6562 R-015-204 .11

HEALTH AND SAFETY PLAN FOR FIELDS TASKS PERFORMED IN SUPPORT OF SOLID WASTE INCINERATOR AREA SAMPLING AT THE FEMP

10/00/91

ASI/IT FEMP
60
H&S PLAN

HEALTH AND SAFETY PLAN FOR FIELDS TASKS PERFORMED IN SUPPORT OF SOLID WASTE INCINERATOR AREA SAMPLING AT THE FEMP

PREPARED BY:
STEPHEN W. DUCE
W.LEE VITTITOW

OCTOBER 1991

HEALTH AND SAFETY PLAN

FOR FIELD TASKS PERFORMED IN SUPPORT OF

SOLID WASTE INCINERATOR AREA SAMPLING

AT THE FEMP

Prepared by Stephen W. Duce and W. Lee Vittitow

October 1991

HEALTH AND SAFETY PLAN FOR FIELD TASKS PERFORMED IN SUPPORT OF SOLID WASTE INCINERATOR AREA SAMPLING AT THE FEMP

Prepared by Stephen W. Duce and W. Lee Vittitow

October 1991

REVIEWED AND APPROVED BY:

Greg McAnarney (ASI)

Stephen W. Duce, Chief of Health and Safety (ASI/IT)

S.W. Coyle, WEMCO/FM

W. Lee Vittitow, Senior Industrial Hygiene (ASI/IT)

for J.J. Volpe, WEMCO IRS&T

NOTE: This plan and associated permits shall be reviewed with each worker and be posted at the work site at all times when work is being performed. Compliance with this requirement is evidenced by signature in Section No. 14.

STPHSP.MB2

HEALTH AND SAFETY PLAN
FOR FIELD TASKS PERFORMED IN SUPPORT OF
SOLID WASTE INCINERATOR AREA SAMPLING
AT THE FEMP

Prepared by Stephen W. Duce and W. Lee Vittitow

October 1991

REVIEWED AND APPROVED BY:

Greg McAnarney (ASI)

Stephen W. Duce, Chief of Health and Safety (ASI/IT)

S.W. Coyle, WEMCO EM

W. Lee Vittitow, Senior Industrial Hygiene (ASI/IT)

J.J. Volpe, WEMCO IRS&T

NOTE: This plan and associated permits shall be reviewed with each worker and be posted at the work site at all times when work is being performed. Compliance with this requirement is evidenced by signature in Section No. 14.

STPHSP.MB2

TABLE OF CONTENTS

TABLE OF FIGURES

1.0 HISTORY AND DESCRIPTION OF AREA

Purpose of the Study

A study of the immediate environs on and around the Fernald Environmental Management Project (FEMP) property is to be conducted to obtain information that will be used in evaluating a removal action for the solid waste incinerator (SWI) at FEMP. The overall study includes field sampling, laboratory analyses, and related field tasks to support the evaluation/decision making process. Field sampling is scheduled to begin in January of 1992.

Description of Area

The study area approximates a rectangle having the dimensions of 800 ft. by 1400 ft., with the SWI nearly at the center. Most of the site study area is located within the FEMP property boundary. An additional area extending approximately 200 ft. beyond the FEMP/DOE property is also included in the study plan (see Figure 1).

Activities Performed or Uses of the Area

Historically this area was used for operation of an incinerator. Radioactive materials were incinerated in the past at this facility. The exterior walls of the incinerator building were made of transite, an asbestos material. The walls are still in sound condition with little degradation of the visible transite.

Currently, adjacent land is used for grazing of dairy cattle. A fence is used around many of the grazing areas to keep the cattle inside the grazing area. Underground utilities for water/sewage run through the survey area. An active sewage treatment facility is on the study area. Overhead power lines are used to supply power to air monitoring stations within the study area. Overhead high-power utility lines also run through the study area.

Unusual Features

The main feature of this area is that it resides on a bench formed by geologic erosion of the river valley floor by the Miami River. This bench area has steep sides that could be difficult to traverse during inclement weather, i.e. rain, snow, or dew conditions. Additionally there are swales that carry surface water runoff from the local area.

2.0 WORK AREA ORGANIZATION AND SITE ACCESS CONTROL

The ASI/IT Chief of Health and Safety (Stephen Duce) or his designee will act as the Health and Safety Officer (HSO) to provide over-sight of all activities to ensure the requirements of this Health and Safety Plan are followed.

Site identification and access control requirements will vary for the tasks covered by this Health and Safety Plan. The following describes the minimum site identification and control measures for each task. Figure 2 shows approximate locations for soil samples.

