humidity permit, or when working in the vicinity of electrical equipment) are the minimum requirements for all field personnel. Tank tops, sandals, shorts and sleeveless shirts are not acceptable. Clothing must provide protection from cuts, scratches, chemicals, biologic hazards (mosquitoes/hornets, etc.) exposure to the sun, and other hazards employees may encounter.

Employees working on or near energized electrical equipment must wear flame-resistant clothing in accordance with NFPA 70E defined risk categories (Hazard Risk 1, 2, 3 or 4), including long-sleeved shirts and other PPE as required in HASP Appendix K.

3.9.1 Eye and Face Protection

Employees who are performing jobs that expose them to eye or face hazards (chemicals, particulates or arc flash) must wear the correct eye and/or face protection.

Safety glasses with sideshields that meet the requirements on ANSI Z87.1-2003 are required where there is risk associated with projected particulate, chips, electrical arc blast or other debris. Safety glasses with sideshields are required when working near a drilling rig or excavation equipment, chipping or breaking concrete or ice, or any time an employee is working with impact hand tools (e.g., hammer, chisel, etc.).

Chemical goggles must be worn to protect the eyes from contact with chemicals that could be splashed, sprayed or dropped into the eyes.

Faceshields are required when the potential for arc flash exists. Faceshields may be required when there is potential risk to the face from contact with chemicals or projected objects. Operations that may require both eye and face protection include, but are not limited to, liquid sampling (including groundwater sampling and remedial system compliance sampling), pouring or transporting chemicals.

3.9.2 Head Protection

Hard hats that meet the requirements of ANSI Z89.1-1986 and ANSI 89.1-1997 are to be worn when there is a potential for injury to the head from falling or flying objects.

Type 1, Class E hard hats (those that reduce the danger of contact exposure to high voltage conductors) will be worn by Hull employees in work areas were there is a potential for injury to the head and contact with electrically charged conductors. These work areas include, but are not limited to, construction areas, work areas below grade, near drilling rigs and excavation equipment, and under elevated work areas. The Site Safety Officer may identify other work areas where hard hats are required.

3.9.3 Foot Protection

Safety shoes/boots shall be worn by employees working in areas where there is a danger of foot injuries due to falling/rolling objects, or from vehicle traffic.

3.9.4 Hand Protection

Employees will wear hand protection, commensurate with the hazardous exposure: chemical substances, cuts or lacerations, abrasions, punctures, thermal burns, and cold temperatures.

Selection of gloves that protect skin against the absorption of harmful substances is based on degradation, breakthrough time, and permeability rate characteristics of the glove. When breakthrough or permeation of the glove material occurs, gloves will be discarded.

Use of a specific glove type (nitrile, PVC, butyl, neoprene) in field activities, such as leachate sampling, groundwater sampling at remediation and investigation sites, surface water sampling, and groundwater and soil sampling will be based on the chemical properties of the contaminant, duration of exposure and physical requirements.

3.9.5 Respiratory Protection

Hull employees may be required to enter environments where airborne contaminants or lowered oxygen concentrations exist, thus necessitating the use of respiratory protective equipment. When possible, it is advisable to eliminate the need for respiratory protection using engineering controls or administrative procedures.

In cases where employees or contractors desire to wear respiratory for assurance purposes and when the need for respiratory protection has not been documented, those individuals must adhere to Hull's respiratory protection procedures, including medical authorization.

Consult Appendix E for guidance with respiratory protection and Appendix G for ambient-air monitoring.

3.9.6 Levels of Protective Clothing

Based on evaluation of potential hazards, the following levels of personnel protection have been identified for Hull operations.

Level D	◆ Work clothing, as dictated by weather ◆ Work shoes or boots ◆ Hardhat	◆ Safety eyewear w/ Sideshields ◆ Ear protection, as necessary ◆ Gloves, as necessary
Level D Modified	◆ Work clothing, as dictated by weather ◆ *Saranex, Tyvek* (or equivalent) coveralls with hood and, if appropriate, a respirator (when handling or contact may occur with contaminated soils or asbestos containing materials, tank contents, or similar exposures	◆ Work shoes or boots ◆ Nitrile or neoprene gloves (when handling or contact may occur with contaminated soils or materials, tank contents, or similar exposures ◆ Surgical-type undergloves (when using nitrile or neoprene gloves
Level C	Same as for level D modified, except for addition of: Full-face air purifying respirator equipped with combination organic vapor/high efficiency particulate filter cartridges, if face contact is possible.	
Level B	Same as for level D Modified, except for addition of: Full-face, supplied-air respirator operated in the positive pressure mode.	

1. Upgrade from level D to D Modified when there is a possibility of personal contact with contaminated materials.
2. Upgrade from level D Modified to C when the chemical concentration presents an inhalation and skin contact hazard with the face.
3. Upgrade from level C to B when the chemical concentration presents an inhalation and skin contact hazard and the nature of the chemical contaminant is sufficient to warrant the change.

3.10 Site Safety Equipment

Check all items that are required to be immediately available on site

Fire extinguisher	X	First aid kit	X	Flashlight	X
Cell phone	X	Eye wash station	X	Ladder	
Drum dolly		Air horn/signaling device		Fall protection device	
Personal floatation		Safety cones	X	Safety barricade	X
Barricade tape	X	Duct tape	X	Signs	
Other		Other		Other	

3.11 Drilling Safety

In order for projects that involve drilling or direct pushing equipment for well installation and/or subsurface sampling to be completed effectively, safe work practices are necessary. The Site Safety Officer should complete the Drill Rig Inspection Log prior to initiating drilling operations.

A variety of hazards and risks are associated with drilling operations: overhead and subsurface utilities, heavy equipment movement and operation, awkward positions and overexertion, slips and trips, falling objects, electrical contact, noise (Appendix I), and potential flying debris.

Consult Appendix J for drilling safety procedures and the drilling safety inspection form.

3.12 Hazard Summary by Task

Place an "X" opposite each identified hazard that may be present for each task. If any of these potential hazards are checked, it is the site manager's responsibility to determine how to eliminate or mitigate the hazard to protect site personnel. Note: Task numbers refer to tasks identified in the Scope in Section 3.1.

Tasks ► / Hazards ▼	Task 1 - Direct Push Borings for Soil Sample Collection	Task 2 - Direct Push Borings for Soil Sample Collection	Task 3 - Rotary Auger Drilling and Installation of Temporary Wells	Task 4 - Groundwater Sampling				
Heavy equipment or vehicular traffic	X	X	X					
Slips, trips, falls	X	X	X	X				
Moving equipment, rotating parts	X	X	X					
Striking an object	X	X	X					
Hoisting & rigging	X	X	X					
Noise	X	X	X					
Underground utilities	X	X	X					
Energy Sources	X	X	X					
Heat stress (Appendix D)	X	X	X	X				
Inclement weather	X	X	X	X				
Ultraviolet radiation	X	X	X	X				
Animals	X	X	X	X				
Insects	X	X	X	X				
Chemicals in soil and groundwater	X	X	X	X				
Asbestos (Appendix H)*	X	X	X					
Methane	X	X	X	X				

NOTES:

*** Asbestos containing material may potentially be present in landfill material. Appendix I is included in the HASP to aid in identification of potential asbestos containing material.**

3.13 Protective Equipment Summary by Task

Place an "X" opposite each identified hazard that may be present for each task. If any of these potential hazards are checked, it is the site manager's responsibility to determine how to eliminate or mitigate the hazard to protect site personnel. Note: Task numbers refer to tasks identified in the Scope in Section 3.1.

Tasks ► **PPE ▼**	**Task 1 - Direct Push Borings for Soil Sample Collection**	**Task 2 - Direct Push Borings for Soil Sample Collection**	**Task 3 - Rotary Auger Drilling and Installation of Temporary Wells**	**Task 4 - Groundwater Sampling**				
Hard Hat	**X**	**X**	**X**	**X**				
Safety Glasses w/ Sideshields	**X**	**X**	**X**	**X**				
Safety Vest	**X**	**X**	**X**	**X**				
Steel-toed footwear	**X**	**X**	**X**	**X**				
Hearing Protection (Appendix I)	**X**	**X**	**X**					
Boots, Water or Chemical Resistant	**AN**	**AN**	**AN**					
Chemical-Resistant Gloves	**AN**	**AN**	**AN**	**X**				
Abrasion-Resistant Gloves	**AN**	**AN**	**AN**					
Inner Gloves	**AN**	**AN**	**AN**					
Respirator w/ Organic Vapor Filter	**AN**	**AN**	**AN**	**AN**				
Respirator w/ Particulate Filter	**AN**	**AN**	**AN**					
Dust Mask	**AN**	**AN**	**AN**					
Full-face Respirator	**AN**	**AN**	**AN**	**AN**				
Special Respirator Filter	**AN**	**AN**	**AN**					
Coveralls	**AN**	**AN**	**AN**	AN				
Tyvek Coveralls	**AN**	**AN**	**AN**	AN				
Level of Protection Required (D, C, B, or Modified D)	**D**	**D**	**D**	**D**				

Notes:
AN – As Necessary

3.14 Methane

Methane gas generation is a product of anaerobic biodegradation of waste materials and is inherent to landfills. Methane is a colorless, odorless and tasteless flammable gas that presents an imminent danger of explosion when provided with an ignition source. Real-time monitoring with methane monitors and other appropriate equipment will be performed when working at the site.

All field personnel should take precautions when working in areas that have a potential for flammable vapors, including:

1. Standing upwind of the vapor source;
2. Keeping all spark-producing equipment upwind of the vapor source;
3. Prohibiting any open flames or other obvious high fire hazard potential materials from being on-site; and,
4. Grounding any systems having the potential of generating static electricity.

4.0 EDUCATION AND COMMUNICATION

4.1 Employee Orientation

Unit Manager/Project Manager responsibilities

The Project Manager or Unit Manager will provide opportunities for employees working in the field to have the appropriate educational background and awareness in safety and health practices. At a minimum, employees working in the field must demonstrate understanding and competency in the following areas.

1. the importance of safety to Hull operations
2. location and knowledge of the HASP
3. incident and close-call reporting
4. medical monitoring procedures
5. personal protection requirements
6. medical emergency procedures
7. site-specific safe work practices
8. expected field attire
9. nuclear gauge precautions, if appropriate, and
10. fire prevention and emergency response.

4.2 Training for Field Personnel

Employees who conduct field operations more than 30 days per year must participate in the following safety education programs. Project Managers or Unit Managers are responsible to see that field personnel have the necessary educational qualifications to perform their work.

1. OSHA 40-Hour HAZWOPER and annual 8-hour refresher training
2. First Aid/CPR
3. professional driving practices
4. respiratory protection
5. permit-required confined spaces
6. control of hazardous energy (Lockout/Tagout)
7. portable fire extinguishers
8. hazard communication
9. basic industrial hygiene, and
10. other subjects, as necessary

4.3 Contractor Safety

Hull recognizes its moral and legal obligation to assist subcontractors to meet both the spirit and intent of the OSHA law. Hull employees will immediately bring safety and health concerns to the attention of the subcontractors. The Hull site safety coordinator and the Project Manager will be responsible for documenting safety and health-related conversations where hazards or unsafe practices have been brought to the attention of subcontractor personnel.

Hull will invite subcontractor employees to participate in site-specific safety discussions or educational opportunities that are mutually beneficial.

4.4 Health and Safety Meetings and Briefings

Project Briefings

Health and safety policies and practices will be discussed during safety meetings and briefings. When Hull & Associates, Inc. has primary responsibility for site operations, all subcontractors, regulators and other authorized personnel visiting a project site shall review the site HASP and acknowledge understanding by signing the signature page.

Before initiating site activity, a Pre-Project Health and Safety Briefing will be conducted to review and discuss safety and health risks, exposures to chemical hazards and site safe work practices. All employees who may be involved in the project will participate in the Pre-Project Briefing. These briefings provide information and an opportunity for employees to be fully apprised of the health and safety issues and practices and to ask questions.

The Project Manager or Unit Manager will ensure that briefings are scheduled and documented. Copies of the Project Health and Safety Briefing Form will be placed in the project file and the HASP. Project Health and Safety Briefing Forms are available in Appendix B. The Project Manager's will ensure that the Pre-Project Health and Safety Briefings are conducted.

Daily Safety Discussions

Daily Tool-Box safety discussions are required and may be scheduled:

(1) at the start of each day's work,

(2) before starting a new task or work effort,

(3) when risks become known or are observed, or

(4) when close calls occur.

Discussing the safety and health issues before beginning the day's work highlights specific safe practices and hazards associated with the work.

Employees who work alone should discuss safety and health issues and concerns with the Project Manager when they arise. At a minimum, employees who work alone should discuss project safety issues at least once-a-week with the Project Manager or Unit Manager.

All health and safety meetings must be documented and meeting records placed in the project file.

5.0 MEDICAL SURVEILLANCE

5.1 Medical-Surveillance Requirements

Medical records will be maintained at the occupational medical clinic providing services for each office location. Upon termination, Hull will store medical records for 30 years.

Employees who wear a respirator or who work at field sites 10 days in any one three-month period will participate in a medical-surveillance program. Medical evaluations will be provided at time of assignment, annually and at termination of employment. The nature of work determines participation.

