

N60201.AR.000316
NS MAYPORT
5090.3a

SITE HEALTH AND SAFETY PLAN TO PERFORM A BIOSLURPING PILOT SCALE TEST
AND DESIGN NS MAYPORT FL
6/14/1996
BATTELLE

32228-000

19.05.00.0006

SITE HEALTH AND SAFETY PLAN
TO
PERFORM A BIOSLURPING PILOT-SCALE TEST AND DESIGN
AT
NAVAL STATION MAYPORT, FLORIDA

CONTRACT NO. N47408-95-D-0730
DELIVERY ORDER NO. 0011

JUNE 14, 1996

Battelle
505 King Avenue
Columbus, Ohio 43201

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 PROJECT DESCRIPTION	2
2.1 Site Investigation	2
2.2 Bioslurper Pilot Test	2
2.3 Key Personnel and Responsibilities	3
3.0 TRAINING REQUIREMENTS	4
4.0 ANTICIPATED WEATHER CONDITIONS AND PRECAUTIONS	4
5.0 JOB HAZARD ANALYSIS AND CONTROL	5
5.1 Chemical Hazards	5
5.2 Task-Specific Hazards	6
5.2.1 Soil Gas Survey	7
5.2.2 Soil Borings	7
5.2.3 Baildown Test	7
5.2.4 Soil Gas Permeability and In Situ Respiration Testing	7
5.2.5 Bioslurper Installation and Operation	7
5.2.6 Water and Off-Gas Sample Collection	8
5.3 Primary Hazards and Controls	10
5.4 Bioslurper System Controls	11
6.0 RISK ASSESSMENT SUMMARY	12
7.0 MEDICAL PROGRAM	13
8.0 PERSONAL PROTECTIVE EQUIPMENT	15
9.0 GENERAL SAFETY	16
9.1 Housekeeping	16
9.2 Work Practices	16
9.3 Fire Prevention and Protection	17
9.3.1 Fire Prevention	17
9.3.2 Fire Protection	18
9.4 Heat Stress	18
9.4.1 Causes and Preventative Measures	18
9.4.2 Heatstroke	19
9.4.3 Heat Exhaustion	19
9.4.4 Heat Cramps	20
9.4.5 Heat Rash	20
9.4.6 Heat Stress Monitoring and Work Cycle Management	20
9.5 Cold Weather Operations	21
9.6 Biological Vectors	21

TABLE OF CONTENTS
(Continued)

10.0 SITE CONTROL 21

11.0 DECONTAMINATION PROCEDURES 21

12.0 WASTE DISPOSAL 21

13.0 EMERGENCY PROCEDURES 22

 13.1 Personal Injury 22

 13.2 Spills 22

 13.3 Fire or Explosion 24

14.0 REFERENCES 24

APPENDIX A MATERIAL SAFETY DATA SHEETS FOR DIESEL FUEL
AND MINERAL SPIRITS A-1

APPENDIX B MEDICAL EMERGENCY INFORMATION FORM B-1

LIST OF TABLES

Table 1. Primary Health Hazards and Exposure Limits for Chemical Substances Expected
at SWMU 7 6

LIST OF FIGURES

Figure 1. Diagram of the Bioslurper Pilot Test System 8

Figure 2. Location of the Base Hospital 13

Figure 3. Naval Station Mayport Florida Site Map 23

SITE HEALTH AND SAFETY PLAN
TO
PERFORM A BIOSLURPING PILOT-SCALE TEST AND DESIGN
AT
NAVAL STATION MAYPORT, FLORIDA

1.0 INTRODUCTION

This Health and Safety Plan (HASP) is designed to address potential health and safety risks associated with the bioslurping project field activities to be performed at Naval Station (NAVSTA), Mayport, Florida. It has been developed to conform to applicable federal and state Occupational Safety and Health Regulations as defined by OSHA 1910.120. This HASP has been designed to ensure the health and safety of the field team through an integrated program of training, standard operating procedures, and careful site planning and operations. Refer to the site-specific Test Plan for a detailed description of the planned project activities.

A copy of this HASP will be on site during field activities. All site personnel and visitors will be required to read and understand the HASP prior to admission to the project site. During all project activities, the site Health and Safety Officer, or her/his designate, will be responsible for implementation of the HASP.

2.0 PROJECT DESCRIPTION

The objective of the bioslurper pilot-scale demonstration is to evaluate the potential for recovering free-phase light, nonaqueous-phase liquid (LNAPL) present at Solid Waste Management Unit (SWMU) 7 at NAVSTA Mayport, Florida. An initial evaluation of site variables will be conducted, followed by a bioslurper LNAPL recovery test. The intent of the field testing is to predict LNAPL recovery and to obtain site-specific performance data to design and cost a full-scale bioslurper system for recovery of free product and treatment of the contaminated site.