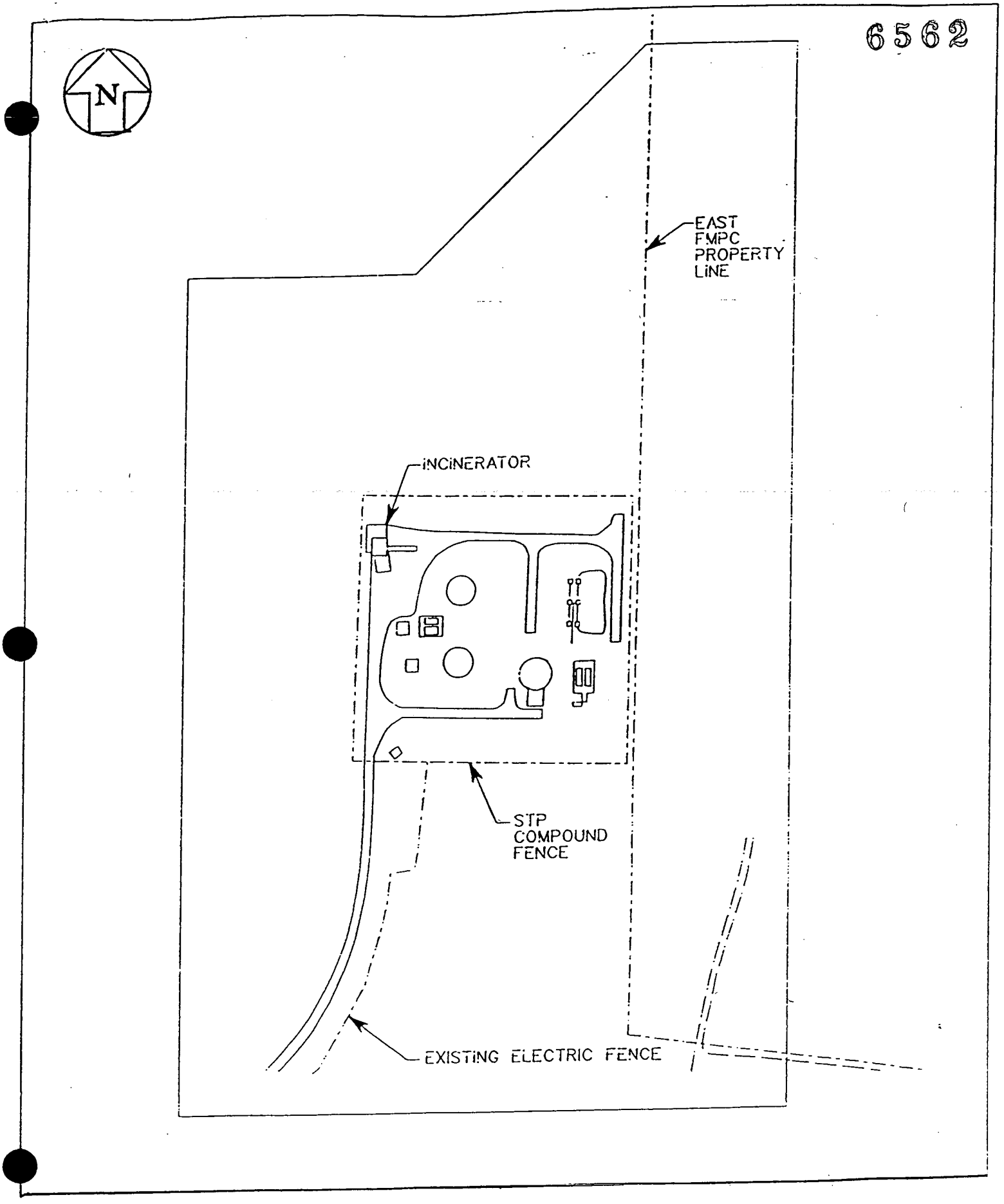

FIGURE 1 SOLID WASTE INCINERATOR STUDY AREA

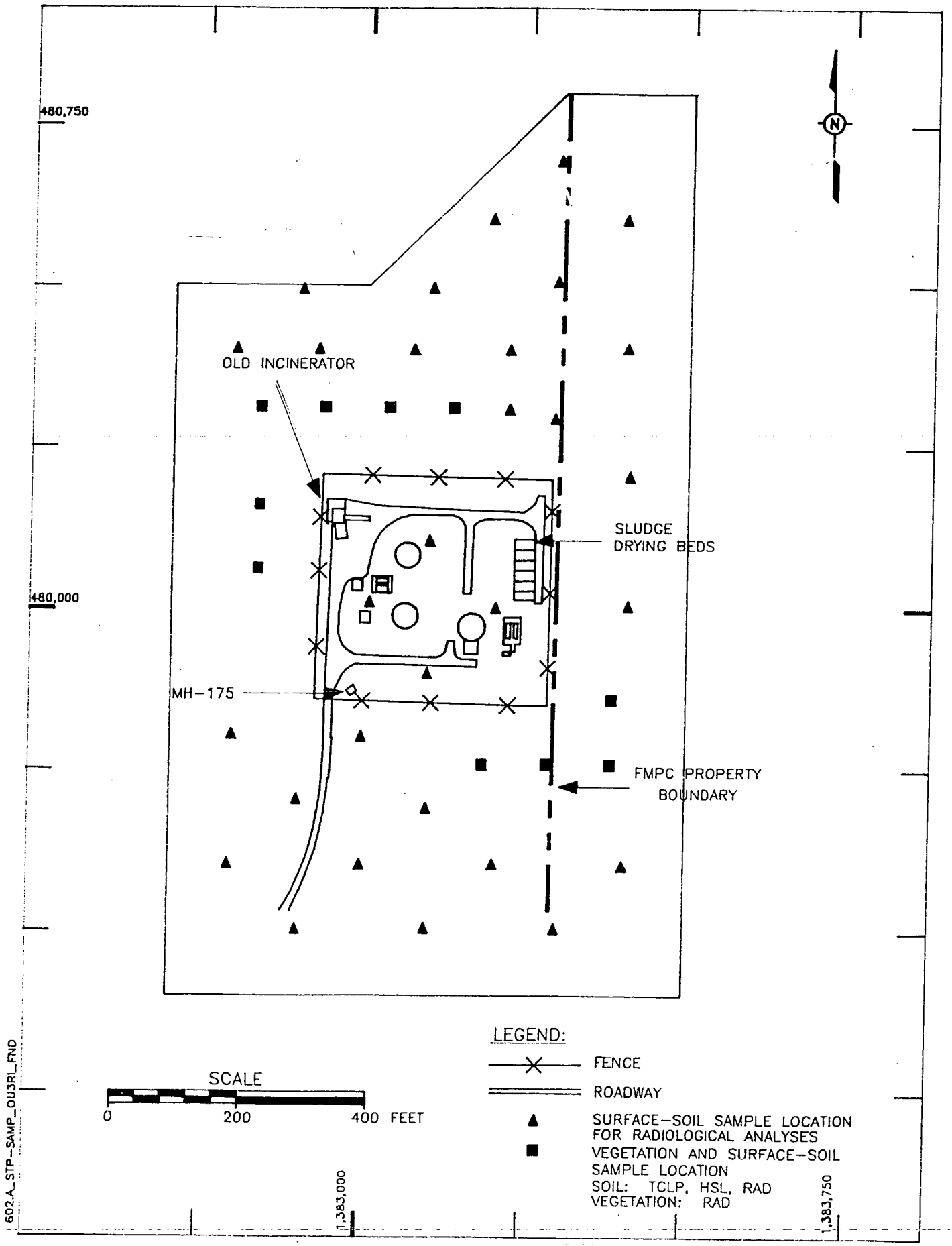

FIGURE 2. SOLID WASTE INCINERATOR - SURFACE SAMPLING LOCATIONS

000008

A) Soil and Vegetation Sampling

During this phase of work, surface soil samples will be obtained using hand augers. Daily, a work zone will be identified with 12 in. traffic cones. The work zone will encompass the area where surface soils samples will be obtained during the day. All permits, a copy of this health and safety plan, and any required safety signs will be posted at the boundary of the work zone. The lead geologist or his designee is required to restrict access of non-authorized personnel to the support area. Personnel performing surface soil sampling will be required to monitor themselves for radioactive and chemical contaminants using a beta-gamma survey meter and a HNu or equivalent prior to leaving the site. If the background exceeds 200 cpm personnel can move outside of the work zone to a low background area (<100 cpm) to perform a survey.

Vegetation samples will be collected at a minimum of 10 locations. No work zones will be required to be set up to prevent access to the work area, i.e. within 10 ft. of the sample collection area. Personnel performing the work are required to restrict access to non-authorized personnel to the work area. Samples will be radiologically screened and packaged on-site for off-site analysis. Personnel performing this sampling will be required to monitor themselves for radioactive contamination using a beta-gamma survey meter prior to leaving the area. If the background exceeds 200 cpm personnel can move outside of the work zone to a low background area (<100 cpm) to perform a survey.

B) Surface Radiation Field Measurements

During this phase of work personnel will characterize emissions from beta and gamma emitters in surface soils. No work zones are required to prevent access to the work area. Personnel performing the work are required to restrict access to non-authorized personnel to the work area. Personnel performing surface radiation measurements will be required to monitor themselves for radioactive contaminates using a beta/gamma survey meter prior to leaving the area.

3.0 TASK ACTIVITIES/WORK PLAN

Personnel will contact CONTROL at the start and end of each work day for accountability.

A) Soil Sampling

Surface soil samples will be collected at a minimum of 40 locations using a hand auger. Sample depth will be limited to within 6 in. of the surface. At each location the samples will be monitored for organics using an HNu and for radioactivity using an alpha survey meter and a beta/gamma survey meter. All samples will be radiologically screened and packaged on-site for shipment to outside analysis laboratories.

B) Surface Radiation Field Measurements

Radiation field surveys will be conducted by field personnel within the study area. Surface contamination will be measured using a portable sodium iodide (NaI) detector. The survey will utilize a grid coordinate system to ensure that the radiation fields are well characterized.

4.0 HAZARD ASSESSMENTS

The following hazard identification is based on historical information obtained from WEMCO personnel, reports, and drawings; and on a walkover of the study area performed by ASI personnel in October 1991. Additional evaluation criteria were: a) the seasons of the year when work is to be performed, b) experience of similar work packages, and c) worker experience. Capital letters are used in back of each hazard to identify which hazards are pertinent to each task. "S" is used for Soil Sampling, "V" for Vegetation Sampling, and "R" for Surface Radiation Field Measurements.

Interviews with WEMCO Environmental Monitoring and IRS&T personnel indicate little or no significant physical hazards. Review of environmental monitoring data (1989 and 1990) indicate very low levels or radioactive surface contamination in the study area. An interview with WEMCO Site Services indicated that normal incinerable trash was burned in the incinerator, with occasionally waste oils and U contaminated pallets. No records indicate that waste chemicals were burned in the incinerator.

Measurements, performed in October 1991 by ASI/IT's Industrial Hygienist, of electrical/magnetic field strength under the high voltage supply lines show levels that are within limits. Visual inspection, performed in October 1991 by ASI/IT's Chief of Health and Safety, of the transite walls associated with the incinerator show the transite to be in good repair. Therefore, it is reasonable to assume that the incinerator walls do not pose a significant asbestos hazard and no monitoring is required. One asbestos air sample was obtained in the area in December 1991, and confirmed that no air sampling will be required.

In addition to this assessment, the field team routinely reassesses the hazards before starting work to assure that conditions have not changed. All newly identified hazards will be address with the ASI/IT Health and Safety professionals to determine the degree of hazard and if any changes to the safety plan are warranted.

A) Physical Hazards

Many of the physical hazards listed below do not have monitoring requirements but instead rely on worker observation. In the area of environmental factors, this is especially true. Workers need to be aware of potential hazard posed by physical factors and react appropriately, normally avoidance is the easiest method.

Cold stress (see Attachment 1)	S V R
Slick surfaces in the environs of the study area (slips and falls)	S V R
Tripping hazards due to deadfall of trees, mammal dens, fences, etc	S V R
Dairy and other farm animals in grazing areas	S V R
Overhead power lines: high voltage transmission and 240 volt lines	S V R
Underground utilities: water and sewage	S V R
Fences around grazing animals: electric and barb wire	S V R
Poison Ivy or other irritant plants	S V R

B) Chemical Hazards

Chlorine fumes near the sewage treatment plant	S V R
Methanol for decontamination	S V

Appropriate MSDS forms are found in Section 15.

C) Radiological Hazards S V R

Surface soil contamination (total uranium) is at or slightly above background in the study area ranging from 3 to 9 pCi/g with background being approximately 2 to 4 pCi/g. One exception to this is north (approximately 150 ft.) of the old incinerator where activity is about 80 pCi/g. Direct shine from the old incinerator is approximately 50 uR/h at the fence. Airborne contamination, as measured in the 1989 and 1990 environmental monitoring program, is at background levels in the study area for all radionuclides. Radon in the study area is in the 0.6 to 0.9 pCi/l range with background ranging from 0.4 to 0.6 pCi/l.

5.0 STANDARD OPERATION PROCEDURES

Surface soil and vegetation sample collection will be performed in accordance with the methods described in the Remedial Investigation/Feasibility Work Plan and in the RI/FS Quality Assurance Program Plan. Potentially contaminated waste will be collected using ASI procedure FPP 19.06. Work areas will be posted using ASI procedure FPP 19.07.

6.0 EDUCATION AND TRAINING

Project field personnel shall not engage in field activities until they have been trained to a level commensurate with their job function, responsibilities, and the degree of anticipated hazards. The following worker categories specify required pre-training. Documentation of training for all personnel will be provided to WEMCO Centralized Training prior to commencement of work.

A) Worker Category

1. general site worker: 40 hr OSHA, 24 hr supervised field training, 8 hr Refresher as needed, WEMCO safety training: OSHA and You, Fire Extinguisher, General Safety (typical personnel under this requirement: lead geologist, sampling technicians, and health and safety technicians)

2. occasional site worker: 24 hr OSHA, 8 hr supervised field training, 8 hr Refresher as needed, WEMCO safety training: OSHA and You, Fire Extinguisher, General Safety (typical personnel under this requirement: field surveyor personnel and site project managers)

3. site supervisor: same as general site worker plus 8 hr Supervisor Training (typical personnel are lead geologist or other field supervisory personnel)

B) Safety Meeting

1. All personnel working on the SWI field investigation work will attend a "Kick Off" safety meeting which will review scope of work, review the requirements and hazards listed in

this health and safety plan, and document their attendance at the meeting by signature in this document. The Kick Off meeting will be conducted by a Health and Safety representative. Personnel new to the task will be informed of all applicable information given in the initial Kick Off meeting and modifications to the health and safety plan.

2. A Tailgate Safety Meeting will be conducted daily during work periods. Meeting time will be prior to the start of daily work tasks. Meeting topics and attendees will be documented on a Tailgate Safety Meeting Form. Topics areas that can be addressed in a meeting are:

   - work operations
   - personal protective clothing
   - air monitoring data
   - hazard communication
   - hearing conservation
   - monitoring results
   - hazard identification
   - operational safety
   - physical stress
   - emergency procedures
   - communications
   - housekeeping
   - general safety topics
   - special topics as assigned by ASI/IT Health and Safety

3. Visitors to the area will be informed of the requirements of this health and safety plan prior to obtaining access within a work zone.

7.0 MEDICAL SURVEILLANCE

All personnel working on the SWI field study program will be required to maintain a current physical work status and a medical summary form on file in the ASI/IT Health and Safety department files prior to any field work covered within the scope of the work sampling and analysis plan. The medical summary must contain a medical physician's assessment and disposition statement which contains wording to the effect that the individual is medically capable and authorized to wear a respirator and personal protective equipment, and that the individual can work at a hazardous work site.

Any medical restriction noted on a personal medical summary form will be complied with until such time as new documentation rescinding the restriction is received by the ASI/IT Chief of Health and Safety or his designee.

8.0 MONITORING

A) Physical Hazards

Cold Stress monitoring will be performed when daytime temperatures are less than 40°F. A Taylor wind chill meter or thermometer and wind speed indicator will be used to determine effective chill temperature. **Action Levels:** Cooling rate of 1750 W/m^2 or when wind chill

charts indicate a temperature less than -20°F. **Action: protect exposed extremities from cold, take frequent breaks to warm the individual, consume warm fluids. Work will be suspended if ambient temperature drops below 0° F or if the windchill factor drops below -29° F.** Vehicles will be used as break areas.

Electromagnetic field exposure will be monitored prior to the start of any field operations. Areas of monitoring will be under overhead power lines, near transformers, or other large electrical equipment. An ELF radiation survey meter (50-60 Hz) will be used to measure all exposure rates. **Action Levels:** E field > 25 kv/m, H field > 1 mT or > 0.1 mT for pacemaker wearers. **Action: withdraw from the area.**

Underground utilities will be identified, prior to commencement of work, by WEMCO personnel or the Ohio Utilities Protection Services (phone 800-362-2764) or WEMCO personnel. No action limits are applicable to this item other than no ground penetration greater than 8 inches will be allowed within 15 feet of any identified underground utility.