1. **Administrative Personnel** (word processing, accounting, receptionists, office administrators, CADD technicians, co-ops, interns and part-time employees) are not typically included in the medical monitoring program.
2. **Senior Project Managers, Project Managers, senior hydrogeologists, and project engineers** who average 10 field-site visits per quarter will participate in biennial medical-surveillance program. More frequent medical monitoring may be necessary, depending on the nature of their work. Managers traveling to field locations two or more times a week will participate in medical-surveillance program described in paragraph 3 below.
3. **Field Personnel** (environmental scientists, geologists, hydrogeologists, field technicians, design engineers, soils lab technicians, and those who work at field sites and average two or more days per week in any three month period) will participate in the medical-surveillance program. Other work exposures, such as potential exposure to heavy metals or asbestos will require participation in the medical-surveillance program.
4. **Co-ops, interns, and part-time employees** will be considered administrative personnel. If, however, work involves field assignments that meet the criteria described in paragraph 3, these staff members will participate in the medical-surveillance program.

Medical monitoring components for Hull employees includes:

Medical History, Physical Examination, Breath Alcohol, Urinalysis, Pulmonary Function, Laboratory blood analysis, Chest X-ray (1 view), Audiometry, and Blood Lead Level

5.2 Guidelines for the Medical Monitoring Program

1. All employees who may or are expected to perform fieldwork, even on a periodic basis, will receive a baseline physical.
2. Employees who conduct asbestos assessments, sampling, or oversight should receive a chest x-ray during their baseline physical and then every five years through year ten. Beyond year ten, they will receive chest x-rays every two years.
3. When employees leave the company, those individuals who participate in the annual medical surveillance program will receive an exit physical, unless their last health evaluation was within the previous six months. Employees who receive biennial physicals will be provided an exit health evaluation if they are beyond the first year of their biennial exam cycle.
4. Hull encourages female employees who work at field locations that could contain chemicals or heavy metals to advise their supervisor, should they become pregnant.
5. Medical evaluation documentation from the physician will be provided to Hull & Associates, Inc., and will be considered confidential. This documentation will be maintained for the duration of employment plus thirty years. Employees will be provided medical evaluation results at no cost and may wish to provide the results to their personal physician.
6. If the medical surveillance program identifies health issues that could possibly be related to the employee's occupational responsibilities, the physician will notify the Human Resources Manager.

6.0 CONTAMINANT MONITORING

Routine ambient air monitoring will not be undertaken at most sites. However, atmospheric monitoring will be undertaken if it is believed that a risk to worker health may exist, or to document and provide assurance that site exposures to airborne contaminants is at a safe and healthful level.

Should monitoring be performed, the Site Safety Officer will be responsible for conducting monitoring activities, or seeing to it that monitoring takes place. Monitoring will measure airborne contaminant levels in the following three areas:

1. oxygen content;
2. flammable or explosive atmospheres; and
3. toxic chemical concentrations.

Monitoring for contaminants will be executed periodically throughout the work process, starting before work is to begin. If several consecutive monitoring processes indicate that conditions pose no risk to employees, the Site Safety Officer may discontinue monitoring operations. However, the Site Safety Officer will remain alert for changes in operations or developments that indicate the monitoring must be restarted to verify the continued safety of operations.

All monitoring results will be recorded in a project record for the site. Documentation will include date, person conducting the monitoring, instrument type and serial number, date of last calibration, concentrations measured and a description of pertinent site operations and characteristics.

6.1 Oxygen Concentrations

Oxygen concentrations will be measured whenever there is reason to question the level of oxygen to which employees will be exposed. Operations where oxygen monitoring may be necessary include: confined space entry, excavation and trenching, or other suspected conditions.

Should measurement indicate concentrations to be above 23.5 % or below 19.5%, operations will be discontinued, until it is deemed safe to proceed with the operation.

6.2 Flammable or Explosive Atmospheres

A combustible gas indicator will be used to measure concentrations of combustible or flammable gas or vapor during operations. Operations where measurement will be undertaken include those involving confined space entry, excavation and trenching or other operations that may pose a risk of igniting a flammable gas of vapor.

The concentration, as measured by instrumentation, at which operations will be discontinued is 10% of the lower explosive limit (LEL). Work will not resume until the concentration of flammable gas or vapor remains below 10% of the LEL.

6.3 Colorimetric Tubes

Colorimetric tubes may be used to test atmospheres for the presence of toxic chemicals. Colorimetric tubes are accurate to +/- 20%. Colorimetric tubes should be stored in refrigerated locations when not actually in use to preserve the quality of the media. Manufactures make many types of colorimetric tubes, specifically intended to use with specific suspected chemical contaminants. Obtain and use the most specific colorimetric tube for the chemical in question.

6.4 Photoionization Detector

Photoionozation detectors (PIDs) or similar equipment can be used to measure concentrations of chemical contaminants present in the work area and in the workers' breathing zones. Should volatile organic compounds (VOCs) be detected at levels exceeding 5 parts per million, consideration must be given to identifying the specific chemical compound that contributed to the ambient atmospheric concentration. At that point, a decision will be made regarding the safety of continuing with operations. The evaluation must consider whether it is necessary to modify operations, require the use personal protective equipment, or to discontinue operations until it can be demonstrated that operations can be undertaken safely.

The Site Safety Officer will discuss the issues with the safety consultant whenever VOC concentrations increase to 5 ppm or more. The Project Manager will be notified of the plan on how operations will safely proceed. An ongoing monitoring plan will be developed and employed when a PID instrument detects the presence of VOCs at the site. Measurement processes that must be documented in the project file include measuring both ambient air concentrations and breathing zone concentrations.

6.5 Ambient Air Monitoring Decision Matrix

Monitoring Equipment	Measured Level	Action
Oxygen Meter	<19.5%	◆ Stop operations and leave the area. ◆ Contact the safety consultant and notify the PM.
	19.5% - 23.5%	◆ Continue work. ◆ Evaluate any deviations for cause.
	>23.5%	◆ Cease all operations, leave work area, and secure all possible sources of ignition. ◆ Move to a safe area.
Flammable Gas Indicator	0-10%	◆ Continue operations.
	>10% LEL**	◆ Stop work and leave the work area. ◆ Contact the safety consultant and notify PM.
Photoionization Detector	0-5 ppm	◆ Continue operations.
	5-50 ppm	◆ Modified level C protection may be necessary.
	50-100 ppm	◆ Level C protection may be necessary.
	>100 ppm	◆ Cease all operations and leave the work area. ◆ Contact the safety consultant and notify PM.

6.6 CHEMICAL EXPOSURE VALUES

For Common Chemicals

CHEMICAL	TLV-TWA	TLV-STEL	PEL-TWA	IDLH
Acetone	750	1000	750	20000
Asbestos	0.2 f/cc	-	0.1 f/cc	-
Benzene	10-Ca	-	1-Ca	1000
Methyl Bromide-S	5	-	5	2000
Butyl Alcohol-S	50-C	-	50-C	8000
Carbon Tetrachloride-S	5-Ca	-	2	300
Chlorobenzene	10	-	75	2400
Chlorodiphenyl 42% Cl-S	1 mg/m^3-Ca	-	1 mg/m^3-Ca	10 mg/m^3
Chlorodiphenyl 54/% Cl-S	0.5 mg/m^3-Ca		0.5 mg/m^3-Ca	5 mg/m^3
Ethyl Chloride	1000	-	1000	20000
Chloroform	10-Ca	-	2	1000-Ca

Methylene Chloride	50-Ca	100	50	5000-Ca
Ethylene Dibromide S	20-Ca	-	20	400-Ca
1,4-Dichloroethane	75	110	75	1000
Dichlorodifluoromethane	1000	-	1000	50000
1,1-Dichloroethane	100	-	100	4000
Ethylene Dichloride	10	-	1	1000
1,1-Dichloroethylene	5	20	100	4000
1,2-Dichloroethylene	200	-	200	4000
1,2-Dichloropropane	75-Ca	110	75	2000
Diethyl Phthalate	5 mg/m^3	-	5 mg/m^3	-
Dimethyl Phthalate	5 mg/m^3	-	5 mg/m^3	9300 mg/m^3
Endrin-S	0.1 mg/m^3	-	0.1 mg/m^3	2000 mg/m^3
Ethyl Acetate	400	-	400	10000
Ethyl Benzene	100	125	100	2000
Isophorone	5-C	-	4	800
Methyl Ethyl Ketone	200	300	200	3000
Methyl Isobutyl Ketone	50	75	50	3000
Naphthalene	10	15	10	500
Nitrobenzene-S	1	-	1	200
Pentachlorophenol-S	0.5 mg/m^3	-	0.5 mg/m^3	150 mg/m^3
Phenol	5 mg/m^3	-	5 mg/m^3	250 mg/m^3
Isopropyl Aclohol	400	500	400	12000
1,1,2,2-Tetrachloroethane-S	1	-	1	150-Ca
Tetrachloroethylene	50	200	25	500-Ca
Tetrahydrofuran	200	250	200	20000
Toluene-S	50	-	100	2000
Chlorinated Camphene-S	0.5 mg/m^3	1.0 mg/m^3	0.5 mg/m^3	200 mg/m^3-Ca
1,1,1-Trichloroethane	350	450	350	1000
1,1,2-Trichloroethane-S	10	-	10	500-Ca
Trichlorofluoromethane	1000-C	-	1000	10000
Vinyl Chloride	5-Ca	-	1-Ca	3600-Ca
Xylenes	100	150	100	1000

IDLH	Immediately dangerous to life and health
-	No value found
C	Ceiling limit: Airborne concentration that should not be exceeded during any part of the working exposure
S	Skin hazard: Contribution to the overall exposure by absorption through the skin, including mucous membranes and eyes
Ca	Suspected or confirmed human carcinogen
ppm	Parts per million of contaminant by volume per million parts of air
mg/m3	Milligrams of contaminant per cubic meter of air
f/cc	Asbestos fibers per cubic centimeter of air
*	Polychlorinated biphenyls (PCBs)

Threshold Limit Value or Permissible Exposure Limit – Time Weighted Average (TLV or PEL-TWA) is the time weighted average concentrations for an eight-hour day or 40-hour work week, to which all workers may be repeatedly exposed, day after day, without adverse effects. PELs are specified by OSHA standards. TLVs are unenforceable, but recommended by the American Conference of Governmental Industrial Hygienists (ACGIH).

Threshold Limit Value – Short-term Exposure Limit (TLV-STEL): the maximum concentration to which it is felt the average worker can be exposed for a period of up to 15 minutes continuously without adverse effects (ACGIH).

Appendix A – Health & Safety Plan Acknowledgement

I have read and fully understand the Health & Safety Plan (HASP) for this project. I agree to comply with the requirements, the spirit and intent of the plan.

Print Name	Signature	Date

Injury-Incident/Property-Damage Analysis

Hull & associates, inc.

TO BE COMPLETED BY SUPERVISOR

Complete and FAX to Safety & Health (614.792.7568) and HR (614.793.9070) within 24 hours of incident, injury or property damage.

Please Print Clearly

Employee Name	Office/Unit	Job Assignment

Date of Incident	Time of Day	Date Reported to You ☐ Same as Indicated ☐ Other

Incident Location

INJURY

Last Day Worked (If Applicable) Date of Expected Return

Treatment at Time of Incident	Time in Job	Job Assigned was Routine
☐ First Aid ☐ Squad ☐ Hospital/Clinic ☐ No Treatment		☐ Yes ☐ No - Describe

Treatment Facility and Doctor

Describe Treatment Provided

Injury Type (Cut, Bruise, Strain, etc.)	Injury Location (Hand, Foot, Back, etc.)	Extent of Injury (Minor, Severe, Length of Cut, etc.)

What operation was taking place at the time of the incident?

Witnesses (Name and Organization)

Property

Property Damage and Estimated Value of Damage

What operation was taking place at the time of the incident?

What Immediate Action was Taken

Witnesses (Name and Organization)

Vehicle Incident

Police report completed? Date? ☐ Yes ☐ No

Drug screen initiated? Date? ☐ Yes ☐ No

Contributing Factors	☐ Weather ☐ Roadway ☐ Speed ☐ Distraction ☐ Seatbelts ☐ Mechanical ☐ Assumptions ☐ Judgment ☐ Following Distance

Witnesses (Name and Organization)

What Happened? (Detail **WHAT** the employee was doing. **WHERE** did the incident happen? **WHAT** tools/equipment were in use? **WHO** was involved? **REMEMBER** that facts are important, faultfinding is not.) IF APPROPRIATE, provide additional comments/diagrams on second page.

Instructions: Information provided in the following section is intended to be the best information available at the time the form is completed. It should be recognized that the situation is fluid and ultimate actions may be adjusted, as new information is developed.

Supervisor/Team Leader/Project Manager Analysis of Multiple Causes and Proposed Actions

1.	1.	Due Date
2.	2.	
3.	3.	
4.	4.	
5.	5.	

