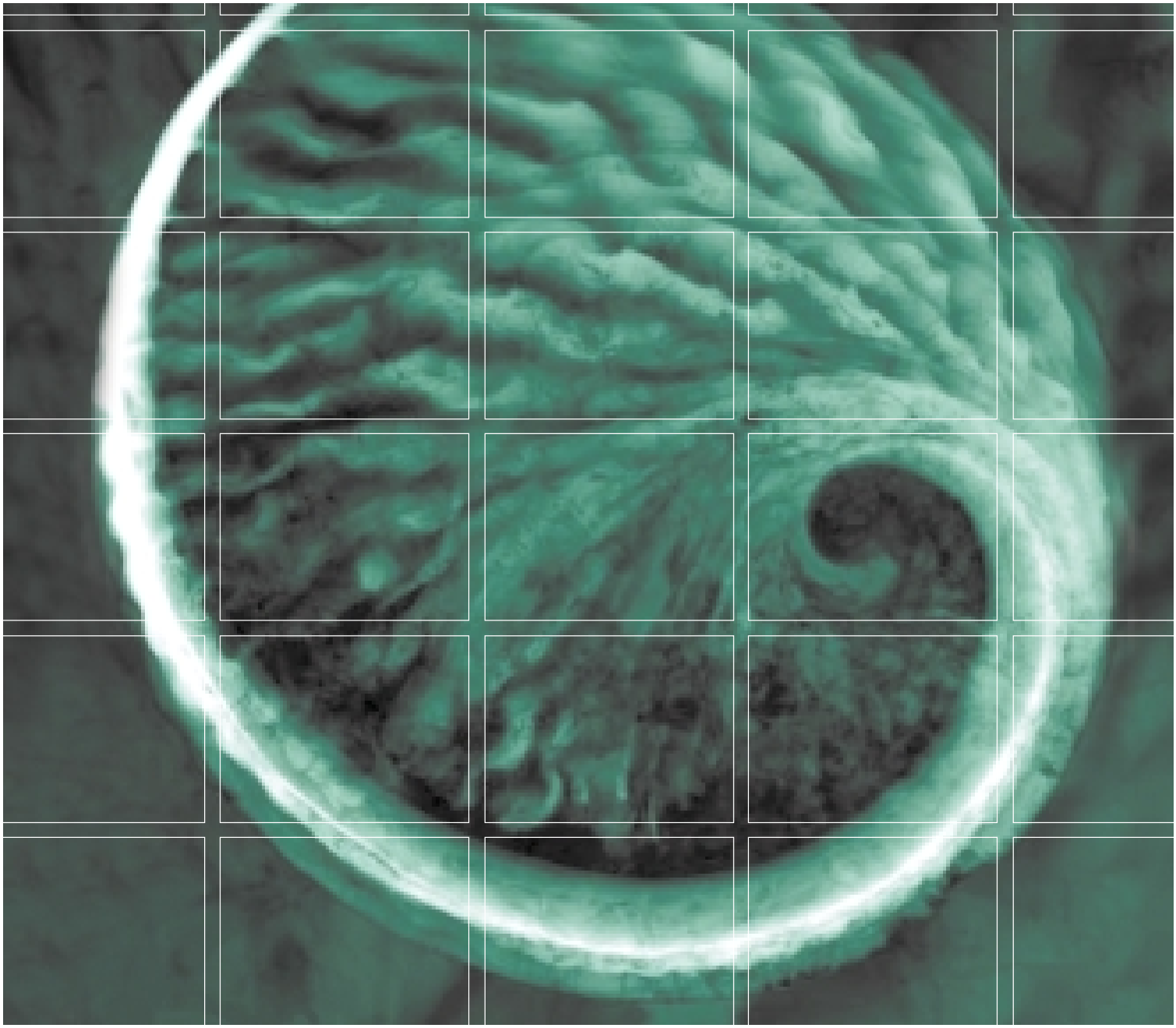


Interim Status Report and CAS Work Plan Revision

Whirlpool Facility, Ft. Smith, Arkansas
Prepared for Whirlpool Corporation

June 25, 2004

Volume 3 of 3

www.erm.com

ERM

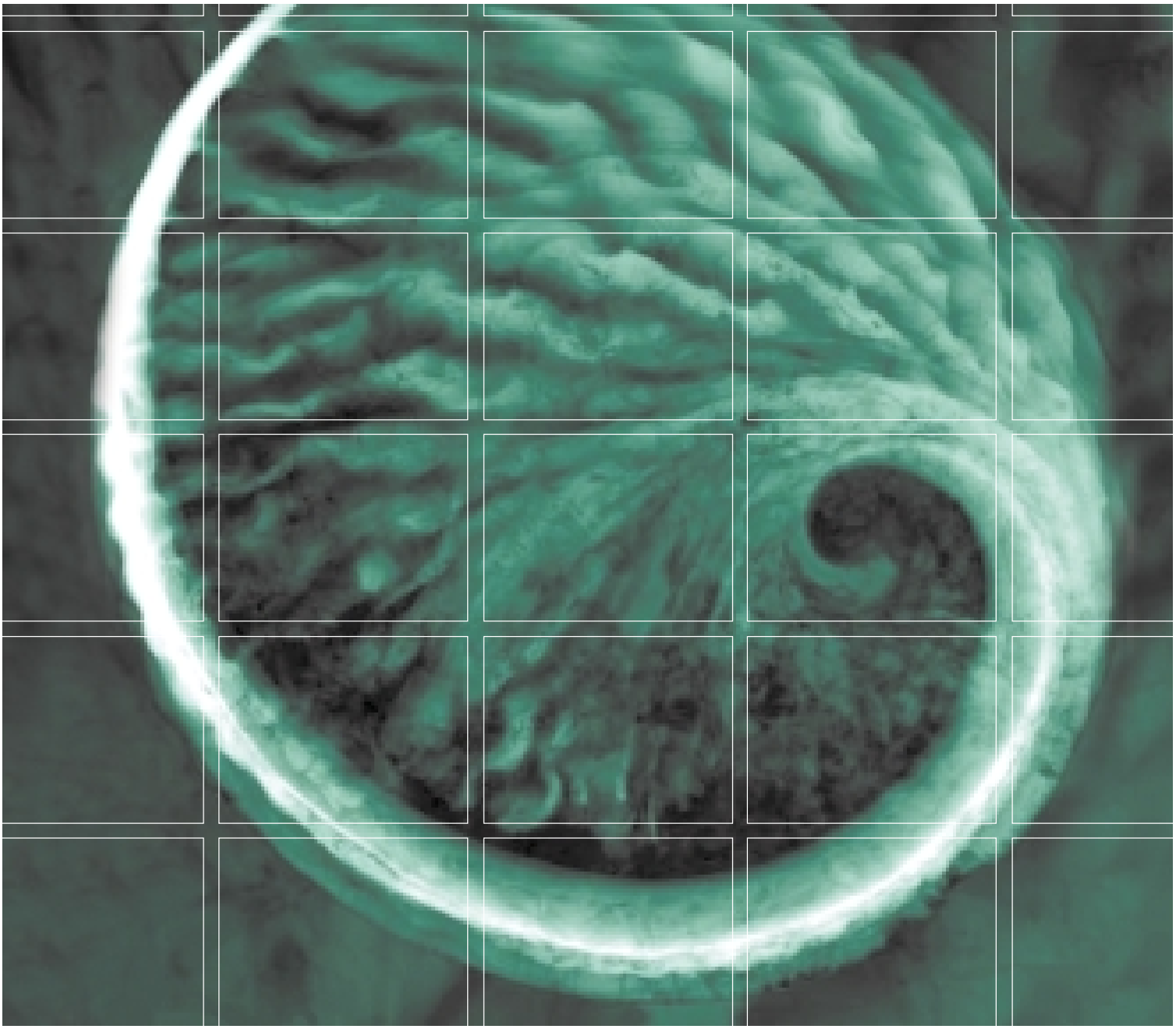
Delivering sustainable solutions in a more competitive world

Site Health & Safety Plan

Appendix E

June 25, 2004
Project No. 0014507

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000



Site-Specific Health and Safety Plan

Corrective Action Strategy Implementation Field Activities
Whirlpool Facility, Fort Smith, Arkansas

Prepared for Whirlpool Corporation

August 15, 2003

www.erm.com

Delivering sustainable solutions in a more competitive world

ERM

Whirlpool Corporation

Site-Specific Health and Safety Plan: *Corrective Action Strategy Implementation Field Activities Whirlpool Facility, Fort Smith Arkansas*

August 15, 2003

W.O. # 581-013

H. Reiffert Hedgcoxe, P.G
Partner-in-Charge

Troy Meinen, P.G.
Project Manager

Jan Simon Clark, CIH, CSP
Project H&S Consultant

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
T: 281-600-1000
F: 281-600-1001

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST OF ATTACHMENTS

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Environmental Resources Management (ERM) developed the following Health and Safety Plan (HASP) for use by ERM personnel and by ERM contractors (individually, an "ERM Contractor" and collectively, "ERM Contractors"). ERM personnel must adhere to the practices and procedures specified in the HASP. Each ERM Contractor must review the HASP and agree to accept and abide by the HASP, subject to any modifications to the HASP (to address the ERM Contractor's more stringent practices and procedures) agreed upon in writing by ERM and the ERM Contractor. The ERM Contractor shall indicate such acceptance by signing Section 20 of this document prior to commencing work at the Site. However, if any ERM Contractor commences work at the Site, the ERM Contractor shall be deemed to have accepted the HASP and the terms hereof and the failure to execute and return to ERM a copy of this notice shall not be relevant to such interpretation.

If a contractor or a person other than the Client, ERM employees and ERM Contractors (individually, a "Third Party" and collectively, "Third Parties") receives a copy of the HASP, such Third Party should not assume that the HASP is appropriate for the activities being conducted by the Third Party.

NO THIRD PARTY HAS THE RIGHT TO RELY ON THE HASP. EACH THIRD PARTY SHOULD ABIDE BY ITS OWN SITE-SPECIFIC HEALTH AND SAFETY PLAN IN ACCORDANCE WITH ITS OWN PROFESSIONAL JUDGMENT AND ESTABLISHED PRACTICES.

ERM shall not be responsible for the implementation of any Third Party safety program(s), except to the extent otherwise expressly agreed upon by ERM and a Third Party in writing. The services performed by ERM for the Client and any right of the client and/or an ERM Contractor to rely on the HASP shall in no way inure to the benefit of any Third Party, including, but not limited to, employees, agents, or consultants and subcontractors of ERM Contractors, so as to give rise to any cause of action by such Third Party against ERM.

The HASP generated by ERM in connection with the Project is for use on a specific site and in connection with a specific project. ERM makes no representation or warranty as to the suitability of the HASP for reuse on another site or as to the suitability of the HASP for reuse on another project or for modifications made by the Client or a Third Party to the HASP.

1. Site Name and Address

Whirlpool Corporation
6400 Jenny Lind Rd.
Fort Smith, Arkansas 72917

2. ERM Project Personnel and Responsibilities

ERM Partner-in-Charge (PIC): H. Reiffert Hedgcoxe, P.G.
Responsible for all work and conducts ultimate Quality Assurance/Quality Control (QA/QC) overview.

ERM Project Manager (PM): Troy Meinen, P.G.
Manages day-to-day activities; reports to PIC.

ERM Project Health and Safety Consultant: Jan Simon Clark, CIH, CSP
Directs development of HASP; provides technical advice on health and safety issues.

ERM Site Safety Officer (SSO): Troy Meinen, P.G. and Karin W. Shultz or Designee
Responsible for implementation of HASP; reports to PIC and PM.

3. Site Description

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Road on the south side of Fort Smith, Arkansas (Figure 1). The facility manufactures side-by-side household refrigerators, trash compactors and icemakers. The facility has been operated by Whirlpool for over 30 years.

Surrounding property uses include light industrial/commercial activities to the south and east, residential to the north and undeveloped land to the west (Figure 3-1). Residential properties to the north include single-family homes and two multi-family units. No recreational or agricultural properties are located in the vicinity of the Whirlpool facility. In addition, schools, hospitals, day care centers, etc. are located at least 0.5 miles from the facility.

Data from a series of soil and ground water investigations at the site indicate the presence of trichloroethylene (TCE) and other related solvents in the shallow ground water.

4. Field Activities

Example 2: In addition to routine ground water monitoring activities, planned work activities in and near the facility include the implementation of off-site ground water plume delineation, which is described in the Corrective Action Strategy Work Plan:

Major tasks to be performed by ERM personnel and/or ERM subcontractors include the following:

- Boring/monitoring well drilling;
- Monitor well installation;
- Monitor well development;
- Environmental media (soil/ground water) sampling; and
- Ground water level measurements.

5. Hazard Identification and Control

Hazard Identification Process

Prior to initiating any new project activity or when there is a change in site conditions, the Site Safety Officer (SSO) will assist project team members in completing a Job Hazard Analysis (JHA). A copy of the JHA form is located in Attachment 1. The SSO or designee will review the JHA with all ERM personnel and/or ERM subcontractors daily prior to starting work.

Chemical Hazards

Chemicals may be introduced into the body by ingestion, inhalation, or absorption through the skin. Since not all chemicals have the same level of toxicity, the length of time for the exposure and the concentration of the chemical are important in determining the risk. Inhalation and skin contact are the most common routes of entry. Chemicals can be introduced into the body by ingestion when chemicals present on the hands are transferred to food or cigarettes.

Based on historical soil and ground water sampling, the following chemicals of concern may be encountered at the site. Material Safety Data Sheets for chemicals of concern are available from the client contact or can be accessed using the computerized MSDS System found on the plantwide computer system. Pertinent health and safety information for the following chemicals of concern are summarized in Table 5-1.

Trichloroethene	1,1-Dichloroethene
trans-1,2-Dichloroethene	Vinyl Chloride
cis-1,2-Dichloroethene	

TABLE 5-1: Summary of Chemical Hazards for Chemicals of Concern

	Published Exposure Limit (8-hour TWA [2])	***Routes of Exposure***	***Target Organs***	***Signs/Symptoms of Exposure (Acute versus Chronic Effects)***	***First Aid &Emergency Response***
Chemical Name Trichloroethylene (Trichloroethene, TCE) CAS 79-01-6 Vapor Pressure 58 mm Hg at 25 °C Ionization Potential 9.45 eV	50 ppm (ACGIH TLV)	Inhalation Skin contact Ingestion	Eyes, skin, respiratory tract, heart, liver, CNS	Acute Eye irritation; skin irritation including dermatitis; headache; vertigo; visual disturbance; fatigue; giddiness; tremors; sleepiness; unnatural drowsiness; nausea; vomiting; pulmonary edema Chronic Cardiac arrhythmias; liver injury	Flush eyes/skin with water Move to fresh air, administer artificial respiration if not breathing If ingested do NOT induce vomiting. Seek medical attention
Vinylidene chloride (1,1 Dichloroethene) CAS: 75-35-4 Vapor Pressure: 600 mm Hg at 25 °C Ionization Potential: 9.6 eV	5 ppm (ACGIH TLV)	Inhalation Skin contact Ingestion	Eyes, skin, respiratory tract, liver, kidneys, CNS	Irritation of eyes; conjunctivitis, transit corneal injury; skin irritation including dermatitis, drowsiness, dizziness; unconsciousness; CNS depressant; liver and kidney dysfunction	Flush eyes/skin with water Move to fresh air, administer artificial respiration if not breathing If ingested rinse mouth, DO NOT induce vomiting, give plenty of water to drink Seek medical attention
cis 1,2-Dichloroethene CAS: 156-59-2 Vapor Pressure: 175 mm Hg at 25°C Ionization Potential: 9.80 eV	200 ppm (OSHA PEL and ACGIH TLV)	Inhalation Ingestion Skin contact	Eyes, respiratory system, CNS	Acute: Irritation of eyes and respiratory system; CNS depression.	Flush eyes/skin with water Move to fresh air, administer artificial respiration if not breathing If ingested, rinse mouth Seek medical attention

TABLE 5-1 (Cont'd): Summary of Chemical Hazards for Chemicals of Concern

Chemical	*Published Exposure Limit [1] (8-hour TWA [2])*	*Routes of Exposure*	*Target Organs*	*Signs/Symptoms of Exposure (Acute versus Chronic Effects)*	*First Aid &Emergency Response*
Vinyl chloride CAS: 75-01-4 Vapor Pressure: 2800 mm Hg at 25 °C Ionization Potential: 10.00 eV	1 ppm (OSHA PEL) 5 ppm (15-minute OSHA STEL[5])	Inhalation Skin contact	Eyes, skin, CNS, liver, spleen, blood	Acute: Eye irritation; frostbite on skin; CNS effects; and, lowering of consciousness. Chronic: Effects the liver, spleen, blood, peripheral blood vessels, tissue and bones of the fingers; and, carcinogenic.	Flush eyes/skin with water Move to fresh air, administer artificial respiration if not breathing Seek medical attention
trans 1,2-Dichloroethene CAS: 156-60-5 Vapor Pressure: 352 mm Hg at 25°C Ionization Potential: 9.80 eV	200 ppm (OSHA PEL and ACGIH TLV)	Inhalation Ingestion Skin contact	Eyes, respiratory system, CNS	Acute: Irritation of eyes and respiratory system; CNS depression.	Flush eyes/skin with water Move to fresh air, administer artificial respiration if not breathing If ingested, rinse mouth Seek medical attention

NOTES:

1. The most conservative published occupational exposure limit is listed. Sources for occupational exposure limits were OSHA and ACGIH.
2. TWA = time weighted average
3. mg/m^3 = milligrams of contaminant per cubic meter of air
4. ACGIH TLV = American Conference of Governmental Industrial Hygienists Threshold Limit Value
5. ppm = parts of contaminant per million parts of air
6. OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit

Sources of information include published exposure limits in 29 CFR 1910.1000 or the 2002 TLV Booklet published by ACGIH, NIOSH pocket guide, Chemical/Physical Properties from Texas Risk Reduction Program, International Chemical Safety Cards, MSDSs, and the HNU listing of Photoionization Characteristics of Selected Compounds.

The following chemicals are routinely used by ERM at the site. The MSDS for these chemicals are located in Attachment 2. Pertinent health and safety information for these chemicals is summarized in Table 5-2.

- Portland Cement
- Liquinox
- Gasoline
- Isobutylene Balance Air
- Bentonite
- Silica Sand

Ambient Air Monitoring

Ambient air monitoring should be conducted by the SSO when there is a question of employee exposure to hazardous concentrations of substances to assure the proper selection of engineering controls, work practices, and PPE. Additional monitoring should be conducted under any of the following circumstances.

- Work begins on a different portion of the site;
- Change in job tasks;
- Change in weather;
- Change in ambient levels of hazardous constituents as indicated by the sense of smell or changes in the physical appearance of the soil or ground water;
- When new hazardous substances are encountered; and
- During high-risk operations (e.g. drum opening, or handling of leaking drums, or when working in areas with obvious liquid contamination).

Ambient air monitoring will be conducted using direct-reading real-time instruments as indicated in Table 5-3. If more that one instrument is listed, either instrument may be chosen. Not all work at the site will require ambient air monitoring for all contaminants. During the mobilization phase of a particular project task or activity, either the Project Manager or the SSO will determine what contaminants may be encountered in order to have the appropriate instrumentation on-site. The Project Health and Safety Consultant is available to assist the Project Manager or the SSO in determining the appropriate instrumentation.

TABLE 5.3: Ambient Air Monitoring Instruments

Contaminant	***Instrument***
Organics	OVM Model 580B with 11.8 eV lamp

Direct reading instrumentation will be calibrated daily per manufacturer's instructions. Cylinders of the appropriate calibration gas will be required for fieldwork lasting longer than one day.

Under stable site conditions, ambient air monitoring will be conducted at least once every two hours in the workers' breathing zone and at other locations based on the

TABLE 5-2: Summary of Chemical Hazards for Chemicals Routinely Used by ERM

	Exposure Limit [1] (8-hr TWA [2])	***Routes of Exposure***	***Target Organs***	***Signs/Symptoms of Exposure (Acute versus Chronic Effects)***	***First Aid & Emergency Response***
Chemical Name: Gasoline CAS: 86290-81-5 Vapor Pressure: 5-15 psi at 100°F Ionization Potential: N/A, mixture	300 ppm [5] (ACGIH TLV)	Inhalation Skin contact Ingestion	Skin, CNS, respiratory system	Acute Irritation of eyes and skin; CNS effects include headache, nausea, dizziness, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, disorientation, tremors, convulsions, loss of consciousness Chronic Dermatitis; may effect the CNS and liver; possible carcinogen	Flush eyes/skin with water Move to fresh air, administer artificial respiration if not breathing If ingested, do not induce vomiting, drink water or milk Seek medical attention
Chemical Name: Portland Cement Vapor Pressure: N/A, solid Ionization Potential: N/A, solid	10 mg/m^3 (ACGIH TLV)	Inhalation Skin contact Ingestion	Eyes, skin, respiratory system	Acute Irritation of eyes, skin and respiratory system; skin burns Chronic Contains trace amounts of crystalline silica which cause silicosis and may be carcinogenic	Flush eyes/skin with water Administer artificial respiration if not breathing Seek medical attention immediately if ingested
Chemical Name: Bentonite Vapor Pressure: N/A, solid Ionization Potential: N/A, solid	0.05 mg/m^3 (ACGIH TLV for crystalline silica)	Inhalation Skin contact Ingestion	Eyes, skin, respiratory system	Acute Irritation of eyes, skin and respiratory system Chronic Contains trace amounts of crystalline silica which may cause silicosis; potential carcinogenic	Flush eyes/skin with water Administer artificial respiration if not breathing Seek medical attention immediately if ingested

TABLE 5-2 (Cont'd): Summary of Chemical Hazards for Chemicals Routinely Used by ERM

Chemical	*Exposure Limit (1) (8-hr TWA (2))*	*Routes of Exposure*	*Target Organs*	*Signs/Symptoms of Exposure (Acute versus Chronic Effects)*	*First Aid & Emergency Response*
Chemical Name: Silica sand Vapor Pressure: N/A, solid Ionization Potential: N/A, solid	0.05 mg/m^3 (ACGIH TLV)	Inhalation Skin contact Ingestion	Eyes, respiratory system	Acute Irritation of eyes; coughing Chronic Silicosis; lung carcinogen	Flush eyes with water Move to fresh air Seek medical attention
Chemical Name: Isobutylene Balance Air CAS: N/A, mixture Vapor Pressure: N/A, gas at ambient conditions Ionization Potential: N/A, mixture	None established	Inhalation	Respiratory system	Acute: Simple asphyxiant, difficulty breathing, cyanosis, rapid pulse, impairment of senses, mental disturbances, and convulsions Chronic: None known	Move to fresh air, administer artificial respiration if not breathing See medical attention

NOTES:

7. The most conservative published occupational exposure limit is listed. Sources for occupational exposure limits were OSHA and ACGIH.
8. TWA = time weighted average
9. mg/m^3 = milligrams of contaminant per cubic meter of air
10. ACGIH TLV = American Conference of Governmental Industrial Hygienists Threshold Limit Value
11. ppm = parts of contaminant per million parts of air
12. OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit

Sources of information include published exposure limits in 29 CFR 1910.1000 or the 2002 TLV Booklet published by ACGIH, NIOSH pocket guide, Chemical/Physical Properties from Texas Risk Reduction Program, International Chemical Safety Cards, MSDSs, and the HNU listing of Photoionization Characteristics of Selected Compounds.

professional judgment of the SSO or the Project Health and Safety Consultant. Ambient air monitoring results will be record on the Ambient Air Monitoring Form found in Attachment 3. If site conditions become unstable or change dramatically ambient air monitoring will be conducted more frequently based on the professional judgment of the SSO or the Project Health and Safety Consultant.

Table 5-4 outlines the steps to be taken by the SSO when the action levels of the various contaminants are exceeded. Respiratory protection is selected based on occupational exposure limits of the constituents at the site and the potential for exposure to vapors and dust from site activities.

TABLE 5-4: Action Levels and Response Actions Requirements

Chemical	***Action Level***	***Response Actions***
Organics	PID reads 5 ppm sustained in the breathing zone for 1 minute	• Stop work and workers leave immediate area • SSO evaluates need for Tyvek coveralls, dons half-face respirator with organic vapor cartridges and monitors again after allowing vapors to dissipate • If readings are less than 5 ppm, resume work • If readings are 5 ppm or greater, resume work wearing half-face respirators with organic vapor cartridges and Tyvek coveralls if required.
	PID reads 10 ppm sustained in the breathing zone for 1 minute	• Stop work and workers leave immediate area • Contact Project Manager and Project Health and Safety Consultant • Evaluation work practices and assess engineering controls to reduce airborne concentrations. • SSO waits 15 minutes, evaluates need for Tyvek covers, dons half-face respirator with organic vapor cartridges, approaches work area slowly, if PID reaches 5 ppm, back out and wait an additional 15 minutes before repeating monitoring

Site-Specific and Task-Specific Hazards and Control Strategies

The hazards and control strategies associated with planned work activities are summarized in Table 5-5. During the mobilization phase of a specific work task, the project team can quickly review the hazards and control strategies by locating the task or activity to be performed on the table. Hazards that are common to all activities performed at the site at listed first. The hazards listed for a particular task or activity includes the common hazards.

However prior to initiating any new project activity or when there is a change in site conditions, an additional JHA will be completed. A copy of the JHA form is located in Attachment 1.