B) Chemical Hazards

Volatile organics will be monitored using an HNu Model 101 with a 10.2 eV probe or equivalent photoionization meter on all surface soil augerings. Monitoring will be done in the breathing zone and at the bore hole to determine the presence of volatile organics. **Action Level:** detection to 10 ppm in breathing zone. **Action: withdraw from the area or use full-face APR's with an organic vapor/acid gas/HEPA filter cartridge. When readings are >10 ppm withdraw from the area and call for health and safety review of the area.**

Chlorine vapors will be monitored intermittently using Drager Tubes specific for chlorine (0.3 to 5.0 ppm range) when work is to be performed in the immediate vicinity and/or downwind of the waste treatment facility. **Action level:** 0.5 ppm. **Action: use of full-face APR's with organic vapor/acid gas/HEPA filter cartridge. When readings are >5ppm withdraw from the area and call for health and safety review of the area.**

Any circumstance which could have resulted in an intake of chemicals by inhalation, ingestion or absorption shall immediately be reported to a supervisor and ASI Health and Safety. Health and Safety will evaluate the situation. ASI's Health and Safety personnel will report the circumstance of possible chemical exposure to WEMCO's AEDO. The AEDO will determine what reporting requiremts the incident mandates.

C) Radiological Hazards

Radiological hazards will be monitored using an alpha survey meter and a beta/gamma survey meter (HP 210 probe or equivalent) on each soil augering. During any personnel frisking only a beta/gamma survey probe will be required. Monitoring will be done on the soil to determine the presence of radioactive contaminants. A pre-job survey of the study area will be performed using a Micro-R meter and a beta/gamma survey meter to detect areas having high surface contamination levels. **Action Level:** > 2 mR/h or > 5000 cpm beta/gamma. **Action: withdraw from the area and contact ASI/IT Health and Safety personnel.**

Airborne particulate radioactivity samples will be taken with breathing zone air sample pumps

(2 lpm) if surface soil contamination exceeds the action level. **Action Level:** surface soil contamination > 5000 cpm/100 cm^2.

Full face respirators with a particulate cartridge will be worn if air sampling data indicate airborne activity > 2 E-12 uCi/ml.

Radon will not be monitored for as existing environmental monitoring data (1989 and 1990) shows that concentrations are significantly below regulatory limits.

Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor and ASI Health and Safety. ASI's Health and Safety personnel will report the circumstance of possible radioactive material intake to IRS&T Radiological Safety Section for evaluation. A urine sample and Incident Investigation Report form will be provided as required.

9.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Level D clothing will be required as a minimum for all field personnel. Level D clothing is basically a work uniform and provides no protection against chemicals. Level D is intended for use on sites where the risk from inhalation and/or contact from chemical contaminants is very low to non-existent. **Level D clothing is not street clothes!** Level D clothing consists of:

- safety shoes (high top)
- safety glasses or goggles (safety glasses ANSI Z87.1 approved)
- coveralls
- work gloves
- hard hat (when in drilling exclusion zone)
- safety goggles will be worn by personnel performing chemical decontamination

Hearing protection will be required when noise levels exceed 85 dBA TWA for any field operation or impact noise exceeds 140 dBA.

For cold weather, appropriate personal clothing should be worn to protect against exposure to the elements. In this situation, Tyvek will be used as an outer coverall, meeting the requirement of Level D clothing. Hard hat liners will be provided by Health and Safety personnel upon request.

If monitoring results indicate readings to any chemical greater than 50% of the PEL or radiological contaminant at or greater than the Action Limit, Level C clothing will be required. Level C clothing consists of:

- hard hat
- face shield (optional)
- air purifying respirator with appropriate filter cartridges (HEPA filter for particulate and combination particulate-organic vapor/acid gas for particulates and chemical vapors)
- disposable outer coverall (Tyvek, Saranex, or equivalent)
- inner gloves (latex or PVC)
- outer chemical resistant gloves
- chemical resistant boots

- outer disposable booties (latex)

10.0 SAFETY EQUIPMENT

All field teams will be required to have available two methods for communication with FEMP site and ASI/IT. This requirement can be satisfied by the use of a Cellular Phone and a two-way radio operating on the same frequency as the FEMP site radio frequency, or having multiple two-way radios at the work area..

Daily, during soil sampling periods, a work zone will be established using procedure FPP 19.07 Work Site Identification and Posting.

Personal decontamination supplies will be required for personnel taking soil samples for removal of any chemical or radiological contamination.

Equipment decontamination supplies will be required at each sample location or collection area where sampling equipment is to be decontaminated prior to any further sampling work. These supplies consist of collection basins, appropriate decontamination agents, plastic bags for collection of solid wastes, and collection drums for liquid wastes.

Five quarts of warm water for initial flushing of eyes until affected person can be taken to a WEMCO emergency eyewash station.

11.0 DECONTAMINATION PROCEDURES

On a daily basis a decontamination area will be set up, as required, for the removal of possible contamination of personnel, PPE as required for the removal of Level C clothing, and equipment. Dry decontamination will consist of the removal of the outer protective clothing (Tyvek, booties, gloves, respirator, etc.). Plastic bags will be used to collect the generated waste and used respirators. The bags of waste are to be handled according to procedure FPP 19.06. Used respirators will be returned to the WEMCO respirator cleaning facility.

All field personnel will be required to monitor themselves for radioactive and organic contamination as required in this plan using an HP 210 probe or equivalent for beta/gamma and an HNu Model 101 with a 10.2 eV probe or equivalent for organics. In the event of skin contamination notify an ASI/IT Health and Safety person who will come to the site and assist in getting the contamination removed. WEMCO Radiation Safety will be notified by the lead geologist or ASI Health and Safety representative. If a Health and Safety person is not available, the affected area is to be covered and the individual involved is to report to WEMCO HPs for decontamination. **Skin contamination is to be removed only by ASI/IT Health and Safety or WEMCO HP.**

Chemical contamination will be removed by washing with soap and water and rinsing the affected area. These steps will continue until monitoring results are negative.

Equipment will be decontaminated as required by the SWI sampling plan, or the RI/FS QAPP. If the decontamination is to be performed in the field, an area will be set up where this is to take place. A ground cloth will be required to collect any spillage of the decontamination agents. Appropriate containers will be used to wash, rinse and dry the equipment such that all liquid is

collected. Waste liquids are to be collected in a container and held until turned over to WEMCO for final disposition. Dry wastes are to be handled according to procedure FPP 19.06. Personnel performing the decontamination shall wear gloves, aprons, and safety goggles or face shields or respirators as required.

12.0 EMERGENCY PLANS

WEMCO has an established Emergency Response Plan and organization and this will be utilized for any emergency. The WEMCO program includes emergency medical service, fire suppression service, and security on all shifts, seven days a week. ASI/IT personnel will not attempt: a) a confined-space rescue, b) to fight significant fires, c) to control significant chemical spills, or d) to stop significant releases. When necessary, contact CONTROL by radio or by calling 738-6511 on the phone system.

In the event of an accident or injury, Bruce Myers (ASI) will be contacted (mobile 1-646-9504 or office 738-9921). He will then contact the WEMCO AEDO by phone (738-6431). In the event that Bruce cannot be reached, the lead geologist or field leader will call the AEDO and inform him of the situation status. Written reporting requirements will be directed by the AEDO.

12.1 Injuries

In the event of injuries, site personnel will try to minimize the consequences as directed by WEMCO Medical when possible. The process of determining what is appropriate to do requires that each situation be evaluated on a case-by-case basis. Personnel will render first aid (CPR, severe bleeding, etc.) only in life threatening situations as per directive from WEMCO's Medical Services Director.

A) Minor Injuries

Minor injuries (sprains, strains, and cuts) are expected to be taken to WEMCO Medical for first aid. Field treatment will be limited to pressure bandaging to control bleeding. All injured personnel will report to WEMCO medical in a timely manner for final treatment and evaluation of injuries, and all injuries will be reported to ASI/IT project health and safety (Stephen Duce.).

B) Serious Injuries

WEMCO CONTROL will be notified immediately of any serious injury by radio or calling 738-6511. The ASI/IT crew will use standard first aid procedures to stabilize the bleeding and/or treat for shock pending arrival of WEMCO response personnel. CPR should be administered only by persons currently certified in CPR. Prior to performing CPR, the rescuer should consider what caused the victim to collapse. Chemicals around the nose and mouth can endanger the rescuer. Additionally the would be rescuer should use latex gloves and a pocket mask resuscitator with a one way valve or filter, when available, to minimize exposure to contagious pathogens.

C) Chemical Splashes

Eyes

Move the victim to an uncontaminated area. Hold the victim's eyes open and flush eyes with available water or isotonic saline directing the flow from the bridge of the nose across the eye. The natural response to eye pain is to close the eyes. The rescuer must keep the eyes open to remove chemicals from under the eyelids. The flushing solution can cause extreme discomfort if it is too hot or too cold; try to maintain solution near body temperature. Following the initial flush the individual should be transported by ambulance, if available, to WEMCO Medical Services for further treatment.

Additionally:

- Notify CONTROL (radio or call 738-6511)
- Request an ambulance
- State location of injured employee
- Tell CONTROL the name of the chemicals, if know
- Tell CONTROL what was done to treat the patient(s)
- Tell how many patients to expect

Skin

Skin contamination can involve less hazardous chemicals (methanol) or strongly hazardous chemicals (strong acids). Treatment for skin contamination should take into consideration the concentration and effects of the chemical(s) involved. As a general rule the following steps should be performed: Move the victim to an uncontaminated location. Remove contaminated clothing and wash the affected skin areas. Flush the skin for 15 minutes and then go to WEMCO Medical Services for treatment.

D) Injuries Complicated by Contamination

Radio CONTROL or call 738-6511. All injuries within the process area, i.e., the fenced area around the SWI, will be assumed to involve contamination until proven otherwise by WEMCO. Injuries complicated by radiological and/or chemical contamination will be evaluated after considering the hazards associated with the contamination. In most instances, the site contamination is only of concern if long-term exposures occur. In these instances, the injury will be given the highest priority and contamination reduced as soon as practical.

Injuries of persons contaminated with acutely toxic chemicals will be treated so as to minimize the hazard to both the rescuer and the victim. If the rescuer cannot safely attempt rescue, he/she should not attempt it.

E) General Procedures for Injuries

- The victim should be moved into an uncontaminated area and given a preliminary decontamination.
- Preliminary decontamination generally consists of flushing with water to dilute and remove most of the contaminant. It also includes removal of contaminated clothing.