Employee's Signature (If Possible)	Supervisor's Name	Date Completed

Additional Signatures

	Print Name	Date

Additional Space for Diagrams and Further Explanation

Job Hazard Analysis Form

Process	Job	Date
Worker's name	Supervisor	Analysis by
Department	Protective Equipment Required	

	Sequence of Basic Process Steps	Potential Risks/Hazards	Recommended Safe Procedure(s)
1			
2			
3			
4			
5			
6			

Health & Safety Project Briefing Form

911 is Active ____ Yes ____ No

Project Code		Project Name		Briefing Date	
Project Location				Project Duration	
Project Manager and Phone Number			Site Safety Officer and Phone Number		
Subcontractor #1	Company	Contact		Phone	
Subcontractor #2	Company	Contact		Phone	
Site Contact Information	Name		Phone 1		Phone 2
PMC Safety Contact	Ted Ingalls Joe Hammond Karl Sommer		(623) 547-5940 (614) 204-6765 (614) 286-9078		(614) 204-7088 (419) 628-2949 (614) 830-0182
Hospital and Location				Hospital Phone	

Scope of Activities	
Identify the Physical Hazards	
Identify the Chemical Hazards	
Identify the Biologic Hazards	
Identify the Environmental Hazards	

Protective Equipment Required	____ Hard Hat	____ Safety Vest	____ Insect Repellant	____ Hearing Protection	Other
	____ Steel Toes	____ Sunscreen	____ Tyvek Coveralls	____ Signs or Cones	Other
Respiratory Protection	____ Full Face Filter	____ Half Mask Filter	____ Full Face Filter	____ Powered Air Purifying Respirator	
	Cartridges ____ Organic/Acid Gas Vapor	____ Particulate Filter	____ Combination		
Eye Protection	____ Safety Glasses w/ Sideshields	____ Chemical Goggles	____ Faceshield	____ Other	
Hand Protection	____ Nitrile	____ Butyl	____ Rubber	____ Neoprene	____ PVC

Atmospheric Monitoring Required ____ Yes ____ No

____ Photo Ionization Detection	____ Flame Ionization Detection	____ Flammable and Explosive Levels	____ Oxygen Levels	____ Heat Stress Monitor

Additional Comments

Print Attendee Name	Signature	Date

Appendix C – Material Safety Data Sheets*

*While other COCs may be present at the Site, the below listed COC's (common synonyms and trade names in parentheses) are anticipated to be the most likely and/or toxicity drivers.

- **Arsenic**
- **Asbestos**
- **Benzene** (Benzol; phenyl hydride)
- **Benzo(a)pyrene**
- **Methane**
- **PCBs**

CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

1000 PPM ARSENIC

Section 1 - Product and Company Identification
1000 PPM ARSENIC

Product Identification: 1000 PPM ARSENIC
Date of MSDS: 03/15/1992 **Technical Review Date:** 11/22/1994
FSC: 6550 **NIIN: LIIN:** 00F037415
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Post Office Box: N/K
Manufacturer's Address1: 5540 MARSHALL ST
Manufacturer's Address2: ARVADA, CO 80002-3108
Manufacturer's Country: US
General Information Telephone: 303-431-8454
Emergency Telephone: 303-431-8454
Emergency Telephone: 303-431-8454
MSDS Preparer's Name: DANIEL A GOLDSTEIN
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 1R664
Special Project Code: N

Preparer Information

Preparer's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Preparer's Address1: 5540 MARSHALL STREET
Preparer's Address2: ARVADA, CO 80002
Preparer's CAGE: 1R664
Assigned Individual: N

Contractor Information

Contractor's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Contractor's Address1: 5540 MARSHALL STREET
Contractor's Address2: ARVADA, CO 80002
Contractor's Telephone: 303-431-8454
Contractor's CAGE: 1R664

Section 2 - Compositon/Information on Ingredients
1000 PPM ARSENIC

Ingredient Name: ARSENIC, ARSENICALS (HUMAN CARCINOGEN BY OSHA, NTP, IARC - GROUP 1) *94-3*
Ingredient CAS Number: 7440-38-2 **Ingredient CAS Code:** M
RTECS Number: CG0525000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: <1

% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.5 MG/CUM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.1 MG/CUM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Ingredient Name: HYDROCHLORIC ACID, HYDROGEN CHLORIDE, MURIATIC ACID HYDROCHLORIDE
Ingredient CAS Number: 7647-01-0 **Ingredient CAS Code:** M
RTECS Number: MW4025000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 5
% Enviromental Weight:
Other REC Limits: 7 PPM
OSHA PEL: 5 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: C 11 MG/CUM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
1000 PPM ARSENIC

Health Hazards Acute & Chronic: POISON & CORROSIVE TO SKIN, EYES, MUCUS MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT PERFORATION, PULMONARY EDEMA. ARSENIC IS EXTREMELY TOXIC.

Signs & Symptoms of Overexposure:
IRRITATION, BURNING, REDNESS, COUGH, SHORTNESS OF BREATH, PAIN, VOMITING, CYANOSIS. ARSENIC: ACUTE VOMITING/DIARRHEA, SHOCK, CHRONIC NEUROLOGICAL/SKIN/NAIL CHANGES.

Medical Conditions Aggravated by Exposure:
ASTHMA.

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: YES

Carcinogenicity Explanation: SEE INGREDIENTS

Section 4 - First Aid Measures
1000 PPM ARSENIC

First Aid:
EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. INHALATION: GIVE MOIST OXYGEN. INGESTION: GIVE WATER/MILK. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
1000 PPM ARSENIC

Fire Fighting Procedures:
NONE
Unusual Fire or Explosion Hazard:
NONE
Extinguishing Media:
NONE
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
1000 PPM ARSENIC

Spill Release Procedures:
NEUTRALIZE & FLUSH W/WATER/NETURALIZE & ABSORB. VENTILATE AREA.

Section 7 - Handling and Storage
1000 PPM ARSENIC

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
1000 PPM ARSENIC

Repiratory Protection:
WEAR ACID GAS TYPE DUST/MIST RESPIRATOR IF MIST PRODUCTION OCCURS.
Ventilation:
MECHANICAL/LOCAL EXHAUST: USE IN HOOD.
Protective Gloves:
ACID PROOF
Eye Protection: SPLASH GOGGLES
Other Protective Equipment: ACID PROOF APRON W/SLEEVES, LAB COAT, CLOSED SHOES, SAFETY SHOWER, EYE WASH.
Work Hygenic Practices: N/K
Supplemental Health & Safety Information: BOILING POINT (0-5% ACID): 212-213.26F.

Section 9 - Physical & Chemical Properties
1000 PPM ARSENIC

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: (SEE SUPP)
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 28 **Vapor Density:** >1
Percent Volatile Organic Content:
Specific Gravity: 1
Volatile Organic Content Pounds per Gallon:
pH: <1
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: (WATER =1): 1
Solubility in Water: COMPLETE
Appearance and Odor: CLEAR LIQUID W/NO ODOR
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
1000 PPM ARSENIC

Stability Indicator: YES
Materials to Avoid:
METALS
Stability Condition to Avoid:
FREEZING
Hazardous Decomposition Products:
HYDROGEN
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NONE

Section 11 - Toxicological Information
1000 PPM ARSENIC

Toxicological Information:
N/P

Section 12 - Ecological Information
1000 PPM ARSENIC

Ecological Information:
N/P

Section 13 - Disposal Considerations
1000 PPM ARSENIC

Waste Disposal Methods:
STORE FOR DISPOSAL IN HAZARDOUS WASTE SITE IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
1000 PPM ARSENIC

Transport Information:
N/P

Section 15 - Regulatory Information
1000 PPM ARSENIC

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
1000 PPM ARSENIC

Other Information:
N/P

HAZCOM Label Information

Product Identification: 1000 PPM ARSENIC
CAGE: 1R664
Assigned Individual: N
Company Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Company PO Box:
Company Street Address1: 5540 MARSHALL STREET
Company Street Address2: ARVADA, CO 80002 US
Health Emergency Telephone: 303-431-8454
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C

Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ASBESTOS

Section 1 - Product and Company Identification
ASBESTOS

Product Identification: ASBESTOS
Date of MSDS: 01/01/1985 **Technical Review Date:** 08/02/1979
FSC: 5640 **NIIN:** 00-618-7515
Submitter: A AM
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: AMATEX CORP
Manufacturer's Address1:
Manufacturer's Address2: N/P, NK 00000
Manufacturer's Country: NK
General Information Telephone:
Emergency Telephone: 215-275-4602
Emergency Telephone: 215-275-4602
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 90896
Special Project Code: N

Item Description

Item Name: INSULATION TAPE,THERMAL
Item Manager:
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue:
Unit of Issue Quantity:
Type of Container:

Contractor Information

Contractor's Name: AMATEX CORP
Contractor's Address1: 1032 STANBRIDGE STREET
Contractor's Address2: NORRISTOWN, PA 19401-3666
Contractor's Telephone: 215-277-6100 / 215-277-6108
Contractor's CAGE: 90896

Contractor Information

Contractor's Name: MILITARY SPECIFICATIONS PROMULGATED BY MILITARY
Post Office Box: MANUAL
Contractor's Address1: DEPTS/AGENCIES UNDER AUTH OF DEF STD
Contractor's Address2: 4120 3-M, NK 00000
Contractor's Telephone: 804-279-4371 DSN 695-4371
Contractor's CAGE: 81349

Section 2 - Compositon/Information on Ingredients
ASBESTOS

Ingredient Name: CHRYSOTILE ASBESTOS
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:

>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: N/P **OSHA PEL Code:**
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2F CC, C 10F CC **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview
ASBESTOS

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
ASBESTOSIS, MESOTHELIOMA, BRONCHIOGENIC CARCINOMA, INDICATED SYNERGISM W/CIGARETTE SMOKING

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
ASBESTOS

First Aid:
IF PENETRATION OF SKIN, CONSULT DERMATOLOGIST. IF DUST ENTERS EYE, IRRIGATE

W/NORMAL SALINE & SEE OPHTHALMOLOGIST. IF IN HIGH DUST AREA, REMOVE VICTIM FROM EXPOSURE.

Section 5 - Fire Fighting Measures
ASBESTOS

Fire Fighting Procedures:
N/P
Unusual Fire or Explosion Hazard:
N/P
Extinguishing Media:
N/P
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s):
Upper Limit(s):

Section 6 - Accidental Release Measures
ASBESTOS

Spill Release Procedures:
WET MATL TO PREVENT GENERATION OF FIBEROUS DUST & COLLECT IN SEALED IMPERMEABLE BAG FOR DISPOSAL IN HAZ MATLS LANDFILL.

Section 7 - Handling and Storage
ASBESTOS

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ASBESTOS

Repiratory Protection:
BELOW 10F CC USE RESP FOR FIBROSIS OR PNEUMOCONIOSIS DUST ABO
Ventilation:
LOCAL EXHST IF POSS
Protective Gloves:
COTTON
Eye Protection: SAFETY GLASSES
Other Protective Equipment: N/P
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: TLV >5U LONG IN >5 MICRONS LING ALSO CEILING VALUE OF 10F CC >5 MICRONS LONG. RESP PROT: VE 10F CC USE SELF-CNTNR OR AIR-SUPP RESP, ALL NIOSH APPRVD.

Section 9 - Physical & Chemical Properties

ASBESTOS

HCC: T6
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/P **Vapor Density:** N/P
Percent Volatile Organic Content:
Specific Gravity: 2.4
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/P
Solubility in Water: NEGLIGIBLE
Appearance and Odor: WHITE-GRAY POWDER-LIKE SOLID, NO ODOR
Percent Volatiles by Volume: N/P
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data

ASBESTOS

Stability Indicator: N/P
Materials to Avoid:
N/P
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
N/P
Hazardous Polymerization Indicator: N/P
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information

ASBESTOS

Toxicological Information:
N/P

Section 12 - Ecological Information

ASBESTOS

Ecological Information:
N/P

Section 13 - Disposal Considerations

ASBESTOS

Waste Disposal Methods:
WET WASTE ASBESTOS & BAG IN IMPERMEABLE MATL. LABEL BAGS IAW

29CFR1910.1001. DISPOSAL SHOULD BE IAW 40CFR241. LOCAL, STATE REG MAY BE MORE STRINGENT & SHOULD BE FOLLOWED.