TABLE 5-5: Site-Specific and Task-Specific Hazards and Control Strategies

	Hazards	***Control Strategy***
All activities in project area or associated with project Level D PPE	Biological - poisonous plants, insects, animals	• Appropriate protective clothing where needed (e.g., snake guards in high grass) • Wash exposed body parts and equipment thoroughly after work in highly-vegetated areas • Pant bottoms and sleeve cuffs can be taped closed to prevent skin contact • Insect repellent • Awareness training - what poisonous plants look like and location (if any) of poisonous plants at the site (Attachment 4)
	Foreign matter in eye	• Eye wash stations
	Heat Stress	• Awareness training – signs/symptoms of heat stress disorders • Scheduling of work/rest periods • Replacement fluids • Shaded area for rest breaks • Cool vests or bandanas
	Cold Stress	• Scheduling of work/rest periods • Replacement fluids • Heated area for rest breaks
	Ultraviolet Radiation	• Apply sunscreen frequently to exposed skin (wash hands before re-application)
	Walking working surfaces – uneven terrain, steep grades, slippery surfaces, ditches	• Awareness of terrain and footing
	Overhead hazards or potential for objects to fall from elevated surfaces	• Awareness of surroundings • Toe boards on elevated surfaces

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

Task/Activity	*Hazards*	*Control Strategy*
All activities in project area or associated with project Level D PPE	Operation of heavy equipment such as dozers/back holes	• Operator performs and documents daily equipment inspection • Use of high visibility clothing for personnel working near heavy equipment • Limit access to areas around heavy equipment • Only trained personnel to operate heavy equipment • Employees working around heavy equipment should maintain eye contact with heavy equipment operator
Moving drill rig and associated equipment to/from the site Level D PPE	Moving equipment over uneven terrain Electrical hazards – overhead electrical lines	• Inspect path of travel for ruts, soft spots or other hazards • Use mats or boards if necessary • Awareness of overhead lines • Lower equipment prior to moving • Set rig at least 20 feet away from overhead electrical lines
Rigging-up/down drill rig and associated equipment Level D PPE	Electrical hazards – overhead electrical lines, electrically powered equipment Lifting strain Pinch points	• Use low-voltage equipment with ground fault interrupters (GFCI) • Properly ground equipment • Awareness of overhead lines • Lower equipment prior to moving • Set rig at least 20 feet away from overhead electrical lines • Monitor weather for approaching thunderstorms/lightning • Use equipment designed for the job • Use proper lifting techniques • Lift smaller, lighter loads • Move feet with load, don't twist the back • Avoid awkward postures • Awareness and use correct tool for the job

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

Task/Activity	*Hazards*	*Control Strategy*
Rigging-up/down drill rig and associated equipment Level D PPE	Rotating equipment	• Verify appropriate guarding installed and functional • Prohibit wearing of loose clothing/jewelry that could become caught in rotating equipment
	Heavy equipment being used	• Awareness of location of heavy equipment and operator's blind spots • Make eye contact with heavy equipment operator
	Subsurface hazards	• Locate utility lines and pipelines prior to drilling by either contacting One Call • Client verify existence/absence of any subsurface hazards • Clear location in accordance with approved Pre-drilling protocol
Cementing activities Level D PPE Modified Level D PPE	Inhalation of or skin contact with cement	• Stand upwind • Wear thin latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin nitrile gloves • Tyvek © coveralls if a splash hazard exists • Goggles if a splash hazard exists
	Lifting strain	• Use equipment designed for the job • Use proper lifting techniques • Lift smaller, lighter loads • Move feet with load, don't twist the back • Avoid awkward postures
Concrete coring Level D PPE Modified Level D PPE	Electrical hazards	• Use low-voltage equipment with ground-fault interrupters • Properly ground equipment • Inspect electrical cords or wires for frayed or cracked insulation
	Slippery, wet work surfaces	• Safe work practices
	Noise	• Hearing protection required within 20 feet of generator
	Rotating equipment	• Verify appropriate guarding installed and functional • Prohibit loose clothing, jewelry around rotating equipment • Daily equipment inspections

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

Task/Activity	*Hazards*	*Control Strategy*
Clean-up and restore location Level D PPE Modified Level D PPE	Operation of heavy equipment such as dozer/back holes	• Operator performs and documents daily equipment inspection • Use of high visibility clothing for personnel working near heavy equipment • Limit access to areas around heavy equipment • Only trained personnel to operate heavy equipment • Employees working around heavy equipment should maintain eye contact with heavy equipment operator
	Lifting strain	• Use equipment designed for the job • Use proper lifting techniques • Lift smaller, lighter loads • Move feet with load, don't twist the back • Avoid awkward postures
	Inhalation of or skin contact with drilling fluids/cuttings	• Stand upwind • Wear thin latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin nitrile gloves • Tyvek© coveralls if a splash hazard exists • Goggles if a splash hazard exists
Sampling disposal soils and water from containers Modified Level D PPE	Inhalation/skin contact with constituents in soil and water and skin contact with preservatives in laboratory supplied jars	• Ambient air monitoring per project plan • Stand upwind • Surgical latex or nitrile gloves if handling soil or sampling water • Wear goggles when sampling water

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

	Hazards	***Control Strategy***
Monitor well installation and development Level D PPE Modified Level D PPE Level C PPE	Electrical hazards from electrically powered submersible pump	• Use low-voltage equipment with ground-fault interrupters • Properly ground equipment • Inspect electrical cords or wires for frayed or cracked insulation
	Lifting pumps, boring and well installation materials, and handling drums of development water	• Proper lifting techniques • Two person lifts where necessary • Mechanical aids like fork lifts or cranes where necessary
	Inhalation of/or skin contact with constituents in development water	• Ambient air monitoring per project plan • Stand upwind of well • Wear thin latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves • Tyvek® coveralls
	Inhalation or skin contact with Bentonite, Portland cement, sand during cementing activities	• Ambient air monitoring per project plan • Stand upwind
	Muscle strain or overexertion from bailing well	• Stretch before beginning to bail the well • Take breaks or alternate bailing with a second person
Gauging water level in existing monitoring wells Level D PPE	Skin contact with constituents in ground water	• Ambient air monitoring per project plan • Stand upwind • Wear surgical latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture surgical nitrile gloves

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

Task/Activity	*Hazards*	*Control Strategy*
Environmental media sampling (soil/sludge) Level D PPE Modified Level D PPE Level C PPE	Muscle strain or overexertion from hand augering Inhalation of/or skin contact with constituents in soil Cutting hand with knife while slicing open sample sleeve Subsurface Hazards	• Stretch before beginning to auger • Take breaks or alternate hand augering with a second person • Ambient air monitoring per project plan • Stand upwind • Wear thin latex or nitrile gloves if handling soil • Tyvek® coveralls (when within exclusion zone) • Sharpen knife or cutting tool • Slice away from body • Keep hands out of path of travel of knife or cutting tool • Locate utility lines and pipelines prior to drilling by either contacting One Call • Client verify existence/absence of any subsurface hazards • Clear location in accordance with approved Pre-drilling protocol
Environmental media sampling (ground water/ LNAPL) Level D PPE Modified Level D PPE	Inhalation of/or skin contact with constituents in ground water Muscle strain or overexertion from bailing well Electrical hazards from electrically powered pump	• Ambient air monitoring per project plan • Stand upwind • Wear thin latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves • Tyvek® coveralls (when within exclusion zone) • Stretch before beginning to bail the well • Take breaks or alternate bailing with a second person • Use low-voltage equipment with ground-fault interrupters • Properly ground equipment • Inspect electrical cords or wires for frayed or cracked insulation

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

Task/Activity	*Hazards*	*Control Strategy*
Decontamination of Heavy Equipment Modified Level D PPE	Inhalation of/or skin contact with constituents in soil/water adhered to equipment	• Ambient air monitoring per project plan • Stand upwind • Wear thin latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves • Tyvek® coveralls • Rubber boots if potential to significantly splash feet
	Accidents from equipment operations, tools and rotating parts (i.e., pressure washer)	• Verify appropriate guarding installed and functional • Prohibit loose clothing and jewelry around rotating equipment • Inspect hoses prior to use • Bleed lines prior to disconnecting hoses
Decontamination of sampling equipment Modified Level D PPE	Inhalation of/or skin contact with constituents in soil/water adhered to sampling equipment	• Ambient air monitoring per project plan • Stand upwind • Latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture latex or nitrile gloves • Coated Tyvek® coveralls if potential for splashing onto clothing • Rubber boots if potential to significantly splash feet
Personnel decontamination Level D PPE Modified Level D PPE	Inhalation of/or skin contact with constituents in soil/water	• Ambient air monitoring per project plan • Stand upwind • Wear thin latex or nitrile gloves • Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves • Tyvek® coveralls • Rubber boots if potential to significantly splash feet

TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

Task/Activity	*Hazards*	*Control Strategy*
Boring/Well drilling Well plugging & abandonment Level D PPE Modified Level D PPE	Accidents from equipment operations, tools and rotating parts Electrical hazards – overhead electrical lines, electrically powered equipment Subsurface hazards Lifting drill pipe, augers, bags of sand/cement/ bentonite Noise Moving drill rig over uneven terrain Rupture of high pressure hydraulic or air lines Inhalation or skin contact with constituents in soil cuttings/cores	• Verify appropriate guarding installed and functional • Prohibit loose clothing and, jewelry around rotating equipment • Use low-voltage equipment with ground-fault interrupters • Properly ground equipment • Awareness of overhead electrical lines • Lower drill rig boom prior to moving rig • Erect rig at least 20 feet away from overhead electrical lines (to work closer than 20 feet to overhead electrical lines, contact HSO) • Locate utility lines and pipelines prior to drilling • Probe proposed drilling site with 5-foot steel rod prior to drilling • Visually inspect proposed drilling site • Use proper lifting techniques • Use two person lifts when necessary • Use mechanical aids like fork lifts or cranes when necessary • Hearing protection for all personnel in areas > 85 dBA • Inspect path of travel for ruts, soft spots or other hazards • Use mats if necessary • Lower drill rig boom prior to movement • Inspect high pressure hydraulic or air lines prior to use • Ambient air monitoring per project plan • Stand upwind during drilling • Wear thin latex or nitrile gloves when handling soil • Wear Tyvek® coveralls if drilling using a mud-based system

6. Personal Protective Equipment

The level of PPE selected for a task is based on the following.

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity;
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done; and
- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be better identified.

In addition to summarizing the general PPE requirements for tasks performed at the site, Table 6-1 also serves as the written certification that the PPE Hazard Assessment has been conducted. The signature page containing the client's name, project name and number, date and signatures of the parties responsible for the development of the HASP also serve as part of the written certification.

Respiratory Protection

The type of respiratory protection required will be based on the results of ambient air monitoring, the results of any models used to predict ambient air concentrations, and the professional judgment of either the SSO or the Project Health and Safety Consultant. Respiratory protection requirements are outlined on Table 5-4.

As required by 29 CFR 1910.134, *Respiratory Protection*, a cartridge change-out schedule will be developed based on either the results of ambient air monitoring, the results of any models used to predict ambient air concentration or the professional judgment of the Project Health and Safety Consultant and the results of the 3M Respirator Service Life Software. Although 3M respiratory protection devices may not be worn, the results generated by the Respirator Service Life Software serve as a point of reference in determining the cartridge change-out schedule.

At a minimum, new respirator cartridges must be placed on the respirator at the beginning of the shift and after lunch.

TABLE 6-1: Personal Protection Equipment Requirements		
PPE Level	**Ensemble Components**	**Anticipated Use**
Level D Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.	• Long pants and shirt with sleeves • Steel-toed footwear (during drilling activities) • Safety glasses with molded side shields • Hard hat (during drilling activities) • General purpose work gloves if task does not involve water or wet materials • Hearing protection • High visibility traffic vest (when near traffic)	Moving and rigging up drill rig Clean up and restoration of Site Monitor well installation Environmental media sampling Disposal soils/liquids sampling Gauging water levels
Modified Level D	Level D and the following: • Disposal Tyvek coveralls • Steel-toed rubber boots or disposal boot covers over shoes • Thin latex or nitrile gloves • Green nitrile gloves over thin latex or nitrile gloves when primary gloves may tear or puncture	Any of the above-referenced tasks in which there is moderate potential for skin contact Cementing activities Monitor well development Decontamination activities
Level C Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin prot1ection is needed.	Level D or Modified Level D and the following: • Half-face air purifying respirator with combination organic vapor/high efficiency particular air (HEPA) cartridges	Any of the above-referenced tasks in which there is moderate potential for skin contact with constituents and data indicating need for respiratory protection
Level B Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed.	Not anticipated to be required	Tasks requiring Level B PPE are not anticipated during this project. If Level B PPE is needed, as determined by the SSO and/or the Project Health and Safety Consultant, the HASP will be revised.
Level A Should be worn when the highest level of respiratory, skin, and eye protection is needed.	Not anticipated to be required	Tasks requiring Level A PPE are not anticipated during this project. If Level A PPE is needed, as determined by the SSO and/or the Project Health and Safety Consultant, the HASP will be revised

7. Heat Stress

Heat stress is caused by a combination of factors such as temperature, humidity, type of work being performed, and use of personal protective equipment including protective clothing. Heat stress tends to increase body temperature, heart rate, and sweating. The key to preventing heat stress is education of personnel relative to the hazards associated with working in the heat and implementation of proper controls and work practices. Table 7-1 summarizes heat stress disorders and prevention/first aid issues.

When the temperature is above 80 degrees Fahrenheit, the SSO will monitor both the temperature and the humidity throughout the day in order to determine the Heat Index. The National Weather Service has developed a Heat Index that combines the ambient temperature and humidity into value that reflects how hot it really feels. This Heat Index can be used to determine the risk associated with working outdoors during the hot months of the year. To use the chart (Table 7-2), read the temperature at the left and humidity across the top, the Heat Index is where the two intersect. For example, with a temperature of 96 and a humidity of 50%, the Heat Index is 108.

The SSO will also inform site workers when the Heat Index Risk Level, as defined on Table 7-3, reaches Danger and/or Extreme Danger, the following additional precautions may be implemented at the discretion of the SSO based on factors such as use of Tyvek coveralls and the physical activity associated with each task. The following actions or work practices will be implemented, as practical, as part of the Heat Stress Management Program.

- Designated areas will be used for site workers to take breaks and for eating.
- If possible, physically demanding and strenuous tasks may be scheduled for the cooler parts of the day.
- Site workers will be required to drink 6-8 ounces of cool water or electrolyte replacement drinks every 60 minutes. Diabetics should use caution when using electrolyte replacement drinks to replenish fluids. Electrolyte replacement drinks may have high sugar content.
- Site workers taking prescription medications should check with their doctor or other medical professional regarding the interaction between working in hot environments and their medications.
- SSO will more closely observe site workers, especially those working in Tyvek coveralls or performing strenuous job tasks.
- Implement worker rotation during strenuous or physically demanding job tasks.
- SSO will implement a work-rest cycle.

The work-rest cycle outlined below may be implemented based on the professional judgment of the SSO and/or the Project Health and Safety Consultant.

Heat Index	***Risk Level***	***Work-Rest Cycle***
> 130	Extreme Danger	15 minute break every 30 minutes
105-130	Danger	15 minute break every 60 minutes
90-105	Extreme Caution	15 minute break every 90 minutes
80-90	Caution	15 minute break every 120 minutes

TABLE 7-1: Heat Stress Disorders

Disorder	*Symptoms*	*Cause*	*Prevention/First Aid*
Heat Rash or Prickly Heat	♦ Rash ♦ Itching	♦ Hot, humid conditions ♦ Sweat doesn't evaporate easily ♦ Sweat ducts become clogged	♦ Ointments ♦ Keep skin clean and dry ♦ Good daily personal hygiene
Heat Cramps	♦ Sudden onset of muscle cramps usually in legs or arms ♦ Hot, moist skin ♦ Normal pulse ♦ Normal or slightly elevated temperature	♦ Loss of water (sweating) ♦ Loss of electrolytes ♦ Replacing water but not electrolytes	♦ Move into shade ♦ Loosen clothing ♦ Drink tepid electrolyte drinks or water ♦ Seek medical assistance if conditions persist
Heat Exhaustion	♦ Pale, clammy skin ♦ Profuse perspiration ♦ Thirst from dehydration ♦ Weakness ♦ Headache ♦ Nausea ♦ Loss of coordination	♦ Overexertion ♦ Excessive loss of water and electrolytes	♦ Move into shade ♦ Remove PPE ♦ Loosen street clothing ♦ Cool by applying damp cool compresses or ice packs ♦ Drink tepid electrolyte drinks or water ♦ Summon medical assistance
Heat Stroke	♦ Elevated temperature (>103F) ♦ Flushed, hot, dry skin ♦ Absence of sweating ♦ Delirious ♦ Rapid pulse ♦ Nausea ♦ Headache ♦ Dizziness ♦ Unconsciousness	♦ Failure of body's cooling (sweating) mechanism	♦ Summon medical assistance ♦ Move to shade ♦ Remove PPE ♦ Loosen street clothing ♦ Cool by fanning or applying damp compress or ice packs

TABLE 7-2: Heat Index Chart

		Relative Humidity (%)												
		40	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**
Temperature (F)	**110**	136												
	108	130	137											
	106	124	130	137										
	104	119	124	131	137									
	102	114	119	124	130	137								
	100	109	114	118	124	129	136							
	98	105	109	113	117	123	128	134						
	96	101	104	108	112	116	121	126	132					
	94	97	100	102	106	110	114	119	124	129	136			
	92	94	96	99	101	105	108	112	116	121	126	131		
	90	91	93	95	97	100	103	106	109	113	117	122	127	132
	88	88	89	91	93	95	98	100	103	106	110	113	117	121
	86	85	87	88	89	91	93	95	97	100	102	106	108	112
	84	83	84	85	86	88	89	90	92	94	96	98	100	103
	82	81	82	83	84	84	85	86	88	89	90	91	93	95
	80	80	80	81	81	82	82	83	84	84	85	86	86	87

TABLE 7-3: Heat Index Risk Level and Associated Health Effects

Heat Index	Associated Risk
>130	**Extreme Danger** Heat stroke highly likely with continued exposure
105-130	**Danger** Heat exhaustion and heat cramps likely and heat stroke possible with prolonged exposure and/or physical activity
90-105	**Extreme Caution** Heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity
80-90	**Caution** Fatigue possible with prolonged exposure and/or physical activity

NOTES:

- Heat Index values were devised for shady, light wind conditions. Exposure to full sun may increase these values by up to 15 degrees.
- Heat Index values were devised for the general public wearing typical lightweight summer clothing. Acclimatized workers may be able to work under conditions with a slightly higher Heat Index.
- The use of personal protective equipment, including clothing increases the heat stress load on the body.

8. Client Specific Requirements

Client specific requirements for the work governed by this HASP are included in "Safety Standards for Contractors" included as Attachment 9.

9. Safe Work Practices and Standard Operating Procedures

General Site Provisions

Smoking and Eating Areas
Smoking will only be allowed in designated areas. Upon mobilization at the site, the SSO will establish smoking areas per site-specific or client-specific requirements. Individuals caught smoking outside the designated smoking areas will be subject to disciplinary action up to and including immediate termination.

Upon mobilization at the site, the SSO will establish eating and break areas per site-specific or client-specific requirements. Eating will only be allowed in the designated areas and the areas will be maintained in a clean and sanitary condition.

Sanitation and Potable Water
Restrooms and hand washing facilities are available in the Manufacturing Building and other site buildings.

Containers used for drinking water will be equipped with a tap and capable of being tightly closed. In addition, the container will be labeled as "Drinking Water" or "Potable Water." Disposal cups will be stored in a sanitary condition and a receptacle for disposing of the cups will be near-by.

Temporary Facilities
This project will not require any temporary facilities.

Standard Operating Procedures

The following standard operating procedures will be adhered to at all times.

- All personnel entering the site must check in with the SSO.
- All individuals entering the site must demonstrate to the SSO that they have been adequately trained as defined in Section 10.
- All individuals must be familiar with emergency communication methods and how to summon emergency assistance.
- Use of alcoholic beverages before, during operations, or immediately after hours is absolutely forbidden. Alcohol can reduce the ability to detoxify compounds absorbed into the body as the result of minor exposures and may have negative effects with exposure to other chemicals. In addition, alcoholic beverages will dehydrate the body and intensify the effects of heat stress.
- Horseplay of any type is forbidden.

- All unsafe conditions will be immediately reported to the SSO, who will document such conditions in the field log. The SSO will be responsible for ensuring that the unsafe condition is correctly as quickly as possible.
- Smoking, matches, and lighters are only allowed in the designated smoking area.
- Avoid contact with potentially contaminated substances. Avoid, whenever possible, kneeling on the ground, or leaning or sitting on trucks, equipment or the ground. Do not place equipment on potentially contaminated surfaces.
- If PPE becomes torn or saturated with contaminated material, immediately leave work area, and replace the affected PPE. Additionally, wash any exposed skin thoroughly with soap and water.

Safe Work Practices

Ergonomics

Ergonomic risk factors include repetitive motion, force, awkward posture and vibration. The key to preventing ergonomic injuries is education of personnel relative to the hazards and risk factors and implementation of proper controls and work practices. When completing JHAs the Project Health and Safety Consultant will assist project team members in identifying ergonomic risk factors and appropriate control methods.

Several tasks associated with this project have the potential to cause back injuries, if proper lifting techniques are not followed. Site workers should not lift objects that are beyond their physical capabilities and the use of mechanical devices such as forklifts is encouraged. Also, when shoveling site workers should not twist their backs while moving materials with the shovel. The proper technique is to move the feet.

Proper lifting techniques are summarized below.

- Place feet shoulder width apart with toes pointing slightly out;
- Bend at your knees keeping back straight;
- Get a good grip on the object and pull object close to your body;
- Tighten abdominal muscles;
- Keep your head up, looking forward, and lift with your legs while maintaining a straight back;
- Keep load close to your body and ensure your view is not obstructed;
- If one end of the load is heavier than the other, the heavier end should be closest to your body;
- Move your feet to relocate the object as opposed to twisting your back; and
- When placing the object down, bend your knees and use your leg muscles while keeping your back straight.

Pre-Drilling/Pre-Excavation and Probing Protocol

Prior to mobilizing to the field, the Project Manger will be responsible for ensuring the following issues have been adequately addressed.

- Verifying the Client has contacted the local one call service or equivalent to identify underground pipelines, utility lines, and fiber optic cable;
- Verifying the Client has contacted the appropriate municipality to identify underground water and sewer lines;
- Verifying the Client has contacted posted pipeline companies; and
- Contacting client to identify underground pipelines or other obstructions.

Prior to commencing drilling or excavating activities, the intended path will be hand-probed to a depth to ensure that the drilling or excavating activity will not hit an underground obstruction. Under no circumstances should drilling or excavating activities be conducted in an area that has not been probed. The probing rod will be pushed into the ground by hand and will not be struck with a hammer or other similar tool.

Fall Protection

This project does not involve working from heights more than six feet above grade.

In the event that a problem develops with the drill rig mast, the mast will be lowered to provide access below six feet above grade. The distance above grade is measured from the employee's feet to the grade or approved work surface.

Weather Related Events

Weather related events that may impact field work include, but are not limited to, rain, thunder, lightning, flash flooding and tornados. The SSO will be responsible for determining what site work can be performed safely in the rain and at what point work will cease due to either quality or safety issues. In the event of thunder and/or lightning, all work will be suspended until 15 minutes have elapsed from the last clap of thunder or flash of lightning.

During rain, lightning and/or thunder events, site workers should seek shelter in either a building or vehicle. In the event of a tornado, site workers should proceed to the closest shelter location as identified in Attachment 10 "Evacuation and Emergency Plan".

Night Work

*T*his project will not involve activities being performed at night.

Noise

Employees performing any noisy task regardless of duration of the task, or employees working within 20 feet of the person performing the task will wear hearing protection consisting of either earplugs or earmuffs. Noisy tasks include, but are not limited to, operating heavy equipment, using power tools, and operation of a drill rig or geoprobe.

Personnel operating a drilling rig/geoprobe or standing within 20 feet of a drilling rig/geoprobe during operation will also wear hearing protection.

10. Employee Training

All employees and subcontractors working on-site, who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site will receive training meeting the requirements of 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER) before they are permitted to engage in any job task. Employees will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility. Once on-site all site workers will receive training covering at a minimum the following.

- Names of personnel and alternates responsible for site safety and health;
- Safety, health and other hazards present on the site;
- Use of PPE;
- Work practices by which the employee can minimize risks from hazards;
- Safe use of engineering controls and equipment on the site; and
- Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards.

In addition, all site workers are required to be trained on Whirlpool "Safety Standards for Contractors" (Attachment 9) and this HASP.

Subcontractor Training

The SSO will verify that subcontractor personnel have received all appropriate training as required by this HASP prior to their arriving on-site. Verification will consist of reviewing written training documentation such as copies of training certificates or cards issued be a Contractor Safety Council provided by the subcontractor. Copies of the written training documentation will be retained in the project file. Subcontractor personnel will not be allowed to work at the site unless said training documentation is available.

Daily Tailgate Safety Meeting

A tailgate safety meeting will be conducted each morning. The daily safety meeting meetings will include awareness concerns such as special concerns regarding health and safety, pollution prevention or a discussion of recent incidents or safety observations. Issues such as any changes to the HASP or JHAs and comments from the project personnel will be addressed daily. The meetings will include a discussion of what tasks will be completed that day and how those tasks will be conducted safely. The meetings will be documented on the Daily Safety Meeting form found in Attachment 5.

11. Medical Surveillance

All ERM employees are enrolled in a medical surveillance program. All employees receive an initial medical examination and consultation prior to assignment to any job site. In addition, employees receive an annual medical examination, a medical examination upon termination of employment, and a medical examination when the employee exhibits signs or symptoms relating to possible overexposure to hazardous substances or when an injury or exposure above published exposure limits has occurred in an emergency situation.

Additional medical surveillance should be provided for employees who:

- Are or may be exposed to hazardous substances or health hazards at or above published exposure levels for these substances for 30 days or more a year;
- Wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134, *Respiratory Protection*; and
- Are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

12. Site Control Measures

All ERM personnel and/or ERM subcontractors must sign in at the Whirlpool Contractor Gate when arriving on-site and must sign out when leaving the site at the end of the day. In addition, the SSO or designee shall check in with the Site contact on the first day of field activities.

For drilling and or excavation projects the work area shall be identified with flagging and a specific decontamination area shall be designated. Access to the work area shall be monitored by the SSO to keep unauthorized individuals away from the drilling and excavation activities.

13. Decontamination Procedures

Decontamination involves the orderly controlled removal of contaminants from both personnel and equipment. The purpose of decontamination procedures is to prevent the spreading of contaminated materials into uncontaminated areas. All site personnel should limit contact with contaminated soil, ground water or equipment in order to reduce the need for extensive decontamination.

Equipment and materials used in the decontamination process may include the following.

- High pressure/hot water cleaning using only potable water/fire water;
- Phosphate-free detergent;
- Five-gallon bucket;
- Potable water;

- Distilled water;
- Paper towels; and
- Brushes.

Personnel Decontamination
The following decontamination procedures will be utilized.

- Clean shoes with phosphate-free detergent and water;
- Remove all PPE and dispose of the PPE in the designated drums; and
- Wash hands and any skin that may have come in contact with affected soil or ground water with moistened disposable towels, such as baby wipes, or soap and water.

Spent PPE and decontamination water shall be stored in sealed containers for disposal by the Client.

Equipment Decontamination
The following decontamination procedures will be utilized for small equipment.

- Clean small equipment with phosphate-free detergent and water;
- Clean large equipment (drilling rig, track hole, front end loader, bobcat, bull dozer) using a high pressure/hot water cleaner with only potable water/fire water; and
- The decontamination of large equipment shall be conducted in a decontamination pad or pad designated by the Client and all wash water must be collected and stored for disposal by the Client.

Contaminated disposable equipment and decontamination water shall be stored in sealed containers for disposal by the Client.

14. Confined Space Entry Procedures

Entry into permit-required confined spaces is not anticipated. If a project task or activity would involve entry into a permit-required confined space or if there is a question as to whether or not a job task or activity involves a permit-required confined space, the Project Manager or SSO will contact the Project Health and Safety Consultant for assistance.

15. Spill Containment Program

The spill contamination program for this project will involve the use of preventative measures in order to reduce the potential for environmental releases. These preventative measures will include the following.

- Equipment inspection; and
- General housekeeping practices.

If project activities involve the use of drums or other containers, the drums or containers will meet the appropriate DOT regulations and will be inspected and their integrity assured prior to being moved. Operations will be organized so as to minimize drum or container movement. Drums or containers that cannot be moved without failure will be overpacked into an appropriate container.

Hydraulic Fluid/Engine Oil/Fuel Spills

In the event of an unexpected release of hydraulic fluid, engine oil, gasoline or diesel fuel, the release material will be absorbed with sorbent pads, which will be placed in a designated drum for disposal. Impacted soil will be excavated and placed on plastic sheeting and covered until characterization and/or disposal can be arranged.

16. Site Communication

Telephones will be used for communication between the project team and the client. Cell phones may be used as part of the communication method. However, cell phones cannot be used in operating process units or while driving any type of vehicle.