- As soon as the contaminant has been reduced to an acceptable level, the rescuer should stabilize the victim. More thorough decontamination can be performed at a later time.
- Care should be taken to minimize the spread of contaminant through runoff.
- Notify WEMCO CONTROL of:
  - The contaminant(s) involved
  - Any field instrument readings
  - Extent of injuries
  - What treatment has been performed (including decontamination)
  - Number of victims
  - Your location
  - Telephone number
- CALLER HANGS UP LAST. The dispatcher is trained to be calm and ask for the appropriate information in the order that it appears on his/her form. In some instances, the facility may be complex and require additional information such as cross streets or an escort from the entrance to the site.
- If rescuer calls the hospital, notify the emergency room and the ambulance service of the contaminant involved so that they can prepare for the arrival.

12.2 Chemical/Radiological Releases and Spill Containment

The proposed operations pose a possibility for spilling or releasing hazardous materials. Potentially spillable materials include gasoline and methanol. If a minor spill of methanol or gasoline (<1 gal) occurs, ASI/IT will take steps to control/contain or clean the release such as shoveling contaminated soil into a drum. If a large release in the form of a spill greater than one gallon, or a vapor cloud is observed, ASI/IT personnel will immediately withdraw at least 300 feet upwind or offwind and notify WEMCO emergency services.

Radio CONTROL or call 738-6511. CONTROL will dispatch the necessary personnel to handle the situation. If possible, the following information should be included in the notification:

- Cause of release, if known
- Location of release
- Time of release
- Chemical identity
- Quantity involved
- If radioactive material is involved
- If materials are leaving the area as a vapor/gas/liquid
- If fire is involved
- The number of known exposures or injuries (if any)

Additional information may be requested such as:

- What has been/is being done to minimize the hazard
- Degree of hazard to responders based on caller's knowledge of the contaminants

12.3 Fire Hazards

Radio CONTROL or call 738-6511. Fire hazard operations include field activities such as drilling into containers of pyrophoric materials, using flammable decontamination solutions, etc. Report all fires before making any effort to control or fight the fire. All uncontrolled fires will be reported to WEMCO, and the fire brigade requested before attempting any fire suppression activity. Small fires which appear to be controllable by field personnel will be controlled only if the safety of the field personnel is not jeopardized.

12.4 Adverse Weather

Work will be stopped if lightning, heavy or persistent rain, or other adverse weather conditions are in the area. This includes any weather conditions whose impact is judged to be detrimental by the ASI/IT field staff or appropriate Health and Safety representatives.

12.5 Emergency Telephone Numbers and Points of Contact

			Radio
Ambulance:	(513)738-6511		CONTROL
Hospital:	(513)738-6511		CONTROL
Fire:	(513)738-6511		CONTROL

POINTS OF CONTACT	**Work**	**Home**	**Radio**
ASI/IT			
Alvin Lutrell, V.P. (WMD)	(615)483-1274	[redacted]	
John Wood, Proj. Director	(513)738-3100		
Bruce Myers, Field Manager	(513)738-9221		Mobile 1-646-9504
Stephen Duce, H.P. HSO	(513)738-3100	[redacted]	
Lee Vittitow, Sr. IH	(513)738-3100		
Greg McAnarney, H&S (Corp)	(505)828-0959	[redacted]	
WEMCO			
Utility Engineer (AEDO)	(513)738-6431		202
Industrial Hygiene	(513)738-6207		357
Radiation Safety	(513)738-6889		355
Fire and Safety	(513)738-6235		303

ADDITIONAL HELP NUMBERS

Center for Disease Control	(404)633-5313
Chemtrec	(800)424-9300
CMA Chemical Referral Center	(800)262-8200
DOT Hazardous Materials Information	(202)366-4488
Emergency Planning and Community Right-to-Know	(800)535-0202
Federal Emergency Management Agency	(817)898-9104
National Response Center Hotline	(800)424-8802
Occupational Safety and Health Administration	(800)582-1708
American Chemical Society	(202)872-4600
Substance Identification	(800)848-6538
National Safety Council	(312)527-4800

HOSPITALS

The nearest medical facility is the WEMCO medical department. It is the primary choice for on-site injuries. First aid and ambulance service is available at the WEMCO medical department. Radio or call 738-6511 to contact CONTROL. WEMCO maintains an emergency response capability which includes an ambulance and EMT trained personnel. The WEMCO ambulance will transport the injured worker(s) to the nearest hospital if necessary or WEMCO Medical Services personnel will arrange for local transportation to the nearest hospital.

If WEMCO ambulances are unavailable for any reason, CONTROL will call for a community ambulance. The lead field person should confirm that an ambulance has been called. Location of the WEMCO Medical Department can be seen in Figure 3.

WEMCO has an established Emergency Response Plan and organization and this will be utilized for any emergency other than minor injuries. The WEMCO program includes emergency medical service, fire suppression service, and security on all shifts, seven days a week. ASI/IT personnel may attempt to treat injuries as specified below; however they will not attempt: a)a confined-space rescue, b) to fight significant fires, c) to control significant chemical spills, or d) to stop significant releases. When necessary, contact CONTROL by radio or by calling 738-6511 on the phone system.

In the event of an accident or injury, Bruce Myers (ASI) will be contacted (mobile 1-646-9504 or office 738-9221). He will then contact the WEMCO AEDO by phone (738-6431). In the event that Bruce cannot be reached, the lead geologist or field leader will call the AEDO and inform him of the situation status. Written reporting requirements will be directed by the AEDO.

13.0 AMENDMENTS

This Health and Safety Plan is based on information available at the time of preparation. Unexpected conditions may arise which require reassessment of safety procedures or this health and safety plan. It is important that personnel protective measures be thoroughly assessed by the supervisor in charge and by an ASI/IT Health and Safety representative prior to and during the planned task activities. Unplanned activities and/or changes in the hazard status shall require a review and may require changes in this plan.

Changes in the anticipated hazard status or unplanned activities are to be submitted as an amendment to this Health and Safety Plan. All changes and amendments shall be approved by the plan author, ASI/IT Health and Safety (both Corporate and Site), and WEMCO IRS&T.

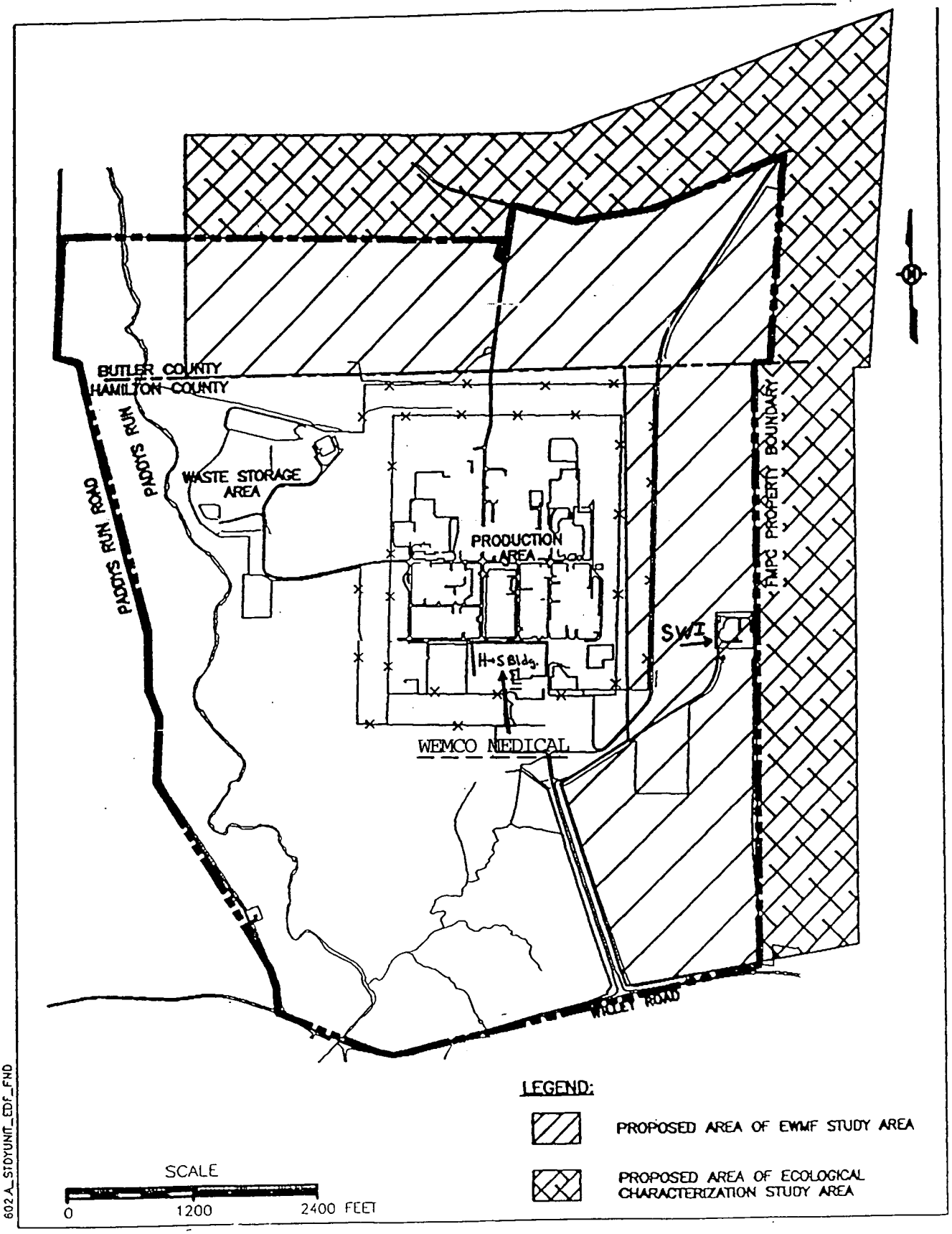

Figure 3 Route to WEMCO Medical

14.0 APPROVAL AND COMPLIANCE STATEMENT

The undersigned persons have read and understand this Health and Safety Plan and agree to follow its provisions.

Name (printed)	Signature	Date
TEAM LEADER		
DESIGNATED SITE SAFETY OFFICER		

14.0 (CONTINUED)

15.0 ATTACHMENTS

15.1 Attachment 1 Cold Stress

15.0 COLD STRESS

Cold stress will be an occupational hazard if project work takes place in the winter months. Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body, or result in profound generalized cooling, causing death. Areas of the body which have high surface area-to-volume ratio such as fingers, toes, and ears, are the most susceptible.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at negative 18°F.