2.1 Site Investigation

Site characterization activities will consist of collecting data on the geologic and hydrologic characteristics of the site as well as data indicating the extent of contamination. The overall objective of the investigation is to collect sufficient site-specific data to design a full-scale bioslurper system to extract LNAPL and biodegrade hydrocarbons present in the unsaturated zone in the area of SWMU 7.

The site investigation activities will consist of the following tasks:

1. Advancement of soil borings. Soil samples for hydrocarbon analysis will be collected from the borings. The soil borings will be converted to soil gas monitoring points.
2. Performance of soil gas surveys. Soil gas samples will be collected and field analyses will be conducted for total petroleum hydrocarbons, oxygen, and carbon dioxide.
3. Performance of an air permeability test. Soil gas pressures and injection flowrates will be monitored during bioslurper activities.
4. An in situ respiration test will be conducted. Soil gas samples will be collected and field analyses will be conducted for total petroleum hydrocarbons, oxygen, carbon dioxide, and helium tracer.
5. Performance of baildown tests. Baildown tests will be performed to determine the LNAPL recharge rate in site monitoring wells.

2.2 Bioslurper Pilot Test

A pilot-scale bioslurper test will be performed for 2 weeks. A trailer-mounted bioslurper system will be installed for conducting field treatability testing. A brief startup test will be conducted to ensure

that the system is installed properly and operates safely. All system components will be checked for problems and/or malfunctions. After installation is complete and the bioslurper system is confirmed to be operating properly, the pilot-test will be initiated. LNAPL and water extraction rates will be closely monitored. Air permeability testing will be performed to determine the effective treatment area for the bioslurper system and to estimate scale-up requirements. Vadose zone hydrocarbon biodegradation rates will be established through in situ respiration testing. Discharge water and off-gas samples will be collected at regular intervals to determine mass loadings and treatment requirements.

2.3 Key Personnel and Responsibilities

G.B. Wickramanayake, Ph.D., P.E., is the program manager. Mr. Jeff Kittel, the project superintendent, is responsible for providing technical oversight for the field activities. Mr. Steve Rosansky, the project engineer, is responsible for providing management oversight for the field activities. Mr. Rosansky is responsible for the full implementation of this HASP. He (or appointed designee) will serve as the Health and Safety Officer during the field operations. The site supervisor/Health and Safety Officer will have a thorough knowledge of the site Health and Safety Plan as well as experience with hazard evaluation, risk assessment, monitoring equipment, and decontamination procedures. He will be responsible for ensuring that proper health and safety requirements are followed as specified in this HASP. He will have the authority to modify the HASP on site if site conditions require this response.

3.0 TRAINING REQUIREMENTS

Personnel working at field operations must recognize and understand the potential health and safety risks associated with the work at the site. All of Battelle's site employees will have completed the OSHA 40-hour hazardous waste site training course and applicable 8-hour annual updates. Copies of training certificates for site personnel will be maintained on site. In addition, all Battelle employees will have had a minimum of 2 weeks of field experience under the supervision of a trained supervisor. Personnel also will receive hazard communication training for the chemicals which they will be working with. All personnel entering the site shall read the HASP and sign a statement that they understand what is required of them under the HASP. A field health and safety meeting will be held prior to beginning fieldwork to discuss the HASP.

All visitors to the site, even if escorted, must receive a briefing on safety if exposure to hazardous chemicals in amounts above recommended guidelines is possible. Visitors not complying with the above requirements will not be allowed to enter the restricted work areas; however, they may observe site conditions from a safe distance. Personnel must receive hazard communication training for the chemicals they are exposed to in the workplace (29 CFR 1910.1200).

4.0 ANTICIPATED WEATHER CONDITIONS AND PRECAUTIONS

Performance of project activities will occur during the summer months. All personnel will be equipped with clothing/gear that is appropriate for the weather conditions.

Weather conditions will be closely observed and weather broadcasts will be monitored. Work shall cease in the event of heavy rain or high winds. Under no circumstance will work be continued if lightning is observed in the area. Personnel will leave the site and seek shelter until the storm subsides.

5.0 JOB HAZARD ANALYSIS AND CONTROL

Preparation of this HASP was based on the proposed scope of project activities to be undertaken at NAVSTA Mayport, Florida as well as on the available analytical data regarding the chemical contamination expected at the site.