17. Communication and Review of Site-Specific Health and Safety Plan

An initial review of the site-specific HASP will be held either prior to mobilization or after mobilization but prior to commencing work at the site to communicate HASP details and answer questions to individuals working at the site. Daily tailgate safety meetings will be held each morning to review work practices for the day and to discuss safety issues. Any new hazard or safety information will be disseminated at the daily tailgate safety meeting or as needed throughout the day.

18. Emergency Repsonse Plan

This section describes possible contingencies and emergency procedures to be implemented at the site. Additionally, the Whirlpool "Evacuation/Emergency Plan is included as Attachment 10.

Personnel Roles and Lines of Authority

The SSO has primary responsibility for site evacuation and notification in the event of an emergency situation. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve the evacuation of personnel from the site area and ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. If the SSO is not available, the ERM Project Geologist/Engineer will assume these responsibilities. Subcontractors are responsible for assisting the SSO in their mission within the parameters of their scope of work.

Emergency Alarms, Evacuation Routes and Procedures

In the event of an emergency, it is important to be aware of the prevailing wind direction and evacuate upwind or crosswind. For drilling and excavation activities, the SSO shall designate at least two evacuation routes and muster points for each specific

work area. These routes and muster points shall be sketched on a site map and attached to the JHA and reviewed during the job safety meeting prior to starting work.

In the event of a tornado proceed to the nearest Whirlpool indoor shelter location as specified in Attachment 10. In the event of facility emergency while on Whirlpool property, proceed to the nearest outdoor muster point as specified in Attachment 10. If off-site during a facility emergency, remain off-site and move across wind away from the facility. The SSO shall notify the site contact of the location of all ERM personnel and subcontractors.

Facility Requirements

The following actions will be taken in the event of a plant evacuation or severe weather.

- The shelter areas and evacuation routes are posted at locations throughout the plant. A copy is included in Attachment 10;
- An intermittent siren means to proceed to shelter areas. Contractor will proceed to the location closest to their work area;
- A constant siren means to evacuate the Plant. The contractor will proceed to the exit closest to their work area;
- All persons, Whirlpool and Contractor personnel will remain in Shelter or out of the Plant until all clear is announced; and
- Contractor must make sure all potential danger is eliminated to the best of their ability before proceeding to shelter or evacuation. (Machines, Lifts, lowered and turned off, torches and gases to torches turned off, electricity to welders and machines turned off.) It is recommended that someone be designated ahead of time to make sure these things are done, that everyone has left the area and following instructions.

Assembly Points

As work tasks outlined in this HASP may occur throughout the facility, primary assembly points and evacuation routes will vary. For drilling and excavation tasks, assembly points and evacuation routes will be designated by the SSO for each specific work area prior to starting work. The Assembly Points and evacuation routes will be illustrated on a site map and attached to the JHA.

In the event of an emergency requiring evacuation to an Assembly Point, the SSO will be responsible to account for the presence of all project team members and subcontractors on-site at the time of the emergency.

Reporting Emergencies

All, including any late developing or aggravated injuries, must receive prompt medical attention. For non-life threatening injuries or illnesses site workers should be transported to the hospital. For life threatening injuries or illnesses, the local emergency responders should be contacted via 911.

The SSO is responsible for reporting all injuries, illnesses, fires, spills/releases, property damage or near-misses to the following individuals.

- Injured/involved employee's supervisor;
- ERM Project Manager;
- ERM Partner-In-Charge;
- ERM Project Health and Safety Consultant; and
- Client Contact.

In the event of a chemical spill the SSO will contact the client contact and provide necessary assistance to aid the client contact in completing the steps outlined in Attachment 10.

The Project Health and Safety Consultant will be responsible for notifying the ERM Southwest Corporate Health and Safety Director of the incident. In addition, the Project Health and Safety Consultant will assist in completing any incident forms and assisting with the incident investigation.

Emergency Contacts

In the event of an emergency, the SSO will contact the following as appropriate.

This list must be completed at the Project Kick-off Meeting.

Title/Name	***Phone Numbers***
ERM-Southwest, Inc., Partner-in-Charge H. Reifert Hedgcoxe, P.G	Work: 281-600-1083 Home: 713-467-2838 Mobile: 713-248-8897
Project Manager Troy Meinen, P.G.	Work: 281-600-1027 Home: 713-839-8974 Mobile: 713-962-5495
Site Safety Officer TBD: Project Specific	Work: Home: Mobile:
Project Geologist/Engineer TBD: Project Specific	Work: Mobile:
Project Health and Safety Consultant Jan Simon Clark, CIH, CSP	Work: 281-600-1029 Home: 281-225-9738 Mobile: 281-744-3250
Primary Client Contact Scott Horton	Work: 479-648-2698 Pager: 479-648-2737-495
Secondary Client Contact Rick Moore	Work: 479-648-7506 Pager: 479-648-2737-248
Local Emergency Responders Plant First Aid Plant Ambulance Off-Site Emergency	Phone: 479-648-2484 479-648-2277 911
Hospital St. Edward Mercy Medical Center 7301 Rogers Ave Fort Smith, AR 72903 Sparks regional Medical Center 1311 South I Street Fort Smith, AR 72901	Phone: 479-484-6000 Phone: 479-441-4999

Incident Investigations

An ERM Incident Form (Attachment 6) will be completed and forwarded to the Project Manager within 24 hours of an incident. All incidents will be investigated in a timely manner. The SSO and/or the Project Manager will schedule the investigation and include project supervision (ERM, subcontractors, and client), the injured/involved employee(s) and the Project Health and Safety Consultant. Root cause analysis will be performed to assess the apparent cause and identify corrective measures to be implemented to prevent re-occurrence. The last page of the Incident Form is used to document the investigation.

Directions to Nearest Hospital

The nearest hospitals are St. Edward Mercy Medical Center and Sparks Regional Medical Center. A map and written directions to both medical facilities are located in Attachment 7.

Emergency Drills

In accordance with the HAZWOPER Standard emergency response plans will be rehearsed regularly as part of the overall training program for site operations. The frequency of this drill (rehearsal) is outlined on Table 18-1. All drills will be documented on the Emergency Drill Evaluation Form found in Attachment 8. Drills do not need to be elaborate. A table-top scenario during the daily safety meeting is an adequate drill.

TABLE 18-1: Emergency Drill Frequency

Project Duration	***Drill Frequency***
Less than 30 days	None, cover during review/sign-off of HASP
Greater than one month but less than one year	Once
Greater than one year	Annually

19. Safety Equipment

A first aid kit containing first aid items for minor incidents only is maintained in each ERM Southwest vehicle. Drill rigs/geoprobes, if on site, will have a fire extinguisher on board.

Eye wash stations will be located in each ERM vehicle and will be staged in front of the drill rig/geoprobe during drilling operations.

20. Certification of Familiarity with Plan by Site Personnel

By signing below, signee certifies that they have read, understand and will abide by the contents of this HASP.

Name	Signature	Company	Date

Job Hazard Analysis Forms

Attachment 1

August 15, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Generic Job Hazard Analysis Form

August 15, 2003
W.O. #581-013

Generic Job Hazard Analysis
(Fill Out As Needed for New Activities if Not Covered Under Other JHA)

Required for those projects that don't require a HASP (see Project Safety Evaluation Checklist).

Prior to conducting fieldwork a Job Hazard Analysis must be completed and reviewed with all members of the Project Team. At the time of site mobilization, the Job Hazard Analysis will be verified and reviewed again with the Project Team at the beginning of each day as fieldwork continues.

Client:	W.O. #
Project Name:	
Location:	
ERM Principal-in-Charge:	Date:
ERM Project Manager:	Revision No.:
ERM Project Team:	
Subcontractors:	

Field Work Description

NOTE: For any hazards that are not applicable for your task, mark the left hand column with N/A. Do not leave any hazards blank.

Hazard Identification	**Describe Hazard Control (appropriate for site)**
Job Location/Setting:	☐ Industrial area on navigable water bodies ☐ Commercial area ☐ Urban area ☐ Residential area ☐ Undeveloped/vacant ☐ Lone worker
☐ Chemicals at site List or attach separate page	☐ MSDS location _____ ☐ PPE (see PPE Section) ☐ Exposure monitoring ☐ Decontamination: Circle method: Liquinox w/distilled water rinse High-pressure water rinse Water rinse Other (specify) _____
☐ Chemicals ERM will take to site	☐ Attach copies of MSDSs for all chemicals taken to client's site.
☐ Dust –Describe source	☐ PPE (see PPE Section) ☐ Exposure monitoring (see monitoring section) ☐ Dust suppression

Hazard Identification	Describe Hazard Control (appropriate for site)
☐ Underground Utilities	☐ Texas One Call or equivalent contacted at least 48 hours but no sooner than 14 days in advance of drilling? ☐ Have posted pipeline or other companies been contacted? ☐ Has Principal-in-Charge been notified and approved working within 10 feet of a fiber optic line? ☐ Have the municipal utilities (gas, water and sewer) been contacted? ☐ Have utilities been marked within entire work area? ☐ Has client identified any underground piping ? ☐ Has each drilling location been probed to at least 10 feet or to the drilling depth (whichever is shallower)? ☐ Has client approved drilling locations and utility clearance?
☐ Overhead Lines	☐ Have lines been deactivated and locked out if drilling or equipment operation is within 20 feet of overhead lines? ☐ Spotter for overhead lines during rig/equipment movement
☐ Confined Space	Contact ERM Health and Safety for assistance
☐ Combustible materials, Fire, Explosion	☐ Remove combustible materials ☐ Relocate work ☐ Isolation/Lock-out Tag-out (LOTO) ☐ Area air monitoring ☐ PPE/Flame Retardant Clothing (FRC) (See PPE Section) ☐ Fire watch ☐ Fire extinguisher available
☐ Heat/Cold Stress	☐ Work/Rest regimen ☐ Task rotation, shared tasks ☐ Source of cool water/electrolyte replacement drinks ☐ Ventilation ☐ Wear appropriate clothing for the weather
☐ Lightning/Thunder	☐ Suspend all work until 15 minutes after last thunder or lightning ☐ Take shelter in vehicle or building ☐ Do not stand under trees or near drilling rig
☐ Rain	☐ Determine what work can be performed safely in rain ☐ Determine what point work will be stopped due to quality/safety issues
☐ Biting/Stinging Insects	☐ Use insect repellent ☐ Survey work location for presence of stinging insect nests (ant mounds, wasp nests, bee hives, etc.)
☐ Poisonous Plants (Ivy, Oak, Sumac, etc.) NOTE: Use of weed killing herbicides not allowed unless applied by client	☐ Review plant identification information ☐ Remove/maintain plant material (mowing, weed-eating) ☐ Use Poisonous Plant Protection ☐ Barrier Cream ☐ Personal protective equipment (disposable coveralls, gloves, disposable boots, tape at wrists and ankles)
☐ Snakes	☐ Remove/maintain plant material (mowing, weed-eating) ☐ Survey work locations for presence of snakes ☐ Use snake guards to protect legs
☐ Noise – Describe source	☐ PPE (see PPE Section) ☐ Relocate work ☐ Control noise source
☐ Lighting/Visibility	☐ Adequate for task ☐ Nighttime considerations ☐ PPE (see PPE Section) ☐ Safety cones

Hazard Identification	Describe Hazard Control (appropriate for site)
☐ Lifting, Pulling, Pushing, Repetitive Motion	☐ Get equipment designed for the job ☐ Proper technique ☐ Smaller, lighter loads ☐ Prepare for "unexpected release" ☐ Move feet to turn with load
☐ Airborne/Flying Material	☐ Cover/Shield source ☐ PPE (see PPE Section) ☐ Positioning
☐ Rotating/Moving Equipment and Pinch Points	☐ Energy isolation, Lock-out/Tag-out (LOTO) ☐ Guarding, barricading ☐ No loose clothing ☐ Positioning
☐ Sharp Objects	☐ Guarding ☐ PPE (see PPE Section) ☐ Positioning
☐ Falling Objects	☐ Secure objects ☐ Guarding, covers ☐ PPE (see PPE Section) ☐ Barricading
☐Hazards from others working in vicinity	☐ Communication: Specify Method
☐ Environmental Spill	☐ Containment ☐ Waste Plan ☐ Waste containers ☐ Other
☐ Site-specific training required	☐ Specify training requirement:
☐ Client-specific safety procedure/policy required?	☐ Specify client specific safety procedure or policy (attach a copy)
☐ Client permit required?	☐ Specify method for obtaining permit:
☐ Subcontractor on-site	☐ Obtain proof of required (including site-specific) training ☐ Obtain proof of required (including site-specific) medical surveillance
☐ Other Hazards	☐ Description:

Exposure Monitoring

The following equipment will be used to monitor personal exposure:

_____

_____

_____

_____

Emergency Plan (required for every site job)

Method of obtaining assistance	
Evacuation Route	

Prevailing wind direction	
Emergency call list	911 or Other emergency #: ERM Project Manager: ERM Principal In-Charge: Client Contact: Subcontractor Contact:
Emergency assembly area	

Emergency Plan

First aid equipment availability	First Aid kit is available in each ERM vehicle. Eye-wash bottles available
Nearest Medical Assistance Address: Phone Number:	

Personal Protective Equipment Required (Check boxes to indicate PPE requirements)

- ☐ Field clothes (long or short sleeve shirt, long pants)
- ☐ Disposable coveralls: specify type:
- ☐ High visibility or reflective vests
- ☐ Flame Retardant Clothing
- ☐ Hard-hat
- ☐ Steel toe boots/shoes
- ☐ Disposable shoe covers
- ☐ Respiratory Protection
  - ☐ Half-face cartridge respirator, cartridge type:
  - ☐ Cartridge change frequency
  - ☐ Other respirator type
- ☐ Gloves: specify type(s) _____
- ☐ Hearing protection: specify type(s) _____
- ☐ Eye Protection: Safety glasses with side shields

☐ Additional eye protection (specify)
_____

PPE Hazard Assessment Certified by: _____
(Note: PPE can be certified by any knowledgeable staff member)
Date: _____

Project team (including subcontractors) has seen, been briefed and understand the contents of this Job Hazard Analysis.

Name	Signature	Date

Job Hazard Analysis Form
Geoprobe/Drilling Activities

August 15, 2003
W.O. #581-013

Job Hazard Analysis
Geoprobe/Drilling Activities

Required for those projects that don't require a HASP (see Project Safety Evaluation Checklist).

Prior to conducting fieldwork a Job Hazard Analysis must be completed and reviewed with all members of the Project Team. At the time of site mobilization, the Job Hazard Analysis will be verified and reviewed again with the Project Team at the beginning of each day as fieldwork continues.

Client: Whirlpool Corporation	W.O. #
Project Name:	
Location: Fort Smith, Arkansas	
ERM Principal-in-Charge: Reiffert Hedgcoxe	Date:
ERM Project Manager: Troy Meinen	Revision No.:
ERM Project Team:	
Subcontractors:	

Field Work Description

Conduct soil borings or monitor well installation using geoprobes or hollow-stem auger drill rig.

NOTE: For any hazards that are not applicable for your task, mark the left hand column with N/A. Do not leave any hazards blank.

Hazard Identification	**Describe Hazard Control (appropriate for site)**
Job Location/Setting:	☐ Industrial area on navigable water bodies ☐ Commercial area ☐ Urban area ☐ Residential area ☐ Undeveloped/vacant ☐ Lone worker
■ Chemicals at site List or attach separate page See HASP	■ MSDS location See HASP/WHR Contact ■ PPE (see PPE Section) ■ Exposure monitoring ■ Decontamination: Circle method: Liquinox w/distilled water rinse High-pressure water rinse Water rinse Other (specify) _____
■ Chemicals ERM will take to site	■ See HASP for MSDSs for all chemicals taken to client's site.
☐ Dust –Describe source	☐ PPE (see PPE Section) ☐ Exposure monitoring (see monitoring section) ☐ Dust suppression

Hazard Identification	Describe Hazard Control (appropriate for site)
■ Underground Utilities	☐ Utility Locator Service contacted at least 48 hours but no sooner than 14 days in advance of drilling? ☐ Have posted pipeline or other companies been contacted? ☐ Has Principal-in-Charge been notified and approved working within 10 feet of a fiber optic line? ☐ Have the municipal utilities (gas, water and sewer) been contacted? ☐ Have utilities been marked within entire work area? ☐ Has client identified any underground piping ? ☐ Has each drilling location been probed to at least 10 feet or to the drilling depth (whichever is shallower)? ☐ Has client approved drilling locations and utility clearance?
■ Overhead Lines	☐ Have lines been deactivated and locked out if drilling or equipment operation is within 20 feet of overhead lines? ☐ Spotter for overhead lines during rig/equipment movement
☐ Confined Space	Contact ERM Health and Safety for assistance
■ Combustible materials, Fire, Explosion	■ Remove combustible materials ☐ Relocate work ☐ Isolation/Lock-out Tag-out (LOTO) ☐ Area air monitoring ☐ PPE/Flame Retardant Clothing (FRC) (See PPE Section) ☐ Fire watch ■ Fire extinguisher available
■ Heat/Cold Stress	■ Work/Rest regimen ■ Task rotation, shared tasks ■ Source of cool water/electrolyte replacement drinks ☐ Ventilation ■ Wear appropriate clothing for the weather
■ Lightning/Thunder	■ Suspend all work until 15 minutes after last thunder or lightning ■ Take shelter in vehicle or building ■ Do not stand under trees or near drilling rig
■ Rain	■ Determine what work can be performed safely in rain ■ Determine what point work will be stopped due to quality/safety issues
■ Biting/Stinging Insects	☐ Use insect repellent ■ Survey work location for presence of stinging insect nests (ant mounds, wasp nests, bee hives, etc.)
■ Poisonous Plants (Ivy, Oak, Sumac, etc.) NOTE: Use of weed killing herbicides not allowed unless applied by client	■ Review plant identification information ☐ Remove/maintain plant material (mowing, weed-eating) ☐ Use Poisonous Plant Protection ☐ Barrier Cream ☐ Personal protective equipment (disposable coveralls, gloves, disposable boots, tape at wrists and ankles)
■ Snakes	☐ Remove/maintain plant material (mowing, weed-eating) ■ Survey work locations for presence of snakes ☐ Use snake guards to protect legs
■ Noise – Describe source	■ PPE (see PPE Section) ☐ Relocate work ☐ Control noise source
☐ Lighting/Visibility	☐ Adequate for task ☐ Nighttime considerations ☐ PPE (see PPE Section) ☐ Safety cones

Hazard Identification	Describe Hazard Control (appropriate for site)
■ Lifting, Pulling, Pushing, Repetitive Motion	■ Get equipment designed for the job ■ Proper technique ■ Smaller, lighter loads ■ Prepare for "unexpected release" ■ Move feet to turn with load
■ Airborne/Flying Material	☐ Cover/Shield source ■ PPE (see PPE Section) ■ Positioning
■ Rotating/Moving Equipment and Pinch Points	☐ Energy isolation, Lock-out/Tag-out (LOTO) ■ Guarding, barricading ■ No loose clothing ■ Positioning
■ Sharp Objects	■ Guarding ■ PPE (see PPE Section) ■ Positioning
☐ Falling Objects	☐ Secure objects ☐ Guarding, covers ☐ PPE (see PPE Section) ☐ Barricading
☐Hazards from others working in vicinity	☐ Communication: Specify Method
■ Environmental Spill	■ Containment ■ Waste Plan ■ Waste containers ☐ Other
☐ Site-specific training required	☐ Specify training requirement:
☐ Client-specific safety procedure/policy required?	☐ Specify client specific safety procedure or policy (attach a copy)
☐ Client permit required?	☐ Specify method for obtaining permit:
■ Subcontractor on -site	■ Obtain proof of required (including site-specific) training ■ Obtain proof of required (including site-specific) medical surveillance
☐ Other Hazards	☐ Description:

Exposure Monitoring

The following equipment will be used to monitor personal exposure:

OVM 580B with 11.8 bulb

Emergency Plan (required for every site job)

Method of obtaining assistance	911
Evacuation Route	

Prevailing wind direction	
Emergency call list	911 or Other emergency #: 911 ERM Project Manager: Troy Meinen, (713) 962-5495 ERM Principal In-Charge: Reif Hedgcoxe, (281) 600-1083 Client Contact: Scott Horton, (479) 648-2737, x495 Subcontractor Contact:
Emergency assembly area	

Emergency Plan

First aid equipment availability	First Aid kit is available in each ERM vehicle and drill rig. Eye-wash bottles available in ERM vehicle
Nearest Medical Assistance Address: Phone Number:	 See HASP See HASP

Personal Protective Equipment Required (Check boxes to indicate PPE requirements)

- ■ Field clothes (long or short sleeve shirt, long pants)
- ☐ Disposable coveralls: specify type:
- ☐ High visibility or reflective vests
- ☐ Flame Retardant Clothing
- ■ Hard-hat when within 20 feet of drill rig/geoprobe
- ■ Steel toe boots/shoes when within 20 feet of drill rig
- ☐ Disposable shoe covers
- ☐ Respiratory Protection
  - ☐ Half-face cartridge respirator, cartridge type:
  - ☐ Cartridge change frequency
  - ☐ Other respirator type
- ■ Gloves: specify type(s) surgical latex or nitrile or general work gloves depending on task
- ■ Hearing protection: specify type(s) ear plugs within 20 ft of drill rig
- ■ Eye Protection: Safety glasses with side shields

☐ Additional eye protection (specify)
_____

PPE Hazard Assessment Certified by: _____
(Note: PPE can be certified by any knowledgeable staff member)
Date: _____

Project team (including subcontractors) has seen, been briefed and understand the contents of this Job Hazard Analysis.

Name	Signature	Date

Job Hazard Analysis Form
Ground Water Sampling/Well Development

August 15, 2003
W.O. #581-013

Job Hazard Analysis
Ground Water Sampling/Well Development

Required for those projects that don't require a HASP (see Project Safety Evaluation Checklist).

Prior to conducting fieldwork a Job Hazard Analysis must be completed and reviewed with all members of the Project Team. At the time of site mobilization, the Job Hazard Analysis will be verified and reviewed again with the Project Team at the beginning of each day as fieldwork continues.

Client: Whirlpool Corporation	W.O. #
Project Name:	
Location: Fort Smith, Arkansas	
ERM Principal-in-Charge: Reiffert Hedgcoxe	Date:
ERM Project Manager: Troy Meinen	Revision No.:
ERM Project Team:	
Subcontractors:	

Field Work Description

Gauge water levels in wells. Purge water from wells using pumps or bailers. Collect samples from monitor wells.

NOTE: For any hazards that are not applicable for your task, mark the left hand column with N/A. Do not leave any hazards blank.

Hazard Identification	**Describe Hazard Control (appropriate for site)**
Job Location/Setting:	☐ Industrial area on navigable water bodies ☐ Commercial area ☐ Urban area ☐ Residential area ☐ Undeveloped/vacant ☐ Lone worker
■ Chemicals at site List or attach separate page See HASP	■ MSDS location See HASP/WHR Contact ■ PPE (see PPE Section) ☐ Exposure monitoring ■ Decontamination: Circle method: Liquinox w/distilled water rinse High-pressure water rinse Water rinse Other (specify) _____
■ Chemicals ERM will take to site	■ See HASP for MSDSs for all chemicals taken to client's site.
☐ Dust –Describe source	☐ PPE (see PPE Section) ☐ Exposure monitoring (see monitoring section) ☐ Dust suppression

Hazard Identification	Describe Hazard Control (appropriate for site)
☐ Underground Utilities	☐ Utility Locator Service contacted at least 48 hours but no sooner than 14 days in advance of drilling? ☐ Have posted pipeline or other companies been contacted? ☐ Has Principal-in-Charge been notified and approved working within 10 feet of a fiber optic line? ☐ Have the municipal utilities (gas, water and sewer) been contacted? ☐ Have utilities been marked within entire work area? ☐ Has client identified any underground piping ? ☐ Has each drilling location been probed to at least 10 feet or to the drilling depth (whichever is shallower)? ☐ Has client approved drilling locations and utility clearance?
☐ Overhead Lines	☐ Have lines been deactivated and locked out if drilling or equipment operation is within 20 feet of overhead lines? ☐ Spotter for overhead lines during rig/equipment movement
☐ Confined Space	Contact ERM Health and Safety for assistance
☐ Combustible materials, Fire, Explosion	☐ Remove combustible materials ☐ Relocate work ☐ Isolation/Lock-out Tag-out (LOTO) ☐ Area air monitoring ☐ PPE/Flame Retardant Clothing (FRC) (See PPE Section) ☐ Fire watch ☐ Fire extinguisher available
■ Heat/Cold Stress	■ Work/Rest regimen ■ Task rotation, shared tasks ■ Source of cool water/electrolyte replacement drinks ☐ Ventilation ■ Wear appropriate clothing for the weather
■ Lightning/Thunder	■ Suspend all work until 15 minutes after last thunder or lightning ■ Take shelter in vehicle or building ■ Do not stand under trees or near drilling rig
■ Rain	■ Determine what work can be performed safely in rain ■ Determine what point work will be stopped due to quality/safety issues
■ Biting/Stinging Insects	☐ Use insect repellent ■ Survey work location for presence of stinging insect nests (ant mounds, wasp nests, bee hives, etc.)
■ Poisonous Plants (Ivy, Oak, Sumac, etc.) NOTE: Use of weed killing herbicides not allowed unless applied by client	■ Review plant identification information ☐ Remove/maintain plant material (mowing, weed-eating) ☐ Use Poisonous Plant Protection ☐ Barrier Cream ☐ Personal protective equipment (disposable coveralls, gloves, disposable boots, tape at wrists and ankles)
■ Snakes	☐ Remove/maintain plant material (mowing, weed-eating) ■ Survey work locations for presence of snakes ☐ Use snake guards to protect legs
■ Noise – Describe source	■ PPE (see PPE Section) ☐ Relocate work ☐ Control noise source
☐ Lighting/Visibility	☐ Adequate for task ☐ Nighttime considerations ☐ PPE (see PPE Section) ☐ Safety cones

Hazard Identification	Describe Hazard Control (appropriate for site)
■ Lifting, Pulling, Pushing, Repetitive Motion	■ Get equipment designed for the job ■ Proper technique ■ Smaller, lighter loads ■ Prepare for "unexpected release" ■ Move feet to turn with load
☐ Airborne/Flying Material	☐ Cover/Shield source ☐ PPE (see PPE Section) ☐ Positioning
☐ Rotating/Moving Equipment and Pinch Points	☐ Energy isolation, Lock-out/Tag-out (LOTO) ☐ Guarding, barricading ☐ No loose clothing ☐ Positioning
■ Sharp Objects	☐ Guarding ■ PPE (see PPE Section) ■ Positioning
☐ Falling Objects	☐ Secure objects ☐ Guarding, covers ☐ PPE (see PPE Section) ☐ Barricading
■ Hazards from others working in vicinity	■ Communication: Specify Method
■ Environmental Spill	■ Containment ■ Waste Plan ■ Waste containers ☐ Other
☐ Site-specific training required	☐ Specify training requirement:
☐ Client-specific safety procedure/policy required?	☐ Specify client specific safety procedure or policy (attach a copy)
☐ Client permit required?	☐ Specify method for obtaining permit:
☐ Subcontractor on-site	☐ Obtain proof of required (including site-specific) training ☐ Obtain proof of required (including site-specific) medical surveillance
☐ Other Hazards	☐ Description:

Exposure Monitoring

The following equipment will be used to monitor personal exposure:

None

Emergency Plan (required for every site job)

Method of obtaining assistance	911
Evacuation Route	See HASP for evacuation/shelter instructions and maps
Prevailing wind direction	

Emergency call list	911 or Other emergency #: 911 ERM Project Manager: Troy Meinen, (713) 962-5495 ERM Principal In-Charge: Reif Hedgcoxe, (281) 600-1083 Client Contact: Scott Horton, (479) 648-2737, x495 Subcontractor Contact:
Emergency assembly area	See HASP for evacuation/shelter assembly area maps

Emergency Plan

First aid equipment availability	First Aid kit is available in each ERM vehicle Eye-wash bottles available in ERM vehicle
Nearest Medical Assistance Address: Phone Number:	 See HASP See HASP

Personal Protective Equipment Required (Check boxes to indicate PPE requirements)

- ■ Field clothes (long or short sleeve shirt, long pants)
- ☐ Disposable coveralls: specify type:
- ☐ High visibility or reflective vests
- ☐ Flame Retardant Clothing
- ☐ Hard-hat when within 20 feet of drill rig/geoprobe
- ☐ Steel toe boots/shoes when within 20 feet of drill rig
- ☐ Disposable shoe covers
- ☐ Respiratory Protection
  - ☐ Half-face cartridge respirator, cartridge type:
  - ☐ Cartridge change frequency
  - ☐ Other respirator type
- ■ Gloves: specify type(s) surgical latex or nitrile or general work gloves depending on task
- ■ Hearing protection: specify type(s) ear plugs within 20 ft of generator if used
- ■ Eye Protection: Safety glasses with side shields

☐ Additional eye protection (specify)

_____

PPE Hazard Assessment Certified by: _____
(Note: PPE can be certified by any knowledgeable staff member)
Date: _____

Project team (including subcontractors) has seen, been briefed and understand the contents of this Job Hazard Analysis.