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

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

- Frost nip or initial frostbite: characterized by suddenly blanching or whitening of skin
- Superficial frostbite: skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient
- Deep frostbite: tissues are cold, pale, and solid; extremely serious injury
- Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature; its symptoms are usually exhibited in five stages:
  - shivering
  - apathy, listlessness, sleepiness, and sometimes rapid cooling of the body to less than 95°F
  - unconsciousness, glassy stare, slow pulse, and slow respiratory rate
  - freezing of the extremities
  - death

15.1 Prevention of Cold Stress Injuries

Thermal socks, long cotton or other thermal underwear, hard hat liners, glove liners, and other cold weather gear can aid in the prevention of hypothermia. Blankets, warm drinks (other than caffeinated coffee), and warm break areas are essential. The overall goal is to keep from getting wet. If workers do get wet, they should dry off and change clothes.

Cold stress training is appropriate for work at this site and can be carried out during the daily tailgate safety meeting.

15.1.1 The Windchill Meter

Windchill will be monitored by the H&S Field Technician using a Tayor Windchill meter or equivalent when conditions warrant.

15.1.2 Exposure Limits

See Windchill chart in Table 8.

15.1.3 Alerting Mechanism

The primary means of alerting work crews of dangerous windchill conditions will be the windchill meter on site. Other methods include contacting the health and safety office by telephone (738-3100), or by weather radio.

TABLE 8

Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

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

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

15.2 Attachment 2 Material Safety Data Sheets

MATHESON GAS PRODUCTS
MATERIAL SAFETY DATA SHEET

6562

022

MATERIAL SAFETY DATA SHEET

MATHESON GAS PRODUCTS
30 SEAVIEW DRIVE
SECAUCUS, NEW JERSEY 07096
(201) 867-4100

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300

#10102

SUBSTANCE IDENTIFICATION

CAS-NUMBER 7782-50-5

SUBSTANCE: CHLORINE

TRADE NAMES/SYNONYMS:
CHLORINE MOLECULAR; CHLORINE MOL.; DIATOMIC CHLORINE; DICHLORINE; MOLECULAR CHLORINE; STCC 4904120; UN 1017; CL2; MAT04600

CHEMICAL FAMILY:
HALOGEN

INORGANIC GAS

MOLECULAR FORMULA: CL2

MOLECULAR WEIGHT: 70.906

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: CHLORINE PERCENT: 100.0
CAS# 7782-50-5

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
CHLORINE:
0.5 PPM (1.5 MG/M3) OSHA TWA; 1 PPM (3 MG/M3) OSHA STEL
0.5 PPM (1.5 MG/M3) ACGIH TWA; 1 PPM (3 MG/M3) ACGIH STEL
0.5 PPM NIOSH RECOMMENDED 15 MINUTE CEILING

100 POUNDS SARA SECTION 302 THRESHOLD PLANNING QUANTITY
10 POUNDS SARA SECTION 304 REPORTABLE QUANTITY
10 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY
SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING.

PHYSICAL DATA

DESCRIPTION: PALE GREENISH-YELLOW GAS WITH A CHARACTERISTIC, SUFFOCATING ODOR.

BOILING POINT: -31 F (-35 C) MELTING POINT: -150 F (-101 C)

SPECIFIC GRAVITY: 3.214 G/L @ 0 C VAPOR PRESSURE: 5168 MMHG @ 21 C

SOLUBILITY IN WATER: 1.46% @ 0 C ODOR THRESHOLD: 0.01 PPM

INHALATION-MOUSE LC50; 660 PPM/4 HOURS INHALATION-RABBIT LCLO; 330 PPM/7 HOURS INHALATION-GUINEA PIG LCLO; 800 PPM/30 MINUTES INHALATION-DOG LCLO; 660 PPM/4 HOURS INHALATION-CAT LCLO, 500 PPM/5 MINUTES INHALATION-MAMMAL LCLO; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS).
CARCINOGEN STATUS: NONE.
LOCAL EFFECTS: CORROSIVE- SKIN, EYE; IRRITANT- MUCOUS MEMBRANES.
ACUTE TOXICITY LEVEL: TOXIC BY INHALATION.
TARGET EFFECTS: POISONING MAY AFFECT THE LUNGS.
AT INCREASED RISK FROM EXPOSURE: PERSONS WITH PRE-EXISTING HEART DISEASE OR TUBERCULOSIS.

HEALTH EFFECTS AND FIRST AID

INHALATION:
CHLORINE:
CORROSIVE/TOXIC.
30 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.
ACUTE EXPOSURE- MUCOUS MEMBRANE IRRITATION MAY OCCUR AT 0.2 TO 16 PPM AND COUGH AT 30 PPM. INHALATION OF 500 PPM FOR 5 MINUTES HAS BEEN LETHAL IN HUMANS AND 1000 PPM MAY BE FATAL AFTER A FEW DEEP BREATHS. OCCUPATIONAL EXPOSURES HAVE RESULTED IN BURNING OF THE NOSE AND MOUTH WITH RHINORRHEA, RESPIRATORY DISTRESS WITH COUGHING, CHOKING, WHEEZING, RALES, RETCHING, HEMOPTYSIS, SUBSTERNAL PAIN, DYSPNEA, AND CYANOSIS. TRACHEOBRONCHITIS, PROGRESSING TO IMMEDIATE OR POSSIBLY DELAYED PULMONARY EDEMA AND OCCASIONAL PNEUMONITIS HAVE ALSO BEEN REPORTED. COUGH GENERALLY INCREASES IN FREQUENCY AND SEVERITY AFTER TWO TO THREE DAYS AND BECAME PRODUCTIVE OF THICK MUCOPURULENT SPUTUM, WHICH DISAPPEARS BY THE END OF 14 DAYS. LUNG DAMAGE IS USUALLY NOT PERMANENT; RESPIRATORY DISTRESS USUALLY SUBSIDES WITHIN 72 HOURS. AT HIGH CONCENTRATIONS, CHLORINE MAY ACT AS AN ASPHYXIANT BY CAUSING CRAMPS OF THE LARYNX MUSCLES AND SWELLING OF THE THE MUCOUS MEMBRANES. OTHER SYMPTOMS MAY INCLUDE SALIVATION, ANXIETY, SNEEZING, PALLOR OR REDNESS OF THE FACE, WEAKNESS, HOARSENESS, HEADACHE, DIZZINESS, AND GENERAL EXCITEMENT AND RESTLESSNESS. MASSIVE INHALATION MAY ALSO CAUSE DEATH BY CARDIAC ARREST.
CHRONIC EXPOSURE- PERSONS REPEATEDLY EXPOSED TO LOW CONCENTRATIONS MAY DEVELOP CHLORACNE, OLFACTORY DEFICIENCY AND TOLERANCE BUILD-UP. PROLONGED AND REPEATED EXPOSURE TO 0.8-1.0 PPM MAY CAUSE PERMANENT, ALTHOUGH MODERATE REDUCTION IN PULMONARY FUNCTION. CHRONIC EXPOSURE AT 5 PPM MAY RESULT IN INFLAMMATION OF THE MUCOUS MEMBRANES OF THE NOSE, DISEASE OF THE BRONCHI, AND INCREASED SUSCEPTIBILITY TO RESPIRATORY INFECTION INCLUDING TUBERCULOSIS. DENTAL EROSION MAY OCCUR. ANIMALS SURVIVING SUBLETHAL EXPOSURES FOR 15 TO 193 DAYS AFTER GASSING SHOWED MARKED EMPHYSEMA.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
CHLORINE:
CORROSIVE.
ACUTE EXPOSURE- HIGH VAPOR CONCENTRATIONS MAY IRRITATE THE SKIN AND CAUSE BURNING AND PRICKING SENSATIONS, INFLAMMATION, AND VESICLE FORMATION. CONTACT WITH LIQUID MAY CAUSE BURNS, BLISTERING, TISSUE DESTRUCTION, AND

ALKYL ISOTHIOUREA SALTS: FORMATION OF EXPLOSIVE NITROGEN TRICHLORIDE.
AMMONIA: EXPLODES WHEN HEATED.
ANTIMONY: IGNITION REACTION.
ARSENIC: SPONTANEOUS IGNITION.
N-ARYLSULFINAMIDES: POSSIBLE VIOLENT REACTION.
BENZENE: EXPLOSIVE REACTION CATALYZED BY LIGHT.
BORON: IGNITES ON CONTACT.
BROMINE PENTAFLUORIDE: EXPLOSIVE REACTION.
CALCIUM CHLORITE: FORMS EXPLOSIVE CHLORINE DIOXIDE.
CALCIUM NITRIDE: INCANDESCENT REACTION.
CARBON (ACTIVATED): IGNITES ON CONTACT.
CARBON DISULFIDE: EXPLOSIVE REACTION IN THE PRESENCE OF IRON CATALYST.
CESIUM NITRIDE: ATTACKED BY CHLORINE.
3-CHLOROPROPYNE: POSSIBLE EXPLOSION.
CHROMYL CHLORIDE + CARBON: POSSIBLE EXPLOSION.
COMBUSTIBLE MATERIALS: CONTACT WITH THE LIQUID IS LIKELY TO RESULT IN AN EXPLOSION. CONTACT WITH THE GAS MAY RESULT IN IGNITION OR AN EXPLOSION.
DIBORANE: EXPLODES ON CONTACT AT AMBIENT TEMPERATURES.
DICHLOROMETHYLARSINE: POSSIBLE EXPLOSION.
DIETHYL ETHER: EXPLODES.
DIETHYLZINC: IGNITION.
DIMETHYLFORMAMIDE: EXPLOSION HAZARD.
DIMETHYL PHOSPHORAMIDATE: MAY FORM EXPLOSIVE NITROGEN TRICHLORIDE.
DIOXYGEN DIFLUORIDE: IGNITION OR EXPLOSIVE REACTION.
DISILYL OXIDE: EXPLOSIVE REACTION.
4,4'-DITHIODIMORPHOLINE: MAY FORM EXPLOSIVE COMPOUND.
ETHYLENE: EXPLOSIVE REACTION IN THE PRESENCE OF LIGHT OR CATALYSTS.
ETHYLENE IMINE: FORMATION OF EXPLOSIVE 1-CHLOROETHYLENE IMINE.
ETHYLPHOSPHINE: EXPLOSION ON CONTACT.
FLAMMABLE COMPOUNDS: CONTACT WITH THE LIQUID IS LIKELY TO RESULT IN AN EXPLOSION. CONTACT WITH THE GAS MAY RESULT IN IGNITION OR AN EXPLOSION.
FLUORINE: IGNITION FOLLOWED BY EXPLOSION ON SPARKING.
HEXACHLORODISILANE: IGNITION ABOVE 300 C WITH POSSIBLE EXPLOSION.
HYDRAZINE: IGNITION REACTION.
HYDROCARBONS: CONTACT WITH THE LIQUID IS LIKELY TO RESULT IN AN EXPLOSION. CONTACT WITH THE GAS MAY RESULT IN IGNITION OR AN EXPLOSION. ADDITION OF A LEWIS ACID TO CHLORINE-HYDROCARBON MIXTURES WILL RESULT IN THE RELEASE OF LARGE VOLUMES OF HYDROGEN CHLORIDE.
HYDROGEN: EXPLOSIVE MIXTURES.
HYDROGEN PEROXIDE + POTASSIUM HYDROXIDE: LUMINESCENT REACTION.
HYDROXYLAMINE: SPONTANEOUS IGNITION.
IODINE: VIOLENT REACTION.
IRON CARBIDE: INCANDESCENT REACTION.
LITHIUM SILICIDE: INCANDESCENT REACTION WHEN HEATED.
METALS AND ALLOYS: IGNITION ON CONTACT; SOME METALS MAY BE CORRODED IN THE PRESENCE OF MOISTURE.
METAL ACETYLIDES: IGNITION REACTION.
METAL HYDRIDES: IGNITION.
METAL OXIDES: VIGOROUS REACTION AND POSSIBLE IGNITION.
METAL PHOSPHIDES: IGNITION.
NITROGEN COMPOUNDS: MAY FORM EXPLOSIVE NITROGEN TRICHLORIDE.
NITROGEN TRIIODIDE: EXPLOSIVE REACTION ON CONTACT.
NON-METAL HYDRIDES: IGNITE ON CONTACT.
OXYGEN: EXPLOSION ON HEATING.
OXYGEN DIFLUORIDE: EXPLODES ON WARMING.
PHENYLMAGNESIUM BROMIDE: POSSIBLE EXPLOSION.
PHOSPHOROUS: EXPLOSIVE REACTION ON CONTACT WITH THE LIQUID; IGNITION ON CONTACT WITH THE GAS.