5.1 Chemical Hazards

The soil and groundwater in the area of the site are contaminated with LNAPL that most closely resembles diesel fuel and mineral spirits. Material Safety Data Sheet (MSDS) for diesel fuel and mineral spirits are located in Appendix A. Diesel fuel is generally characterized as having low toxicity because of its high viscosity. Diesel fuel is considered by the National Institute for Occupational Safety and Health (NIOSH) to present no significant acute oral hazard. Inhalation of both mineral spirits and diesel vapors causes irritation to respiratory membranes, and at high concentrations can cause central nervous depression. Dermatitis may result from prolonged skin exposure to diesel, due to defatting of the skin.

The primary potential health hazards associated with exposure to the chemical substances identified are provided in Table 1. Applicable employee 8-hour permissible exposure limits (PELs) and threshold limit values (TLVs) also are indicated in Table 1. The PELs are defined by the United States Department of Labor, Occupational Safety and Health Administration (OSHA), in the Code of Federal Regulations (CFR), Title 29, Labor, Section 1910.1000, or other appropriate sections.

The TLVs listed are recommended by the American Conference of Governmental Industrial Hygienists (ACGIH). TLVs refer to airborne concentrations of substances and represent conditions to which it is believed nearly all workers may be repeatedly exposed, 8 hours per day, day after day, for a 40-year working lifetime, without adverse effect. Because of wide variation in individual susceptibility, however, a small percentage of workers may experience discomfort when exposed to chemical substances at concentrations equal to or below the TLVs. A still smaller percentage of persons may be affected more seriously from exposures at or below TLVs due to aggravation of a preexisting condition or the development of an occupational illness. TLVs are based on the best available information from industrial experience, from human and animal studies, and when possible from a combination of the three sources.

**Table 1. Primary Health Hazards and Exposure Limits for Chemical Substances
Expected at SWMU-7**

Compound	Federal OSHA Exposure Limit (PEL) (ppmv)	ACGIH TLV (ppmv)	Primary Health Hazard
Total Petroleum Hydrocarbons	500	300	Dizziness, drowsiness, irritated eyes
Benzene	1	10	Irritated eyes and nose, headache, nausea, fatigue, carcinogenic
Toluene	200	100	Irritated eyes and nose, nausea, affects liver and central nervous system
Xylenes	100	100	Irritated eyes and nose, nausea, affects liver and central nervous system
Mineral Spirits	100	100	Irritated eyes and nose, nausea, dizziness, affects liver and central nervous system
Diesel Fuel	NA	NA	Irritated eyes and nose, nausea, dizziness, affects liver and central nervous system

NA= Not available.

The time-weighted average TLV (TLV-TWA) represents a time-weighted average exposure for an 8-hour day, 40-hour workweek. The majority of TLVs are expressed as TLV-TWAs. Certain substances have a skin notation following the TLV which implies that the overall exposure to a substance is enhanced by skin, mucous membrane, and/or eye exposure. Some substances have a ceiling value designated by the letter "C." Ceiling values should not be exceeded at any time during the workday.

5.2 Task-Specific Hazards

Investigations will be conducted to evaluate the following: geology, hydrogeology, bioactivity, and free-product availability. The project activities to be performed include a soil gas survey, installation of monitoring points and sampling of soil, baildown tests, soil gas permeability tests, in situ respiration tests, installation and operation of the pilot bioslurper system, and discharge water and off-gas collection.

5.2.1 Soil Gas Survey

A soil gas survey will be conducted to choose an optimum site for the soil gas monitoring points. Probes will be driven manually or with a power hammer at various points to locate the most contaminated areas. Possible hazards include objects striking feet and eyes, electrical shock, and exposure to organic vapors.

5.2.2 Soil Borings

The site investigation will involve the use of a manually driven hand auger to advance soil borings and to install monitoring points. Soil samples will be taken during this part of the investigation. Soil samples will be collected with brass sleeves inserted into a manually driven hand auger. Possible hazards include exposure to organic vapors or free-phase petroleum; objects striking feet; objects striking eyes; exposure to the elements; and possible fire, explosion, and/or electrocution as a result of rupturing a utility line.

5.2.3 Baildown Test

Baildown testing involves collecting LNAPL from the sampling wells using a bottom-filling bailer. The LNAPL is removed from the well and poured into a graduated cylinder to determine its volume. Possible hazards include exposure to free-phase petroleum and to organic vapors and/or fire.

5.2.4 Soil Gas Permeability and In Situ Respiration Testing

Activities conducted for the soil gas permeability and in situ respiration testing will include soil gas sampling and analysis and minor maintenance repairs. Possible hazards include exposure to organic vapors; objects striking feet; objects striking eyes; electrical shock; and possible fire or explosion.