Section 14 - MSDS Transport Information
ASBESTOS

Transport Information:
N/P

Section 15 - Regulatory Information
ASBESTOS

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
ASBESTOS

Other Information:
N/P

HMIS Transportation Information

Product Identification: ASBESTOS
Transporation ID Number: 80085
Responsible Party CAGE: 90896
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 08/02/1979
MFN: 08/02/1979
Submitter: A TP
Status Code: C

Container Information
- **Unit of Issue:**
- **Container Quantity:**
- **Type of Container:**
- **Net Unit Weight:** 74 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0

Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: WHITE ASBESTOS
DOT PSN Code: PVR
Symbols: I
DOT PSN Modifier: ,(CHRYSOTILE, ACTINOLITE, ANTHOPHYLLITE, TREMOLITE)
Hazard Class: 9
UN ID Number: UN2590
DOT Packaging Group: III
Label: CLASS 9
Special Provision(s):
Packaging Exception: 155
Non Bulk Packaging: 216
Bulk Packaging: 240
Maximimum Quanity in Passenger Area: 200 KG
Maximimum Quanity in Cargo Area: 200 KG
Stow in Vessel Requirements: A
Requirements Water/Sp/Other: 34,40

IMO Detail Information

IMO Proper Shipping Name: ASBESTOS, WHITE
IMO PSN Code: BRN
IMO PSN Modifier:
IMDG Page Number: 9024
UN Number: 2590
UN Hazard Class: 9?
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 6.1-04
Medical First Aid Guide Number: NON

IATA Detail Information

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA PSN Modifier:
IATA UN Id Number: N/R
IATA UN Class: N/R
Subsidiary Risk Class: N/R
UN Packaging Group: N/R
IATA Label: N/R
Packaging Note for Passengers: N/R
Maximum Quantity for Passengers: N/R
Packaging Note for Cargo: N/R
Maximum Quantity for Cargo: N/R
Exceptions: N/R

AFI Detail Information

AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI Symbols:

AFI PSN Code: ZZZ
AFI PSN Modifier:
AFI UN Id Number: N/R
AFI Hazard Class: N/R
AFI Packing Group: N/R
AFI Label: N/R
Special Provisions: N/A
Back Pack Reference: N/A

HAZCOM Label Information

Product Identification: ASBESTOS
CAGE: 90896
Assigned Individual: N
Company Name: AMATEX CORP
Company PO Box:
Company Street Address1: 1032 STANBRIDGE STREET
Company Street Address2: NORRISTOWN, PA 19401-3666 US
Health Emergency Telephone: 215-275-4602
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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BENZENE

Section 1 - Product and Company Identification
BENZENE

Product Identification: BENZENE
Date of MSDS: 01/01/1985 **Technical Review Date:** 02/29/1984
FSC: 6810 **NIIN:** 00-973-8588
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: BURDICK & JACKSON LAB (SEE SUP DATA)
Manufacturer's Address1: 1953 S HARVEY STREET
Manufacturer's Address2: MUSKEGON, MI 49442-6101
Manufacturer's Country: US
General Information Telephone: 616-726-3171
Emergency Telephone: 616-726-3171
Emergency Telephone: 616-726-3171
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: BURDI
Special Project Code: N

Item Description

Item Name: BENZENE,ACS
Item Manager:
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue:
Unit of Issue Quantity:
Type of Container: BOTTLE,GLASS

Contractor Information

Contractor's Name: BURDICK & JACKSON, INC.
Contractor's Address1: 1953 S. HARVEY STREET
Contractor's Address2: MUSKEGON, MI 49442
Contractor's Telephone: 616-726-3171
Contractor's CAGE: BURDI

Contractor Information

Contractor's Name: BURDICK AND JACKSON DIV OF BAXTER HEALTHCARE CORP.
Contractor's Address1: 1953 S HARVEY STREET
Contractor's Address2: MUSKEGON, MI 49442-6101
Contractor's Telephone: 616-726-3171, CHEMTREC 800-424-9300
Contractor's CAGE: 2H215

Section 2 - Compositon/Information on Ingredients
BENZENE

Ingredient Name: BENZENE (SARA III)
Ingredient CAS Number: 71-43-2 **Ingredient CAS Code:** M
RTECS Number: CY1400000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:

>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >90
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 1PPM/5STEL;1910.1028 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 PPM; A2; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
BENZENE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
EYE: IRRIT. VAPOR: DIZZY,NAUSEA,INCOORDINATION,STUPOR,UNCONSCIOUSNESS & CHANGE IN BLOOD COMPOSITION.

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
BENZENE

First Aid:
EYE: FLUSH WITH WATER 15 MIN,GET MED ATTN. INHALATION: REMOVE FROM EXPOSURE,GIVE ARTIFICIAL RESPIRATION IF NEEDED,GET MEDICAL ASSISTANCE.

Section 5 - Fire Fighting Measures
BENZENE

Fire Fighting Procedures:
SELF-CONT BREATH APP,WATER FOG TO COOL EXPOSED CONTAINERS.
Unusual Fire or Explosion Hazard:
BURNS VIGOROUSLY AND EMITS ACID FUMES.
Extinguishing Media:
FOAM,CO*2,DRY CHEMICAL
Flash Point: Flash Point Text: 12F/-11C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.3
Upper Limit(s): 7.9

Section 6 - Accidental Release Measures
BENZENE

Spill Release Procedures:
PROTECT FROM IGNITION. WEAR SELF CONTAINED BREATHING APPARATUS.

Section 7 - Handling and Storage
BENZENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BENZENE

Repiratory Protection:
NIOSH/MSHA APPROVED RESP DEVICE IN ACCORD WITH EXPOSURE OF CONCERN.
Ventilation:
LOCAL/HIGH RATE MECHANICAL
Protective Gloves:
CHEMICAL TYPE
Eye Protection: GOGGLES/FACE MASK
Other Protective Equipment: AS REQUIRED TO PREVENT SKIN CONTACT.
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: MFR CONT: PHILLIPS PETROL CO MFR'S THE RAW MATERIAL,BURDICK & JACKSON LAB. REFINES IT TO DESIRED PCT,SPEC & GRADE. CONTAINER SIZE: 500 ML BOTTLE

Section 9 - Physical & Chemical Properties
BENZENE

HCC: F5

NRC/State License Number: N/A
Net Property Weight for Ammo: N/A
Boiling Point: Boiling Point Text: 176F/80C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: 100 **Vapor Density:** 2.77
Percent Volatile Organic Content:
Specific Gravity: 0.884
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: <1 (ETHYL ETHER)
Solubility in Water: NEGLIGIBLE
Appearance and Odor: COLORLESS LIQUID. AROMATIC HYDROCARBON ODOR
Percent Volatiles by Volume: 100
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
BENZENE

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDANTS
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
N/P
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
BENZENE

Toxicological Information:
N/P

Section 12 - Ecological Information
BENZENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
BENZENE

Waste Disposal Methods:
BURN UNDER CONTROLLED CONDITIONS. COMPLY WITH LOCAL,STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information

BENZENE

Transport Information:
N/P

Section 15 - Regulatory Information
BENZENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
BENZENE

Other Information:
N/P

HMIS Transportation Information

Product Identification: BENZENE
Transporation ID Number: 95976
Responsible Party CAGE: BURDI
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 09/05/1986
MFN: 09/05/1986
Submitter: N TN
Status Code: C

Container Information
- **Unit of Issue:**
- **Container Quantity:**
- **Type of Container:** BOTTLE,GLASS
- **Net Unit Weight:**

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: BENZENE
DOT PSN Code: BRS
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1114
DOT Packaging Group: II
Label: FLAMMABLE LIQUID
Special Provision(s): B101,T8
Packaging Exception: 150
Non Bulk Packaging: 202
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 L
Maximimum Quanity in Cargo Area: 60 L
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: BENZENE
IMO PSN Code: BXB
IMO PSN Modifier:
IMDG Page Number: 3185
UN Number: 1114
UN Hazard Class: 3.2
IMO Packaging Group: II
Subsidiary Risk Label: -
EMS Number: 3-03
Medical First Aid Guide Number: 312

IATA Detail Information

IATA Proper Shipping Name: BENZENE
IATA PSN Code: DBA
IATA PSN Modifier:
IATA UN Id Number: 1114
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 305
Maximum Quantity for Passengers: 5L
Packaging Note for Cargo: 307
Maximum Quantity for Cargo: 60L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: BENZENE
AFI Symbols:
AFI PSN Code: DBA
AFI PSN Modifier:
AFI UN Id Number: UN1114
AFI Hazard Class: 3

AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: BENZENE
CAGE: BURDI
Assigned Individual: N
Company Name: BURDICK & JACKSON, INC.
Company PO Box:
Company Street Address1: 1953 S. HARVEY STREET
Company Street Address2: MUSKEGON, MI 49442 US
Health Emergency Telephone: 616-726-3171
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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F1003 BENZO(E)PYRENE

Section 1 - Product and Company Identification
F1003 BENZO(E)PYRENE

Product Identification: F1003 BENZO(E)PYRENE
Date of MSDS: 10/23/1992 **Technical Review Date:** 12/29/1994
FSC: 6550 **NIIN: LIIN:** 00F037550
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: CHEM SERVICE INC
Post Office Box: 3108
Manufacturer's Address1: 660 TOWER LN
Manufacturer's Address2: WEST CHESTER, PA 19381-3108
Manufacturer's Country: US
General Information Telephone: 215-692-3026/800-452-9994
Emergency Telephone: 215-692-3026/800-452-9994
Emergency Telephone: 215-692-3026/800-452-9994
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 84898
Special Project Code: N

Preparer Information

Preparer's Name: CHEM SERVICE INC
Post Office Box: 3108
Preparer's Address1: N/K
Preparer's Address2: WEST CHESTER, PA 19381
Preparer's CAGE: 84898
Assigned Individual: N

Contractor Information

Contractor's Name: CHEM SERVICE INC
Post Office Box: 3108
Contractor's Address1: N/K
Contractor's Address2: WEST CHESTER, PA 19381
Contractor's Telephone: 215-692-3026
Contractor's CAGE: 84898

Contractor Information

Contractor's Name: CHEM SERVICE, INC
Post Office Box: 599
Contractor's Address1: 660 TOWER LN
Contractor's Address2: WEST CHESTER, PA 19301-9650
Contractor's Telephone: 610-692-3026
Contractor's CAGE: 8Y898

Section 2 - Compositon/Information on Ingredients
F1003 BENZO(E)PYRENE

Ingredient Name: BENZOPYRENE
Ingredient CAS Number: 192-97-2 **Ingredient CAS Code:** M
RTECS Number: DJ4200000 **RTECS Code:** M
=WT: =WT Code:

=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
F1003 BENZO(E)PYRENE

Health Hazards Acute & Chronic: EYES: IRRITATION. SKIN: IRRITATION, HARMFUL IF ABSORBED. INGESTION: HARMFUL. INHALATION: HARMFUL, IRRITATION TO RESPIRATORY TRACT & MUCOUS MEMBRANES. POSSIBLE MUTAGEN-MAY CAUSE BIRTH DEFECTS IN FUTURE GENERATIONS. POSSIBLE TERATOGEN-CAUSESEMBRYO-FETAL DAMAGE.

Signs & Symptoms of Overexposure:
IRRITATION.

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures

F1003 BENZO(E)PYRENE

First Aid:
EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-2O MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: DON'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/CONVULSIVE. IF VOMITING, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
F1003 BENZO(E)PYRENE

Fire Fighting Procedures:
N/K
Unusual Fire or Explosion Hazard:
N/K
Extinguishing Media:
CO2, DRY CHEMICAL POWDER/SPRAY.
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
F1003 BENZO(E)PYRENE

Spill Release Procedures:
EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Section 7 - Handling and Storage
F1003 BENZO(E)PYRENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
F1003 BENZO(E)PYRENE

Repiratory Protection:
WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation:
CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves:
N/K

Eye Protection: EYE SHIELDS
Other Protective Equipment: N/K
Work Hygenic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Health & Safety Information: MELTING POINT: 352.4-354.2F.

Section 9 - Physical & Chemical Properties
F1003 BENZO(E)PYRENE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: (SEE SUPP)
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: INSOLUBLE
Appearance and Odor: WHITE TO YELLOW/GREEN CRYSTALLINE SOLID.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
F1003 BENZO(E)PYRENE

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
TOXIC FUMES.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
F1003 BENZO(E)PYRENE

Toxicological Information:
N/P

Section 12 - Ecological Information
F1003 BENZO(E)PYRENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
F1003 BENZO(E)PYRENE

Waste Disposal Methods:
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
F1003 BENZO(E)PYRENE

Transport Information:
N/P

Section 15 - Regulatory Information
F1003 BENZO(E)PYRENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
F1003 BENZO(E)PYRENE

Other Information:
N/P

HAZCOM Label Information

Product Identification: F1003 BENZO(E)PYRENE
CAGE: 84898
Assigned Individual: N
Company Name: CHEM SERVICE INC
Company PO Box: 3108
Company Street Address1: N/K
Company Street Address2: WEST CHESTER, PA 19381 US
Health Emergency Telephone: 215-692-3026/800-452-9994
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:

Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

METHANE (0-30,000 PPM IN AIR)

Section 1 - Product and Company Identification
METHANE (0-30,000 PPM IN AIR)

Product Identification: METHANE (0-30,000 PPM IN AIR)
Date of MSDS: 03/27/1995 **Technical Review Date:** 07/22/1998
FSC: 6830 **NIIN: LIIN:** 00N052479
Submitter: N EN
Status Code: A
MFN: 02
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: GASTECH INC
Manufacturer's Address1: 8407 CENTRAL AVE
Manufacturer's Address2: NEWARK, CA 94560-3431
Manufacturer's Country: US
General Information Telephone: 510-794-6200
Emergency Telephone: 800-535-3431
Emergency Telephone: 800-535-3431
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: DO808
Special Project Code: N

Contractor Information

Contractor's Name: GAS TECH INC. JOHNSON INSTRUMENT DIV
Contractor's Address1: 8445 CENTRAL AVE
Contractor's Address2: NEWARK, CA 94560-3431
Contractor's Telephone: 510-794-6200
Contractor's CAGE: 51906

Contractor Information

Contractor's Name: GASTECH INC
Contractor's Address1: 8407 CENTRAL AVE
Contractor's Address2: NEWARK, CA 94560-3431
Contractor's Telephone: 510-794-6200
Contractor's CAGE: DO808

Section 2 - Compositon/Information on Ingredients
METHANE (0-30,000 PPM IN AIR)

Ingredient Name: AIR, COMPRESSED; (AIR)
Ingredient CAS Number: 25635-88-5 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >97
% Enviromental Weight:
Other REC Limits: N/K

OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: METHANE
Ingredient CAS Number: 74-82-8 **Ingredient CAS Code:** M
RTECS Number: PA1490000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: <0.3
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: ASPHYXIANT **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
METHANE (0-30,000 PPM IN AIR)

Health Hazards Acute & Chronic: ACUTE/CHRONIC:NONE IDENTIFIED. TARGET ORGANS:NONE IDENTIFIED.

Signs & Symptoms of Overexposure:
NONE SPECIFIED BY MANUFACTURER.