Name	Signature	Date

Material Safety Data Sheets

Attachment 2

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM HYDROXIDE, 0.01 to 0.1 NORMAL VOLUMETRIC SOLUTIONS

MSDS Number: S4038 --- *Effective Date: 05/17/01*

1. Product Identification

Synonyms: None
CAS No.: 1310-73-2
Molecular Weight: 40.00
Chemical Formula: NaOH in water
Product Codes:
J.T. Baker: 5653, 5663, 5664
Mallinckrodt: 6146, H350, H373

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Hydroxide	1310-73-2	0 - 0.4%	No
Water	7732-18-5	> 99%	No

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, RESPIRATORY TRACT AND GASTROINTESTINAL TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Orange (General Storage)

Potential Health Effects

The health effects from exposure to diluted forms of this chemical are not well documented. They are expected to be less severe than those for concentrated forms which are referenced in the descriptions below.

Inhalation:
Mists are irritants to respiratory tract.
Ingestion:
Corrosive. Swallowing may cause burns of the mouth, throat and stomach.
Skin Contact:
Can be corrosive to skin. May cause irritation.
Eye Contact:
Sodium Hydroxide: Corrosive! May cause irritation of eyes, and with greater exposures, severe burns with possibly blindness resulting.
Chronic Exposure:
Prolonged contact can dehydrate and remove oils from skin.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders may be susceptible to these solutions.

4. First Aid Measures

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes, and fluid intake are also required.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from

entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

J. T. Baker NEUTRACIT(R)-2 or BuCAIM(R) caustic neutralizers are recommended for spills of this product.

---

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Protect from freezing.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Sodium hydroxide:
-OSHA Permissible Exposure Limit (PEL):
2 mg/m3 Ceiling
-ACGIH Threshold Limit Value (TLV):
2 mg/m3 Ceiling
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
Not expected to require personal respirator usage. If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING:

Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Clear, colorless solution.
Odor:
Odorless.
Solubility:
Miscible in water.
Density:
1.0-1.05
pH:
12 - 13 (0.01N-0.2N)
% Volatiles by volume @ 21C (70F):
> 90 (as water)
Boiling Point:
ca. 100C (ca. 212F)
Melting Point:
ca. 0C (ca. 32F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
No hazardous decomposition products.
Hazardous Polymerization:

Will not occur.

Incompatibilities:

Sodium hydroxide in contact with acids and organic halogen compounds, especially trichloroethylene, may causes violent reactions. Contact with nitromethane and other similar nitro compounds causes formation of shock-sensitive salts. Contact with metals such as aluminum, magnesium, tin, and zinc cause formation of flammable hydrogen gas. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Precautions should be taken including monitoring the tank atmosphere for carbon monoxide to ensure safety of personnel before vessel entry.

Conditions to Avoid:

Heat, incompatibles.

---

11. Toxicological Information

Sodium hydroxide: irritation data: skin, rabbit: 500 mg/24H severe; eye rabbit: 50 ug/24H severe. Investigated as a mutagen.

--------\Cancer Lists\----------

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Sodium Hydroxide (1310-73-2)	No	No	None
Water (7732-18-5)	No	No	None

---

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA

hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Not regulated.

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Sodium Hydroxide (1310-73-2)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

	--Canada--			
Ingredient	Korea	DSL	NDSL	Phil.
Sodium Hydroxide (1310-73-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Sodium Hydroxide (1310-73-2)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

	-RCRA-	-TSCA-

Ingredient	CERCLA	261.33	8(d)
Sodium Hydroxide (1310-73-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: No information found.
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, RESPIRATORY TRACT AND GASTROINTESTINAL TRACT.
Label Precautions:
Avoid breathing mist.
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Keep container closed.
Use with adequate ventilation.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:

No changes.

Disclaimer:

****

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SULFURIC ACID, 52 - 100 %

MSDS Number: S8234 --- *Effective Date: 02/18/02*

1. Product Identification

Synonyms: Oil of vitriol; Babcock acid; sulphuric acid
CAS No.: 7664-93-9
Molecular Weight: 98.08
Chemical Formula: H2SO4 in H2O
Product Codes:
J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5889, 5897, 5960, 5961, 5971, 5997, 6902, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9691, 9693, 9694
Mallinckrodt: 2468, 2876, 2878, 2900, 2904, 3780, 4222, 5524, 5557, H644, H976, H996, V344, V651, XL003

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	52 - 100%	Yes
Water	7732-18-5	0 - 48%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.

Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.

Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.

Eye Contact:
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.
Chronic Exposure:
Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician immediately.
Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

---

5. Fire Fighting Measures

Fire:
Concentrated material is a strong dehydrating agent. Reacts with organic materials and may cause ignition of finely divided materials on contact.
Explosion:
Contact with most metals causes formation of flammable and explosive hydrogen gas.
Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Do not use water on material. However, water spray may be used to keep fire exposed containers cool.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

---

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Sulfuric Acid:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -
1 mg/m3(TWA), 3 mg/m3 (STEL), A2 - suspected human carcinogen for sulfuric acid contained in strong inorganic acid mists.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Clear oily liquid.

Odor:
Odorless.
Solubility:
Miscible with water, liberates much heat.
Specific Gravity:
1.84 (98%), 1.40 (50%), 1.07 (10%)
pH:
1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1.
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
ca. 290C (ca. 554F) (decomposes at 340C)
Melting Point:
3C (100%), -32C (93%), -38C (78%), -64C (65%).
Vapor Density (Air=1):
3.4
Vapor Pressure (mm Hg):
1 @ 145.8C (295F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Concentrated solutions react violently with water, spattering and liberating heat.
Hazardous Decomposition Products:
Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.
Conditions to Avoid:
Heat, moisture, incompatibles.

---

11. Toxicological Information

Toxicological Data:
Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m3/2H; standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen, mutagen, reproductive effector.
Carcinogenicity:
Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

--------\Cancer Lists\----------

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Sulfuric Acid (7664-93-9)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.
Environmental Toxicity:
LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.
This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this

product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

International (Water, I.M.O.)

Proper Shipping Name: SULPHURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

	--Canada--			
Ingredient	Korea	DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

	-RCRA-	-TSCA-	
Ingredient	CERCLA	261.33	8(d)
Sulfuric Acid (7664-93-9)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 2P
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **2** Other: **Water reactive**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on

duration and level of exposure.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Do not contact with water.

Label First Aid:

In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

****
****

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

****
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MATERIAL SAFETY DATA SHEET
Oglebay Norton Industrial Sands, Inc.

Date Prepared: February 14, 2001

SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Names/Trade Names:
Silica Sand sold under various names: Oglebay Norton Industrial Sands, Inc., Colorado Silica Sand ®, Glass Sand, Flint

Synonyms/Common Names: Sand, Silica Sand, Quartz, Crystalline Silica, Flint, Ground Silica, Foundry Sand, Engine Sand, Frac Sand, Filtration Sand, Bunker Sand, Turf Sand, Glass Sand

Manufacturer's Name: Oglebay Norton Industrial Sands, Inc.

OGLEBAY NORTON INDUSTRIAL SANDS, INC.
1000 Oglebay Norton Drive
Brady, TX 76825-0429
Telephone Number for Information: 915-597-0721
Toll Free Telephone Number: 800-858-4123

SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredient: Crystalline silica (quartz), typically 90.0% to 99.9%

Chemical Formula: SiO_2
CAS#: 14808-60-7

OSHA PEL: Exposure to airborne crystalline silica shall not exceed an 8-hour time-weighted average limit as stated in 29 CFR §1910.1000 Table Z-1-A, Air Contaminants, specifically:

$$\frac{10\ mg/m^3}{SiO_2+2}$$

ACGIH TLV: Crystalline Silica (quartz)
TLV-TWA = 0.1 mg/m^3 Respirable Crystalline Silica (quartz)

See Threshold Limit Value and Biological Exposure Indices for American Conference of Governmental Industrial Hygienists (latest edition).

Silica Sand (Brady, Colorado Springs, Riverside, Bakersfield)

Other Recommended Limits:
National Institute for Occupational Safety and Health (NIOSH). Recommended standard maximum permissible concentration=0.05 mg/m^3 (respirable free silica) as determined by a full-shift sample up to 10-hour working day, 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica.

CAUTION:
Crystalline silica exists in several forms, the most common of which is quartz. If crystalline silica (quartz) is heated to more than 870°C it can change to a form of crystalline silica known as trydimite, and if crystalline silica (quartz) is heated to more than 1470°C, it can change to a form of crystalline silica known as cristobalite. Crystalline silica as trydimite and cristobalite are more fibrogenic than crystalline silica as quartz. The OSHA PEL for crystalline silica as trydimite and cristobalite is one-half the PEL for crystalline silica (quartz); the ACGIH TLV for crystalline silica as trydimite and cristobalite is one-half the TLV for crystalline silica as quartz.

SECTION III – HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

Oglebay Norton Industrial Sands, Inc. material is a white or tan sand, or ground sand. It is not flammable, combustible or explosive. Crystalline silica (quartz) is not known to be an environmental hazard.

Crystalline silica (quartz) is incompatible with hydrofluoric acid, fluorine, chlorine trifluoride or oxygen difluoride.

POTENTIAL HEALTH EFFECTS:

Inhalation:

a. Silicosis Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability and death.
b. Cancer Respirable crystalline silica (quartz) inhaled from occupational sources is classified as carcinogenic to humans.
c. Scleroderma There is evidence that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of scleroderma, an autoimmune disorder manifested by a fibrosis (scarring) of the skin and internal organs.
d. Tuberculosis Silicosis increases the risk of tuberculosis.
e. Nephrotoxicity There are several studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of kidney disorders.
f. Arthritis There is evidence that exposure to respirable crystalline silica is associated with the increased incidence of crippling arthritis.

Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

Skin Contact: May cause skin irritation. See Section VII.

Ingestion: Not applicable.

Chronic Effects: The adverse health effects—silicosis, cancer, scleroderma, tuberculosis, nephrotoxicity and arthritis —are chronic effects.

Silica Sand (Brady, Colorado Springs, Riverside, Bakersfield)

Signs and Symptoms of Exposure : There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis are the same; additionally, weight loss and fever are associated with acute silicosis. The symptoms of scleroderma include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Medical Conditions Generally Aggravated by Exposure : The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

See Section XI, Toxicological Information, for additional detail on potential adverse health effects.

SECTION IV – FIRST-AID MEASURES

Inhalation: No specific first-aid is necessary since the adverse health effects associated with exposure to crystalline silica (quartz) result from chronic exposures. If there is a gross inhalation of crystalline silica (quartz), remove the person immediately to fresh air, give artificial respiration as needed, seek medical attention as needed.

Eye Contact: Wash immediately with water. If irritation persists, seek medical attention.

Skin Contact: Not applicable.

Ingestion: Not applicable.

SECTION V – FIRE FIGHTING MEASURES

Flammability: Crystalline silica (quartz) is non-flammable and non-explosive
Extinguishing Media: None required
Flash Point: None
Special Fire Fighting Procedures: N/A
Flammable Limits: None
Unusual Fire and Explosion Hazards: None

SECTION VI – ACCIDENTAL RELEASE MEASURES

Spills: Use dustless methods (vacuum) and place into closable container for disposal, or flush with water. Do not dry sweep. Wear protective equipment specified below.

Waste Disposal Method: See Section XIII.

SECTION VII – HANDLING AND STORAGE

WARNING LABEL
DO NOT BREATHE THIS MATERIAL
Never Use This Material For Sand Blasting

Silica sand material contains fine dust. If you breathe this dust you can suffer severe, irreversible lunge damage and death. Some medical reports state inhalation of silica dust may cause lung cancer. Medical reports also link breathing silica dust to crippling arthritis and skin and eye irritation.

You must never use this material without having a government-approved respirator. The work area must also be thoroughly ventilated by the use of forced air ventilation during and after use of this material.

Prior to use or handling, you are advised to review and thoroughly understand all health precautions outlined in the Material Safety Data Sheet (MSDS) provided to you by your employer by the supplier of this material.

Respirator Protection
It is a violation of federal safety laws (OSHA) for employers to require workers to use this material without full respiratory protection. The federal laws that apply are: 29CFR 1910.134; 29CFR 1910.1000; 29CFR 1910.94.

Ventilation

Finely divided silica dust is nearly invisible. Work areas must be thoroughly ventilated with forced ventilation fans sufficient to exhaust all silica dust and provide a complete air exchange every five minutes. Continue ventilation even after operations have been completed.

Other Protective Equipment
Dust can be harmful to skin and eyes. You need to wear tight goggles, heavy rubber gloves. Clothing should be tight fitting at the cuffs, neck and ankles to prevent dust from contacting your body. Clothing should be regularly washed to prevent dust accumulation.

Warning Symptoms and First Aid
If you experience shortness of breath, coughing, lung and/or throat irritation these may be early warning signs that silica dust is causing a medical condition such as silicosis. Avoid further contact with the material and see your doctor at once if such symptoms occur. Swelling of joints, and joint pain, may signal the start of arthritis, which is also reported to be aggravated by silica exposure. Again, if such symptoms occur seek immediate medical attention.
If eye contact and irritation take place, flush your eyes continuously with clear cold water for at least 15 minutes and then see your doctor for an examination and possible treatment.

Precautions During Storage
Avoid breakage of bagged material or spills of bulk material. See control measures in Section VIII.

Safety Notes: Federal safety regulations require that employers train workers in the safe use of this material and that they hold periodic safety meetings to assure that safety precautions are being maintained. Report any concerns about these issues to OSHA, at (202)999-OSHA.

The OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, and 1928.21, and state and local worker or community "right to know" laws and regulations should be strictly followed.

WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARDS AND THE REQUIRED OSHA PRECAUTIONS. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT THE OSHA PRECAUTIONS FOR HANDLING CRYSTALLINE SILICA.
See also American Society for Testing and Materials (ASTM) standard practice E 1132-86, "Standard Practice for Health Requirements Relating to Occupational Exposure to Quartz Dust."

For Additional Health and Safety Information, Call OSHA, at (202) 999-OSHA

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Local Exhaust
Use sufficient local exhaust to reduce the level of respirable crystalline silica to below the PEL. See ACGIH "Industrial Ventilation, A Manual of Recommended Practice" (latest edition).

Respiratory Protection
The following chart specifies the types of respirators that may provide respiratory protection for crystalline silica.

CONDITION Particulate Concentration	MINIMUM RESPIRATORY PROTECTION*
10 x PEL or less	Any particulate respirator, except single-use or quarter-mask respirator. Any fume respirator or high efficiency particulate filter respirator. Any supplied-air respirator. Any self-contained breathing apparatus.
50 x PEL or less	A high efficiency particulate filter respirator with a full facepiece. Any supplied-air respirator with a full facepiece, helmet, or hood. Any self-contained breathing apparatus with a full facepiece.
500 x PEL or less	A powered air-purifying respirator with a high efficiency particulate filter. A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous-flow mode.
Greater than 500 x PEL or entry and escape from unknown concentrations	A type C, supplied-air respirator with a full facepiece, hood, or helmet, operated in a positive pressure mode (see 29 CFR1910.94(a)) (iii)) Also see 30 CFR Part 11.
***Use only NIOSH-approved or MSHA-approved equipment. See 29 CFR §1910.134 and 42 CFR §84.**	
See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection"	

Silica Sand (Brady, Colorado Springs, Riverside, Bakersfield)

Permissible Exposure Levels:

Component	**CAS Number**	**Percentage (by weight)**
Crystalline Silica (Quartz)	14808-60-7	90.0 – 99.9

Exposure Guidelines						
OSHA		**ACGIH**		**NIOSH**		
TWA	**STEL**	**TWA**	**STEL**	**TWA**	**STEL**	**Unit**
10 % Si02+2	None	.1	None	.05	None	mg/m^3

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White or tan sand; granular, crushed, or ground

Odor: None

Boiling Point: 4046°F
Vapor Pressure (mm Hg.): None
Specific Gravity (Water = 1): 2.65
Vapor Density (Air = 1): None
Melting Point: 3110°F

Solubility in Water: Insoluble in water
Evaporation Rate (Butyl Acetate = 1): None

SECTION X – STABILITY AND REACTIVITY

Stability: Crystalline silica (quartz) is stable.

Incompatibility (Materials to Avoid): Contact with powerful oxidizing agents such as fluorine, chlorine trifluoride, oxygen difluoride, may cause fires.

Hazardous Decomposition or Byproducts: Silica will dissolve in hydrofluoric acid and produce a corrosive gas - silicon tetrafluoride.

Hazardous Polymerization: Will not occur.

SECTION XI – TOXICOLOGICAL INFORMATION

A. SILICOSIS

The major concern is silicosis, caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years of exposure to relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability.

Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pumonale).

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz and cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is *carcinogenic to humans* (*Group 1*)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates..." (1997). (Emphasis added)

NTP - The National Toxicology Program, in its Sixth Annual Report on Carcinogens, concluded that "silica, crystalline (respirable)" may reasonably be anticipated to be a carcinogen, based on sufficient evidence in experimental animals and limited evidence in humans.

OSHA - Crystalline silica (quartz) is not regulated by the U. S. Occupational Safety and Health Administration as a carcinogen.

There is substantial literature on the issues of the carcinogenicity of crystalline silica, which the reader should consult for additional information. A summary of the literature is set forth in "Exposure to crystalline silica and risk of lung cancer; the epidemiological evidence", Thorax, Volume 51, pp. 97-102 (1996). The official statement of the American Thoracic Society on the issue of silica carcinogenicity was published in "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997). The official statement concluded that "The available data support the conclusion that silicosis produces increased risk for bronchogenic carcinoma. The cancer risk may also be increased by smoking and other carcinogens in the workplace. Epidemiologic studies provide convincing evidence for increased cancer risk among tobacco smokers with silicosis. Less information is available for never-smokers and for workers exposed to silica but who do not have silicosis. For workers with silicosis, the risks for lung cancer are relatively high and consistent among various countries and investigators. Silicosis should be considered a condition that predisposes workers to an increased risk of lung cancer." Id. at 763.

C. SCLERODERMA

There is evidence that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of scleroderma, an immune system disorder manifested by a fibrosis (scarring) of the lungs, skin and other internal organs. Recently, the American Thoracic Society noted that "there is persuasive evidence relating scleroderma to occupational silica exposures in setting where there is appreciable silicosis risk." The following may be consulted for additional information on silica, silicosis and scleroderma (also known as progressive systemic sclerosis): Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

E. NEPHROTOXICITY

There are several recent studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of kidney disorders. The following may be consulted for additional information on silica, silicosis and nephrotoxicity: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Further evidence of human silica nephrotoxicity in occupationally exposed workers", British Journal of Industrial Medicine, Vol. 50, No. 10, pp. 907-912 (1993). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

F. ARTHRITIS

There are recent studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of arthritis. The following may be consulted for additional information on silica exposure and arthritis: American Journal of Industrial Medicine, Volume 35, pp. 375-381 "Connective Tissue Disease and Silicosis", Rosenman KD; Moore-Fuller M.; Reilly MJ. (1999). Environmental Health Perspective, Volume 107, pp. 793-802 "Occupational Exposure to Crystalline Silica and Autoimmune Disease", Parks CG; Conrad K; Cooper GS. (1999).

SECTION XII – ECOLOGICAL INFORMATION

Crystalline silica (quartz) is not known to be ecotoxic; i.e., no data suggests that crystalline silica (quartz) is toxic to birds, fish, invertebrates, microorganisms or plants. For additional information on crystalline silica (quartz), see Sections IX (physical and chemical properties) and X (stability and reactivity) of this MSDS.

SECTION XIII – DISPOSAL CONSIDERATIONS

General: The material may be landfilled; however, used material may contain materials derived from other sources that because of contamination may not be disposed of in landfills. Disposed material should be covered to minimize generation of airborne dust.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

The above applies to materials as sold by Oglebay Norton Industrial Sands, Inc. The material may be contaminated during use, and it is the responsibility of the user to assess the appropriate disposal of the used material.

SECTION XIV – TRANSPORT INFORMATION

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U.S. Department of Transportation Table of Hazardous Materials, 49 CFR §172.101.

SECTION XV – REGULATORY INFORMATION

UNITED STATES (FEDERAL AND STATE)

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.

Emergency Planning and Community Right to Know Act: Crystalline silica (quartz) is not an extremely hazardous substance under Section 302 and is not a toxic chemical subject to the requirements of Section 313.

Clean Air Act: Crystalline silica (quartz) mined and processed by Oglebay Norton Industrial Sands, Inc. was not processed with or does not contain any Class I or Class II ozone depleting substances.

TSCA No.: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

NTP: Respirable crystalline silica (quartz) is classified as a probable carcinogen.

OSHA Carcinogen: Respirable crystalline silica (quartz) is not listed.

California Proposition 65: Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

WHMIS Classification: D-2A

OTHER

EINECS No.: 231-545-4

EEC Label (Risk/Safety Phrases): R 48/20, R 40/20, S22, S38

IARC: Crystalline silica (quartz) is classified in IARC Group 1.

National, state, city, county or local emergency planning, community right to know or other laws, regulations or ordinances may be applicable—consult applicable national, state, provincial or local laws.

SECTION XVI – OTHER INFORMATION

Hazardous Material Information System (HMIS):

Health	*****
Flammability	**0**
Reactivity	**0**
Protective Equipment	**E**

*** For further information on health effects, see Sections III and XI of this MSDS.**

National Fire Protection Association (NFPA):

Health	**0**
Flammability	**0**
Reactivity	**0**

http://www.msha.gov - The Mine Safety Health Administration Home Page, which contains general (not mining specific) information on silicosis. Click on "Silicosis Prevention".
http://www.cdc.gov/niosh/silicpag.html - NIOSH Hotlinks to Silicosis Prevention.

OGLEBAY NORTON INDUSTRIAL SANDS, INC. DISCLAIMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION CONTAINED HEREIN. WE ACCEPT NO RESPONSIBILITY AND DISCLAIM ALL LIABILITY FOR ANY HARMFUL EFFECTS WHICH MAY BE CAUSED BY EXPOSURE TO OUR SILICA. CUSTOMER-USERS OF SILICA MUST COMPLY WITH ALL APPLICABLE HEALTH AND SAFETY LAWS, REGULATIONS, AND ORDERS, INCLUDING THE OSHA HAZARDOUS COMMUNICATION STANDARD.

MATERIAL SAFETY DATA SHEET (MSDS) FOR PORTLAND CEMENT

(Complies with OSHA's Hazard Communication Standard, 29 CFR 1910.1200)

CEMEX CEMENT OF TEXAS, L.P.
BLACONES CEMENT PLANT
2880 WALD ROAD
NEW BRAUNFELS, TEXAS 78132

Section 1 - IDENTIFICATION

Supplier/Manufacturer

CEMEX Cement of Texas, L.P.
Balcones Cement Plant
2880 Wald Road
New Braunfels, Texas 78132

Emergency Contact Information

(210) 250-4100

Chemical name and synonyms

Portland Cement (CAS #65997-15-1)

Product name

"CEMEX Type I"
"CEMEX Type II"
"CEMEX Type I/II"

Chemical family	Formula	
Calcium salts.	$3CaO.SiO_2$	(CAS #12168-85-3)
	$2CaO.SiO_2$	(CAS #10034-77-2)
	$3CaO.Al_2O_3$	(CAS #12042-78-3)
	$4CaO.Al_2O_3.Fe_2O_3$	(CAS #12068-35-8)
	$CaSO_4.2H_2O$	(CAS #13397-24-5)

Other salts: Small amounts of MgO, and trace amounts of K_2SO_4 and Na_2SO_4 may also be present.

Section 2 - COMPONENTS

Hazardous Ingredients

Portland cement clinker (CAS# 65997-15- 1) - approximately - 93.5-96.0 % by weight
ACGIH TLV-TWA (2000) = 10 mg total dust/m^3
OSHA PEL (8-hour TWA) = 50 million particles/ft^3

Gypsum/Calcium Sulfate Dihydrate (CAS# 7778-18-9) - approximately - 4.0-6.5 % by weight
ACGIH TLV-TWA (2000) = 10 mg total dust/m^3
OSHA PEL (8-hour TWA) = 15 mg total dust/m^3
OSHA PEL (8-hour TWA) = 5 mg respirable dust/m^3

Respirable quartz (CAS# 14808-60-7) - approximately - 0.01-0.06 % by weight
ACGIH TLV-TWA (2000) = 0.05 mg respirable quartz dust/m^3
OSHA PEL (8-hour TWA) = (10 mg respirable dust/$m^{3)}$/(percent silica + 2)

Trace Ingredients

Trace amounts of naturally occurring chemicals might be detected during chemical analysis. Trace constituents may include up to 0.75% insoluble residue, some of which may be free crystalline silica, calcium oxide (Also known as lime or quick lime), magnesium oxide, potassium sulfate, sodium sulfate, chromium compounds, and nickel compounds.

Section 3 - HAZARD IDENTIFICATION

Emergency Overview

Portland cement is a light gray powder that poses little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet portland cement can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry portland cement.

Potential Health Effects

Relevant Routes of Exposure:
Eye contact, skin contact, inhalation, and ingestion.

Effects Resulting from Eye Contact:
Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by large amounts of dry powder or splashes of wet portland cement may cause effects ranging from moderate eye irritation to chemical burns or blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

Effects Resulting from Skin Contact:
Discomfort or pain cannot be relied upon to alert a person to hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Dry portland cement contacting wet skin or exposure to moist or wet portland cement may cause more severe skin effects including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (alkali) chemical burns.

Some individuals may exhibit an allergic response upon exposure to portland cement, possibly due to trace elements of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with portland cement products.

Effects Resulting from Inhalation:
Portland cement may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease.

Exposure to portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects Resulting from Ingestion:
Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed. Portland cement should not be eaten.