5.2.5 Bioslurper Installation and Operation

The pilot-scale bioslurper system was designed to operate with minimal site support. The system includes a 7.5-hp 230-V explosion-proof liquid ring pump, an oil/water separator with 10-gpm flow

capacity, and a 225-gallon surge tank and pump for directing extracted LNAPL/groundwater to the base-supplied 40,000-gallon capacity temporary storage system. A conceptual diagram of the bioslurper pilot test system is shown in Figure 1. All field personnel are responsible for reading and understanding the operating manuals for each piece of equipment. Assembly of the bioslurper system includes making the necessary electrical connections, plumbing an existing monitoring well to the bioslurper system manifold, installing a slurper drop tube and well seal in an existing monitoring well, plumbing the bioslurper pump to the oil/water separator, and plumbing the discharge line to the base-supplied 40,000-gallon temporary storage system. The installation will be performed by field personnel. Required electrical work will be performed by a qualified electrical contractor. The primary hazards of installation include objects striking the head, feet, or eyes; electrical shock; and exposure to the elements.

The operation of the bioslurper system is described in detail in the Test Plan. The system will operate for approximately 14 days. The most likely time for an incident to occur is during sample collection. Personnel potentially could be exposed to free-phase petroleum and organic vapors. Safety switches have been installed to reduce the potential for spills due to equipment failure. These are discussed in detail in Section 5.4.

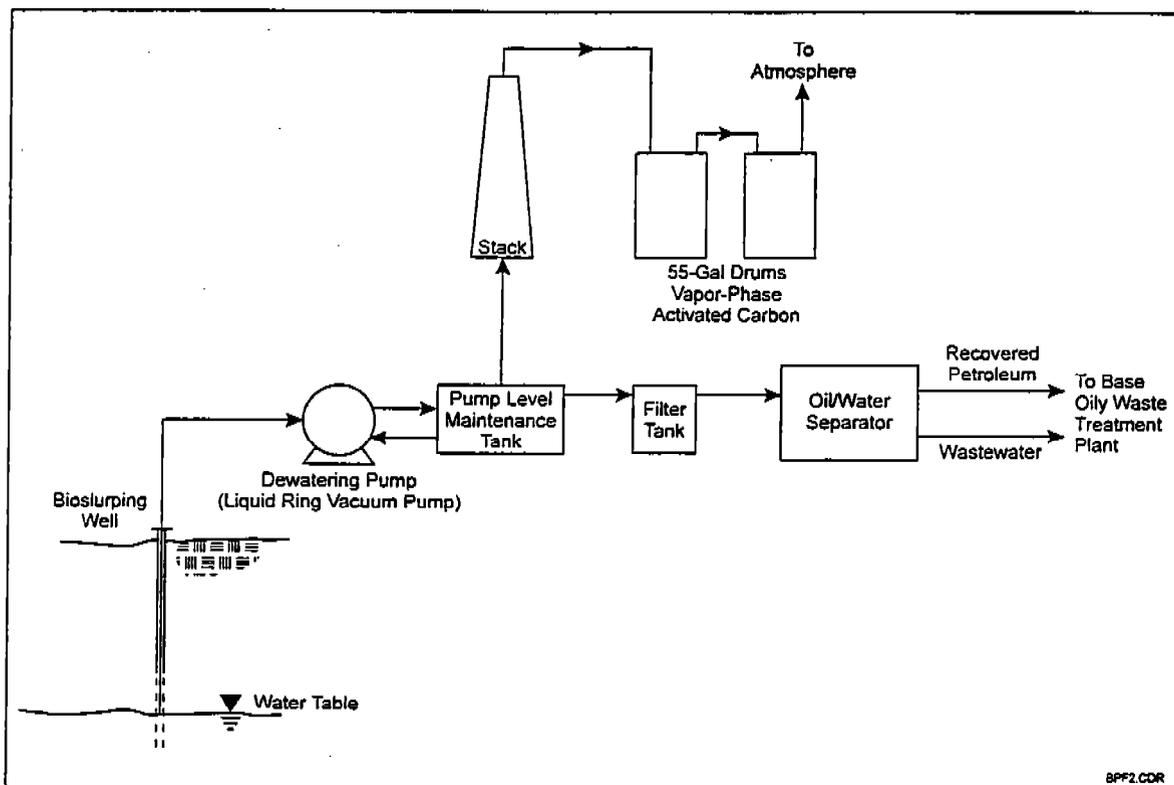


Figure 1. Diagram of the Bioslurper Pilot Test System.