DISPOSAL

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZARDOUS WASTE NUMBER D001.
100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

CONDITIONS TO AVOID

AVOID CONTACT WITH COMBUSTIBLE MATERIALS (WOOD, PAPER, OIL, ETC); CONTACT MAY RESULT IN IGNITION OR EXPLOSION. MATERIAL MAY BE POISONOUS; AVOID INHALATION OF VAPORS OR CONTACT WITH SKIN. DO NOT ALLOW MATERIAL TO CONTAMINATE WATER SOURCES.

SPILL AND LEAK PROCEDURES

SOIL SPILL:
DIG A PIT, POND, LAGOON OR HOLDING AREA TO CONTAIN LIQUID OR SOLID MATERIAL. DIKE SURFACE FLOW USING SOIL, SANDBAGS, FOAMED POLYURETHANE OR FOAMED CONCRETE. ABSORB BULK LIQUID WITH FLY ASH OR CEMENT POWDER. ADD CAUSTIC SODA.

AIR SPILL:
APPLY WATER SPRAY TO KNOCK DOWN AND REDUCE VAPORS. KNOCK-DOWN WATER IS CORROSIVE AND TOXIC AND SHOULD BE DIKED FOR CONTAINMENT AND LATER DISPOSAL.

WATER SPILL:
NEUTRALIZE WITH CAUSTIC SODA.

IF DISSOLVED, AT A CONCENTRATION OF 10 PPM OR GREATER, APPLY ACTIVATED CARBON AT TEN TIMES THE AMOUNT THAT HAS BEEN SPILLED.

USE MECHANICAL DREDGES OR LIFTS TO EXTRACT IMMOBILIZED MASSES OF POLLUTION AND PRECIPITATES.

OCCUPATIONAL SPILL:
STOP LEAK IF YOU CAN DO IT WITHOUT RISK. KEEP COMBUSTIBLES AWAY FROM SPILLED MATERIAL. KEEP UNNECESSARY PEOPLE AWAY; ISOLATE AREA AND DENY ENTRY UNTIL GAS HAS DISPERSED. VENTILATE CLOSED SPACES BEFORE ENTERING.

REPORTABLE QUANTITY (RQ): 10 POUNDS
THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:
THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

EMERGENCY WASH FACILITIES:
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES AND/OR SKIN MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN AND QUICK DRENCH SHOWER WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED: MATHESON GAS PRODUCTS; NO DISTRIBUTION EXCEPT AS REQUIRED BY LAW.
CREATION DATE: 01/24/89 REVISION DATE: 08/09/90

-ADDITIONAL INFORMATION-

MATHESON MAKES NO WARRANTIES, GUARANTEES OR REPRESENTATIONS OF ANY KIND OR NATURE WITH RESPECT TO THE PRODUCT OR THIS DATA, EITHER EXPRESSED OR IMPLIED, AND WHETHER ARISING BY LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE WHATSOEVER, WHETHER SPECIAL, INDIRECT, CONSEQUENTIAL OR COMPENSATORY, DIRECTLY OR INDIRECTLY RESULTING FROM THE PUBLICATION, USE OR RELIANCE UPON THIS DATA

ASHLAND P.O. BOX 391
ASHLAND, KENTUCKY 41101

6562

TELEPHONE:
(606) 324-7133

MATERIAL SAFETY DATA SHEET

ACCEPTED BY OSHA AS ESSENTIALLY SIMILAR TO OSHA FORM 20

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH ASHLAND OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

I. GENERAL INFORMATION

PRODUCT NAME	DATA SHEET NO.	DATE PREPARED	CODE NUMBER
GASOLINE - UNLEADED	05	4-12-83	RME

II. PRODUCT IDENTIFICATION

PRODUCT CLASS	GENERAL OR GENERIC IDENTIFICATION: LIGHT PETROLEUM DISTILLATE - MOTOR FUEL 10378
PASSES D.O.T. TEST FOR HAZARDOUS CLASSIFICATION	HAZARD CLASSIFICATION: FLAMMABLE LIQUID, U.N. 1203

III. HAZARDOUS COMPONENTS (SEE DEFINITION ON REVERSE SIDE)

INGREDIENT	%	TLV
PETROLEUM DISTILLATE (BOILING POINT RANGE 80-440° F)	> 90	300* PPM

* ACGIH RECOMMEND 8 HOUR TIME WEIGHTED AVERAGE EXPOSURE LIMIT FOR GASOLINE.

NOTE: SEE SECTION IX FOR A SPECIFIC TOXICITY STATEMENT CONCERNING GASOLINE

IV. PHYSICAL DATA

INITIAL BOILING POINT	IF LIQUID AT 68°F: [x] PRODUCT [ ] COMPONENT (%)	80 °F @ 760 mmHg
SPECIFIC GRAVITY	[ ] GREATER THAN WATER [ ] EQUAL TO WATER [ ] LESS THAN WATER	0.6 - 0.7 @ °F
VAPOR PRESSURE	IF LIQUID AT 68°F OR WHICH SUBLIME: [ ] PRODUCT [ ] COMPONENT (%)	500-700 mmHg @ 68 °F
PERCENT VOLATILES	INGREDIENT WITH INITIAL BOILING POINT BELOW 423°F	100%
VAPOR DENSITY	FOR VOLATILE PORTION OF PRODUCT: [ ] LIGHTER THAN AIR [x] HEAVIER THAN AIR	(air = 1)
EVAPORATION RATE	[ ] FASTER THAN ETHER [x] SLOWER THAN ETHER	(=1)

V. FIRE AND EXPLOSION DATA (CONTINUED BACK OF THIS PAGE)

FLASH POINT	[ ] LESS THAN 73°F [ ] 73-100°F [ ] 100-200°F [ ] MORE THAN 200°F	-45 °F
LOWER EXPLOSION LIMIT	[x] PRODUCT [ ] LOWEST VALUE OF COMPONENT	1.4
HAZARDOUS DECOMPOSITION PRODUCTS	KNOWN HAZARDOUS PRODUCTS RESULTING FROM HEATING, BURNING, ETC. OR UNREACTED RAW MATERIAL: MAY FORM TOXIC MATERIALS: CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS.	

IV

FIRE AND EXPLOSION DATA (CONTINUED)

SPECIAL FIRE FIGHTING PROCEDURES	INDICATE EQUIPMENT TO PROTECT FIREMEN FROM TOXIC PRODUCTS/COMBUSTION OR IF WATER IS NOT TO BE USED 6562 WATER MAY BE INEFFECTIVE. SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.
UNUSUAL FIRE AND EXPLOSION HAZARDS	PRODUCT IGNITES FXPLOSIVELY. *SEE SECTION IX.
EXTINGUISHING MEDIA	[X] DRY CHEMICAL [ ] WATER FOG [X] CARBON DIOXIDE [X] REGULAR FOAM [ ] ALCOHOL FOAM [ ] OTHER: _____

V

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	OSHA ESTABLISHED VALUE NOT ESTABLISHED FOR PRODUCT. SEE SECTION II.
EFFECTS OF OVER-EXPOSURE FOR ☐PRODUCT ☐COMPONENT	KNOWN EFFECTS LISTED, UNLESS NOT APPLICABLE DUE TO PHYSICAL FORM OF PRODUCT EYES-CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING BLURRED VISION. SKIN-PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS. BREATHING-EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION. SWALLOWING-CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.
SPECIAL FIRST AID ACTION	IF ON SKIN THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER, REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE. IF IN EYES FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY, GET MEDICAL ATTENTION. IF SWALLOWED DO NOT INDUCE VOMITING, KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL. IF BREATHED IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED, GIVE ARTIFICAL RESPIRATION. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION.