Carcinogenic potential:
Portland cement is **not** listed as a carcinogen by NTP, OSHA, or IARC. It may however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a contaminate in Portland cement, is now classified by IARC as known human carcinogen (Group I). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".

Medical conditions which may be aggravated be, inhalation or dermal exposure:
Pre-existing upper respiratory and lung diseases.
Unusual (hyper) sensitivity to hexavalent chromium (chromium^{+6}) salts.

Section 4 - FIRST AID

Eyes

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

Skin

Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of Airborne Dust

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside.

Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

Section 5 - FIRE AND EXPLOSION DATA

Flash point .....None	Lower Explosive Limit.....None
Upper Explosive Limit.....None	Auto ignition temperature.....Not Combustible
Extinguishing media.....Not Combustible	Special fire fighting Procedures.....None
Hazardous combustion products....None	Unusual fire and explosion hazards...None

Section 6 - ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in an appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash portland cement down drains.

Dispose of waste material according to local, state and federal regulations.

Section 7 - HANDLING AND STORAGE

Keep portland cement dry until used. Normal temperatures and pressures do not affect the material.

Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin Protection

Prevention is essential to avoiding potentially severe skin injury. Avoid contact with unhardened portland cement. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened portland cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Wear sturdy boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams: barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry portland cement or by wet cement or concrete fluids with a pH neutral soap. Wash again at the end of work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

Respiratory Protection

Avoid actions that cause dust to become airborne. Use local or general exhaust ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA approved (under 30 CFR 11) or NIOSH approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after June 10, 1998 must be certified under 42 CFR 84.)

Ventilation

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye Protection

Where potentially subject to splashes or puffs of cement, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with portland cement or fresh cement products.

Section 9 - PHYSICAL AND CHEMICAL, PROPERTIES

Appearance.....Gray Powder
Physical state.....Solid (powder)
Solubility in water...Slightly soluble (0.1 to 1.0%)
Vapor density.....Not applicable
Melting point.....Not applicable
Evaporation rate.....Not applicable
Odor.....No distinct odor
pH (in water).....12 to 13
Vapor pressure.....Not applicable
Boiling point.....Not applicable (i.e., > 1000C)
Specific gravity (H20 = 1.0).....3.15

Section 10 - STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

Unintentional contact with water.

Incompatibility

Wet portland cement is alkaline. As such it is incompatible with acids, ammonium salts and phosphorous.

Hazardous decomposition

Will not spontaneously occur. Adding water produces (caustic) calcium hydroxide

Hazardous Polymerization

Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

For a description of available, more detailed toxicological information contact the supplier or manufacturer.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

No recognized unusual toxicity to plants or animals

Relevant physical and chemical properties

(See Sections 9 and 10.)

Section 13 - DISPOSAL

Dispose of waste material according to local, state and federal regulations. (Since portland cement is stable, uncontaminated material may be saved for future use).

Dispose of bags in an approved landfill or incinerator.

Section 14 - TRANSPORTATION DATA

Hazardous materials description/proper shipping name

Portland is cement is not hazardous under U.S. Department of Transportation (DOT) regulations.

Hazard class

Not applicable

Identification number

Not applicable.

Required label text

Not applicable.

Hazardous substances/reportable quantities (RQ)

Not applicable.

Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200

Portland cement is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

Status under CERCLA/SUPERFUND 40 CFR 117 and 302

Not listed.

Hazard Category under SARA(Title III), Sections 311 and 312

Portland cement qualifies as a "hazardous substance" with delayed health effects.

Status under SARA (Title III), Section 313

Not subject to reporting requirements under Section 313.

Status under TSCA (as of May 1997)

Some substances in portland cement are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act

Portland cement is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under California Proposition 65

This product contains up to 0.05 percent of chemicals (trace elements) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

Section 16 - OTHER INFORMATION

Prepared by

Kevin Keegan
Director - Health and Safety
CEMEX, Inc.
Houston, Texas

Approval date or Revision date

Approved: December, 2001

Other important information

Portland cement should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that portland cement chemically reacts with water, and that some of the intermediate products of this reaction (that is those present while a portland cement product is "setting") pose a more severe hazard than does dry portland cement itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide the all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY CEMEX, Inc. except that the product shall conform to contracted specifications. The information provided herein was believed by CEMEX, Inc. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

HYDROCHLORIC ACID, 33 - 40%

MSDS Number: H3880 --- *Effective Date: 05/10/01*

1. Product Identification

Synonyms: Muriatic acid; hydrogen chloride, aqueous
CAS No.: 7647-01-0
Molecular Weight: 36.46
Chemical Formula: HCl
Product Codes:
J.T. Baker: 5367, 5537, 5575, 5800, 5814, 5839, 5894, 5994, 6900, 7831, 9529, 9530, 9534, 9535, 9536, 9537, 9538, 9539, 9540, 9544, 9548
Mallinckrodt: 2062, 2612, 2624, 2626, 5587, H611, H613, H987, H992, H999, V078, V628

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Hydrogen Chloride	7647-01-0	33 - 40%	Yes
Water	7732-18-5	60 - 67%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.

Ingestion:
Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea. Swallowing may be fatal.

Skin Contact:
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.

Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth.

Long term exposures seldom occur due to the corrosive properties of the acid.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

---

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

5. Fire Fighting Measures

Fire:

Extreme heat or contact with metals can release flammable hydrogen gas.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

If involved in a fire, use water spray. Neutralize with soda ash or slaked lime.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
5 ppm Ceiling
-ACGIH Threshold Limit Value (TLV):
5 ppm Ceiling

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Colorless, fuming liquid.
Odor:
Pungent odor of hydrogen chloride.
Solubility:
Infinite in water with slight evolution of heat.
Density:
1.18
pH:
For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
53C (127F) Azeotrope (20.2%) boils at 109C (228F)
Melting Point:
-74C (-101F)

Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
190 @ 25C (77F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Containers may burst when heated.
Hazardous Decomposition Products:
When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
A strong mineral acid, concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.
Conditions to Avoid:
Heat, direct sunlight.

---

11. Toxicological Information

Inhalation rat LC50: 3124 ppm/1H; oral rabbit LD50: 900 mg/kg (Hydrochloric acid concentrated); investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
----------	-----	----------	----------

Hydrogen Chloride (7647-01-0)	No	No	3
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to biodegrade.
When released into the soil, this material may leach into groundwater.
Environmental Toxicity:
This material is expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: HYDROCHLORIC ACID
Hazard Class: 8
UN/NA: UN1789
Packing Group: II
Information reported for product/size: 475LB

International (Water, I.M.O.)

Proper Shipping Name: HYDROCHLORIC ACID
Hazard Class: 8
UN/NA: UN1789
Packing Group: II
Information reported for product/size: 475LB

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Hydrogen Chloride (7647-01-0)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
Hydrogen Chloride (7647-01-0)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Hydrogen Chloride (7647-01-0)	5000	500*	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

		-RCRA-	-TSCA-
Ingredient	CERCLA	261.33	8(d)
Hydrogen Chloride (7647-01-0)	5000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2R
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

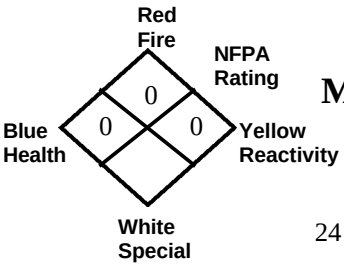
16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 16.
Disclaimer:
****
****
Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly

trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)



Liqui-Nox ®

MATERIAL SAFETY DATA SHEET

Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
24 Hour Emergency Number – Chem-Tel (800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	LIQUI-NOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 2001
Chemical Family:	Anionic Liquid Detergent
Manufacturer Catalog Numbers for sizes	1232, 1201, 1215 and 1255

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in LIQUI-NOX¨ as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	214°F
Vapor Pressure (mm Hg):	No Data
Vapor Density (AIR=1):	No Data
Specific Gravity (Water=1):	1.075
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Slower
Solubility in Water:	Completely soluble in all proportions.
Appearance:	Yellow liquid, nearly odorless
pH:	8.5 (1%)

IV. FIRE AND EXPLOSION DATA

Flash Point:	None (Cleveland Open Cup)
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO_2, foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Conditions To Avoid:	None
Incompatibility (Materials To Avoid):	Oxidizing agents.
Hazardous Decomposition or Byproducts:	May release SO_2 on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? No Skin? Yes Ingestion? Yes
Health Hazards (Acute and Chronic):	Skin contact may prove locally irritating, causing drying and/or chapping. Ingestion may cause discomfort and/or diarrhea.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Prolonged skin contact may cause drying and/or chapping.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. For small spills recover as much as possible with absorbent material and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	No special precautions in storing. Use protective equipment when handling undiluted material.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Not Required
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are recommended.
Eye Protection:	Goggles and/or splash shields are recommended.
Other Protective Clothing or Equipment:	Not required
Work/Hygienic Practices:	No special practices required

ExxonMobil

MATERIAL SAFETY DATA BULLETIN

FUELS, AUTOMOTIVE GASOLINE, UNLEADED

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: FUELS, AUTOMOTIVE GASOLINE, UNLEADED
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 281-834-3296
Product and Technical Information: 800-662-4525 703-846-6693
MSDS Fax on Demand: 613-228-1467, other MSDS information: 856-224-4644

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: GASOLINE AND PROPRIETARY ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
GASOLINE	80-90
METHYL-TERT-BUTYL ETHER (1634-04-4)	10-20

COMPONENT(S) OF PRODUCT INGREDIENTS INCLUDE:

XYLENE (1330-20-7)	10
TRIMETHYL BENZENE (25551-13-7)	8
TOLUENE (108-88-3)	6
ETHYL BENZENE (100-41-4)	3
N-HEXANE (110-54-3)	3
BENZENE (71-43-2)	2

NOTE: The concentration of the components shown above may vary substantially. In certain countries benzene content may be limited to

(Section continued next page)

lower levels (eg. US reformulated gasoline). Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present (eg. concentration to provide a minimum oxygen content of 1.5 Wt% in the US). Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane and isopentane. The reportable component percentages, shown in the Regulatory Information section, are based on API's evaluation of a typical gasoline mixture.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

This product is considered hazardous according to regulatory guidelines (See Section 15).

EMERGENCY OVERVIEW: Clear (May Be Dyed) Liquid. EXTREMELY FLAMMABLE, HIGH HAZARD. Liquid can release considerable vapor at temperatures below ambient which readily form flammable mixtures. Vapors settle to ground level and may reach, via drains and other underground passages, ignition sources remote from the point of escape. Product can accumulate a static charge which may cause a fire or explosion. DOT ERG No. : 128

POTENTIAL HEALTH EFFECTS: Skin irritation. May cause eye and respiratory irritation, dizziness, nausea, loss of consciousness, and in cases of extreme exposure, possibly death. Low viscosity material-if swallowed may enter the lungs and cause lung damage. Overexposure to benzene may result in cancer, blood disorders and damage to the bone marrow. Long-term exposure to gasoline vapor has caused kidney and liver cancer in laboratory animals. Case reports of chronic gasoline abuse (such as sniffing) and chronic misuse as a solvent or as a cleaning agent have shown a range of nervous system effects, sudden deaths from heart attacks, blood effects and leukemia. These effects are not expected to occur at exposure levels encountered in the distribution and use of gasoline as a motor fuel.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water. Immediately remove contaminated clothing, including shoes. (See Section 16 - Injection Injury)
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.
INGESTION: Seek immediate medical attention. Do not induce vomiting.
NOTE TO PHYSICIANS: Material if ingested may be aspirated into the lungs and can cause chemical pneumonitis. PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE: Skin contact may aggravate an existing dermatitis. Benzene- Individuals with liver disease may be more susceptible to toxic effects. Hexane- Individuals with neurological disease should avoid exposure.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon Dioxide, Foam, Dry Chemical, Water Fog.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate area. For large spills, fire fighting foam is the preferred agent and should be applied in sufficient quantities to blanket the product surface. Water may be ineffective, but water should be used to keep fire-exposed containers cool. Water spray may be used to flush spill away from exposures, but good judgement should be practiced to prevent spreading of the product into sewers, streams or drinking water supplies. If a leak or spill has not ignited, apply a foam blanket to suppress the release of vapors. If foam is not available, a water spray curtain can be used to disperse vapors and to protect personnel attempting to stop the leak.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: EXTREMELY FLAMMABLE, HIGH HAZARD. Liquid can release considerable vapor at temperatures below ambient which readily form flammable mixtures. Vapors settle to ground level and may reach, via drains and other underground passages, ignition sources remote from the point of escape. Product can accumulate a static charge which may cause a fire or explosion.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): < -40(-40) (ASTM D-56).
Flammable Limits (approx.% vol.in air) - LEL: 1.4%, UEL: 7.6%
NFPA HAZARD ID: Health: 1, Flammability: 3, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Eliminate sources of ignition. Warn occupants in downwind areas of fire and explosion hazard. Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Eliminate sources of ignition. Advise occupants and ships in the vicinity in downwind areas of fire and explosion hazard and warn them to stay clear. Notify port and other relevant authorities. Do not confine in area of leakage. Allow liquid to evaporate from the surface. Do not use dispersants.
ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: USE NON-SPARKING TOOLS AND EXPLOSION-PROOF EQUIPMENT. NEVER SIPHON GASOLINE BY MOUTH. GASOLINE SHOULD NOT BE USED AS A SOLVENT OR AS A CLEANING AGENT. Avoid contact with skin. Avoid inhalation of vapors or mists. Use in well ventilated area away from all ignition sources. This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode. Use product with caution around heat, sparks, pilot lights, static electricity, and open flames. It is unlawful and dangerous to put gasoline into unapproved containers. Do not fill container in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters. Store away from all ignition sources in a cool, well ventilated area equipped with an automatic sprinkling system. Outside or detached storage preferred. Storage containers should be grounded and bonded.
SPECIAL PRECAUTIONS: To prevent and minimize fire or explosion risk

(Section continued next page)

from static accumulation and discharge, effectively bond and/or ground product transfer system. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Use the correct grounding procedures. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

ExxonMobil recommends an 8-hour time-weighted average (TWA) exposure of 300 mg/m3 (100 ppm vapor).

		---TWA---		----STEL---		NOTE
Substance Name (CAS-No.)	Source	ppm	mg/m3	ppm	mg/m3	
GASOLINE						
	OSHA	300	900	500	1500	
	ACGIH	300	890	500	1480	
METHYL-TERT-BUTYL ETHER (1634-04-4)						
	ACGIH	40	144			
	XOM	25		75		
XYLENE (1330-20-7)						
O, M, P, -Isomers	OSHA	100	435	150	655	
O, M, P, -Isomers	ACGIH	100	434	150	651	
TRIMETHYL BENZENE (25551-13-7)						
	OSHA	25	125			

(Section continued next page)

	ACGIH	25	123		
TOLUENE (108-88-3)					
	OSHA	100	375	150	560
Skin	ACGIH	50	188		
	XOM		200		
ETHYL BENZENE (100-41-4)					
	OSHA	100	435	125	545
	ACGIH	100	434	125	543
N-HEXANE (110-54-3)					
	OSHA	50	180		
Other Isomers	OSHA	500	1800	1000	3600
N-Hexane Skin	ACGIH	50	176		
Other Isomers	ACGIH	500	1760	1000	3500
BENZENE (71-43-2)					
	OSHA	1		5	
Skin	ACGIH	0.5	1.6	2.5	8
Skin	XOM	1			

NOTE: Limits shown for guidance only. Follow applicable regulations.

VENTILATION: Ventilation equipment must be explosion proof.
RESPIRATORY PROTECTION: Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-contained breathing apparatus may be required for use in confined or enclosed spaces.
EYE PROTECTION: If splash with liquid is possible, chemical type goggles should be worn.
SKIN PROTECTION: Impervious gloves should be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Clear (May Be Dyed)
ODOR: Gasoline
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 20(68)
MELTING POINT C(F): NA
FLASH POINT C(F): < -40(-40) (ASTM D-56)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA

(Section continued next page)

VAPOR PRESSURE-mmHg 20 C: > 200.0
VAPOR DENSITY: 3.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.79
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 1
VISCOSITY AT 40 C, cSt: < 1.0
VISCOSITY AT 100 C, cSt: NA
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): NA
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Heat, sparks, flame and build up of static electricity.
INCOMPATIBILITY (MATERIALS TO AVOID): Halogens, strong acids, alkalies, and oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---
ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Irritant. (Primary Irritation Index: 3 or greater but less than 5). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Inhalation of high concentrations of vapors or aerosols/mists, especially deliberate or abuse exposure, may cause respiratory system irritation and damage. These exposures may also result in central nervous system depression and damage, possibly leading to death. Prolonged skin contact with gasoline may cause severe skin irritation similar to a chemical burn. The

(Section continued next page)

above effects, which may result from the whole gasoline or some of the gasoline components, are well documented in the medical literature. HAZARDS OF COMBUSTION PRODUCTS: Exposure to high concentrations of carbon monoxide can cause loss of consciousness, heart damage, brain damage and death.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

Two dermal studies resulted in significant irritation in rabbits but no significant systemic toxicity. 90-day inhalation exposures (approximately 1500 ppm vapor) in rats and monkeys produced light hydrocarbon nephropathy in male rats, but no other significant systemic toxicity.

---NEUROTOXICOLOGY (SUMMARY)---

Exposure to high concentrations of unleaded gasoline in rodents caused reversible central nervous system depression, however, no persistent neurotoxic effects were observed in subchronic inhalation studies of gasoline blending streams. No neurotoxic effects, as measured by a functional observation battery, motor activity, and neuropathology, were observed in rats exposed to light alkylate naphtha for 13 weeks at concentrations up to 6600 ppm. The medical literature clearly documents neurotoxic effects in humans from abusive gasoline inhalation (sniffing).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

Two separate inhalation teratology studies of unleaded gasoline vapor at exposures up to 1600 ppm and 9000 ppm for 6 hours/day on days 6-20 did not result in any significant developmental effects in rats. No significant effects were observed in the mothers or offspring. A two-generation inhalation reproductive study (CONCAWE) of unleaded gasoline showed no reproductive or developmental effects in rats exposed to concentrations up to 20, 000 mg/m3 (approx. 8000 ppm).

---CHRONIC TOXICOLOGY (SUMMARY)---

A lifetime mouse skin painting study of unleaded gasoline applied at 50 microliters, three times weekly, resulted in some severe skin irritation and changes, but no statistically significant increase in skin cancer or cancer to any other organ. A lifetime inhalation study of vaporized unleaded gasoline at up to 2000 ppm caused liver tumors in female mice and increased kidney tumors in male rats. The kidney tumors resulted from the formation of a compound unique to male rats, and are not considered relevant to humans. The U.S. EPA Risk Assessment Forum concluded that the male rat kidney tumor results are not relevant for human risk assessment. The implications for the female mice liver tumor data for human risk assessment have not been fully determined. Multiple short-term cancer predicative tests (Ames Test, etc.) have routinely been negative (no cancer or mutagenic potential) for unleaded gasoline.

---SENSITIZATION (SUMMARY)---

Unleaded gasoline was not a skin sensitizer in tests in a Buehler

(Section continued next page)

Guinea Pig Sensitization Assay.

---OTHER TOXICOLOGY DATA---

Gasoline and Refinery Streams: Isolated constituents of gasoline may display these or other potential hazards in laboratory tests. Gasoline consists of a complex blend of petroleum/processing derived paraffinic, olefinic, naphthenic and aromatic hydrocarbons which include up to 5% benzene (with 1-2 % typical in the U.S.), n-hexane, mixed xylenes, toluene, ethylbenzene and trimethyl benzene. Benzene has also caused damage to the fetus of test animals in developmental studies. Benzene has tested positive (mutagenic) in a number of short-term cancer/mutation predicative tests. Repeated exposures to low levels of benzene (50-500 ppm) have been reported to result in blood abnormalities including anemia and, in rare cases, leukemia in both animals and humans. Prolonged exposure to n-hexane may result in a condition known as peripheral neuropathy. This is nervous system damage and is characterized by numbness of the extremities and, in extreme cases, paralysis. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. Methyl Tertiary Butyl Ether (MTBE) was tested for carcinogenicity, neurotoxicity, chronic, reproductive, and developmental toxicity. The NOAEL for all end points evaluated in three animal species was 400 ppm or greater. An increase in kidney tumors/damage and liver tumors was observed in animals exposed to high concentrations of MTBE. Some embryo/fetal toxicity and birth defects were observed in the offspring of pregnant mice exposed to maternally toxic doses of MTBE, however the offspring of exposed pregnant rabbits were unaffected. The significance of the animal findings at high exposures are not believed to be directly related to potential human health hazards in the workplace.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative substances. When released into the environment, some of the constituents of gasoline will volatilize and be photodegraded in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation. Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant. Based on test results for similar products, this substance may be toxic to aquatic organisms such as algae and daphnia (EL50/ IrL50 =1-10 mg/L). This substance has also been shown to be toxic to fish

(Section continued next page)

(LL50 = 1~10 mg/L). The majority of the components in this product would be expected to be inherently biodegradable.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning for fuel value in compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).

BENZENE: 2.0000 PCT (TCLP)
FLASH: < -40(-40) C(F)

14. TRANSPORT INFORMATION

USA DOT:	
SHIPPING NAME:	Gasoline
HAZARD CLASS & DIV:	3
ID NUMBER:	UN1203
ERG NUMBER:	128
PACKING GROUP:	PG II
STCC:	NE
DANGEROUS WHEN WET:	No
POISON:	No
LABEL(s):	Flammable Liquid
PLACARD(s):	Flammable
PRODUCT RQ:	NA
MARPOL III STATUS:	NA
RID/ADR:	
HAZARD CLASS:	3
HAZARD SUB-CLASS:	3(b)
LABEL:	3
DANGER NUMBER:	33
UN NUMBER:	1203
SHIPPING NAME:	Motor Spirit
REMARKS:	NA
IMO:	
HAZARD CLASS & DIV:	3
UN NUMBER:	1203
PACKING GROUP:	PG II
SHIPPING NAME:	Gasoline
LABEL(s):	Flammable Liquid
MARPOL III STATUS:	NA

(Section continued next page)

ICAO/IATA:
HAZARD CLASS & DIV: 3
ID/UN Number: 1203
PACKING GROUP: PG II
SHIPPING NAME: Gasoline
SUBSIDIARY RISK: NA
LABEL(s): Flammable Liquid

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: F+ T Extremely flammable, Toxic.

Risk Phrase(s): R12-45-38-65-67.
Extremely flammable. May cause cancer. Irritating to skin. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness and dizziness.

Safety Phrase(s): S16-53-45-2-23-24-29-43-62.
Keep away from sources of ignition - No smoking. Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Keep out of the reach of children. Do not breathe vapor. Avoid contact with skin. Do not empty into drains. In case of fire use foam/drypowder/CO2. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Contains: Low Boiling Point Naphtha.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES:
FIRE CHRONIC ACUTE

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.

(Section continued next page)

BENZENE(COMPONENT ANALYSIS)	71-43-2	2%
PSEUDOCUMENE (1,2, 4-TRIMETHYLBENZENE)(COMPONENT ANALYSIS)	95-63-6	3%
ETHYL BENZENE(COMPONENT ANALYSIS)	100-41-4	3%
TOLUENE(COMPONENT ANALYSIS)	108-88-3	6%
N-HEXANE(COMPONENT ANALYSIS)	110-54-3	3%
XYLENES(COMPONENT ANALYSIS)	1330-20-7	10%
METHYL-TERT-BUTYL ETHER	1634-04-4	<15%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
GASOLINE		1, 8, 19, 20, 21, 23, 25
BENZENE (COMPONENT ANALYSIS) (2.00%)	71-43-2	1, 2, 4, 6, 9, 10, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
NAPHTHALENE (COMPONENT ANALYSIS) (0.50%)	91-20-3	16, 22
PSEUDOCUMENE (1,2, 4-TRIMETHYLBENZENE) (COMPONENT ANALYSIS)	95-63-6	1, 20, 24, 25
ETHYL BENZENE (COMPONENT ANALYSIS)	100-41-4	1, 8, 10, 18, 19, 20, 21, 23, 24, 25, 26
TOLUENE (COMPONENT ANALYSIS) (6.00%)	108-88-3	1, 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
N-HEXANE (COMPONENT ANALYSIS)	110-54-3	1, 10, 18, 19, 20, 21, 23, 24, 25, 26
TERT-AMYL METHYL ETHER	994-05-8	11, 15
XYLENES (COMPONENT ANALYSIS) (10.00%)	1330-20-7	1, 10, 18, 19, 20, 21, 22, 23, 24, 25, 26
METHYL-TERT-BUTYL ETHER	1634-04-4	1, 21, 24, 25
TRIMETHYL BENZENE (COMPONENT ANALYSIS)	25551-13-7	1, 10, 18, 19, 20, 21, 23, 25, 26

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK

(Section continued next page)

26=RI RTK

Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: UNLEADED MOTOR FUEL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Precautionary Label Text:

CONTAINS GASOLINE, BENZENE, AND ETHYLBENZENE

DANGER!

EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. CAUSES SKIN IRRITATION. RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.

OVEREXPOSURE TO BENZENE MAY RESULT IN CANCER, BLOOD DISORDERS, AND DAMAGE TO THE BONE MARROW. LONG-TERM EXPOSURE TO GASOLINE VAPOR HAS CAUSED KIDNEY AND LIVER CANCER IN LABORATORY ANIMIALS, BLOOD EFFECTS, AND NERVOUS SYSTEM DAMAGE.

Keep away from heat, sparks, and flame. Avoid all personal contact. Avoid prolonged breathing of vapor. Use with adequate ventilation. Keep container closed. Approved portable containers must be properly grounded when transferring fuel. For use as a motor fuel only. Misuse of gasoline may cause serious injury or illness. Never siphon by mouth. Not to be used as a solvent or skin cleaning agent.

FIRST AID: In case of contact, wash skin with soap and water. Immediately remove contaminated clothing, including shoes. Destroy or

(Section continued next page)

wash clothing before reuse. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a physician.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 2*, MPPEC: CF, TRN: 123455-20, CMCS97: EMGF20, REQ: PS+C, SAFE USE: G
EHS Approval Date: 01MAR2002

****

****

****

MATERIAL SAFETY DATA SHEET May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

PRODUCT NAME: PUREGOLD® MEDIUM CHIPS

Section I MANUFACTURER'S INFORMATION

MANUFACTURER'S NAME & ADDRESS:

CETCO – ***Drilling Products Group***
1500 West Shure Drive
Arlington Heights, IL 60004

Date Prepared: February 1, 2002

Telephone: 847-392-5800 / Fax: 847-577-5571
EMERGENCY CONTACT: *CHEMTREC* 800-424-9300
E-mail: www.cetco.com

Section II HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

PRODUCT IDENTIFICATION:

Chemical Name: Bentonite Clay
Chemical Family: Natural Mineral, Montmorillonite
CAS No: 1302-78-9 (Bentonite is on the TSCA inventory)
Formula: Naturally occurring hydrated aluminosilicate of sodium, calcium, magnesium, and iron
NFPA/HMIS: Health – 1*, Fire - 0, Reactivity - 0, Specific Hazard - *See Section VI.*
DOT Class: Not Regulated (49 CFR, IMDG, ICAO, IATA)

HAZARDOUS COMPONENTS: (Specific Chemical Identity: Common Name(s))	OSHA PEL (TWA)	ACGIH TLV (TWA)	NIOSH REL (TWA)	% (optional)
Quartz: CAS# 14808-60-7 (naturally occurring constituent)	–	–	–	–
Respirable Quartz:	0.1 mg/m^3	50 µg/m^3	50 µg/m^3	<1- 2%
Nuisance Dust - Respirable:	5 mg/m^3	3 mg/m^3	–	–
Total Dust:	15 mg/m^3	10 mg/m^3	–	–

OSHA PEL - OSHA Permissible Exposure Limit, 8 hour Time-Weighted Average
ACGIH TLV - American Conference of Governmental Industrial Hygienists Threshold Limit Value, 8 hr. TWA, 40 hr. week
NIOSH REL - National Institute for Occupational Safety and Health, Recommended Exposure Limit, 10 hr. TWA, 40 hr. week

*** WARNING:** This product contains a small amount of quartz that may cause delayed respiratory disease if inhaled over a prolonged period of time. Avoid breathing dust. Use NIOSH/MSHA approved respirator where TLV for quartz may be exceeded. IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 68, 1997) concludes that quartz is carcinogenic to humans (IARC classification 1).