5.2.6 Water and Off-Gas Sample Collection

Discharge water and offgas samples will be collected for sample analysis at various periods throughout the test program. Discharge water samples will be collected from the bioslurper oil/water separator discharge. Samples will be collected into airtight glass vials. Off-gas samples will be collected from the bioslurper stack using Summa™ canisters. Possible hazards include objects striking eyes; exposure to free-phase petroleum and organic vapors; and possible fire or explosion.

5.3 Primary Hazards and Controls

The potential hazards and required control measures for the proposed scope of the environmental project activities to be conducted at NAVSTA Mayport, Florida for the Bioslurping pilot-scale demonstration are summarized below.

- Flying particulate: Safety glasses will be worn by all site personnel.
- Objects striking head: Hard hats will be worn in the vicinity of overhead hazards (e.g., in the drilling rig area).
- Objects striking foot: Steel-toed boots will be worn.
- Slips, trips, and falls: Attempts will be made to minimize slips, trips, and falls by providing clear footing.
- Exposure to organic contaminants: Disposable gloves, coveralls, and boot covers will be worn when sampling contaminated soil and water.
- Exposure to free product: Exposure to free product will occur during sampling. Safety goggles, disposable gloves, coveralls, and boot covers will be worn during sampling.
- Exposure to organic vapors: Negative-pressure, NIOSH-approved cartridge respirators will be available to site personnel should conditions warrant.
- Severing a utility line: A severed utility line could result in fire, explosion, or electrocution. To prevent severed lines, an underground utility locating company will be subcontracted to locate and mark existing utility lines.
- Electrical shock: All major electrical work (e.g., wiring, control panel construction) will be performed by a qualified electrical contractor. Care will be taken to de-energize and ground electrical equipment prior to any necessary repair work. Before

undertaking repair work, the energy source will be either permanently disconnected or temporarily tagged and locked out to prevent the equipment from accidentally energizing. Tagging and locking out must meet OSHA 29 CFR 1910.147 Lockout/Tagout Program requirements.

- Fire: Open-flame ignition sources (e.g., smoking) will be restricted from the work area. Free-phase petroleum will be stored in appropriate containers. Signs indicating flammable liquids will be posted where appropriate. Appropriate fire extinguishers will be available to site personnel during drilling activities. A fire extinguisher will be permanently located on the site.
- Noise: The operation of pumps, drills, vehicles, aircraft, and other sources will create areas where excessive noise is present. The field personnel will identify areas with a high noise level. Earplugs/earmuffs will be worn as warranted. Areas with high noise level per OSHA 29 CFR Part 1910.95 must be signed with the appropriate warning.

5.4 Bioslurper System Controls

The bioslurping system was designed to operate maintenance-free for an extended period of time. However, there is always a possibility of equipment failure. The principal concern is a malfunction that would result in free product and/or contaminated water overflowing from any of the holding tanks. Equipment faults (kinked hose, clogged discharge port) or human error could potentially cause an overflow situation to occur. To prevent potential accidents, overflow float switches will be installed in both of the 20,000-gallon temporary storage tanks as well as inside the 225-gallon surge tank. These switches will shut down the liquid ring pump if any tank becomes full. Personnel will monitor the system on a daily basis. If personnel discover that the liquid ring pump has shut down, the reason for failure will be determined. The ring pump will then be restarted.

6.0 RISK ASSESSMENT SUMMARY

The project activities will involve minimal disturbance of contaminated soils. No risk to the communities at or near the site or to the environment is anticipated as a result of the project activities. Free-phase LNAPL collected during the pilot test will be quantified and pumped from the bioslurper process to the base-supplied 40,000-gallon capacity temporary storage system. The discharge stream will be subsequently pumped to and treated by the base Oily Water Treatment Plant. The source of exposure to the workers will be from organic vapors when drilling boreholes, installing monitoring points, emptying sample devices, and collecting samples. There is also an exposure risk of splashing LNAPL during baildown tests and during sample collection and transfer. The air permeability and in situ respiration tests are expected to vent minimal organic vapors and will be designed to discharge vapors away from the work area. The total organic vapor exposure as a result of project activities is not expected to approach the concentration limits of an 8-hour, time-weighted average as listed in Table 1 based on anticipated minimal work area exposure time.