CTIVITY DATA	HAZARDOUS POLY-MERIZATION	OF ENERGY ☐ CAN OCCUR ☒ CANNOT OCCUR 6562
	STABILITY	CONDITIONS TO AVOID IF UNSTABLE UNDER NORMAL CONDITIONS ☒ STABLE ☐ UNSTABLE
	INCOMPATA-BILITY (MATERIALS TO AVOID)	COMMON MATERIALS OR CONTAMINANTS WHICH WOULD RESULT IN A HAZARDOUS REACTION WITH THE PRODUCT ARE SHOWN AVOID CONTACT WITH STRONG OXIDIZING AGENTS (E.G. NITRIC ACID, PERMANGANATES, ETC.).
SPILL OR LEAK CEDURES SONABLE AUTIONS TO AKEN AND ETHODS OF NUP TO BE D IN THE ENT OF LAGE OF PRODUCT	STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	SMALL SPILL ELIMINATE ALL SOURCES OF IGNITION. VENTILATE AREA, ABSORB LIQUID ON PAPER, VERMICULITE FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD. ALLOW TO EVAPORATE. LARGE SPILL ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIKE AREA OF SPILL TO PREVENT SPREADING, PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY EARTH, FLOOR ABSORBENT, OR OTHER MATERIAL AND SHOVEL INTO CONTAINERS.
	WASTE DISPOSAL METHOD	SMALL SPILL ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DESTROY REMAINING MATERIAL BY BURNING IN AN IRON PAN. LARGE SPILL DESTROY BY LIQUID INCINERATION.
TECTIVE UIPMENT TO BE USED	RESPIRATORY PROTECTION	IF TLV OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE IS ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MESA RESPIRATORS UNDER SPECIFIED CONDITIONS. (SEE YOUR SAFETY EQUIPMENT SUPPLIER).
	PROTECTIVE GLOVES	WEAR RESISTANT GLOVES SUCH AS: NEOPRENE, BUNA-N.
	EYE PROTECTION	CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED: HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER).
	VENTILATION	PROVIDE SUFFICIENT MECHANICAL (GENERAL), AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN EXPOSURE BELOW TLV'S.
	OTHER PROTECTIVE EQUIPMENT	TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SPECIAL PRECAUTIONS OR OTHER COMMENTS:

CODE NUMBER 6562

THE ATLANTIC RICHFIELD COMPANY FILED A TSCA 8(e) NOTICE WITH THE ENVIRONMENTAL PROTECTION AGENCY ON DECEMBER 9, 1981 CONCERNING AN AMERICAN PETROLEUM INSTITUTE SPONSORED CHRONIC INHALATION STUDY. THE STUDY HAS SHOWN CHRONIC EXPOSURE TO UNLEADED GASOLINE VAPORS HAS CAUSED ADVERSE HEALTH EFFECTS IN CERTAIN LABORATORY TEST ANIMALS. MALE RATS EXPOSED FOR APPROXIMATELY TWO YEARS TO VARIOUS LEVELS OF UNLEADED GASOLINE VAPORS SHOWED INCREASED LEVELS OF DEGENERATIVE KIDNEY DISEASE AND KIDNEY CANCER. IT SHOULD BE NOTED THAT THE KIDNEY CANCERS OCCURRED LATE IN THE ANIMALS' LIVES AND WERE NOT THE CAUSE OF DEATH IN ANY CASE. THE KIDNEYS OF FEMALE RATS AND MALE AND FEMALE MICE ALSO IN THE STUDY DID NOT SHOW SIMILAR TOXIC RESPONSES. HOWEVER, FEMALE MICE EXPOSED TO THE HIGHEST DOSES LEVELS OF UNLEADED GASOLINE DID SHOW SLIGHTLY HIGHER LEVELS OF LIVER CANCER.

*(CONTD. FROM SECTION IV)

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE GROUND OR MAY BE MOVED BY VENTILATION AND IGNITED BY PILOT LIGHTS, OTHER FLAMES, SPARKS, HEATERS, SMOKING, ELECTRIC MOTORS, OR OTHER SOURCES AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT.

NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATA SHEET MUST BE OBSERVED.

AZARDOUS INGREDIENT IS ONE WHICH MEETS ONE OR MORE OF THE FOLLOWING CRITERIA:

1. It is listed in the annual Registry of Toxic Effects of Chemical Substances, or is known to be toxic within the parameters of that Registry, and is present at a level of 1% or greater. DOT Poisons are listed if present at any level.
2. It has an OSHA established 8-hour time-weighted average or acceptable ceiling concentration (c), or an American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Value, and by the nature of the product or its known use, is likely to become airborne.
3. It contributes to one or more of the following hazards of the product:
   a. Flashpoint below 200°F (cc), or subject to spontaneous heating or decomposition.
   b. Causes skin burns. (DOT)
   c. Strong oxidizing agent. (DOT)
   d. Subject to hazardous polymerization.

Each hazardous ingredient is listed be chemical, generic, or proprietary name, its level in the product is expressed as 1% or less, 1-10%, 10-30%, 30-60%, or greater than 60%, or by other means if such information is proprietary. Adopted ACGIH values are only listed, with appropriate notation, where OSHA values are not available.

MATERIAL SAFETY DATA SHEET

LIQUID CARBONIC
SPECIALTY GAS CORPORATION
135 SOUTH LA SALLE STREET • CHICAGO, ILLINOIS 60603-4252
PHONE: (312) 855-2500

Isobutylene 6562

Revision Feb. 1987

24 Hour Emergency Phone Numbers: (504)673-8831; CHEMTREC (800)424-9300

SECTION I--PRODUCT IDENTIFICATION

CHEMICAL NAME: Isobutylene
COMMON NAME AND SYNONYMS: Isobutene, 2-Methylpropene
CHEMICAL FAMILY: Aliphatic Hydrocarbons FORMULA: $(CH_3)_2CH$

SECTION II--HAZARDOUS INGREDIENTS

MATERIAL	VOLUME %	CAS NO.	1985-6 ACGIH TLV UNITS
Isobutylene	99.5	115-11-7	TWA 1,000 ppm STEL 1,250 ppm for LPG (Liquified Petroleum Gas)

SECTION III--PHYSICAL DATA

BOILING POINT (°F.)	19.6	SPECIFIC GRAVITY (H_2O=1)	0.594 @ 20°C
VAPOR PRESSURE (mmHg.)	24.3 psig @ 70°F	% VOLATILE BY VOLUME	100
VAPOR DENSITY (AIR=1)	2.011	EVAPORATION RATE (BUTYL ACETATE=1)	Rapid
SOLUBILITY IN WATER	Insoluble		
APPEARANCE AND ODOR	A colorless flammable gas with an unpleasant odor similar to coal gas.		

SECTION IV--FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED) -105°F(C.C.) FLAMMABLE LIMITS LEL 1.8 UEL 8.8
EXTINGUISHING MEDIA: Carbon Dioxide, dry chemical, halon and water.
SPECIAL FIRE FIGHTING PROCEDURES: Stop flow of gas if possible. Use water spray to cool fire exposed containers. If feasible, allow fire to burn itself out to avoid accumulation of an unburned flammable mixture.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep personnel away from fire scene since containers can rupture violently when exposed to fire. Fire fighters should use self-contained breathing apparatus and protective clothing. Unless gas supply is shut-off, it can reignite or explode. Vapor can flow to distant ignition source than flash back.

SECTION V--HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? No
Carcinogenicity: NTP? No IARC Monographs? No OSHA? No
EFFECTS OF OVEREXPOSURE: Isobutylene is defined as a simple asphyxiant by displacing air. Can cause dizziness, drowsiness, and eventual unconsciousness. Liquid contact with eyes or skin may cause tissue freezing or frostbite.
EMERGENCY AND FIRST AID PROCEDURES: If inhaled: Remove to fresh air. Obtain prompt medical assistance. Unconscious persons should be given artificial resuscitation and supplemental oxygen. Keep warm and at rest.
Eye or skin contact: Promptly flush affected areas with copious quantities of tepid water (105-115°F). Remove contaminated clothing. A physician should see the patient promptly, if cryogenic burn has resulted in blistering of the dermal surface or deep tissue freezing.

Form SI-00307 Rev. 7/87

SECTION VI--REACTIVITY DATA

6562

STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: Heat, flame, direct sunlight and ignition sources.

INCOMPATABILITY (MATERIALS TO AVOID): Oxygen and strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: CO_2 and water vapor. Can produce carbon monoxide when oxidized with deficiency of oxygen.
HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WON'T OCCUR (X)

CONDITIONS TO AVOID: N/A

SECTION VII--SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from affected area. Stop leaks if possible. Emergency personnel should use self-contained breathing apparatus and should have protective clothing. Eliminate sources of ignition. Supply maximum ventilation with explosion-proof equipment.

WASTE DISPOSAL METHOD: Relocate leaking containers in a remote downwind area out doors, and allow to vent to atmosphere. Incinerate gas by controlled burning in flare if possible. Follow Federal, State and Local regulations.

SECTION VIII--SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use self-contained breathing apparatus when necessary.

VENTILATION: LOCAL EXHAUST (X) Provide adequate ventilation in sumps, MECHANICAL (GENERAL) (X) confined areas and to meet TWA standards.

PROTECTIVE GLOVES: Rubber or plastic EYE PROTECTION: Safety goggles, safety glasses or face shield.
OTHER PROTECTIVE EQUIPMENT: Safety shoes, eyewash, safety shower and protective clothing if liquid contact potential exists.

SECTION IX--SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat and ignition. Keep away from oxidizers such as oxygen, chlorine and fluorine. Electrical equipment should be explosion-proof. Piping connections and containers should be grounded. Use check valve or trap in discharge line to prevent hazardous back flow. Post "No Smoking" or "Open Flame" signs in storage and use areas. Cylinder temperature should be kept under 130°F.
OTHER PRECAUTIONS: Use only DOT or ASME coded containers. Electrically ground all lines and equipment. Cylinders must not be recharged except by or with consent of Liquid Carbonic. For more information, refer to CGA Bulletin SB-2 "Oxygen Deficient Atmospheres" and CGA Pamphlet P-1 "Safe Handling of Compressed Gases in containers.

No.174

TEXAS LEAD & SUPPLY CO. INC.

Phone: (713) 683-2003
683-2004
Post Office Box 19981
5500 CENTRAL CREST
HOUSTON, TEXAS 77018

DEC. 17 1991

MATERIAL SAFETY DATA SHEET

NFPA 0 2 0 W

VENDOR AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR SUCH INJURY. FURTHERMORE, VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. POSTING THIS DOCUMENT FOR EMPLOYEE NOTIFICATION IS RECOMMENDED BY THE VENDOR.

10324 LEAD

TRADE NAMES	Soft Lead
SYNONYMS	Calcium, Strontium and/or Tin Lead Alloy; Pure Lead
INTENDED USE	Industrial

II HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT (CAS#)	WEIGHT %	HAZARD DATA
Lead (CAS# 7439-92-1)	97-100	50 ug/m3*
Calcium (CAS# 7440-70-2)	0-3	5 mg/m3*
Strontium (CAS# 7440-24-6)	0-3	N/A
Tin (CAS# 7440-31-5)	0-3	2 mg/m3**
Copper (CAS# 7440-50-8)	0-1	100 ug/m3*
Aluminum (CAS# 7429905)	0-1	5 mg/m3**

*Ref: Occupational Safety & Health Standards, General Industry Standards Part 1910
**1981 ACGIH Threshold Limit Values

III PHYSICAL DATA

BOILING POINT @ 760 MM Hg	Greater than 2709°F	MELTING POINT	621-1112°F
SPECIFIC GRAVITY (H2O = 1)	11.0 - 11.3	VAPOR PRESSURE	Not Applicable
VAPOR DENSITY (AIR = 1)	Not Applicable	SOLUBILITY IN H2O (% BY WT)	Negligible
% VOLATILES BY VOL	Not Applicable	EVAPORATION RATE (BUTYL ACETATE = 1)	Not Applicable
APPEARANCE AND ODOR	Metallic silver-gray; no apparent odor		

IV HEALTH HAZARD INFORMATION

Routes of Exposure When Processing or Handling

Inhalation	Dust, vapor and/or fume may be irritating to the respiratory system, and can result in both acute and chronic overexposure.
Skin Contact	Dust, vapor and/or fume may cause irritation.
Skin Absorption	Dust, vapor and/or fume are not readily absorbed through the skin.
Eye Contact	Dust, vapor and/or fume may cause irritation.
Ingestion	Dust, vapor and/or fume may be absorbed by the digestive system, and can result in both acute and chronic overexposure.