Note: The Permissible Exposure Limits (PELs) reported above are the pre-1989 limits that were reinstated by OSHA June 30, 1993 following a decision by the United States Circuit Court of Appeals for the 11th Circuit. Federal OSHA is now enforcing these PELs. More restrictive exposure limits may be enforced by some other jurisdictions.

National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/ m^3) as determined by a full shift sample up to a 10 hour working day, 40 hours per week. *See*: 1974 NIOSH criteria for a recommended Standard for Occupational Exposure to Crystalline Silica for more detailed information.

Section III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	- Not Applicable	**Specific Gravity** (Water = 1.0)	- 2.5
Vapor Pressure (mm Hg.)	- Not Applicable	**Melting Point**	- Not Applicable
Vapor Density (Air = 1.0)	- Not Applicable	**Evaporation Rate** (Butyl Acetate = 1.0)	- Not Applicable
Solubility in Water	- Negligible		
Appearance and Odor	- Pale gray to buff chips, odorless		

Section IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (*Method Used*) - Not Applicable
Extinguishing Media - This product is not considered flammable, nor will it support combustion. Use extinguishing media appropriate to the surrounding fire.
Flammable Limits - Not Applicable **LEL** - Not Applicable **UEL** - Not Applicable
Special Fire Fighting Procedure - Not Applicable
Unusual Fire/Explosion Hazards - None known

Section V REACTIVITY DATA

Stability: Stable - X **Conditions to Avoid** - None Known
Incompatibility (*Materials to Avoid*)**:** None Known
Hazardous Decomposition or By-products: None Known
Hazardous Polymerization: Will Not Occur - X **Conditions to Avoid** - None Known

Section VI HEALTH HAZARD DATA

This product is a chemically inert, non-combustible mineral. A single exposure will not result in serious adverse effects. Excessive occupational, uncontrolled inhalation of dust may cause lung disease, silicosis, with symptoms of shortness of breath and reduced pulmonary function.

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? No

Health Hazards (Acute and Chronic): May cause delayed respiratory disease if dust inhaled over a prolonged period of time.

Inhalation: Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may cause irritation of the nose, throat and respiratory passages. Inhalation of dust may have the following serious chronic health effects:

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to *IARC Monograph 68, Silica, Some Silicates and Organic Fibers* (published in June 1997) in conjunction with the use of these materials.

The National Toxicology Program classifies respirable crystalline silica as a known human carcinogen. For further information *See*: "Adverse effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, page 761-765, 1997.

Section VI HEALTH HAZARD DATA (continued)

Skin Contact: No adverse effects expected

Eye Contact: Contact may cause mechanical irritation and possible injury

Ingestion: No adverse effects expected for normal, incidental ingestion

Chronic Health Effects: See "Inhalation" subsection above with respect to silicosis, cancer status and other data with possible relevance to human health.

Signs and Symptoms of Exposure: There are generally no signs or symptoms of exposure to crystalline silica. See "Inhalation" subsection above for symptoms of silicosis.

Medical Conditions Generally Aggravated by Exposure: Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation should not be exposed to crystalline silica dust.

Emergency and First Aid Procedures:

Eye Contact – Flush the eyes immediately with large amounts of water, lifting the upper and lower lids occasionally. If irritation persists or for imbedded foreign body, get immediate medical attention.

Gross Inhalation – Remove to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult have qualified personnel administer oxygen. Get prompt medical attention.

Skin Contact - No first aid should be needed since this product does not affect the skin. Wash exposed skin with soap and water before breaks and at the end of the shift.

Ingestion - If large amounts are swallowed, get immediate medical attention.

Section VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled: Vacuum if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Avoid adding water; product will become slippery when wet. Waste Disposal Method – Follow federal, state and local regulations for solid waste.

Handling and Storing Precautions: Do not breathe dust. Use normal precautions against bag breakage or spills of bulk material. Avoid creation of respirable dust. Use good housekeeping in storage and use areas to prevent accumulation of dust in work areas. Use adequate ventilation and dust collection. Maintain and use proper, clean respiratory equipment. Launder clothing that has become dusty. Empty containers (bags, bulk containers, storage tanks, etc.) retain silica residue and must be handled in accordance with provisions of this Material Safety Data Sheet. Warn and Train employees in accordance with state and federal regulations.

Other Precautions: Slippery when wet.

WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS – USERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARDS AND OSHA PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT OSHA PRECAUTIONS.

Section VIII CONTROL MEASURES

Respiratory Protection: Use appropriate respiratory protection for respirable particulate based on consideration of airborne workplace concentration and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (Z88.2) OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic.

Ventilation: Use local exhaust as required to maintain exposures below applicable occupational exposure limits (*See Section II*). See also ACGIH "Industrial Ventilation – A Manual for Recommend Practice", (*current edition*).

Protective Gloves: Recommended.

Eye Protection: Safety glasses or goggles recommended.

Other Protective Clothing or Equipment: As appropriate for work environment. Dusty clothing should be laundered before reuse.

Section VIII CONTROL MEASURES (continued)

Transportation Data:	**U.S. DOT Hazard Classification**
Proper Shipping Name:	**Not regulated**
Technical Name:	**N/A**
UN Number:	**N/A**
Hazard Class/Packing Group:	**N/A**
Labels Required:	**None**
DOT Packaging Requirements:	**N/A**
Exceptions:	**N/A**

Section IX OTHER REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

SARA 313: This product contains the following chemicals subject to annual release reporting requirements under the SARA section 313 (40 CFR 372): None

CERCLA Section 103 Reportable Quantity: None

California Proposition 65: This product contains the following substances known to the state of California to cause cancer and/or reproductive harm: crystalline silica (respirable).

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or are exempt from notification requirements.

European Inventory of Commercial Chemical Substances: All the components of this product are listed on the EINECS Inventory or exempt from notification requirements. (The EINECS number for Quartz: 231-545-5)

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances List or exempt from notification requirements.

Japan MITI: All the components of this product are existing chemical substances as defined in the Chemical Substance Control Law

Australian Inventory of Chemical Substances: All the components of this product are listed on the AICS Inventory or exempt from notification requirements.

Canadian WHMIS Classification: This product contains crystalline silica (respirable), classified as a Class D, Division 2, Subdivision A substance.

European Community Labeling Classification: Harmful (Xn)

European Community Risk and Safety Phrases: R40, R48, S22

REFERENCES:

Registry for Toxic Effects of Chemical Substances (RTECS), 1995.
Patty's Industrial Hygiene and Toxicology.
NTP Ninth Annual Report on Carcinogens, 1997.
IARC Monograph Volume 68, Silica, Some Silicates and Organic Fibers, 1997.

MATERIAL SAFETY DATA SHEET

Date Prepared: May 1, 2002

1. PRODUCT/COMPANY IDENTIFICATION

SAKRETE® Products:
High Strength Concrete Mix
Glass Block Mortar
Mortar Mix
Sand Mix
Type S Mortar

American Stone-Mix Products:
Amspec Type S Mortar
B-Dry Waterproofers Sand Mix
Block -Fill Grout
Evercrete Sand Mix
General Purpose Concrete
GFG-210
Metro Mix 240
Metro Mix 240 AE
Metro Mix 240 MS
Metro Mix 240 MS AE
Rip Rap
Waterproofers Sand Mix

Emergency Telephone:
800-424-9300 (Chemtrec) or
703-527-3887 (Outside USA)

Manufacturer's Name & Address:
American Stone-Mix, Inc.
8320 Bellona Ave.
Towson, MD 21204

Telephone Number for Information: 800-354-8609

2. EMERGENCY AND FIRST AID

EMERGENCY INFORMATION: This product is a gray cementitious mixture of cement, sand and or stone. When in contact with moisture in eyes or on skin, or when mixed with water, it becomes highly caustic (pH > 12) and will damage or burn (as severely as third-degree) the eyes or skin. Inhalation may cause irritation to the moist mucous membranes of the nose, throat and upper respiratory system or may cause or may aggravate certain lung diseases or conditions. Use exposure controls or personal protection methods described in Section 12.

EYES: Immediately flush eye thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

SKIN: Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation or inflammation develops or persists. Seek immediate medical treatment in the event of burns.

INHALATION: Remove person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Seek medical help if coughing and other symptoms do not subside. Inhalation of large amounts of Concrete requires immediate medical attention.

INGESTION: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

3. COMPOSITION INFORMATION

DESCRIPTION: This product consists of a heterogeneous mixture of hydraulic cement, sand and rock. The major compounds are:

$3CaO•SiO_2$	Tricalcium Silicate	CAS #12168-85-3
$2CaO•SiO_2$	Dicalcium Silicate	CAS #10034-77-2
$3CaO•Al_2O_3$	Tricalcium Aluminate	CAS #12042-78-3
$4CaO•Al_2O_3•Fe_2O_3$	Tetracalcium aluminoferrite	CAS #12068-35-8
$CaSO_4•2H_2O$	Calcium Sulfate dihydrate (Gypsum)	CAS #7778-18-9 (CAS #13397-24-5)
SiO_2	Silica Sand	CAS #14808-60-7

4. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

COMPONENT	OSHA PEL	ACGIH TLV-TWA	NIOSH REL
Hydraulic Cement	5 mg respirable dust/m^3 15 mg total dust/m^3	10 mg total dust/m^3	
Calcium sulfate (CAS #7778-18-9) [Gypsum (CAS #13397-24-5)]	5 mg respirable dust/m^3 15 mg total dust/m^3	10 mg total dust/m^3	
Iron oxide (CAS #1309-37-1)	10 mg/m^3	5 mg/m^3	
Calcium carbonate (CAS #1317-65-3)	5 mg respirable dust/m^3 15 mg total dust/m^3	10 mg total dust/m^3	
Magnesium oxide (CAS #1309-48-4)	15 mg total dust/m^3	10 mg total dust/m^3	
Calcium oxide (CAS #1306-78-8)	5 mg/m^3	2 mg/m^3	

MAY CONTAIN:

Amorphous Silica (CAS #7631-86-9	80 mg/m^3 / SiO_2	10 mg/m^3
Aluminum Oxide (CAS #1344-28-1	5 mg respirable dust/m^3 15 mg total dust/m^3	10 mg/m^3

TRACE INGREDIENTS:

Due to the use of substances mined from the earth's crust, trace amounts of naturally occurring, potentially harmful constituents may be detected during chemical analysis.

5. HAZARD IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

NOTE: Potential health effects may vary depending upon the duration and degree of exposure. To reduce or eliminate health hazards associated with this product, use exposure controls or personal protection methods as described in Section 12.

EYE CONTACT:

(Acute/Chronic) Exposure to airborne dust may cause immediate or delayed irritation or inflammation of the cornea. Eye contact by larger amounts of dry powder or splashes of wet material may cause effects ranging from moderate eye irritation to chemical burns and blindness.

SKIN CONTACT:

(Acute) Exposure may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Discomfort or pain cannot be relied upon to alert a person to a hazardous skin exposure.

(Chronic) Dry material coming in contact with wet skin or exposure to wet material may cause more severe skin effects, including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of chemical (caustic) burns.

(Acute/Chronic) Some individuals may exhibit an allergic response upon exposure. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers.

INHALATION:

(Acute) Exposure may cause irritation to the moist mucous membranes of the nose, throat and upper respiratory system. Pre-existing upper respiratory and lung diseases may be aggravated by inhalation.

(Chronic) Inhalation exposure to free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or cause or aggravate other lung diseases or conditions.

INGESTION:

(Acute/Chronic) Internal discomfort or ill effects are possible if large quantities are swallowed.

CARCINOGENIC POTENTIAL:

This product is not recognized as a carcinogen by NTP, OSHA, or IARC. However, it may contain trace amounts of heavy metals recognized as carcinogens by these organizations. In addition, it also contains crystalline silica, which IARC classifies as a known human carcinogen (Group I). The NTP, in it's ninth Annual Report on Carcinogens, classified "silica, crystalline (respirable)" as a known carcinogen. (See also Sections 4 and 12.)

6. ACCIDENTAL RELEASE MEASURES
(See Section for Regulatory Information)

Contain material to prevent contamination of soil, surface water or ground water. Use dry clean-up methods that do not disperse dust into the air or entry into surface water. Material can be used if not contaminated. Place in an appropriate labeled container for disposal or use. Avoid inhalation of dust and contact with skin and eyes. Use exposure control and personal protection methods as described in Section 12.

7. PHYSICAL/CHEMICAL DATA

APPEARANCE/ODOR:	Gray, odorless	**PHYSICAL STATE:**	Solid (Powder mixed with sand and rock.)
BOILING POINT:	> 1000°C	**MELTING POINT:**	> 1000°C
VAPOR PRESSURE:	Not applicable	**VAPOR DENSITY:**	Not applicable
pH (IN WATER) (ASTM D 1293-95)	12 to 13	**SOLUBILITY IN WATER:**	Slightly soluble (0.1% to 1.0%)
SPECIFIC GRAVITY (H_2O = 1.0):	2.5 – 2.8	**EVAPORATION RATE:**	None

8. FIRE AND EXPLOSION

FLASH POINT:	None	**LOWER EXPLOSIVE LIMIT:**	None
AUTO IGNITION TEMPERATURE:	Not combustible	**UPPER EXPLOSIVE LIMIT:**	None
FLAMMABLE LIMITS	Not applicable	**SPECIAL FIRE FIGHTING PROCEDURES:**	None
EXTINGUISHING MEDIA:	Not combustible	**UNUSUAL FIRE AND EXPLOSION HAZARDS:**	None
HAZARDOUS COMBUSTION PRODUCTS:	None		

9. STABILITY AND REACTIVITY DATA

STABILITY:	Product is stable. Keep dry until used.
CONDITIONS TO AVOID:	Unintentional contact with water. Contact with water will result in hydration and produces (caustic) calcium hydroxide.
INCOMPATIBILITY:	Wet material is alkaline. As such, it is incompatible with acids, ammonium salts and aluminum metal.
HAZARDOUS DECOMPOSITION:	Will not occur.
HAZARDOUS POLYMERIZATION:	Will not occur.

10. PRECAUTIONS FOR HANDLING AND STORAGE

HANDLING AND STORAGE

Keep dry until used. Handle and store in a manner so that airborne dust does not exceed applicable exposure limits. Use adequate ventilation and dust collection. Use exposure control and personal protection methods as described in Section 12.

11. TOXICOLOGICAL INFORMATION

See Section 5 for Hazard Identification. No recognized unusual toxicity to plants and animals.

Conditions aggravated by exposure: Eye disease, Skin disorders and Chronic Respiratory conditions.

12. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION:

Use local exhaust or general dilution ventilation to control dust levels below applicable exposure limits. Minimize dispersal of dust into the air.

If local or general ventilation is not adequate to control dust levels below applicable exposure limits or when dust causes irritation or discomfort, use MSHA/NIOSH approved respirators.

EYE PROTECTION:

Wear safety glasses with side shields or goggles to avoid contact with the eyes. In extremely dusty environments and unpredictable environments, wear tight-fitting unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when handling cement or cement containing products.

SKIN PROTECTION:

Wear impervious abrasion- and alkali-resistant gloves, boots, long-sleeved shirt, long pants or other protective clothing to prevent skin contact. Promptly remove clothing dusty with dry material or clothing dampened with moisture mixed with material, and launder before re-use. If contact occurs, wash areas contacted by material with pH neutral soap and water.

13. DISPOSAL CONSIDERATIONS

DISPOSAL:

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/ Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

IF THIS MATERIAL AS PACKAGED, BECOMES A WASTE, IT DOES NOT MEET THE CRITERIA FOR A HAZARDOUS WASTE AS DEFINED BY THE ENVIRONMENTAL PROTECTION AGENCY UNDER THE AUTHORITY OF THE RESOURCE CONSERVATION AND RECOVER ACT (40CFR 261), DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

Comply with all applicable local, state and federal regulations for disposal of unusable or contaminated materials. Dispose of packaging/containers according to local, state and federal regulations.

14. TRANSPORTATION DATA

Not hazardous under U.S. DOT or TDG regulations.

15. OTHER REGULATORY INFORMATION

Status under US OSHA Hazard Communication Rule 29 CFR 1910.1200:	Considered a hazardous chemical under this regulation and should be included in the employer's hazard communication program.
Status under CERCLA/Superfund, 40 CFR 117 and 302:	Not listed.
Hazard Category under SARA (Title III), Sections 311 and 312:	Qualifies as a hazardous substance with delayed health effects.
Status under SARA (Title III), Section 313:	Not subject to reporting requirements under Section 313.
Status under TSCA (as of May 1997):	Some substances are on the TSCA inventory list.
Status under the Federal Hazardous Substances Act:	Hazardous substance subject to statutes promulgated under the subject act.
Status under California Proposition 65:	This product contains crystalline silica, a substance known to the State of California to cause cancer. This product also may contain trace amounts of heavy metals known to the State of California to cause cancer, birth defects or other reproductive harm.
Status under Canadian Environmental Protection Act:	Not listed.
Status under Canadian WHMIS:	Considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class D2A, E - Corrosive Material) and subject to the requirements of WHMIS.

16. OTHER INFORMATION

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. It is the user's obligation to determine the conditions of safe use of this product.

Ambient Air Monitoring Form

Attachment 3

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Ambient Air Monitoring Form

Date	Time	Ambient Air Monitoring Location	Results

Identification of Poisonous Plants

Attachment 4

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Identifying Poisonous Plants

Most species of poison ivy, oak, and sumac have three leaflets; hence the saying, "Leaves of three, let it be." These plants vary significantly in appearance in different regions of the country, but in most species the flower and fruit structures arise in the angle between the leaf and the twig, the flowers are greenish in spring, and the plant's mature fruit is off-white or pale yellow-green.

Several varieties, including two species each of poison ivy, poison oak, and poison sumac and six subspecies of poison ivy (*Toxicodendron radicans*), are found in the United States. Poison ivy (see figure A below) generally grows east of the Rocky Mountains and poison oak in the West. Both poison ivy and poison sumac are found along the Gulf Coast. Poison oak prefers swampy areas in the Southeast.

Figures A1, A2: Courtesy of Lisa A. Gamer, MD; figure A3: staff photo; figure A4: Janet Robidoux

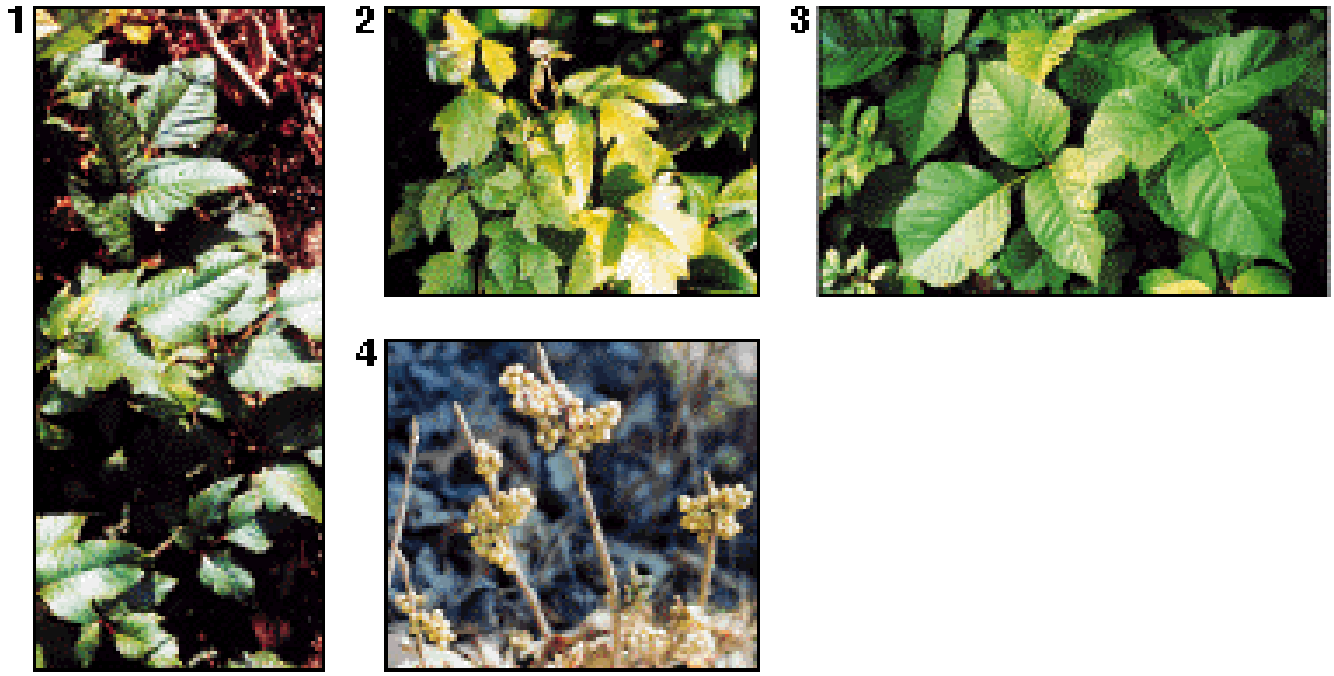


Figure A. Poison ivy (Toxicodendron radicans) can grow as a shrub or vine, but all varieties are characterized by glossy leaves that grow in clusters of three leaflets. The varieties shown here are found in Texas (1,2) and Minnesota (3). The off-white or pale yellow-green berries of poison ivy (4) often remain on the plant through the winter.

Identifying Poisonous Plants

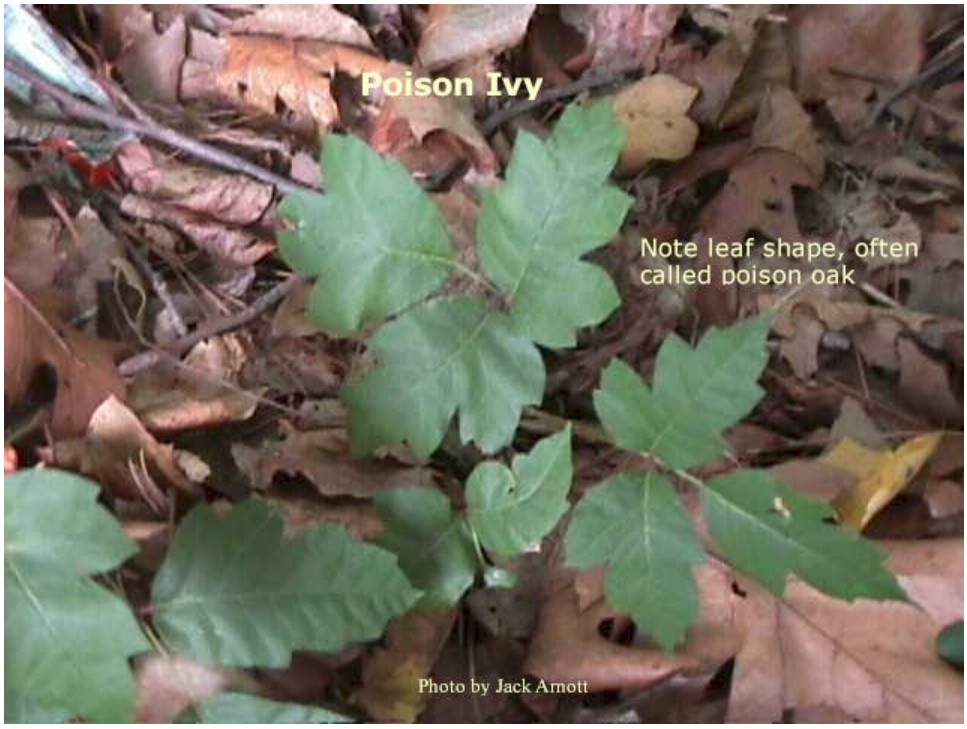
Poison Ivy

A climbing vine with three serrated-edge, pointed leaves grows in the East, Midwest and South. In the northern and western states, poison ivy grows as a non-climbing shrub.

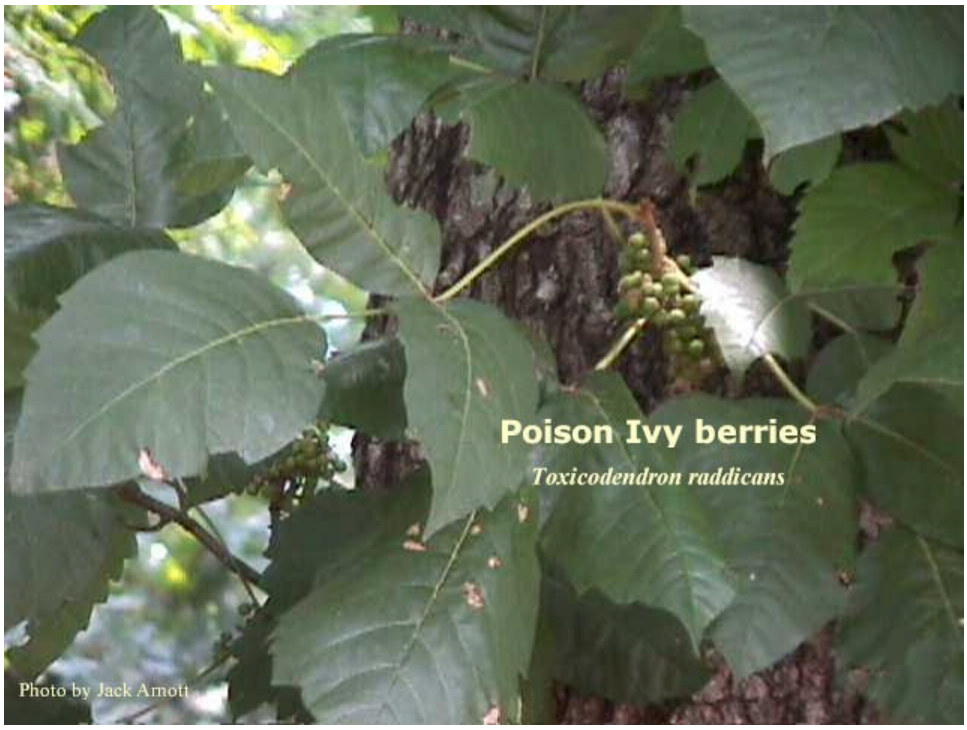
The appearance of these plants is variable. Leaves are alternate and normally consist of three leaflets with the stalk of the central leaflet being longer than those of the other two but can be found with five or even seven leaflets. The leaflets are two to four inches long, dull or glossy green with pointed tips. The middle leaflet is generally larger than the two laterals. The edges of the leaflets may be toothed, lobed, or smooth. Virginia Creeper (*Parthenocissus quinquefolia*) is non-poisonous vine with five leaflets that is often mistaken for poison ivy.