7.0 MEDICAL PROGRAM

All Battelle field personnel undergo a pre-employment health screening and annual physical examinations. This medical surveillance program is overseen by a board-certified occupational medicine physician on staff at Battelle. Physical examinations include the following:

- Height, weight, temperature, pulse, and blood pressure
- Vision test
- Audiometric test
- Head, nose, and throat examination
- Blood and urine tests to check general liver, kidney, and multiple-system functions
- Pulmonary function test
- Electrocardiogram and chest x-ray (not annually, determined by doctor and by patient's job history).

Based on the risk assessment that exposure to organic contaminants (liquid and vapor phase) will be minimal, additional medical surveillance is not deemed necessary. Should any site personnel exhibit symptoms of overexposure to organic vapors (e.g., dizziness, nausea, irritated eyes and nose, etc.), they will be removed from the project site to fresh air. If the symptoms persist, the individual will be taken to Beaches Baptist Medical Center. The directions to Beaches Baptist Medical Center are as follows:

From main gate at NAVSTA Mayport turn right on Mayport Rd. Follow Mayport Rd. to Atlantic Ave. and turn right. Follow Atlantic Ave. to Third St. and turn right. Follow Third St. to 13th Ave. South, then turn right. Beaches Baptist Medical Center is located on the left side of the street at 1350 13th Ave. South, Jacksonville Beach, Florida.

The location of the Base Medical/Dental Clinic is shown in Figure 2. The Base Clinic will be used for emergencies only. A first aid kit will be kept on site for nonemergency medical treatment such as cuts, scrapes, and other minor job-related injuries.

Copies of pertinent medical certificates will be maintained by Battelle Health Services. Medical emergency information and phone numbers are listed on the emergency information form in Appendix B. This form will be present on site in a location known to all field personnel.

8.0 PERSONAL PROTECTIVE EQUIPMENT

Based on the risk assessment that exposure to vapor concentrations of hydrocarbons during the project activities will be below applicable exposure threshold limit values, level D personal protective equipment will be worn by all persons entering the work site. Level D equipment includes the following:

- Coveralls
- Steel-toed boots
- Gloves
- Safety glasses or goggles
- Splash-proof goggles when working around hazardous liquids.

In addition, level C equipment will be available in the event that upgrading of the protection level is required. This equipment will include level D equipment and the following:

- Outer disposable coveralls
- Chemical-protective gloves and boots
- Negative-pressure, NIOSH-approved cartridge respirators with the organic vapor cartridge (color code black). All personnel working on site will be required to undergo a respiratory protection program. This program consists of providing training on the proper operation and care of respirators, conducting physicals to determine if individuals are physically fit to wear a respirator, and conducting fit tests to ensure that individuals receive a respirator that fits properly and provides the level of protection indicated by the manufacturer.

Level C personal protective equipment will be worn if considered necessary by the site Health and Safety Officer or his/her designate. Level C personal protective equipment will be required if site operations increase the total petroleum hydrocarbon concentration to 50 ppmv or greater in the breathing zone for a period of 5 minutes. TPH concentrations in the breathing zone will be measured at regular intervals using a GasTech TraceTechtor™.

9.0 GENERAL SAFETY

9.1 Housekeeping

The housekeeping procedures described in the following list relate to uncontaminated trash, debris, and rubbish. The following housekeeping rules will apply at the job site:

- Work areas must be kept clean and free from trash and debris; trash containers must be located throughout the job site.
- Excess scrap material and rubbish must be removed from the work area.
- All surplus materials must be returned to a designated area of the site at the completion of a job.
- Tools and materials must be put in toolboxes or returned to the toolroom after use to avoid creation of a hazard for others.
- Contaminated personal protective equipment, rags, and absorbent pads will be double-bagged and given to the Naval Station hazardous waste management coordinator for proper disposal.
- Personal protective equipment will be returned to the designated area at the end of the work period and will be placed in designated receptacles.
- Eating, drinking, use of tobacco products, chewing gum, etc., are permitted only in designated break areas.

9.2 Work Practices

The following work practices will be followed by all site workers or visitors:

- Whenever possible, workers will remain upwind of all activities that are expected to result in the potential release of airborne contaminants, including soil boring and sampling activities.
- No eating, drinking, or chewing of gum or tobacco, or smoking will be permitted in the work area.
- Any skin contact with contaminated or potentially contaminated surfaces, samples, or equipment shall be avoided.

- Removal of materials from protective clothing or equipment by blowing, shaking, or any other means that could disperse contaminated materials is prohibited.
- The hands and face must be thoroughly washed upon leaving the work area or engaging in any other activities.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
- Because medicine can exaggerate the effects of exposure to toxic chemicals, prescribed drugs should be carefully administered.
- Personnel and equipment in the contaminated area should be limited to the numbers consistent with effective operations.
- Procedures for leaving a contaminated area must be explained before going to the site; decontamination procedures for work areas (Section 11.0) must be observed on the basis of prevailing site conditions.