Medical Conditions Aggravated by Exposure:
NONE IDENTIFIED.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
METHANE (0-30,000 PPM IN AIR)

First Aid:
INGEST:CALL MD IMMEDIATELY (FP N). EYES:IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES, SEEK ASSISTANCE FROM MD (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL:PROV IDE FRESH AIR OR OXYGEN & CONSULT MD.

Section 5 - Fire Fighting Measures
METHANE (0-30,000 PPM IN AIR)

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
COMPRESSED GAS CYLINDER MAY EXPLODE IN HEAT OF FIRE. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE.
Extinguishing Media:
USE METHODS APPROPRIATE TO SURROUNDING FIRE.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
METHANE (0-30,000 PPM IN AIR)

Spill Release Procedures:
EVACUATE & VENTILATE AREA.

Section 7 - Handling and Storage
METHANE (0-30,000 PPM IN AIR)

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
METHANE (0-30,000 PPM IN AIR)

Repiratory Protection:

NIOSH APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
NONE NECESSARY.
Ventilation:
RECOMMENDED.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N).
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: OTHER PREC:HANDLING. THE EMPLOYER IS RESPONSIBLE FOR DETERMINING PRECAUTIONS & DANGERS OF THIS MATERIAL FOR SPECIFIC APPLICATIONS OF THE PRODUCT.

Section 9 - Physical & Chemical Properties
METHANE (0-30,000 PPM IN AIR)

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** 0.98-1
Percent Volatile Organic Content:
Specific Gravity: N/A
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: SLIGHT
Appearance and Odor: COLORLESS; ODORLESS GAS.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
METHANE (0-30,000 PPM IN AIR)

Stability Indicator: YES
Materials to Avoid:
NONE IDENTIFIED.
Stability Condition to Avoid:
NONE IDENTIFIED.
Hazardous Decomposition Products:
CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information

METHANE (0-30,000 PPM IN AIR)

Toxicological Information:
N/P

Section 12 - Ecological Information
METHANE (0-30,000 PPM IN AIR)

Ecological Information:
N/P

Section 13 - Disposal Considerations
METHANE (0-30,000 PPM IN AIR)

Waste Disposal Methods:
EMPTY CONTAINERS MAY BE DISCARDED AS ANY METAL REFUSE, OBSERVING FEDERAL, STATE & LOCAL REGULATIONS. DO NOT INCINERATE.

Section 14 - MSDS Transport Information
METHANE (0-30,000 PPM IN AIR)

Transport Information:
N/P

Section 15 - Regulatory Information
METHANE (0-30,000 PPM IN AIR)

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
METHANE (0-30,000 PPM IN AIR)

Other Information:
N/P

HAZCOM Label Information

Product Identification: METHANE (0-30,000 PPM IN AIR)
CAGE: DO808
Assigned Individual: Y
Company Name: GASTECH INC
Company PO Box:
Company Street Address1: 8407 CENTRAL AVE
Company Street Address2: NEWARK, CA 94560-3431 US
Health Emergency Telephone: 800-535-3431
Label Required Indicator: Y
Date Label Reviewed: 07/22/1998
Status Code: C
Manufacturer's Label Number:

Date of Label: 07/22/1998
Year Procured: N/K
Organization Code: M
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: None
Contact Hazard: None
Fire Hazard: Slight
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Section 1 - Product and Company Identification
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Product Identification: EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)
Date of MSDS: 12/04/1989 **Technical Review Date:** 01/30/1995
FSC: 6810 **NIIN: LIIN:** 00N057170
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: EM SCIENCE
Post Office Box: 70
Manufacturer's Address1: 480 DEMOCRAT RD
Manufacturer's Address2: GIBBSTOWN, NJ 08027
Manufacturer's Country: US
General Information Telephone: 609-354-9200
Emergency Telephone: 800-424-9300 (CHEMTREC)
Emergency Telephone: 800-424-9300 (CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: DO242
Special Project Code: N

Contractor Information

Contractor's Name: E M SCIENCE DIV OF E M INDUSTRIES INC
Post Office Box: 70
Contractor's Address1: 480 DEMOCRAT ROAD
Contractor's Address2: GIBBSTOWN, NJ 08027
Contractor's Telephone: 800-222-0342/609-423-6300
Contractor's CAGE: 63612

Contractor Information

Contractor's Name: EM SCIENCE
Post Office Box: N/K
Contractor's Address1: 480 DEMOCRAT RD
Contractor's Address2: GIBBSTOWN, NJ 08927
Contractor's Telephone: 800-424-9300 (CHEMTREC)
Contractor's CAGE: DO242

Section 2 - Compositon/Information on Ingredients
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Ingredient Name: HEXANE; (N-HEXANE) (CERCLA)
Ingredient CAS Number: 110-54-3 **Ingredient CAS Code:** M
RTECS Number: MN9275000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: 99.9
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 500 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Ingredient Name: POLYCHLORINATED BIPHENYL (AROCHLOR 1254); (PCB 1254) SARA 313 (CERCLA)
Ingredient CAS Number: 11097-69-1 **Ingredient CAS Code:** M
RTECS Number: TQ1360000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.1
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: S, 0.5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: S, 0.5 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Health Hazards Acute & Chronic: TOXIC BY INGESTION AND INHALATION. VAPOR INHALATION CAUSES IRRITATION OF NASAL AND RESPIRATORY PASSAGES, HEADACHE, DIZZINESS, NAUSEA, CENTRAL NERVOUS SYSTEM DEPRESSION. CHRONIC OVEREXPOSURE CAN CAUSE SEVERE NERVE DAMAGE. MAY CAUSE IRRITATION ON CONTACT WITH SKIN OR EYES. MAY CAUSE DAMAGE TO KIDNEYS AND LIVER.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
KIDNEY, LIVER, RESPIRATORY AND CNS CONDITIONS.

LD50 LC50 Mixture: LD50:(ORAL,RAT)28710 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: NO

Carcinogenicity Explanation: AROCLOR 1254:IARC MONO, SUPP, V7, P322, 1987:GROUP 2A. NTP 7TH ANN RPT ON CARCIN, 1994:ANTIC TO BE CARCIN. ANIMAL:LIVER.

Section 4 - First Aid Measures
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

First Aid:
GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE. SKIN:WASH THORO W/SOAP & WATER. EYES:IMMED FLUSH THORO W/WATER FOR @ LEAST 15 MINS. INHAL:REMOVE TO FRESH AIR; GIVE ARTF RESP IF BRTHG HAS STOPPED . INGEST:DO NOT INDUCE VOMIT; GET MED ATTN. REMOVE CONTAMD CLTHG & WASH BEFORE REUSE.

Section 5 - Fire Fighting Measures
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
DANGEROUS FIRE AND EXPLOSION HAZARD. VAPOR CAN TRAVEL DISTANCES TO IGNIT SOURCE & FLASH BACK.
Extinguishing Media:
CARBON DIOXIDE, DRY CHEMICAL, FOAM.
Flash Point: Flash Point Text: -7F,-22C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.2%
Upper Limit(s): 7.5%

Section 6 - Accidental Release Measures
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Spill Release Procedures:
CAUTION:PROD CONTAINS PCB'S (POLYCHLORINATED BIPHENYLS), TOX ENVIRON CONTAMINANT REQUIRING SPEC HNDLG & DISP I/A/W U.S. ENVIRON PROT AGENCY REGS 40 CFR 761. IN CASE OF ACCIDENT/SPILL, CALL TOLL FREE U .S. COAST GUARD

NATL RESPONSE CTR:800-424-8802.

Section 7 - Handling and Storage
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Repiratory Protection:
IF WORKPLACE EXPOS LIM(S) OF PROD/ANY COMPONENT IS EXCEEDED (SEE TLV/PEL), NIOSH/MSHA APPRVD AIR SUPPLIED RESP IS ADVISED IN ABSENCE OF PROPER ENVIRON CONTROL. OSHA REGS ALSO PERMIT OTHER NIOSH/MSHA R ESPS (NEGATIVE PRESS TYPE) (SUPDAT)
Ventilation:
MATL MUST BE HANDLED/TRANSFERRED IN APPRVD FUME HOOD OR W/ADEQ VENTILATION.
Protective Gloves:
NITRILE GLOVES.
Eye Protection: ANSI APPROVED CHEM SAFETY GOGGLES (FP N)
Other Protective Equipment: IMPERVIOUS PROTECT CLOTHING SHOULD BE WORN TO PVNT SKIN CONTACT.
Work Hygenic Practices: WASH THORO AFTER HANDLING. DO NOT TAKE INTERNALLY. EYE WASH & SFTY EQUIP SHOULD BE READILY AVAILABLE.
Supplemental Health & Safety Information: MFG TRADE NAME AND PART NO:1254 STANDARD. RESP PROT:UNDER SPECIFIED CNDTNS (SEE YOUR SFTY EQUIP SUPPLIER). ENGINEERING AND/OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

Section 9 - Physical & Chemical Properties
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 149F,65C
Melting/Freezing Point: Melting/Freezing Text: -139F,-95C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 125 @ 20C **Vapor Density:** 3.0
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 9.0 (BUAC = 1)
Solubility in Water: SLIGHT
Appearance and Odor: LIQUID

Percent Volatiles by Volume: 100
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Stability Indicator: YES
Materials to Avoid:
OXIDIZERS.
Stability Condition to Avoid:
HEAT; CONTACT WITH IGNITION SOURCES.
Hazardous Decomposition Products:
CO*X.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Toxicological Information:
N/P

Section 12 - Ecological Information
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Ecological Information:
N/P

Section 13 - Disposal Considerations
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Waste Disposal Methods:
FOR PROPER DISP INFO, CONTACT NEAREST U.S. ENVIRONMENTAL AGENCY OFFICE. DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Transport Information:
N/P

Section 15 - Regulatory Information
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)

Other Information:
N/P

HAZCOM Label Information

Product Identification: EP80805, POLYCHLORINATED BIPHENYL, PCB (SUPDAT)
CAGE: DO242
Assigned Individual: Y
Company Name: EM SCIENCE
Company PO Box: N/K
Company Street Address1: 480 DEMOCRAT RD
Company Street Address2: GIBBSTOWN, NJ 08927 NK
Health Emergency Telephone: 800-424-9300 (CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 01/30/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 01/30/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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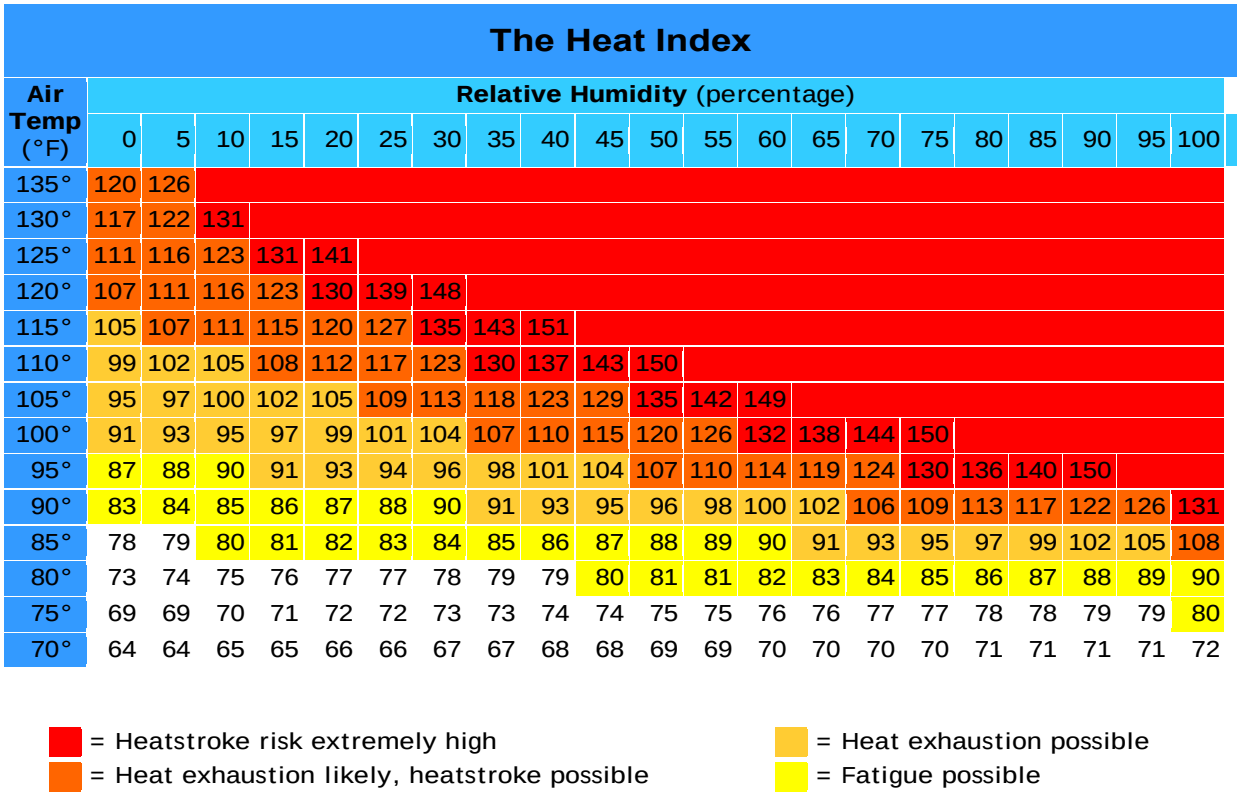
Appendix D - Working in Hot Environments

Heat stress results when the body is unable to cool itself through normal physiologic mechanisms, such as sweating. Protective clothing tends to interfere with the body's ability to cool itself, thus increasing the potential for heat stress. Dehydration, high ambient temperatures, humidity, radiation from the sun and strenuous work contribute to heat stress. Recommended precautions:

1. drink abundant amounts of water;
2. wear light-colored clothing and protect skin from sun exposure;
3. wear clothing that wicks away moisture;
4. wear a wide-brimmed hat;
5. avoid working in the sun;
6. erect a temporary canopy to create shade
7. eat naturally salty foods;
8. take frequent breaks; and
9. work during cooler hours of the day.