Poison ivy can be a shrub or a woody vine. Yellowish-green flowers occur in compact clusters in leaf axils, in June or July followed by waxy, gray-white berries about three-sixteenths of an inch in diameter in late summer.

Identifying Poisonous Plants



Identifying Poisonous Plants



Identifying Poisonous Plants

Poison Sumac

A shrub or bush with two rows of 7-13 leaflets, most common in the peat bogs of the Northern United States and in swampy Southern regions of the country. A water loving swamp shrub (dendritic) or bush with two rows of 7-13 leaflets; growing from 6 to 20 feet in height, the Poison Sumac is found in the east from Quebec to Florida and westward along the coast to far west Texas between Shelby and Hardin counties.

Poison Oak

Poison oak also has three leaves. It grows in the sandy soil of the Southeast as a small shrub. In the western United States poison oak is a very large plant that grows as a standing shrub or climbing vine. Eastern poison oak has the most "oak-looking" leaves of any of the species. It usually has multi-lobed leaves, no aerial roots on the stems, and fuzzy fruits and leaves. It loves sandy soils. Western poison oak is found only along the Pacific coast and into the mountains and it usually has aerial roots extending from the main stem.

Daily Safety Meeting Form

Attachment 5

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Daily Safety Meeting
Whirlpool Facility, Fort Smith, Arkansas

Date:	**Meeting Facilitator:**
AWARENESS ISSUES (special EHS concerns, pollution prevention, recent incidents)	
OTHER ISSUES (HASP changes, new JHAs, attendee comments)	
DISCUSSION OF DAILY ACTIVITIES/TASKS AND SAFETY MEASURES	

ATTENDEES (Print name and initial)

ERM Incident Form

Attachment 6

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Incident Report

Case Number from OSHA 300 Log _____

Instructions: Complete form, route to Project Manager, and route to Medical Recordkeeping Coordinator within 24 hours of incident. If a piece of information does not apply, put N/A in the block. Forms from all incidents involving any injury will be routed to Corporate Health and Safety Manager for OSHA recordability determination.
Note: This form can be used in lieu of OSHA Form 301 Injuries and Illnesses Incident Report

Date and time of incident Date: Time:	**Location of incident** (Name and address)	
Time injured employee started work on day of incident		
Reported by	**Date reported**	**List any witnesses**
Project Number	**Project Manager**	**PIC**
Injured employee name	**Injured employee's home address**	
Injured employee's date of birth	**Injured employee's sex** Male Female	**Injured employee's date of hire at ERM**

Type of Incident (circle one)

First aid/minor injury All other injuries
Vehicle accident Property damage Near miss

What activity/task was taking place just prior to the incident? (Describe the activity/task as well as tools, equipment and material involved and what workers were doing.)

What happened to cause incident? (Describe in detail the incident.)

Immediate actions taken (Describe actions taken and by whom immediately after the incident occurred.)

Incident Report

Case Number from OSHA 300 Log _____

If incident involved an injury, describe injury. (eg. Cut to left ring finger, sprained right ankle, snake bit to left shin, pulled muscles in back)		
What object or substance directly harmed the employee? (Examples, concrete floor, chlorine, H2S, manhole cover. If this question does not apply to the incident, write N/A.)		
If medial treatment was given away from worksite, state name and mailing address of both the facility and treating health care professional.		
Was employee treated in an emergency room? Yes No	**Was employee hospitalized overnight as an in-patient? Yes No**	
Consequences of incident (Describe damage to property/equipment and/or injury. If incident was near miss, describe what could have happened.)		
If the employee died, give date of death		
Is injury an OSHA recordable? (To be completed by Corporate Health and Safety Manager) Yes No Name of person making determination		
Name of person completing form	**Signature of person completely form**	
Title of person completing form	**Phone number of person completing form**	**Date form completed**

Incident Report

Case Number from OSHA 300 Log _____

Instructions: This side of the form will be completed as directed by the Corporate Health and Safety Manager.

Actions leading to incident. Circle all that apply and explain.

Failure to observe warning	Failure to use PPE	Failure to warn	Other
Delayed discovery	Procedure not followed	Abuse/misuse of equipment	

Conditions leading to incident. Circle all that apply and explain.

Temperature/weather	Inadequate maintenance	Nature (animal, insects, plants)
Lack of PPE	Lack of proper instructions	Construction deficiencies
Improper design/engineering	Improper/defective tools/ equipment	Other

Job factors leading to incident. Circle all that apply and explain.

Leadership/supervision	Work practices	Defective tools/equipment
Inadequate communication	Inadequate training	Inadequate inspections
Inadequate work procedures/practices		Other

Personal factors leading to incident. Circle all that apply and explain.

Physical capability	Physical stress/fatigue	Mental stress
Knowledge of task	Employee skills	Attention to details
Other		

Corrective Action	Person responsible	Date completed

Map to Hospital

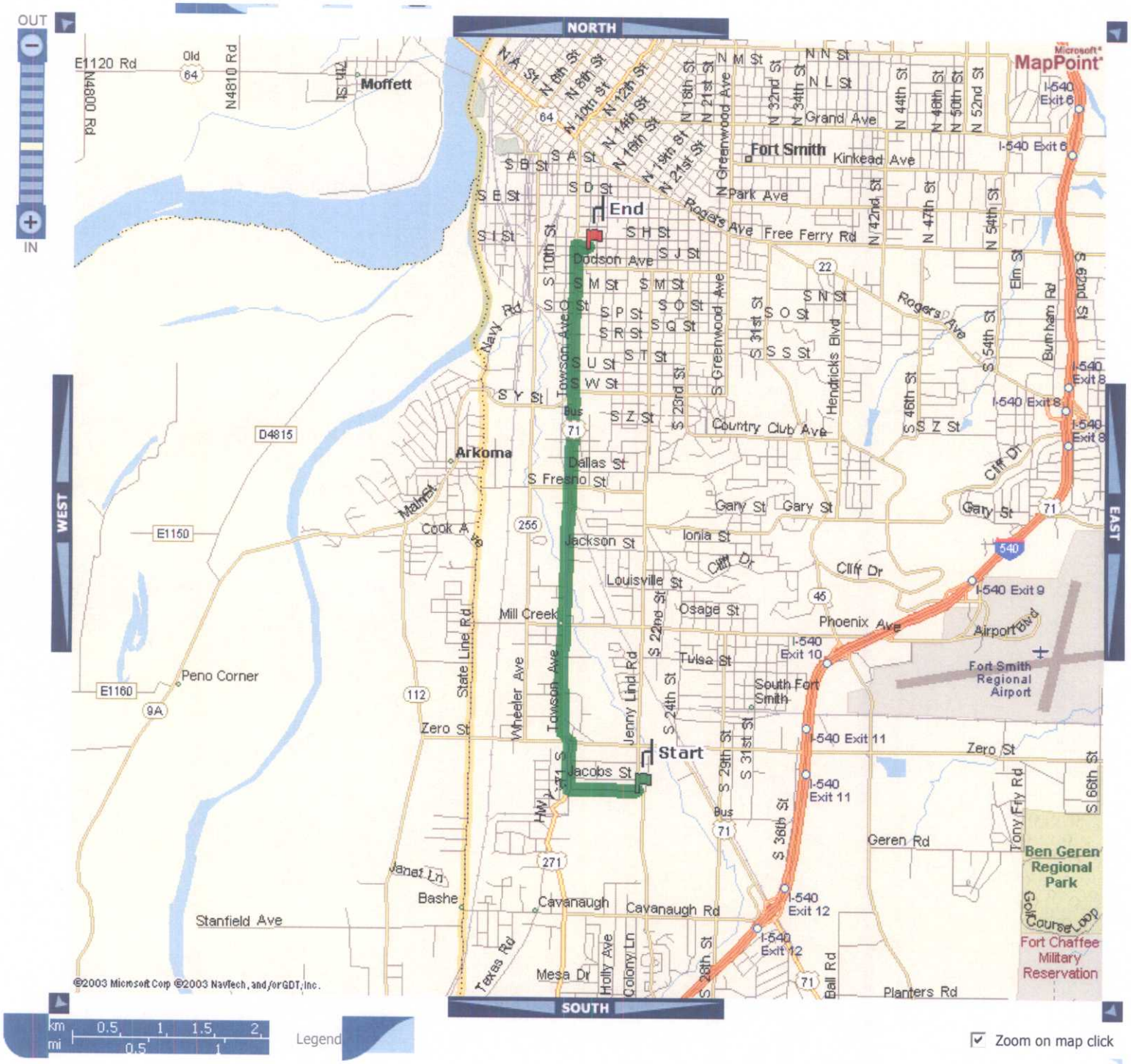
Attachment 7

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Start: 6400 Jenny Lind Ave, Fort Smith, AR 72908
End: St Edward Mercy Medical Center (hospital), Arkansas
Total Distance: 5.3 Miles
Estimated Total Time: 9 minutes

Directions	Miles	Map
Start: Depart 6400 Jenny Lind Ave, Fort Smith, AR 72908 on Jenny Lind Ave (North)	0.1	☐
1: Turn LEFT (West) onto Norge Blvd [Ingersoll Ave], then immediately turn RIGHT (North) onto Jenny Lind Rd	0.1	
2: Road name changes to Jenny Lind Ave	0.2	
3: Turn RIGHT (East) onto SR-255 [Zero St]	1.1	☐
4: Take Ramp (LEFT) onto I-540 [US-71]	2.8	
5: At I-540 Exit 8, turn RIGHT onto Ramp	0.2	☐
6: Take Ramp (RIGHT) onto SR-22 [Rogers Ave]	0.7	
End: Arrive St Edward Mercy Medical Center (hospital), Arkansas		☐



Start: Jenny Lind Rd, Fort Smith, AR 72908
End: Sparks Regional Medical Center (hospital), Arkansas
Total Distance: 4.1 Miles
Estimated Total Time: 9 minutes

Directions	Miles	Map
Start: Depart Jenny Lind Rd, Fort Smith, AR 72908 on Norge Blvd [Ingersol Ave] (West)	0.4	☐
1: Turn RIGHT (North) onto US-271 [HWY-271 S]	0.3	
2: Bear LEFT (North-West) onto US-71 Bus	0.1	
3: Bear RIGHT (North) onto US-71 Bus [Towson Ave]	3.2	☐
4: Turn RIGHT (East) onto S I St **End:** Arrive Sparks Regional Medical Center (hospital), Arkansas	0.1	☐

Emergency Drill Evaluation Form

Attachment 8

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Emergency Drill Evaluation Form

Date of Drill	**Date of Evaluation**
Name of Person Conducting Drill (print)	**Signature of Person Conducting Drill**
Briefly describe the drill scenario	
List the positive attributes of the drill	
List the opportunities for improvement	

Action Items	**Assigned To**	**Estimated Completion Date**
Drill Evaluation Team Members (print names)		

Whirlpool Safety Standards for Contractors

Attachment 9

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

SAFETY STANDARDS FOR CONTRACTORS

I. PURPOSE:

The Whirlpool Fort Smith Division has established both consistent and safe practice guidelines which apply to all at the division, whether they are contract personnel or our own employees. These specific standards and guidelines are necessary for the general health and safety of people working or present within the confines of our property.

II. WHIRLPOOL CONTRACT STANDARDS:

On all written contracts with Whirlpool Corporation, Fort Smith Division located at 6400 JennyLind Rd., Fort Smith, AR., a Delaware Corporation. Having its principal place of business at 2000 - M-63, Benton Harbor, Michigan 49022. This will be required of all contractors.

Property Damage, Safety, and Health

Contractor shall take all necessary precautions to prevent damage of equipment or the material owned by Whirlpool or equipment to be installed as a part of this or any contract project. If deemed necessary by Whirlpool, temporary curtains or walls will be constructed by contractor to permit continuation of the work. The safety of workers shall be considered in the design of all equipment included in this job. It is the contractors responsibility to insure that no construction activity takes place which could damage or endanger the health and safety of any employee. Either of Whirlpool or that of the contractor. In both design and installation of all equipment and the equipment and process used to install such equipment shall adhere to all current requirements of the Occupational Safety and Health Act.

NOTE: Contractor must have current contract liability insurance. Total dollar amount to be set by Whirlpool. Proof of insurance must be on file in Maintenance Dept.

LEGAL REQUIREMENTS

III. EMPLOYER'S REQUIREMENTS UNDER OSHA

Each contractor\ employer - shall furnish to each of his\her employees employment which is free of recognized hazards causing or are likely to cause death or serious physical harm to his\her employees.
All shall comply with OSHA standards promulgated under this act.

REFERENCES: General Industry Standards 29 CFR 1910
OSHA Hazard Communication Standard 29 CFR 1910. 1200

IV. CONTRACTOR'S GENERAL SAFETY AND HEALTH PROVISION

1. 1910.12 Construction Work.

   a. Standards: The standards adopted are Occupational Safety and Health Administration standards. According to the provisions thereof, to every employment and place of employment of every employee engaged in construction work by complying with the appropriate standards prescribed.

   b. Definition: For the purpose of, "construction work" means work for construction, alteration, and/or repair, including painting and decorating.

   c. Construction Safety Act distinguished : Whirlpool adopts as Occupational Safety and Health Administration standards those which are prescribed in the OSHA guidelines.

2. Accident Prevention Responsibilities

   a. It shall be the responsibility of the contractor to initiate and maintain such programs as may be necessary to comply with this part.

   b. The contractor shall provide for the frequent and regular inspections of the job sites, materials and equipment to be made by competent persons designated by the contractor.

   c. The use of any machinery, tools, materials or equipment which are not in compliance to applicable requirements of this part is prohibited. Such machine, tool(s), material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or such item be physically removed from its place of operation.

   d. The contractor shall permit only those employees qualified by training to operate equipment and machinery.

V. CONTRACTOR'S PERSONAL PROTECTIVE EQUIPMENT REQUIREMENT

1. 1910. 94, 95 Personal Protective Equipment

   a. The contractor is responsible for requiring the wearing of appropriate Personal Protective Equipment in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazards to the employee(s).

   b. Regulations governing the use, selection, and maintenance of personal protective and lifesaving equipment are described on, and should be applied, the manufactures instructions for such equipment.

2. EYE PROTECTION:

a. All Whirlpool employees and contractor personnel are\ will be required to have ANSI approved safety glasses, (prescription or non- prescription) on at all times when they are inside Whirlpool facilities, (except office areas and restrooms). For contractor work, side shields are recommended.

b. Eye / face protection meeting ANSI standards required in performing any of the following: 1. Any welding, cutting or brazing operations.
2. When using any chemical agents which could cause eye damage.
3. While performing carpentry.
4. Any chipping or grinding operations.
5. Any general metal fabrication.

3. HEAD PROTECTION:

a. All contractor personnel will be required to wear non-conductive, high impact protective safety hats when entering / working in an area where contractor, maintenance work is being done overhead.

NOTE: <u>Head protection must be worn when performing work off the floor, using scaffolding or any type of motorized carrier to lift person(s) off the floor to perform overhead work.</u>

4. EAR PROTECTION:

a. Ear protection will be required by contractor personnel when performing any work <u>causing or working in</u> an area where the noise level exceeds 85 decibels. This rule will be adhered to no matter the duration of the exposure. Areas requiring hearing protection are identified.

5. FOOT PROTECTION:

a. All contractor personnel will wear shoes with leather or synthetic leather tops and hard soles. Steel toed safety shoes are recommended.

VI. LIFTS, SCAFFOLDING, LADDERS, FOR OVERHEAD CONSTRUCTION

1. FORK LIFTS

a. All lifts used by contractor personnel will be by OSHA standards, having proper safety rails, lanyards attached and toe boards when the lift exceeds the capability of <u>four (4) feet</u>. 1910.67

b. Fork lift trucks will not be used for lifting personnel under any conditions unless the lifting device is an approved personnel carrier. Carrier must be equipped with proper shut off controls, body harness, lanyards (both to be worn by occupant in personnel carrier) ect.. Fork lift must be operated by trained operator, with clear communication between operator and person in carrier.

2. SCAFFOLDING

a. Scaffolding will have appropriate safety rails of 42 inches with an intermediate rail and a 4 inch toe board. 1910.28

3. LADDERS

a. All ladders used shall be in good condition and meet all OSHA standards. 1910.25 Contractors will supply their own ladders.
NOTE: <u>FIBERGLASS LADDERS ONLY</u> ARE TO BE USED ON WHIRLPOOL PROPERTY. USE OF WOOD OR ALUMINUM LADDERS IS FORBIDDEN (with the exception of allowing aluminum ladders to be used in order to provide a grounding path for static discharge only in the paint dept. when cleaning/servicing the spray bells).

VII. REQUIRED SAFETY STANDARDS FOR CONTRACT WORK AT WHIRLPOOL CORPORATION, FORT SMITH DIVISION.

1. GENERAL CONSTRUCTION

a. <u>All floor holes/excavations will have appropriate shoring to assure them against cave in</u>.

b. All excavations shall be provided with suitable solid barriers or railings, plus adequate warning lights or other devices to indicate the danger present.

c. All necessary precautions shall be taken to protect all persons in any area when work is being performed either over head or at floor level (in the case of excavations). Guards or other adequate protection must be provided whenever parts, bolts, tools or other potential hazards are left, around excavations, or above the floor level.

d. Areas in which work is being performed must be kept clean, orderly and safe. Combustible materials must be properly stored. Debris must be removed from the project area at the end of each working day by the contractor.

e. Loose materials such as bolts, nuts, hand tools, ect:, must not be left lying on beams, ledges, or any place from where they could fall or be knocked down to cause damage or injury. They must be immediately removed to the floor level or in case of tools, must be returned to a proper tool belt.

f. Guards removed while making alterations or repairs on equipment, (lockout\tagout also applies) must be replaced before the equipment is turned back on.

g. A flame resistant shield / barrier must be used to protect all persons from the flash of electric welding or hot slag / splatter from torch work.

h. Written approval of the Safety Department must be obtained before <u>any</u> explosives or tools utilizing a power cartridge can be used on Whirlpool property.
Note: <u>Contractor assumes sole responsibility for bodily injury and property damage caused by the use/possession of such explosives or power cartridges.</u> 1910.243 <u>*All loads not discharging properly*</u> are to be disposed of by the contractor. These can not be placed in general trash or offall removal. These loads can not to be left on the floor or machines.

i. All slippery materials such as grease, oil or paint, ect:, which are spilled shall be removed from the floor or other surface immediately.

j. When an opening is made in the roof or walls of a building, the inside must be protected from weather until the opening is re-closed.

k. When it is necessary to leave a job before completion, all materials, rigging, boards, loose nails, and other debris must be carefully removed from the floor. There shall be no materials or equipment left overhead or on the roof unless it is secured in place. Adequate barricades and warnings must be erected at all openings, excavations and obstructions. If a crane or lifting device is being used, the boom/ lift must be lowered to the ground or home position prior to leaving the job.

2. FIRE PROTECTION / SAFETY : ELECTRIC - ACETYLENE WELDERS

A. Electric 1910.254

a. During welding, brazing, cutting operations fire equipment will be in the area at all times. A person qualified as Fire Guard will also be on duty (see: Contractor Fire Guard Prevention and Safety Rules). For Fire Guard contact Whirlpool Security.

b. A cutting and welding permit is required by all contractors for all construction requiring cutting, brazing or welding operations. Maintenance, Project Engineer or Security is responsible for issuing the permit.

c. Hand protection must be provided to welding/cutting operator that is a insulator from heat and electricity.

d. Welding/cutting should not be done directly on concrete floors or on used drums, barrels, tanks or other containers until they have been cleaned to meet OSHA specs. 1910.252(C). If cutting or welding above pits, insure pits are free of grease, oil or debris that could cause a fire. Areas where welding/cutting is to be done must be kept orderly safe and as clean as possible. All debris from area must be removed at the end of each working day by personnel working on the project.

e. All electric welding machines are to be equipped with standard electrical equipment to fit outlets existing on Whirlpools premises. Temporary electrical hookups will not be permitted unless made by a qualified electrician. All portable motor generators with rubber tires, shall be equipped and grounded with proper ground wires while generator is in use. Shields/barriers will be in place to prevent weld flash or sparks from reaching operators/people in vicinity. Dipping hot Electrode Holders in water is prohibited.

B. Acetylene 1910.253

a. Never leave a burning Torch unattained. A Torch should never be put down until the gases have been completely shut off. Hose leaks must repaired at once or replaced by the approved means. NOTE: All Acetylene/Oxygen weld/cutting equipment are to have flash back arrests to prevent internal ignition of gasses.

NOTE: See (a.) (b.) (c.) under Oxygen-fuel gas welding and cutting

b. Acetylene and Oxygen cylinders shall be protected against tipping by use of standard portable welding carts with cylinders secured in place. If portable welding carts are not available, the cylinders shall be secured to a stationary object of sufficient strength to hold the cylinders. Unless the valve is protected by a recess in the cylinder, a metal cap must be used to protect valve against damage when cylinder is not connected for use.

Each set-up must be accompanied by the proper equipment to shut off the valves in case of an emergency. When not in use, acetylene and oxygen cylinders must be removed to an approved outside storage area.

VIII. POWER VEHICLE OPERATION

1. All power vehicles operated by contractor will comply with OSHA standards of operation for vehicle operation on the premises.

a. All operators will wear proper seat belts while operating a power vehicle.

b. Operators are prohibited from carrying passengers at all times.

c. All power vehicles are required to have flashing lights attached and working.
*** Road vehicles entering and moving through the plant must have head lights on or emergency flashers operating.**

d. Operators leaving a Forklift bearing a load, and moving outside a 25 ft radius from the lift must set control at neutral, shut off power, set the brake, and remove the key. If the lift is on an incline, the above applies but also BOTH WHEELS MUST BE CHOKED.

e. When refueling propane powered vehicles, close the valve on the propane bottle and allow the engine to stop before removing the bottle from the vehicle. All fork lifts must have 2 straps attached to the lift to secure propane bottles.
*** DO NOT LEAVE PROPANE BOTTLES SETTING UNATTENDED IN THE PLANT**

d. Keep vehicles under control and operate at a safe speed and manner. Maintain a safe distance of approximately three truck lengths from the vehicle ahead.

e. Give pedestrians the right of way.

f. Yield right of way to emergency vehicles - ambulances, fire trucks, etc.

g. Park or place loads so that aisles, marked areas, fire doors, plant ambulance, fire extinguishers and safety equipment are clear.

h. Safely stack and/or secure all material before moving it.

i. Comply with rated load capacity of the power vehicle.

j. Always lower forks when traveling, with or without a load, allowing enough space to clear floor or yard obstructions.

k. When traveling with a load that limits the line of sight to the front, the lift operator must travel in reverse to maintain an unobstructed view in the direction of travel.

l. When traveling down a ramp, have the load in a trailing position. When going up a ramp, have the load in the forward position.

m. Do not alter or deface a power vehicle in any way, as to make it unsafe. This includes adjustment or interference with speed settings, governors ect..

n. Slow down at all cross aisles. Stop and sound horn before entering main aisles or any location where view is obstructed.

o. At the end of the shift each day turn off propane fuel supply at the tank valve.

IX. NEW CHEMICAL INTRODUCTION PROCEDURE

SCOPE: This policy applies to all contract personnel and covers the selection and ordering of new chemicals or chemicals to be brought in that have not yet been approved by Environmental, Health and Safety Department.

PROCEDURE:

a. All new chemical compounds must be approved before being brought onto the premises by anyone in purchasing, engineering, production, or contract work. This applies to samples coming in on a trial basis, One-Shot items as well as materials which are to be used on a regular basis.

b. The person who wants to use a chemical or chemical(s) for the first time in the plant, must request a current Material Safety Data Sheet from the supplier. The requester must fill out the New Approval Form (Attachment 1) as completely as possible and submit both to the Safety Engineer.

c. The Material Safety Data Sheet and the New Material Approval Form will be reviewed by the Safety and Environmental Engineers.

d. After the new material has been tentatively approved, it must go through the Materials Lab Process before it has full approval for use at the Fort Smith Division.

e. Further instructions are contained on the enclosed "Chemical Introduction" form.

X. DIVISION EMERGENCY EVACUATIONS / SEVERE WEATHER SHELTER PROCEDURES.

a. The shelter areas and evacuation routes are posted at locations through out the plant. A copy is included in the Whirlpool to contractor communication information.

b. An intermittent siren means to proceed to shelter areas. Contractor will proceed to the location closest to their work area.

c. A constant siren means to evacuate the Plant. The contractor will proceed to the exit closest to their work area.

d. All persons, Whirlpool and Contractor personnel will remain in Shelter or out of the Plant until all clear is announced.

e. Contractor must make sure all potential danger is eliminated to the best of their ability before proceeding to shelter or evacuation. (Machines, Lifts, lowered and turned off, torches and gases to torches turned off, electricity to welders and machines turned off.) It is recommended that someone be designated ahead of time to make sure these things are done, that everyone has left the area and following instructions.

XI. CONTRACTOR REQUIREMENTS FOR TILE REMOVAL FROM OFFICE AREA

(1) Contractor will not cut, sand, or cause tile or mastic to become "friable" (airborne).
(2) Contractor is to wear "HEPA" filter respirator while in the room.
(3) Contractor will seal door and ceiling vents with plastic sheeting and masking tape.
(4) Contractor will remove tile from carpet backing and deposit in 55 gallon drums.
(5) Contractor will dispose of carpet, but tile will remain on Whirlpool property, for proper disposal.

XII. ALL CONTRACTOR PERSONNEL WILL COMPLY WITH THE FORT SMITH PLANT RULES AND DRESS CODE STANDARDS. (SEE INCLOSED "REMINDER" SHEET AND "FORT SMITH DIVISION: PLANT RULES").

XIII. CONTROL PROCEDURES

When an unsafe condition is found, or observed, which is determined to have a high hazard capability to either personnel or to the loss of material. Someone in supervision in the area, engineering staff, safety dept., or security will immediately contact the superintendent, supervisor or lead person of the project, requesting that all operations be stopped until the hazard is eliminated. If one of the above cannot be located, the work will be stopped by someone in a Whirlpool management position. When any work stoppage is required, a call will be placed to the management of the contractor and the project engineer. A report will be made to the proper persons involved with the project. A form will be signed as proof that all information has been read and understood.

CONCLUSION

The intent of this document is to provide the contractor with the safety guidelines Whirlpool expects to be followed on this project. This document is not intended to cover all aspects of a safety program or guarantee compliance with federal, state, and local regulation. Whirlpool reserves the right to modify these guidelines without prior notice to the contractor.

Katrina Cheshire
Safety Engineer
Whirlpool Fort Smith Division

Revised 09-14-03

Whirlpool Evacuation/Emergency Plan

Attachment 10

August 11, 2003
W.O. #581-013

Environmental Resources Management
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Procedure No.	Dept.	FT. Smith Division	Effective Date	Revision
09/740/2000	740		02/17/00	05/15/03 Draft

Subject: Evacuation/Emergency Plan

Notice: Changes must be approved by the Safety Department.

1.0 Purpose:

This procedure is designed to identify and establish policies/procedures and responsibility for employee protection during evacuation/emergency situations at the Fort Smith Division of Whirlpool Corporation.

2.0 Scope:

This procedure is applicable to all employees of the Fort Smith Division.