Effects of Overexposure

Acute Overexposure	If left untreated: headache, chills, nausea, weakness, vomiting, loss of appetite, uncoordinated body movements, convulsions, stupor, and possibly coma.
Chronic Overexposure	If left untreated: weakness, insomnia, hypertension, slight irritation to skin and eyes, metallic taste in mouth, anemia, constipation, headache, muscle and joint pains, metal fume fever, ulceration of nasal septum, neuromuscular dysfunction, possible paralysis and encephalopathy.

Emergency and First Aid Procedures

Eyes	Flush with copious quantities of water. Get immediate medical attention.
Skin	Wash thoroughly with soap and water.
Inhalation	Remove from exposure. Get medical attention if experiencing effects of overexposure.
Ingestion	Get immediate medical attention.

Notes to Physician

Lead and its inorganic compounds are neurotoxins which may produce peripheral neuropathy. For an overview of the effects of lead exposure, consult Occupational Safety and Health Administration Appendix A of Occupational Exposure to Lead (29CFR1910.1025). Tin and its inorganic compounds are primary chemical irritants of the skin, and stannic oxide has been shown to cause benign pneumoconiosis. Calcium and strontium compounds should be considered toxic only when they contain toxic substances. Calcium oxide and strontium oxide can be irritating to the skin, eyes and mucous membranes. Inhalation of copper dust has caused, in animals, hemolysis of the red blood cells, deposition of hemofusin in the liver and pancreas, and injury to the lung cells. Copper is not normally toxic when ingested orally in amounts expected from occupational exposure. Exposure to copper dust, vapor or fumes may cause metal fume fever. Aluminum powder causes pneumoconiosis in humans when inhaled as a very fine powder in massive concentrations.

OBC

V FIRE AND EXPLOSION DATA

Flash Point (Test Method)	Not Applicable	Autoignition Temperature	Not Applicable
Flammable Limits In Air (% By Vol)	Lower: Not Applicable	Upper:	Not Applicable
Extinguishing Media	Dry chemical or carbon dioxide should be used on surrounding fire. Do not use water on fires where molten metal is present.		
Special Fire Fighting Procedures	Use full body protective clothing and full-facepiece, self-contained breathing apparatus operated in a positive-pressure mode.		
Unusual Fire and Explosion Hazard	Molten metals produce fume, vapor and/or dust that may be toxic and/or respiratory irritants. The product, or its dust, can react vigorously with strong oxidizing agents.		

VI REACTIVITY DATA

Conditions Contributing To Instability	Not Applicable
Incompatibility	Strong oxidizers and this product may liberate hydrogen gas.
Hazardous Decomposition Products	High temperatures may produce heavy metal fume, vapor and/or dust.
Conditions Contributing to Hazardous Polymerization	Not Applicable

VII SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released or Spilled

Dust material should be vacuumed, or wet swept where vacuuming is not feasible. Particulate matter should be stored in dry containers for later disposal. Do not use compressed air or dry sweeping as a means of cleaning.

Neutralizing Chemicals: Not Applicable

Waste Disposal Method

Dispose of toxic substances and hazardous wastes in accordance with local, state and federal regulations.

VIII SPECIAL PROTECTION INFORMATION

Ventilation Requirements

Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided to areas where exposures are above the permissible exposure limits or threshold limit values specified by OSHA or other local, state and federal regulations.

SPECIFIC PERSONAL PROTECTION EQUIPMENT

Respiratory	As specified by 29CFR1910.1025 Subpart (f) of the Federal Occupational Safety and Health Administration Standard for Occupational Exposure to Lead. Other local and state regulations may also apply.
Eye	Face shield or vented goggles should be used around molten metal.
Glove	Gloves should be worn when handling the product is necessary.
Other Clothing and Equipment	Coveralls, or other full body clothing, shall be worn during product use and properly laundered after use, with the wash water disposed of in accordance with local, state and federal regulations. Hard hat, safety boots and other safety equipment should be worn as appropriate for the industrial environment. Personal clothing and shoes should be protected from contamination with this product.

IX SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS

There are two major means of heavy metal absorption; namely, inhalation and ingestion. Most inhalation problems can be prevented with adequate use of aforementioned ventilation and respirator information.

Always exercise normal, good personal hygiene prior to smoking or eating. Smoking and eating should be confined to non-contaminated areas.

Work clothes and equipment should remain in designated lead contaminated areas, and never taken home or laundered with personal clothing. Launder contaminated clothing before reuse.

Wash hands, face, neck and arms thoroughly before eating or smoking.

The product is intended for industrial use only, and should be isolated from children and their environment.

OTHER HANDLING AND STORAGE REQUIREMENTS

Store in dry area where accidental contact with acids is not possible.

Avoid skin contact.

Adhere to all personal protection equipment procedures when handling, and ventilation requirements when heavy metal exposures are above permissible exposure limits or threshold limit values.

Before Using This Product Be Familiar With The Information Contained In:

The Federal Standard for Occupational Exposure to Lead (29CFR1910.1025): Published in the Federal Register on Tuesday, November 14, 1978, by the Occupational Safety and Health Administration.

PREPARED BY: TEXAS LEAD & SUPPLY CO., INC

ADDRESS P.O. Box 10901, 5800 Central Great, Houston, TX 77018

DATE

10076

6562

MATERIAL SAFETY DATA SHEET 9.112

05/10/86

1491

SECTION I - NAME AND PRODUCT

MFG NAME AND ADDRESS
EM SCIENCES /MCB
P.O. BOX 5018

CHERRYHILL
NJ 080340395

CHEMICAL NUMBER: MMX0485-5
ITEM NUMBER : 432168
VNDR CATLG NBR :
ENTRY DATE : 11-13-85
CHANGE DATE :
EMERGENCY PHONE:609 3549200

CHEMICAL NAME :
METHANOL ANHYD RGT

TRADE NAME SYN :
METHYL ALCOHOL, WOOD ALCOHOL

CHEMICAL FAMILY :
ALCOHOLS

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS:
REFER TO SECTION 4-9

SECTION III - PHYSICAL DATA S/10 = SEE SECTION X

BOIL. POINT	SPECIFIC GRAVITY	VAPOR PRESS.	MELT. POINT	VAPOR DENSITY	EVAP. RATE	SOLUBLE IN WATER	PERCENT VOLATILE
64.5C	0.79	96	-144F	1.1	5.91 BUTYL ACETATE	SOLBLE	100

APPEARANCE AND ODOR:
COLORLESS LIQUID, SLIGHT ALCOHOLIC ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 52 DEG. F. (TCC)
FLAMMABLE LEL: 6.7%
FLAMMABLE UEL: 35%

EXTINGUISHING MEDIA:
CO2, DRY CHEMICAL, FOAM, WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.
WATER SPRAY TO DISPERSE VAPORS.

SPECIAL FIRE FIGHTING PROCEDURES:
WEAR SELF-CONTAINED BREATHING APPARATUS

UNUSUAL FIRE AND EXPLOSION HAZARDS:
ADDITION OF WATER TO BURNING FUEL MAY REDUCE INTENSITY OF FLAME.

MATERIAL SAFETY DATA SHEET 9.112

10/86

SECTION V - HEALTH HAZARD DATA

THRESHOLD-LIMIT-VALUE:
OSHA STD-AIR: TWA 200 PPM

TXDS: ORL-HMN LDLO: 340 MG/KG

EFFECTS OF OVEREXPOSURE:
HIGHLY TOXIC BY FUMES AND CONTACT; INGESTION MAY BE FATAL AND DAILY CONTACT WILL HAVE CUMULATIVE EFFECT.MAY CAUSE INEBRIATION, NAUSEA, VOMITING; CENTRAL NERVOUS SYSTEM DAMAGE; BLINDNESS; DEFATTING, DRYING AND CRACKING OF THE SKIN.

EMERGENCY AND FIRST AID PROCEDURES:
SKIN: WASH WITH SOAP/WATER; GET MEDICAL ASSISTANCE FOR SKIN IRRITATION.
EYES: FLUSH WITH WATER 15 MINUTES; GET MEDICAL ASSISTANCE.
INHALATION: REMOVE TO FRESH AIR; GET MEDICAL ASSISTANCE.
INGESTION: INDUCE VOMITING IF CONSCIOUS; GET MEDICAL ASSISTANCE.

SECTION VI - REACTIVITY DATA

INDICATORS: STABILITY - STABLE POLYMERIZATION - MAY NOT OCCUR

CONDITIONS TO AVOID:
EAT, SPARKS, OPEN FLAME

INCOMPATIBILITY (MATL TO AVOID):
XIDIZERS

HAZARDOUS DECOMPOSITION OR BY PRODUCTS:
OX

POLYMERIZATION CONTIONS TO AVOID:
N/A

SECTION VII - SPILL OR LEAK PROCEDURES OR DISPOSAL

MATERIAL RELEASE OR SPILL PROCEDURES:

VACUATE NON-ESSENTIAL PERSONNEL. ABSORB WITH SAND.

WASTE DISPOSAL METHOD:

) BE PERFORMED IN COMPLIANCE WITH ALL CURRENT LOCAL, STATE, AND EDERAL REGULATIONS.

05/10/86 MATERIAL SAFETY DATA SHEET 9,112 SEQ. NO. 1490

SECTION VIII- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
WEAR AIR-SUPPLIED MASK, DO NOT BREATHE VAPOR.
VENTILATION - LOCAL:
PROVIDE ADEQUATE LOCAL EXHAUST VENTILATION
VENTILATION - MECHANICAL:
PROVIDE ADEQUATE GENERAL MECHANICAL VENTILATION.
VENTILATION - SPECIAL:
N/A
OTHER
DO NOT GET IN EYES OR ON CLOTHING. FACE SHIELD MAY BE NECESSARY
PROTECTIVE GLOVES:
SAFETY GLOVES
EYE PROTECTION:
SAFETY GOGGLES

SECTION IX - SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:
KEEP CONTAINER TIGHTLY CLOSED. NO SMOKING OR FLARES. STORE IN A WELL-VENTILATED AREA, AWAY FROM SOURCES OF IGNITION. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. IF INGESTED, CAN CAUSE BLINDNESS; CANNOT BE MADE NON-POISONOUS.

SECTION X - OTHER INFORMATION

NFPA 704:	1	3	0
	HEALTH	FLAMMABILITY	REACTIVITY

NOTE: NA OR N/A DENOTES NOT-AVAILABLE OR NON-APPLICABLE