9.3 Fire Prevention and Protection

9.3.1 Fire Prevention

The following rules will be enforced to prevent fires:

- Smoking will be prohibited at, or in the vicinity of, operations that may present a fire hazard; "No Smoking-Open Flame" markings will be conspicuously posted.
- Flammable and/or combustible liquids must be handled only in approved, properly labeled metal safety cans equipped with flash arresters and self-closing lids.
- Transfer of flammable liquids from one container to another will be done only when the containers are electrically interconnected (bonded).
- The motors of all equipment being fueled will be shut off during the fueling operations.
- Metal drums for storing flammable/combustible liquids will be equipped with self-closing safety faucets, vent bung fittings, and drip pans, and will be properly grounded; such containers will be stored outside buildings in an area approved by the site supervisor and the plant Fire Marshall whenever working within an operating facility. Such metal drums will be properly grounded and shall be labeled per 29 CFR 1910.1200.

- Electrical equipment installed in exclusion zones must meet requirements for Class 1, Division 1, Group B (National Electrical Manufacturers Association [NEMA] 7) per National Fire Protection Act (NFPA) 70.

9.3.2 Fire Protection

The following measures will be used to protect against fires:

- All vehicles will be equipped with a fire extinguisher of 5 ABC units or higher.
- At least one portable fire extinguisher of 20 ABC units will be located not less than 25 ft or more than 75 ft from any flammable liquid storage area.

9.4 Heat Stress

One of the most common types of stress that can affect field personnel is heat stress. Current thinking is that heat stress may be the most serious hazard to hazardous waste workers.

9.4.1 Causes and Preventative Measures

Heat stress usually results from protective clothing decreasing natural body ventilation and cooling; however, it may occur at any time work is being performed at elevated temperatures.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement) to fatal. Because heat stress is one of the most common and potentially most serious illnesses that hazardous waste site workers encounter, regular monitoring and other preventative measures are vital. Site workers must learn to recognize and treat the various forms of heat stress.

The following procedures shall be followed to minimize the likelihood of heat stress:

- Suggest that workers drink 16 ounces of water before beginning work, such as in the morning or after lunch; provide disposable 4-ounce cups and water; urge workers to drink 1 to 2 gallons of water per day; provide a cool, preferably air-conditioned area for rest breaks; discourage the use of alcohol in nonworking hours, and discourage the intake of coffee during working hours; monitor for signs of heat stress; if an individual

has high blood pressure, she/he must be monitored more often and take precautions (i.e., drink more water).

- Acclimate workers to site work conditions by slowly increasing workloads, i.e., do not begin site work activities with extremely demanding activities.
- Ensure that adequate shelter is available to protect personnel against heat, as well as cold, rain, wind, etc., which can decrease physical efficiency and increase the probability of heat stress; if possible, set up the command post in the shade.
- Good hygienic standards must be maintained by frequent changes of clothing and showering; clothing should be permitted to dry during rest periods; persons who notice skin problems should immediately consult the site supervisor.

9.4.2 Heatstroke

Heatstroke is a dangerous form of heat stress caused by a failure of the heat-regulating mechanisms of the body. The individual's temperature control system that causes sweating stops working correctly. The body temperature rises so high that brain damage and death will result if the person is not cooled quickly. Heatstroke is an acute illness which can be fatal if not promptly and properly managed.

- Symptoms: Red, hot, dry skin, although person may have been sweating earlier; nausea; dizziness; confusion; extremely high body temperature; rapid respiratory and pulse rate; unconsciousness or coma.
- Treatment: Heatstroke is a medical emergency and medical treatment should be obtained as quickly as possible. Heroic measures should be made to cool the person displaying heatstroke symptoms while transporting or waiting for transport to medical facilities. This can be accomplished by soaking with or immersion in cold water or ice.

9.4.3 Heat Exhaustion

Heat exhaustion is a response to heat characterized by fatigue, weakness, and collapse due to intake of water inadequate to compensate for loss of fluids through sweating. The symptoms of heat exhaustion and the treatment are described in the following paragraphs.

- Symptoms: Approximately normal body temperature; pale and clammy skin; profuse perspiration; tiredness, weakness; headache, perhaps cramps; nausea, dizziness, possible

vomiting; possible fainting, but the victim will probably regain consciousness as her/his head is lowered.