Wearing long-sleeved shirts is recommended as a precaution to prevent injury. However, when ambient temperatures are high, especially in combination with humidity, it is recommended that employees wear a short-sleeved shirt to assist the cooling process. Hull personnel are encouraged to change to short-sleeved shirts when the Heat Index is 90 or above. Consult the Heat Index Table below to determine Heat Index levels.



The Heat Index

Air Temp (°F)	Relative Humidity (percentage)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
135°	120	126																			
130°	117	122	131																		
125°	111	116	123	131	141																
120°	107	111	116	123	130	139	148														
115°	105	107	111	115	120	127	135	143	151												
110°	99	102	105	108	112	117	123	130	137	143	150										
105°	95	97	100	102	105	109	113	118	123	129	135	142	149								
100°	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144	150					
95°	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136	140	150		
90°	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122	126	131
85°	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
80°	73	74	75	76	77	77	78	79	79	80	81	81	82	83	84	85	86	87	88	89	90
75°	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
70°	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

= Heatstroke risk extremely high
= Heat exhaustion likely, heatstroke possible
= Heat exhaustion possible
= Fatigue possible

Heat Rash

Symptoms: Red rash, impaired sweating, mild discomfort, and lowered heat tolerance.

Care: Allow the victim to rest in a cooler environment and give him/her water to drink. Wash the victim's skin with cool water.

Heat Cramps

Symptoms: Muscle spasms and pain in abdominal muscles and extremities.

Care: Allow the victim to rest in a cooler environment. Give the victim at least four ounces of water every fifteen minutes for an hour.

Heat Exhaustion

Symptoms: Pallor, faintness, dizziness, temporary loss of breath, profuse sweating, clammy/cool skin, dilated pupils, headache, nausea, and vomiting.

Care: Allow the victim to rest in a cooler environment and remove his/her protective clothing. Give the victim at least four ounces of water every 15 minutes if he/she is conscious and can tolerate it. Place the victim in the shock position (lying down with feet elevated). Cool victim by fan or applying wet towels or sheets etc. Monitor the victim closely. Transport the victim to a medical facility if there are no signs of improvement.

Heat Stroke

Symptoms: Dizziness, nausea, severe headache, constricted pupils, hot dry skin, cessation of sweating, high temperature (usually 100°F and rising), confusion, collapse, delirium, coma, staggering gait, convulsions, and/or loss of consciousness.

Care: Transport the victim **immediately** to a medical facility. If the body is not cooled immediately, irreversible damage to vital organs may develop leading to death. Take the victim to a cooler, uncontaminated area and remove protective clothing. **Do not give the victim anything to drink.** Cool victim with cold water, cold compresses, and rapid fanning.

Ultraviolet Radiation

If unprotected, certain employees not normally acclimated to direct solar radiation are susceptible to severe sunburns. Employees should use sunscreen (SPF-15 or greater) when working in sunny conditions particularly if the employee is prone to burning or if he/she will be outside working for a significant amount of time. The hazards of heat stress and thermal/ultraviolet burns can be severe and debilitating. All employees should monitor one another.

Appendix E - Respiratory Protection

Hull employees may be required to enter environments where airborne contaminants or lowered oxygen concentrations exist, thus necessitating the use of respiratory protective equipment. When possible, it is advisable to eliminate the need for respiratory protective using engineering controls or administrative procedures.

In cases where employees or contractors desire to wear respiratory protection for assurance purposes and when the need for respiratory protection has not been documented, those individuals must adhere to Hull's respiratory protection procedures.

Medical Evaluations

Employees who wear respiratory protection must be medically evaluated and authorized by a physician to wear respiratory protection. As part of the authorization process, employees will need to complete a confidential questionnaire for the physician, relating to past, present, and expected future use of respiratory protection. The physician must also be provided with information such as the size and model of the respirator to be used, the duration and frequency of respirator use, the expected work effort, additional PPE to be worn, and temperature extremes that may be encountered.

An annual follow-up medical evaluation will be required to reassess individual abilities, when an employee reports medical signs and symptoms that are related to his/her ability to use a respirator, or if recommended by the physician when a change in worksite conditions may result in an increased physiological burden on the employee.

Selecting Respiratory Protection

The Site Safety Officer, Project Manager or safety consultant will evaluate potential airborne contaminants and the potential respiratory hazards at worksites to determine the need for respiratory protection.

At times, Hull employees may work at sites where exposures are considered immediately dangerous to life and health (IDLH) from a respiratory standpoint. Hull employees **are not** permitted to enter IDLH atmospheres. Entry into an IDLH or oxygen deficient (<19.5%) atmosphere requires a person to wear a full-facepiece positive pressure self-contained

breathing apparatus (SCBA) with a minimum service life of thirty minutes, or a combination full-facepiece pressure demand supplied-air respirator with auxiliary self-contained air supply.

Hull will attempt to implement engineering controls that mitigate the hazard(s).

Assigned Protection Factors

The assigned protection factor (APF) of a respirator reflects the level of protection that a respirator is expected to provide when correctly fitted and worn. The APF is a number indicating a safety factor for each type of respirator and is used to calculate the maximum atmospheric concentration for effective use. The following table describes APFs for various types of respirators:

Table of NIOSH/OSHA APFs for Various Types of Respirators

Respirator Class and Type	***APF***
Air-Purifying	
Filtering Facepiece	10
Half-Mask	10
Full-Facepiece	50
Powered Air-Purifying	
Half-Mask	50
Full-Facepiece	250
Loose Fitting Facepiece	25
Hood or Helmet	25
Supplied-Air	
Half-Mask-Demand	10
Half-Mask-Continuous	50
Half-Mask-Pressure Demand	1000
Full-Facepiece Demand	50
Full-Facepiece Continuous Flow	250
Full-Facepiece Pressure Demand	2000
Loose Fitting Facepiece	25
Hood or Helmet	25
Self Contained Breathing Apparatus (SCBA)	
Demand	50
Pressure Demand	10,000

The APF can be used to estimate the maximum use concentrations (MUC) for respirators. The MUC is the highest concentration, **not exceeding the IDLH concentration**, of a specific contaminant in which a respirator can be worn. The occupational exposure limit (OEL) equals

the recommended exposure limit (REL), threshold limit value (TLV), or permissible exposure limit (PEL) for a given chemical agent. Hull uses the lowest OEL to determine the MUC.

MUC = APF x OEL (REL, TLV or PEL)

Fit Testing Procedures

Before an employee is permitted to use a respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same model and size of respirator that will be used in the field. Employees must be found medically fit before fit testing. Employees shall be fit tested before initial use of a respirator, whenever a different facepiece is used, and at least annually thereafter. Additional fit testing will be conducted when changes in an employee's physical condition (e.g., facial scarring, dental changes, cosmetic surgery and obvious change in body weight) could affect respirator fit or when an employee expresses that the fit of the respirator is unacceptable. Hull requires that employees using a tight-fitting facepiece respirator pass an appropriate qualitative or quantitative fit test. The fit test shall be administered using OSHA's qualitative or quantitative fit test methods.

Qualitative Fit Tests

Qualitative fit testing may only be used to fit negative pressure air purifying respirators that must achieve a fit factor of 100 or less. Qualitative fit testing will utilize saccharin or Bitrex as the challenge atmosphere. A correct fit is indicated if the wearer completes several exercises (e.g., breathing deeply, moving the head from side to side, moving the head up and down, and talking) and cannot detect the challenge substance while wearing the respirator.

Field Fit Checks

Each time an employee dons a respirator, they must field check their face piece to face seal using either both negative and positive pressure checks.

1. Positive pressure check: cover the exhalation valve and gently exhale into the facepiece. If the mask holds a positive pressure for 10 second, the fit is satisfactory.
2. Negative pressure check: cover the inlet valves and inhale to collapse the mask to your face. If the mask does not leak for 10 seconds, the fit is satisfactory.

Types and Use of Respirators

Respirator users will follow procedures that maintain facepiece seal, prevent removal of respirators in hazardous environments, and provide for continued effective respirator operation throughout the work shift.

Hull employees will generally use half-mask respirators. If there is a risk to the eyes, or exposure to atmospheres containing concentrations of chemicals that exceed the capability of a half-mask respirator, a full-face respirator or supplied-air respirator will be worn. To provide safe breathing atmospheres, the type of respiratory protection system utilized will correspond to the characteristics of chemicals present and the concentrations expected. This includes increasing the level of protective clothing from Level D to a commensurately higher level.

Employees will not be permitted to wear respirators with tight-fitting facepieces if the employee has any facial hair.

Corrective lenses worn by employees present a problem when fitting full-facepiece respirators. Special mountings hold corrective lenses inside full-facepiece respirators. If corrective lenses are needed, the facepiece and lens must be fitted to provide good vision, comfort, and an effective seal.

Cleaning, Disinfecting, Maintenance and Storage

Cleaning and Disinfecting

Each employee who uses a disposable respirator must dispose of the used respirator as soon as practical after wearing. The disposable respirator must not be taken from the worksite for additional use or used a second time under any circumstances.

Multiple-use respirators will be regularly cleaned and disinfected by the respirator user. This shall be done as often as necessary to maintain a clean and sanitary condition.

1. Remove filters or cartridges. Disassemble facepieces by removing speaking diaphragms and/or other components recommended by the manufacturer.
2. Wash the components in a solution of warm soapy water with one milliliter of household bleach added per liter of water.
3. Rinse components thoroughly in clean, warm running water. Drain.

4. Reassemble facepiece.
5. Place the respirator in a sealable plastic bag.

Maintenance

Inspect respirators before each use, during cleaning and after each use for wear and usability.

Respirator inspections should include the following:

1. Check of respirator function, tightness of connections, and the condition of the various parts including, the facepiece, head straps, valves, gaskets, and nose piece.
2. Check the elastomeric parts for pliability and signs of deterioration.

Refrain from interchanging of parts between different brands of respirators or different models manufactured by the same manufacturer. Replacement parts must be NIOSH-approved for the particular respirator in use. Employees are strictly prohibited from altering the respirator in any way.

Storage

When not in use, all respirators need to be stored in a sealed container and protected from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. Gas and vapor cartridges should be kept in a sealed container so they do not passively adsorb gases and vapors from the storage area and thereby reduce service life.

Identification of Filters, Cartridges, and Canisters

All filters, cartridges, and canisters used at the worksite shall be labeled and color-coded with the NIOSH approved label. Label must remain legible. Refer to the table below for examples of contaminants and corresponding color-codes for cartridges commonly used by Hull employees.

Atmospheric contaminant	Colors assigned
Acid gases	White
Acid gases/organic vapors	Yellow
Ammonia/methylamine	Green
Particulates (High efficiency particulate air)	Magenta
Organic vapors	Black
Organic vapors, chlorine, hydrogen chloride, chlorine dioxide, sulfur dioxide, and hydrogen fluoride	Magenta and yellow

Cartridges may be equipped with an end-of-service-life indicator (ESLI). The ESLI is a system that warns the user of the approach of the end of adequate respiratory protection (e.g., the sorbent is approaching saturation or is no longer effective). If there is no ESLI appropriate for conditions at the work site, then a change of schedule for canisters and cartridges based on objective information will be established. Cartridges used by Hull employees will be changed according to a change-out plan established by the Site Safety Officer. Cartridges removed from service should be discarded immediately.

Employee Training

Hull will provide training to employees who are required to use respirators. Training shall include the following elements:

1. how respirators work and how improper fit, usage and maintenance can compromise the protective effect of the respirator;
2. the limitations and capabilities of the respirator;
3. how effectiveness can be compromised;
4. inspecting, wearing and using a respirator;
5. procedures for maintenance and storage of the respirator; and
6. recognizing when respirator function is ineffective.

Training will be conducted before an employee is asked to use a respirator at a worksite. Refresher training will be performed annually, and/or when there are changes in the workplace or type of respirator.

Recordkeeping

The OSC will maintain a record of respirator fit-tests for each office location. The record shall include the name of the employee tested, the type of fit test performed; the specific make, model, style, and size of the respirator tested; the date of the test, and the test results. Fit test records shall be retained until the next fit test is performed.

Appendix F - Lockout/Tagout

Lockout/Tagout Program

This Appendix covers servicing and maintenance (including installation and removal) of machines and equipment in which the unexpected energizing or start up of the machines and equipment or release of stored energy could cause injury. The control of hazardous energy (lockout/tagout) standard, 29CFR 1910.147, requires that energy sources for equipment be turned off or disconnected and tested before performing work. The standard also requires that the switch be locked where possible and a warning tag affixed to each control.

The lockout/tagout program applies to all employees and contractors who are responsible for servicing and/or maintaining equipment that is energized by, but not limited to, electrical, mechanical, hydraulic, pneumatic, gravitational, stored energy, chemical, or thermal source.