3.0 Emergency Telephone Numbers:

A) Whirlpool Locations:

- Medical Department - Ext. 2485 or Pager 481
- Plant First Aid - Ext. 2484 or Pager 114
- Plant Ambulance - Ext. 2277

B) Whirlpool Security

- Site Supervisor - Jerry Snook - Ext. 2462 or Pager 427
- Shift Captain - Ext. 2006 or Pager 427
- South Office - Ext. 2005
- North Office - Ext. 2002
- Northwest Office - Ext. 2003
- West Office - Ext. 2007
- PD Center Office - Ext. 2716

C) Company Doctors

Sparks Family Medicine
8600 South 36th Terrace
Fort Smith, AR. 72908

- Dr. Carson - 709-7465
- Dr. Cheyne - 709-7465

3.0 Emergency Telephone Numbers: (Con't)

D) Local Hospitals

- St. Edward Mercy Medical Center - 484-6000 - ER - 484-6241
- Sparks Regional Medical Center - 441-4999 - ER - 441-6011

E) Miscellaneous

- Fort Smith Fire Department - 911 or 782-9131
- EMS Ambulance - 911
- Fort Smith Police - 911 or 785-4221

F) Staff Directors

- Brian Gahr - Ext. 2400
- Jennifer Karber - Ext. 2403
- Chuck Knapp - Ext. 2473
- Randy Reed - Ext. 2405

G) In case of severe injury (injuries requiring hospitalization) contact:

- Scott Horton - Ext. 2698 or Pager 495
- Joe Keith - Ext. 2624 or Pager 880
- Chuck Knapp - Ext. 2473
- Allen Carmichael - Ext. 2465

4.0 Procedure for Tornado Warning, Watch or Drill:

A) Security will continually monitor (24 hours) area weather conditions; all weather watches and warnings issued by the National Weather Service will be recorded.

B) Definitions:

1) Tornado Watch: Prevailing weather conditions could possibly produce a tornado.

2) Tornado Warning: Either a visual or radar sighting of a tornado in the area.

C) Adviser Responsibilities:

1) Before Emergency Conditions:

4.0 Procedure for Tornado Warning, Watch or Drill: (Con't)

A) Explain this procedure to all employees, be sure to include:

1) Emergency Siren ***(Intermittent sound means take shelter)***.

2) Evacuation route and location of assigned shelter area.

Evacuation map is located at T:\Safety Maps\Evacuation - Manuafacturing Facility.tif; Shelter Map is located at T:\ Safety Maps\Shelter - Manufacturing Facility.tif, Maps for PD Center are located at T:\Safety Maps\Evacuation-Shelter PD Center.tif.

3) Arrange for responsible employee(s), set-up or utility person to check work area and machinery, then report to you at the shelter area.

B) Security will announce over the public address system the following:

Your attention please, Your attention please, This is a tornado alert, shut off your equipment and go to your assigned shelter area. (This will be repeated twice.)

2) During an alert:

A) Advisers will lead their employees in an orderly manner (walk) to the designated shelter area.

B) All employees (salaried and hourly) will move to their designated shelter area.

C) Advisers are responsible for accountability of their employees.

D) Request that everyone assume a low-crouched position and cover their heads with their arms (Prone position).

E) Advisers should move through their employees and assure them of their safety and calm anyone who is creating a disturbance.

F) Enforce the ***"No Smoking"*** policy.

G) Advisers and employees will remain at the designated shelter area until ***"All Clear"*** is announced.

Evacuation/Emergency Maps are displayed throughout the facility and Advisers should post a copy in the work area for all employees to view and personally go over this procedure with each employee on an annual basis.

5.0 Procedure for Evacuation:

A) Advisers Responsibilities:

1) ***Before emergency conditions***: Explain this procedure to all employees, be sure to include:

A) Emergency Siren

1) Constant sound: means ***evacuate***.
2) Intermittent sound: means ***take shelter***.

B) Evacuation route and location of outside assembly area.

Evacuation map located at T:\Safety Maps\Evacuation - Manufacturing Facility.tif for the manufacturing facility and T:\Safety Maps\Evacuation-Shelter PD Center.tif for the PD Center.

C) Arrange for responsible employee(s), set-up or utility person to check work area and machinery, then report to you at the outside assembly area.

2) During an alert or drill:

A) Advisers/Stewards will lead their employees in an orderly manner (walk) to the designated outside assembly area.

B) All employees (salaried and hourly) will move to a safe distance (500 feet) from any building structure.

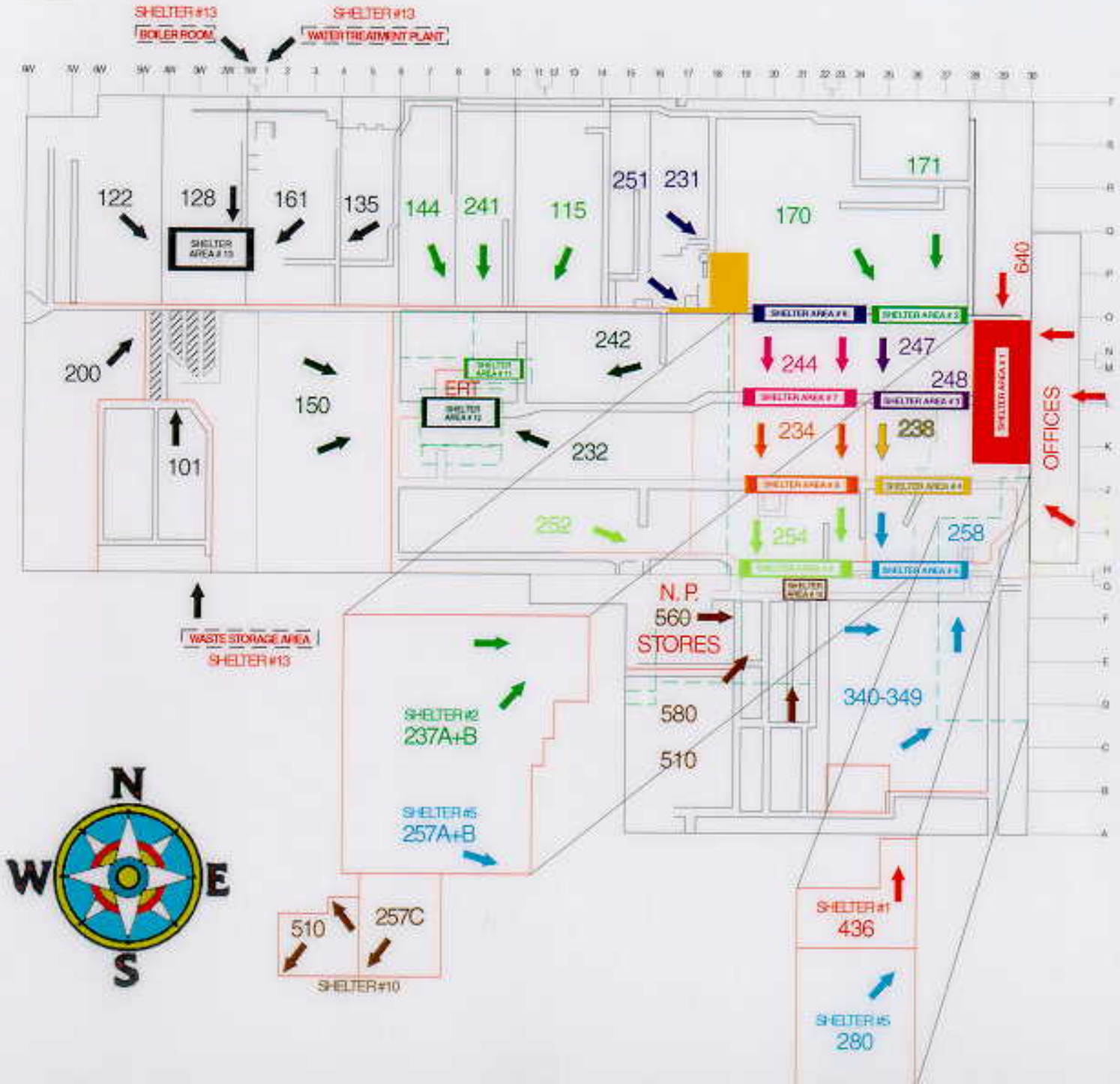
C) Advisers/Stewards are responsible for accountability of their employees.

D) Advisers/Stewards should move through their employees and assure them of their safety and calm anyone who is creating a disturbance.

E) Enforce the ***"No Smoking"*** policy.

F) Advisers and employees will remain outside at the designated assembly area until ***"All Clear"*** is announced.

Evacuation/Emergency Maps are displayed throughout the facility and Advisers should post a copy in the work area for all employees to view and personally go over this procedure with each employee on an annual basis.



SHELTER	BUSINESS UNITS
AREA#1	OFFICE EMPLOYEES, 436, 640
AREA#2	170, 171, 237A+B
AREA#3	247, 248
AREA#4	238
AREA#5	257A+B, 258, 340-349, 280
AREA#6	231, 251
AREA#7	244
AREA#8	234
AREA#9	252, 254
AREA#10	257C, 510, 580, 560
AREA#11	115, 144, 241
AREA#12	150, 232, 242
AREA#13	101, 122, 128, 135, 161, 200 Boiler Room, Water Treatment Plant, Waste Storage Area ("hill")

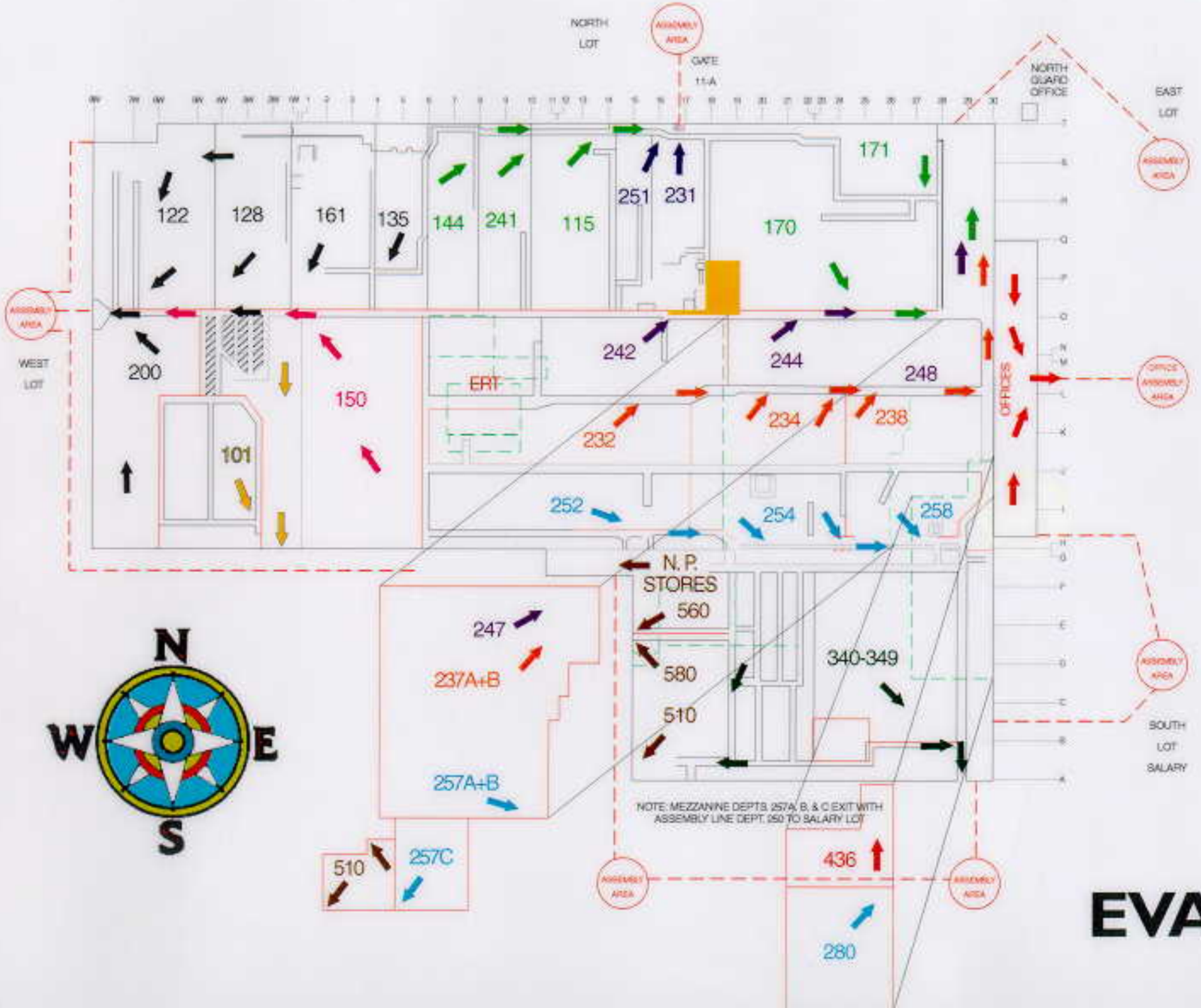
ERT — EMERGENCY RESPONSE TEAM EQUIPMENT STORAGE AREA

MEZZANINE

AMBULANCE TURNAROUND

–WARNING SIGNAL–
INTERMITTENT SIGNAL - INTERMITTENT SIREN (PROCEED TO SHELTER AREA)
REMAIN UNTIL THE "ALL CLEAR" ANNOUNCEMENT IS GIVEN.
ALL MEZZANINE EMPLOYEES EXIT TO GROUND FLOOR AT NEAREST STAIRWAY AND GROUP WITH YOUR DESIGNATED ASSEMBLY LINE B.U.

SHELTER LOCATIONS



EVACUATION PROCEDURES

A CONSTANT SIREN MEANS TO EVACUATE

EVACUATION PROCEDURES FOR THE FORT SMITH DIVISION HAVE BEEN DESIGNED IN PREPARATION OF A FIRE, EXPLOSION, OR OTHER INCIDENT WHICH COULD BE HAZARDOUS TO THE HEALTH AND SAFETY OF DIVISION EMPLOYEES. IF SUCH AN INCIDENT SHOULD EVER OCCUR, AND THE DECISION IS MADE TO EVACUATE, IT IS ESSENTIAL FOR EVERYONE TO IMMEDIATELY FOLLOW THESE STEPS:

EMERGENCY EGRESS PROCEDURES

1. PROCEED TO THE NEAREST EMERGENCY EXIT IN THE DIRECTION IDENTIFIED.
2. PROCEED AT LEAST 500 FT. AWAY FROM THE BUILDING AND GATHER IN DEPARTMENT GROUPS.
3. RETURN TO YOUR WORKSTATION WHEN THE "ALL CLEAR" ANNOUNCEMENT IS MADE.

BY LOOKING AT THE DRAWING, LOCATE YOUR EVACUATION ASSEMBLY AREA. IF YOU HAVE ANY QUESTIONS ABOUT THE ASSEMBLY AREAS OR ROUTES, PLEASE ASK YOUR ADVISER / SHOP STEWARD.

EVACUATION

6.0 Railroad Tracks North Side of Building

A.) Security is notified and brings the railroad into the plant.
B.) Security turns on the red lights and puts up the stop sign at the exit doors on the North side of the building to inform employees that a train is outside.
C.) Security informs railroad engineer of not blocking the exit walkway and ensures the emergency walkway is clear at all times.
D.) Security to notify Safety at any time the railroad blocks the walkway.
E.) Security takes stop sign down and turns red light off after railroad leaves.
F.) A permanent sign informing railroad: DO NOT BLOCK WALKWAY was installed.

7.0 Bomb Incident Procedure:

Located at S:\Safety Procedures\Bomb Incident Procedure.doc

8.0 Chemical Spill or Fire Procedure:

Located at S:\Safety Procedures\Spill Procedure.doc

9.0 "Off Shift" Chemical Spill Procedure:

Located at T:\Safety Procedures\OFFSHIFT - Spill Procedure.doc

Notice: Changes must be approved by the Safety Department.

1.0 Purpose:

This procedure is designed to identify and establish polices/procedure and the responsibility for employee protection during a fire at the Fort Smith Division of Whirlpool Corporation.

2.0 Scope:

This policy and procedure is applicable to all employees of the Fort Smith Division.

3.0 Procedure:

I) When a fire is spotted, *"Dial 2222"*, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

1) Your name and clock number.

2) Location, (Inside Plant - Post location; Outside Plant - geographical location, i.e., South side of plant, Masterbatch facility, West Parking lot, etc.)

A) Security will respond immediately to the area.

B) Security will page key members of the Emergency Response Team to respond immediately to the area by typing in the location and emergency information on the Alpha keyboard.

Note: At this point the security guard shall turn the volume down on the switch board and focus on the 2222 line until the emergency situation has ended.

- *If an ERT member does not contact Security at Ext. 2222 within 2 minutes, repeat process.*

- *If an ERT member does not contact Security at Ext. 2222 within 1 minute, after second page; Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce over the public address system, "ERT report to Post # _____", "ERT report to Post # _____".*

C) The ERT Shift Captain, or Team Leader will determine if the City Fire Department is needed and notify Security.

3.0 Procedure: (Con't)

If the City Fire Department is contacted, a Security officer will meet and direct them to a designated location in the vicinity of the fire.

E) The On-Scene Incident Commander will :

1) Notify Security that they are on the scene.

2) If additional manpower is needed (Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce; over the public address system, "ERT report to Post # _____", "ERT report to Post #_____".

3) Notify the Safety Department.

4) Notify the Business Unit Manager of the concerned area.

F) All injuries must be reported and administered through the Medical Department.

G) A Whirlpool Fire Report must be completed by the ERT Shift Captain, or Shift Team Leader, and (attach the City Fire Department "Fire Report", if contacted) be distributed to the Safety Engineer and Business Unit Manager of the concerned area.

II) When a fire is spotted during non-production, "DIAL 2222", on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

1) Your name and clock number.

2) Location (Inside Plant - Post location, Outside Plant - geographical location, i.e., South side of plant, Master Batch Facility, West parking lot, etc.)

A) Security will respond immediately to the area.

1) Security shall attempt to extinguish the fire.

2) If unsuccessful, contact the Fort Smith Fire Department.

3) In the event the Fire Department is needed contact the following:

A) Katrina Cheshire - Home Phone - (479)478-9880 Pager 880

B) Scott Horton - Home Phone - (918)962-2040 Pager 495

3.0 Procedure: (Con't)

III) Simplex Alarm System (Fire Alarm Activated on Panel)
(Evacuation of Front Offices)

A) Security will:

1) Respond immediately to the location.
2) Page key members of the Response Team to respond immediately to the area by typing in the following:
Fire alarm #_____ initiated at (location).

Note: At this point the security guard shall turn the volume down on the switch board and focus on the 2222 line until the emergency situation has ended.

First Shift Response Team

ERT	- Shift Captain & Team Leader
Maintenance	- Jon Watson, Rick Hamrick, Mechanical & Electrical Shift Advisers
Safety	- Katrina Cheshire, Scott Horton
Employee Relations	- Ron Bankston or Sharen Reeder

Second Shift Response Team

ERT	- Shift Captain & Team Leader
Maintenance	- Mechanical & Electrical Shift Advisers
Production	- Hardy Hodgens & Bill Yocum

Third Shift Response Team

ERT	- Shift Captain & Team Leader
Maintenance	- Mechanical & Electrical Shift Advisers
Production	- Sandy Sprayberry & Jim Webb

- *If an ERT member does not contact Security @ Ext. 2222 within 2 minutes, repeat process.*

- *If an ERT member does not contact Security @ Ext. 2222 within 1 minute, after second page; Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce over the public address system, "ERT report to Post # _____", "ERT report to Post # _____".*

B) The ERT Shift Captain, or Team Leader will determine if the City Fire Department is needed and notify Security.

C) If the City Fire Department is contacted, a Security officer will meet and direct them to a designated location in the vicinity of the fire.

3.0 Procedure: (Con't)

D) The On-Scene Incident Commander will :

1) Notify Security that they are on the scene.
2) If additional manpower is needed **(Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce; over the public address system, "ERT report to Post # _____", "ERT report to Post #_____".**
3) Notify the Safety Department.
4) Notify the Business Unit Manager of the concerned area.

E) Responsibility for contacting security to silence alarm:
Emergency Response Team - Incident Commander

F) Responsibility for bringing employees inside once the emergency has ended:

First Shift - **North Exit - Security**
East Exit - Ron Bankston or Sharen Reeder
South Exit - Ron Bankston or Sharen Reeder

Second Shift - **North Exit - Security**
East Exit - Hardy Hodgens or Bill Yocum
South Exit - Hardy Hodgens or Bill Yocum

Third Shift - **North Exit - Security**
East Exit - Sandy Sprayberry or Jim Webb
South Exit - Sandy Sprayberry or Jim Webb

G) All injuries must be reported and administered through the Medical Department.

H) A Whirlpool Fire Report must be completed by the ERT Shift Captain, or Shift Team Leader, and (attach the City Fire Department "Fire Report", if contacted) be distributed to the Safety Engineer and Business Unit Manager of the concerned area.

IV) Debriefing

A) Once the emergency is over a debriefing shall take place to identify corrective actions and responsibilities.
First Shift - Safety Department will schedule.
Second Shift - Shift Manager will schedule.
Third Shift - Shift Manager will schedule.

B) Safety Tech. Coordinator to issue report to proper individuals.

V) Monthly Drill

A monthly drill will be completed by the appointed individuals. The Safety Department & Security to organize.

4.0 Plastics Department Fire Procedure

A. When a localized fire is noticed in an inline thermoformer, the operator shall perform the following:

1.1 Depress the "FIRE" button
1.2 Alert other operators nearby of the fire and ask for help
1.3 Attempt to extinguish fire if possible

B. Operators near the fire shall perform the following:

1.1 "Dial 2222" on any telephone immediately to notify Security of the fire, and to initiate section 3.0.I
1.2 Activate the 5 building exhaust fans
1.3 Notify the Plastics Department Advisor that there is a fire

C. When a fire occurs, determine if evacuation is needed.

Procedure No.	Dept.	FT. Smith Division	Effective Date	Revision
13/740/2000	740		11/12/99	01/14/03

Subject: Chemical Spills

Notice: Changes must be approved by the Safety Department.

1.0 Purpose:

This procedure is designed to identify and establish polices/procedures and the responsibility for employee protection during chemical spills at the Fort Smith Division of Whirlpool Corporation.

2.0 Scope:

This policy and procedure is applicable to all employees of the Fort Smith Division.

3.0 Procedure:

I) When a chemical spill is spotted, *"Dial 2222"*, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

1) Your name and clock number.
2) Location, (Inside Plant - Post location; Outside Plant - geographical location, i.e., South side of plant, Masterbatch facility, West Parking lot, etc.)
3) Description of chemical type if known.

Note - 1: Do not approach container for information due to possible exposure of chemical.

Note - 2: To the best of your ability, keep everyone away from area until the ERT Hazardous Material Team arrives.

A) Security will respond immediately to the area.

B) Security will page key members of the Emergency Response Team to respond immediately to the area by typing in the location and emergency information on the Alpha keyboard.

- ***If an ERT member does not contact Security within 5 minutes, repeat process.***

- ***If an ERT member does not contact Security within 3 minutes, after second page; Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce over the public address system, "ERT report to Post # _____", "ERT report to Post # _____".***

3.0 Procedure: (Con't)

C) The ERT Shift Captain, or Team Leader will determine if the City Fire Department is needed and notify Security.

D) If the City Fire Department is contacted, a Security officer will meet and direct them to a designated location in the vicinity of the hazardous material spill.

E) The On-Scene Incident Commander will :

1) Notify Security that they are on the scene.
2) If additional manpower is needed (Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce; over the public address system, “ERT report to Post # _____", “ERT report to Post #_____".
3) Notify the Safety Department.
4) Notify the Business Unit Manager of the concerned area.

F) All injuries must be reported and administered through the Medical Department.

G) A Whirlpool Spill Report must be completed by the ERT Shift Captain, or Shift Team Leader, and (attach the City Fire Department Report, if contacted) distributed to the Safety Engineer and Business Unit Manager of the concerned area.

H) Debriefing

1) Once the emergency is over a debriefing meeting will take place
with the ERT, affected area personnel and the Safety Department.

II) When a chemical spill is spotted during non-production, **"DIAL 2222"**, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

1) Your name and clock number.
2) Location (Inside Plant - Post location, Outside Plant - geographical location, i.e., South side of plant, Master Batch Facility, West parking lot, etc.)
3) Description of chemical type if know.

Note 1: Do not approach container for information due to possible chemical exposure.

Note 2: To the best of your ability, keep everyone away from the area until the ERT Hazardous Material Team arrives.

3.0 Procedure: (Con't)

A) Security will respond immediately to the area.

B) Security will page key members of the Emergency Response Team to respond immediately to the area by typing in the location and emergency information on the Alpha keyboard.

- ***ERT members shall notify Security that they are in route to the facility.***

- ***If an ERT member does not contact Security within 5 minutes activate the "call in list". (Members should be contacted until 5 have indicated they are in route to the scene.***

C) The On-Scene Incident Commander will:

1) Notify Security once they have reached the scene.
2) Notify Security if additional manpower is needed and the number of members needed.

D) Security will activate the **"call in list"**.

1) Security should contact active members, which live closest to the plant to respond. *(If the IC requests 10 members, Security may need to contact 20 in order for 10 to respond.)*
2) If the IC requests all, Security should contact all active members. (Do not contact "inactive" members.)
3) Security should record each call made, time of call and comments of conservation. *(Copies of this information should be forwarded to Katrina Cheshire.)*
4) Security shall contact the following:
   A) Katrina Cheshire - Home Phone - (479)-478-9880 Pager 880
   B) Scott Horton - Home Phone - (918)962-2040 Pager 495

E) Debriefing

1) Once the emergency is over a debriefing meeting will take place with the ERT, affected area personnel and the Safety Department. (Safety Department will schedule.)

Procedure for Reporting Chemical Spills on *"OFF SHIFTS"*

I. When a Chemical Spill is spotted, **"DIAL 2222"**, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

A. Your name and clock number.
B. Location (Inside Plant - Post location, Outside Plant - geographical location, i.e., South side of plant, Master Batch Facility, West parking lot, etc.)
C. Description of chemical type if know.

Note 1: Do not approach container for information due to possible chemical exposure.

Note 2: To the best of your ability, keep everyone away from the area until the ERT Hazardous Material Team arrives.

II. Security will page a **"Call 400"** *(this will activate key members of the Emergency Response Team to respond immediately to the area).*

- ***ERT members shall notify Security that they are in route to the facility.***
- ***If an ERT member does not contact Security within 5 minutes activate the "call in list". (Members should be contacted until 5 have indicated they are in route to the scene.***

III. The On-Scene Incident Commander will:

A. Notify Security once they have reached the scene.
B. Notify Security if additional manpower is needed and the number of members needed.

1. Security will activate the **"call in list"**.

A. Security should contact active members, which live closest to the plant to respond. *(If the IC requests 5 members, Security may need to contact 10 in order for 5 to respond.)*
B. If the IC requests all, Security should contact all active members. (Do not contact "inactive" members.)
C. Security should record each call made, time of call and comments of conservation. *(Copies of this information should be forwarded to Kevin Rice and Scott Horton.)*
D. Security shall contact the following:
1. Kevin Rice- Cell Phone- (479)719-9096 Pager 213
2. Scott Horton - Home Phone - (918)962-2040 Pager 495

Revised 01/14/03