Responsibilities

1. An Affected Employee is an employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. Affected Employees are responsible for:
   - Understanding the purpose of a lockout/tagout condition.
   - Obeying the "Do Not Operate" instructions for equipment under lockout/ tagout conditions.
2. An Authorized Employee is a person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An Affected Employee becomes an Authorized Employee when that employee's duties include performing servicing or maintenance. Authorized Employees are responsible for:
   - Verifying isolation and lockout are effective before the start of work.
   - Making notifications to persons who may be affected by equipment being placed in lockout/tagout.

3. All other employees not defined as “Authorized” or “Affected” but work in an area where equipment may be under lockout/tagout conditions are responsible for following these practices:
    - No employee will remove, bypass, or disregard any lockout/tagout device.
    - No employee will attempt to operate, activate, or perform maintenance work to equipment without appropriate instructions and training.

Procedures for Lockout/Tagout

1. Before beginning work, employees or contractors shall mark machines and their disconnecting means so that appropriate switches can be located quickly.
2. Employees must use key locks on devices, machine control boxes, or on electrical circuit breaker boxes during maintenance, repair, installation, or removal operations.
3. Employees must implement additional means as necessary to provide for safety when tags rather than locks are used by implementing an effective tagout program. Tags may be used in lieu of locks only when the tags are proven as effective as locks. Tag devices shall be constructed and printed so that exposure to moisture and corrosive chemicals shall not cause deterioration and render them unreadable. Tagout device attachment means shall be non-reusable, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than fifty pounds. Tagout devices shall warn against hazardous conditions if the machine is energized and shall include a legend such as: **DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE, DO NOT OPERATE**.
4. Lockout and tagout devices should be standardized throughout a project in color, shape, size, and in the case of tagout devices, print and format.

Employees who utilize lockout/tagout procedures when service or maintenance is being performed shall:

1. Notify all Affected Employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shutdown and locked out to perform the servicing or maintenance.

2. Prepare for shutdown by knowing the type, magnitude, and hazards of the energy to be controlled; and the methods to control the energy.
3. Shutdown the machine or equipment using the correct procedures established for the equipment or machine.
4. Isolate the machine or equipment from all energy sources..
5. Affix locks and tags to each energy-isolating device. If the tag cannot be directly affixed to the energy isolation device, the tag shall be located as close as safely possible to the device.
6. Relieve, disconnect, restrain, all stored or residual energy following the application of locks and tags by methods such as grounding, bleeding, blocking, etc. If there is a possibility of resumption of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists.
7. Verify isolation and deenergization of the machine or equipment have been accomplished through testing.
8. The Site Safety Officer or Project Manager will conduct regular inspections of energy control procedures to assure implementation of the program. The inspection shall be designed to correct any deviations or inadequacies observed.
9. If another crew or person continues to work on the maintenance installation, removal, or repair job during the next shift, the relief personnel shall put his/her lock on before the initial personnel removes his/her lock.
10. Minor adjustment and servicing activities, which might take place during normal operations, shall not require lockout/tagout procedures to be employed if they are routine, repetitive, and integral to the use of the equipment for production, but other standard OSHA safeguarding procedures or mechanisms (e.g. guards) must be used.
11. Before locks and tags are removed and energy is restored:
    - The work area shall be inspected to identify that non-essential items have been removed and machine components are operationally intact
    - The work area shall be checked to identify that all employees are safely positioned or removed.

- Affected Employees shall be notified that lockout/tagout devices have been removed, that servicing or maintenance is completed, and that the machine or equipment is ready for use.

12. Each lockout/tagout device shall be removed **only** by the employee who applied the device. If that employee is not available to remove it, the device may be removed under the direction of the Project Manager, but only after it has been verified that the authorized employee is not at the jobsite. The authorized employee shall be notified his/her lock has been removed before he/she resumes work at that job-site.

Appendix G - Ambient-Air Monitoring

Site Ambient-Air Monitoring

Ambient-air monitoring will be conducted, when necessary, to quantify potential exposure to airborne chemicals. Ambient-air monitoring and industrial hygiene monitoring results will assist with decisions pertaining to:

1. Personal protective equipment (PPE); and
2. Areas of potential exposure.

The Site Safety Officer, or other individual designated by the Project Manager will be responsible for on-site air monitoring when the project requires it. In many cases, monitoring will be real-time (direct-reading). Industrial hygiene monitoring may be used to determine:

1. oxygen levels;
2. flammable or explosive atmospheres; and
3. toxic substances

Action levels may differ depending on the contaminants present. The action level is the level at which all work will cease and personnel will exit the area while site conditions are reassessed.

Oxygen Levels

Oxygen levels will be measured to determine if oxygen-deficient atmospheres exist or a potentially explosive atmosphere exists. Field activities where such atmospheres may exist include, but are not limited to, trenching and excavation, confined space entry, and drum sampling. Oxygen content should be measured as percent oxygen in air, with 20.9 percent, as a natural background level. Oxygen levels that differ from background should trigger further investigation. Oxygen levels below 19.5 percent or above 23.5 percent are considered hazardous

Combustible Gas

A Combustible Gas Indicator (CGI) is used to determine if an explosive atmosphere exists. Concentrations of flammable vapor or gas are measured with a CGI as "the percent of the lower

explosive limit" or percent LEL. Ten percent of the LEL (the level that CGIs will alarm) is the action level and indicates that work should cease.

An extended sampling probe enables sampling of a potentially explosive atmosphere from a remote, safe area.

Cases where combustible atmospheres may exist include, but are not limited to, excavations, confined spaces (e.g., manholes), pump houses, well pits, flammable liquid storage areas, and headspace of drums and wellheads.

Organic Gas or Vapor

Photoionization detectors (PIDs) and flame ionization detectors (FIDs), or similar equipment is used to collect sample headspace readings.

In addition, if concentrations of a toxic vapor or gas exceed applicable exposure limits, as measured within worker breathing zones, engineering or administrative controls must be initiated to reduce breathing zone concentrations to healthful levels. If either engineering or administrative controls are infeasible or delayed, PPE will be utilized.

Air contaminants are to be monitored frequency enough to accurately define airborne concentrations during working conditions. "Action levels" for VOCs are generally set at 50 percent of OSHA's TLV. Levels measured by a PID or FID detect total organic compounds present and cannot differentiate between individual compounds. The actual concentration present of any one chemical can be significantly greater than the level obtained by a PID or FID reading.

The use of a particular sampling device must be matched to site-specific conditions. A PID depends on the ionization potential of a chemical for a response to that substance. If the ionization potential exceeds the lamp output, then the meter will not react to that substance. An example is a PID with a 10.2 eV lamp that would not react to 1,1,1-trichloroethane, which has an ionization potential greater than 11.0 eV.

The use of an FID must take into account the oxygen concentration of the sample, dust or particulates, ambient temperature, and flammable gases present. An FID operates by burning

hydrogen from a built-in fuel supply and oxygen. Oxygen deficiency will reduce the flame height or can cause the flame to be extinguished. Most FIDs have flame-out alarms to alert the user when the flame is extinguished. In addition, an FID may be used to detect chemicals with an ionization potential less than oxygen because it destroys the oxygen via the flame as it takes the reading. Action levels should be the same as for a PID.

Colorimetric Tubes

A pump and detector tube system is capable of measuring airborne concentrations of many chemicals or groups of chemicals. Colorimetric tubes have an accuracy of plus or minus 20%. Detection of potentially hazardous chemicals by colorimetric tube is an indication that the chemical is present and may be present in sufficient concentrations that could pose a health risk. Further industrial hygiene monitoring for specific chemicals and their airborne concentrations is necessary to quantify exposures and to enable correct decisions to be made.

Frequencies and Locations

When ambient air monitoring is required, frequencies and locations of monitoring will be determined by the Site Safety Officer, with assistance from the safety consulting organization. The following locations and frequencies may be utilized for each task performed:

1. When sampling drums of uncharacterized waste materials, ambient air shall be monitored for oxygen deficiency, combustible gas, volatile organic compounds (VOCs), and any other hazardous air contaminants suspected to be present (e.g., hydrogen sulfide). Air monitoring shall be conducted before and after opening each drum and periodically throughout drum sampling procedures to identify that no hazardous conditions are present.
2. Emergency response procedures require ambient air monitoring for oxygen-deficient and combustible atmospheres and for atmospheres containing VOCs and other toxics at hazardous concentrations. Monitoring should be conducted continuously throughout emergency response procedures. PPE shall be donned according to the action levels contained in Table 1.
3. Certain projects may require ambient air monitoring during project activities due to site conditions. For these types of projects, exact locations and monitoring frequencies will be determined for each individual site.

Action Levels

The levels of protection and action levels for worker safety are outlined in Table 1. Generally, it is anticipated that work will be conducted in Level D PPE unless conditions warrant increased protection, as determined through air monitoring. The Site Safety Officer has the authority to institute changes in action levels.

Equipment Calibration and Air Monitoring Logs

All air monitoring equipment will be calibrated **DAILY** prior to use, or as recommended by the manufacturer if a higher frequency of calibration is suggested. Calibration instructions will be kept at the site along with calibration gases and other required apparatus. All measurements and calibration data (time, location, readings, initials, etc.) will be recorded on an air-monitoring log or in field equipment notebooks. Personnel operating monitoring equipment will be trained to use the equipment.

AIR MONITORING ACTION LEVELS

TABLE 1

MONITORING EQUIPMENT	MEASURED LEVEL	ACTION
Oxygen Meter	**< 19.5%**	Cease all operations, leave work area, and contact Project Manager.
	19.5% - 23.5%	Continue work. Monitor as required.
	> 23.5%	Cease all operations, leave work area, and contact Project Manager. Potential fire hazard may exist.
Explosive/ Combustible Meter**	**0-10% LEL**	Continue work. Monitor as required.
	>10% LEL	Leave work area and cease all operations. Contact Project Manager. Do not resume activities until situation can be remedied.
PID, OVA, FID, or other similar sampling instrument***	**0-5 ppm**	Continue work. Level D.
	5-50 ppm	Modified Level C Protection (half-face respirator) is required. *
	50-100 ppm	Level C Protection (full face air-purifying respirator) is required.
	> 100 ppm	Cease all operation, leave work area, and contact Project Manager.

*- The appropriate engineering and administrative controls will be used initially to reduce contaminant exposure. Respiratory protection will only be worn if other exposure control mechanisms are not acceptable.

**- Combustible gas readings are not valid in atmosphere with < 19.5% oxygen.

***- Reading above background levels and in breathing zone

Appendix H - Asbestos Containing Material

IDENTIFICATION OF POTENTIAL ASBESTOS-CONTAINING MATERIALS (PACM)

Purpose

This appendix identifies some potential asbestos-containing material (PACM) that may be encountered in landfill material.

General

Materials historically known to contain asbestos should be assumed to contain asbestos unless testing, date of manufacture, label, or manufacturer verifies that it does not. A material may be presumed to be asbestos and treated as though it contained asbestos without being tested or surveyed. The following list, though not comprehensive, includes a number of materials historically known to contain asbestos. Unless these materials meet any of the conditions noted above, they should be assumed to contain asbestos until sampling and analysis determines otherwise.

Sample List of Suspect ACMs

Cement Pipes	Elevator Brake Shoes
Cement Wallboard	HVAC Duct Insulation
Cement Siding	Boiler Insulation
Asphalt Floor Tile	Breaching Insulation
Vinyl Floor Tile	Ductwork Flexible Fabric Connections
Vinyl Sheet Flooring	Cooling Towers
Flooring Backing	Pipe Insulation (corrugated air-cell, block, etc.)
Construction Mastics (floor tile, carpet, ceiling tile, etc.)	Heating and Electrical Ducts
Acoustical Plaster	Electrical Panel Partitions
Decorative Plaster	Electrical Cloth

Textured Paints/Coatings	Electric Wiring Insulation
Ceiling Tiles and Lay-in Panels	Chalkboards
Spray-Applied Insulation	Roofing Shingles
Blown-in Insulation	Roofing Felt
Fireproofing Materials	Base Flashing
Taping Compounds (thermal)	Thermal Paper Products
Packing Materials (for wall/floor penetrations)	Fire Doors
High Temperature Gaskets	Caulking/Putties
Laboratory Hoods/Table Tops	Adhesives
Laboratory Gloves	Wallboard
Fire Blankets	Joint Compounds
Fire Curtains	Vinyl Wall Coverings
Elevator Equipment Panels	Spackling Compounds

Appendix I - Hearing Conservation

Hearing Conservation

Hearing conservation requires monitoring of noise (sound pressure levels) to accurately identify employees who are potentially at risk for "noise-induced hearing loss" when exposed to sound pressures at or above an eight-hour time-weighted average (TWA) of 85 decibels (dB). This value is also referred to as the action level.

Whenever feasible, engineering controls or administrative procedures will be instituted to prevent or reduce exposure to high sound pressure levels. Where this is not feasible or practical, personal protective equipment (e.g., earplugs or earmuffs) will be utilized.

Monitoring

When it is suspected that employees may be exposed to sound pressures at or above the action level, the Site Safety Officer will implement a monitoring program. The monitoring program will measure sound pressures at the site and areas where employees may be at risk.

When circumstances such as high employee mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring inappropriate, the Site Safety Officer will use personal dosimeters to accurately measure exposures. All continuous, intermittent, and impulsive sound levels from 80 dB to 130 dB will be integrated into the noise measurements.

Signs indicating the need to wear hearing protection will be posted on each piece of equipment or in each area which hearing protection is needed. Monitoring will be repeated whenever there is a change in process, equipment, or controls that could increase sound pressure exposures.

The Site Safety Officer will provide employees with an opportunity to observe noise measurements conducted and will communicate survey results to all employees.

Hearing Protection

Sound attenuation devices (hearing protection) will be made available to all workers exposed to noise at or above the action level. Hearing protection will be worn by any employee who is

exposed to an 8-hour TWA of 85 dB or greater, who has not yet had a baseline audiogram, or has experienced a standard threshold shift (hearing loss).

Hearing protection devices (plugs or muffs) must adequately reduce the intensity of the sound pressures. Hearing protection must reduce employee exposures to at least 90 dB, and to 85 dB when a STS has already occurred. The Site Safety Officer will show employees how to use and care for their protectors.

Audiometric Testing

As a part of Hull's hearing conservation program, audiometric testing will be provided for all Hull employees who have an eight-hour TWA exposure of 85 dB. The elements of audiometric testing will include a baseline audiogram, annual audiogram, training, and follow-up procedures. Baseline audiograms are a part of Hull's medical management program.

An annual audiogram will be performed on all employees exposed at or above the action level. The annual audiogram will be compared to the baseline audiogram to determine if a standard threshold shift (noise-induced hearing loss) has occurred. A standard threshold shift (STS) is defined as an average shift in either ear of 10 dB or more at test frequencies of 2,000, 3,000, and 4,000 Hz.

If a STS is identified, the employee must be fitted or refitted with hearing protection, shown how to use them, and required to wear them. If subsequent audiometric tests show that the STS is not persistent, employees whose exposure to noise is less than a TWA of 90 dB may discontinue wearing hearing protectors.

Training

Annual training will be provided for all employees who are potentially exposed to sound pressures at or above an eight-hour TWA of 85 dB.

Recordkeeping

Noise measurement records will be kept for two years. Audiometric test results will be kept for the duration of employment. Audiometric test records must include the name and job classification of the employee, the date, the examiner's name, the date of acoustic or exhaustive calibration, measurements of background sound pressure levels in audiometric test room, and the employee's most recent noise exposure measurement.

Appendix J - Drilling Safety

In order for projects that involve drilling or direct pushing equipment for well installation and/or subsurface sampling to be completed effectively, safe work practices are necessary.

The Site Safety Officer should complete the Drill Rig Inspection Log prior to initiating drilling operations.

A variety of hazards and risks are associated with drilling operations: overhead and subsurface utilities, heavy equipment movement and operation, awkward positions and overexertion, slips and trips, falling objects, and potential flying debris.

Pre-job Health and Safety Briefings (use of Hull's Project H & S Briefing Form is recommended) help site personnel to identify the risks and hazards, to develop plans to eliminate or mitigate the hazards, and to coordinate activities. To document pre-job briefings, the Site Safety Officer should include briefing date, names of attendees and their function, topics discussed, risks and hazards identified, and safety plans to prevent incident and mishap.

During the pre-job briefing, The Site Safety Officer should check to see that the following requirements have been met.

Personnel have been:

40-hour trained	Current with 8-hour refresher training
Enrolled in a medical monitoring program	Fit tested within past 12 months
Trained in drill-rig safety practices	Trained in first aid/CPR
Trained in emergency procedures	Have reviewed the HASP

Personal Protective Equipment requirements:

Hard hat	Protective shoes or boots
Gloves	Safety glasses

Housekeeping requirements:

Storage for tools, equipment and supplies	Pipes, drill rods, casings, augers and other drilling tools are stored to prevent rolling and/or sliding
Penetration or other driving hammers are placed at a safe location and secured	Work area, platforms, scaffolds and walkways are free of materials/obstructions
Controls, control linkages, gauges are free of oil and grease	Gasoline is stored in flammable safety containers and labeled

Maintenance requirements:

Drill rig engine is shut down to make repairs and/or adjustments	Wheels are blocked, leveling jacks are lowered and hand brakes set prior to start up
Pressure on hydraulics, fluid and air systems are released before performing maintenance	Personnel do not climb the mast for maintenance or repairs
Fuel and flammables are removed when welding or cutting	Guards, plugs, hose clamps, chains and cables are in place before beginning operations

Drilling Operations requirements:

Drill-rig derricks are lowered prior to moving from location to location	Personnel check for overhead obstructions and electrical conductors before the rig is moved and/or set up
All components of the drill rig are a minimum of 15 feet from any power line; 20 feet for high voltage lines	Drill rig is leveled and stabilized with solid cribbing
Drill rig is locked before starting operations	Operators control drilling operations from the controls area
Exhaust gases are vented away from confined or enclosed areas	Unattended boreholes are covered and marked
Operations are suspended during thunderstorms	Personnel working on an elevated derrick wear fall-protection equipment attached above the derrick platform to solid structure
Attach tools to derrick with safety lines and leave no tool on the derrick platform	Never guide drill rods or pipe into racks or other supports by taking hold of a moving hoist line or traveling block

Avoid splashing workers and equipment with free-phase product or highly impacted ground water when drilling in areas of high-level soil and ground water impact using air rotary methods:

Attempt to complete the boring to total depth without work stoppages, unless unsafe conditions develop	Upgrade to modified level D including poly-coated *Tyvek*, if impacted soil is expected or encountered
Position ignition sources and personnel upwind of the boring, or utilize fans or air movers	Use a minimum amount of air pressure to evacuate cuttings from the boring, once impacted soil is encountered

Utilities and Power:

Locate and mark all overhead and buried utilities on boring location plans and assignment sheets	Identify and mark utility-pole guy wires
Contact OUPS and/or private organizations to locate and mark buried utilities	Electrical supply for drilling operations should be installed by a qualified person and in accordance with NFPA 70 and API-RP-500B
When moving a drilling rig in close proximity to power lines, all ground personnel must remain a minimum of 20 feet from the rig	Separators and remote power sources should be protected by Ground-Fault Interruption

Safe Work Practices:

Identify that responsibility and coordination for operator and tool handler is clearly defined during connecting and disconnecting auger sections	Handler stands away from rotating auger when connecting and disconnecting auger sections
A pin is inserted an tapped in place, using a hammer or similar device, when securing the auger to a power coupling	A tool hoist is used when lowering the second section of an auger into place
Personnel stand clear of the auger as it is being lifted into place	Long-handled shovel are used to move soil
No attempt shall be made to exceed manufactures' ratings for speed, force, torque, pressure and flow	Clean soil from rotating augers using appropriate tools, not by hand

Pre Drilling Checklist

Project	Project Number
Date	Subcontractor
Site Safety Officer	
Auditor	

Personal Protective Equipment	**Yes**	**N/A**		**Yes**	**N/A**
Hard Hats			Safety Glasses w/ side shields		
Protective footwear			Hearing protection		
Gloves			Work vests		
Traffic cones/barricades			Other		

Safety Devices/Equipment	**Yes**	**N/A**		**Yes**	**N/A**
Emergency shut-down switches – daily			All gauges and warning lights/alarms functioning		
First aid and fire extinguishers on drill rig			Back up alarms		
Tools well maintained			Derrick in down position when rig is moved		
Overhead obstructions identified before movement			Drill rig stabilized before work		
Buried utilities identified and marked			Drill rig safe distance from power lines		
Wire cable, slings inspected daily for wear			Derrick is secured and locked		

Training Requirements	**Yes**	**N/A**		**Yes**	**N/A**
40-Hour Training			8-Hour Refresher		
Drill-rig safe operating procedures			First aid/CPR		
Emergency procedures			Emergency phone numbers posted		
Traffic cones/barricades			Other		

Appendix K - Electrical Safety Practices

This Appendix provides guidance for those who work on electrical circuits, controls, equipment or other electrically-energized parts. This information is not comprehensive and does not address all electrical risks or issues. Additional requirements are contained in the OSHA regulations, 29 CFR 1910 and 1926, and National Fire Protection Association Chapters 70 (The National Electric Code) and 70E (Standard for Electrical Safety in the Workplace).

General Requirements

1. Hull employees are not be permitted to work in proximity to an electrical circuit that could result in contact with electrical energy, unless the circuits are de-energized or guarded effectively by insulation or other means.
2. In areas where the exact location of underground electric power lines is unknown, all available means shall be utilized to locate and de-energize the system. Where a chance of contact with electrified conductors or equipment exists, appropriate insulation/isolation must be utilized.
3. Before work begins, Hull employees must determine by inquiry, direct observation or instrumentation, whether any part of an energized electrical circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool or machine in direct with the electric power circuit.
4. Barriers and warning signs, or other means of guarding, shall be used to ensure that contact with energized circuits or equipment is prevented.
5. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.
6. Worn or frayed electrical cables shall not be used, nor cables that do not have a functional ground conductor.
7. Locations where flammable gases, vapors, dusts or fibers, either as a normal part of operations, or present in the event of an emergency, must be correctly classified in accordance with National Electric Code definitions (Section 500.5). When working in Class I, II or III locations, use the appropriate electrical equipment specifically designed for work in those locations.
8. Instruct employees not to reach blindly into areas that might contain live electrical components.

9. Instruct employees not enter and work on electrical equipment unless adequate illumination is provided.

Preventing Equipment Failures

1. Inspect parts for defects and cleanliness before reassembling or installing.
2. Perform preventative maintenance in accordance with manufacturers' recommendations. If recommendations are not available, consult NETA's Maintenance Testing Specifications for Electrical Power Distribution Equipment and Systems, 2001 edition (www.netaworld.org).
3. Be aware of the energy levels of the equipment involved. NFPA 70E can assist, or do a hazard assessment.

Electrical Safety Work Procedures

1. Inspect/evaluate electrical equipment to identify procedural requirements and hazards. Use a job hazard analysis procedure, such as outlined in HASP Section 3.2, or utilize the analysis contained in NFPA 70E, Part II, Appendix D.
2. Maintain the electrical equipment's insulation and enclosure integrity.
3. Plan every task and document first-time procedures.
4. Live parts to which an employee might be exposed shall be put into an electrically-safe work condition before an employee works on or near them, unless it can be show that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational imitations. Energized parts operating at less than 50 volts to ground shall not be required to be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.
5. Anticipate the unexpected by asking what could go wrong; then adjust to maintain an electrically safe work condition.
6. An electrically safe condition shall be achieved when work is performed in accordance with the procedures outlined in section 120.2 of NFPA 70E. After achieving an electrically safe condition, verify the safety of the system by following the six processes described in NFPA 70E, 120.1.
7. If live parts are not placed in an electrically safe work condition (i.e. for the reason of increased or additional hazards or infeasibility per NPFA 70D, 130.1), the work to be

performed shall be considered energized electrical work and shall be performed by written permit only. See NFPA 70E, Annex J for an example of a written Energized Electrical Work Permit.

8. Identify and obtain the correct tools for the job

9. Before beginning each job, the Site Safety Officer, Project Manager, or designee, shall conduct a job briefing with all employees involved in the work. A discussion identifying issues, such as those described above, may be sufficient. However, a more extensive briefing is required where:

   - the work is complicated or particularly hazardous, or
   - where employees are not expected to recognize and avoid the hazards involved with the job.

Protective Clothing Requirements

1. Estimate or calculate the maximum available arc flash energy to which employees could be exposed due electric arcs

2. Ensure that each employee who is potentially exposed to arc flash hazards does not wear clothing that could melt onto his/her skin or that could ignite and continue to burn when exposed to the estimated heat energy

3. Employees exposed to the possibility of an electric arc must wear clothing with an arc rating greater than or equal to the heat energy estimated. Consult NFPA 70E, Table 3-3.9.2 and Part II, Appendix F, Simplified Two-Category FR Clothing System for guidance.

DIRECTIONS TO HOSPITAL (map attached)

St Joseph Regional Medical Center
810 East LaSalle Ave.
South Bend, Indiana
574-237-7264

EMERGENCY CONTACT NUMBERS

THIS AREA IS EQUIPED WITH 911 EMERGENCY SERVICE

South Bend Police Department	**574-235-9201**
Fire Department	**911**
Lance Turley – Hull Project Manager	**513-459-9677 office** **513-460-8632 cell**
Doug Stuart – Hull Office Manager	**317-558-0558 office** **317-517-6506 cell**
Nivas Vijay – Site Safety Officer	**574-234-1475 office** **574-360-0961 cell**
Anna Kolata – City of South Bend	**574-235-9374 office** **574-532-8914 cell**

YAHOO! DRIVING DIRECTIONS

Text & Map | Text Only

A 1340 South Bend Ave, South Bend, IN 46617

1. Start at **1340 S BEND AVE[IN-23], SOUTH BEND** on **SOUTH BEND AVE[IN-23] - go 0.4** mi
2. Turn L to follow **IN-23 - go 0.6** mi
3. Turn R on **E LA SALLE AVE - go 0.2** mi
4. Arrive at **801 E LASALLE AVE, SOUTH BEND,** on the R

Distance: 1.2 miles, Travel Time: 2 mins

B Saint Josephs Regional Medical Center(574) 237-[redacted] 7264
801 E LaSalle Ave, South Bend, IN

Total Distance: 1.2 miles, Total Travel Time: 2 mins

When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

VERIFY DRIVING DIRECTIONS IN FIELD