- Treatment: Heat exhaustion requires restoration of normal blood volume; small amounts of cool fluids should be given orally every few minutes; have the victim lie down and raise her/his feet from 8 to 12 inches; loosen the victim's clothing; apply cool, wet cloths and fan the victim or remove her/him to an air-conditioned room; if the victim vomits, do not give him any more fluids. Consult with a physician. After an attack of heat exhaustion, advise the victim not to return to work for several days and see that she/he is protected from exposure to abnormally warm temperatures.

9.4.4 Heat Cramps

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

- Symptoms: Acute painful spasms of voluntary muscles, e.g., abdomen and extremities.
- Treatment: Remove victim to a cool area and loosen clothing. Have patient drink 1 to 2 cups of water immediately, and every 20 minutes thereafter, until symptoms subside. Total water consumption should be 1 to 2 gallons per day. Consult with physician.

9.4.5 Heat Rash

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

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

9.4.6 Heat Stress Monitoring and Work Cycle Management

For strenuous field activities that are part of ongoing work site activities in hot weather, the following procedures may be used to monitor the body's physiological response to heat and to manage the work cycle. These procedures may be instituted when the temperature exceeds 70°F.

The heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute for most individuals. The maximum rate is based on an individual's base rate. Base rates vary across the population. If the HR is higher, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%. The procedure is continued until the rate is maintained below 110 beats/minute.

9.5 Cold Weather Operations

It is not expected that cold weather conditions will be experienced at this site.

9.6 Biological Vectors

Black widow spiders, rattlesnakes, and scorpions are prevalent in northern Florida. Caution will be exercised when dealing with biological vectors. Areas with piping, well casings, pump housings, and tool chests will be routinely checked for biological vectors prior to the initiation of work in the area.

10.0 SITE CONTROL

The proposed project site is in an active area of NAVSTA Mayport, Florida. A map of the site is shown in Figure 3.

The Base security personnel control access to the site, limiting access to the project facilities to persons cleared for access to the area. Personnel identified as Base Safety Specialists shall have access to the site without advance notice provided they meet the requirements set forth in this HASP. An exclusion zone will be created to restrict unauthorized personnel from the immediate vicinity of the bioslurper system. This exclusion zone will be demarcated with caution tape.

11.0 DECONTAMINATION PROCEDURES

All disposable materials, including disposable coveralls, gloves, paper towels, etc., will be placed in appropriately marked containers (e.g., plastic bags) and disposed of in accordance with Base regulations. Sampling equipment will be decontaminated with a laboratory-grade detergent solution followed by a distilled water rinse.

12.0 WASTE DISPOSAL

Liquid and solid waste will be generated as a result of project activities. The only regulated substances expected to be encountered during project activities will be petroleum constituents of the contaminants at the site. Free product and contaminated water will be pumped to the 40,000-gallon-capacity temporary storage tank facility and subsequently pumped to the base Oily Water Treatment Plant. Soil cuttings will be placed within the sludge drying beds on the site. Contaminated personal protective equipment, rags, and absorbent pads will be double-bagged and given to the NAVSTA Mayport hazardous waste management coordinator for proper disposal.

13.0 EMERGENCY PROCEDURES

There are three primary scenarios for emergencies occurring during project activities:

- Personal injury requiring medical treatment
- An uncontrolled release of a dangerous substance (e.g., petroleum spill)
- A fire or explosion.

In the event of an emergency, the Base Environmental Director will be notified immediately. Emergency information (phone numbers, emergency care facilities, etc.) is listed on the emergency Information Form in Appendix B. Base safety personnel are authorized to stop operations during situations of imminent danger to the life and health of any personnel, or damage to Navy property.

13.1 Personal Injury

Minor injuries (minor heat exhaustion, cuts, scrapes, etc.) will be treated on site. The site will be equipped with a first aid kit. In addition, a person who has had both cardiopulmonary resuscitation (CPR) and first aid training will be present on site. If the injury is thought to require additional medical attention, the injured individual will be transported to the Beaches Baptist Medical Center. In severe situations, the individual will be transported to the nearest available medical center by either a coworker or an ambulance. All personnel will be responsible for knowing the locations of the medical center.

All injuries will be recorded in a logbook. In the case of severe injuries, the project manager will be notified immediately.

13.2 Spills

Spills will be contained using absorbent pads and/or pillows. A supply of pads/pillows will be stored on site. In the event of a spill, pillows will be placed around the spill to contain it. The spill will be absorbed by placing pads on top of it. The materials used to contain the spill will be treated as hazardous waste and will be disposed of by Naval Station personnel. All spills will be documented and reported to the Base POC and to the Project Manager. Phone numbers for reporting spills are listed in Appendix B.

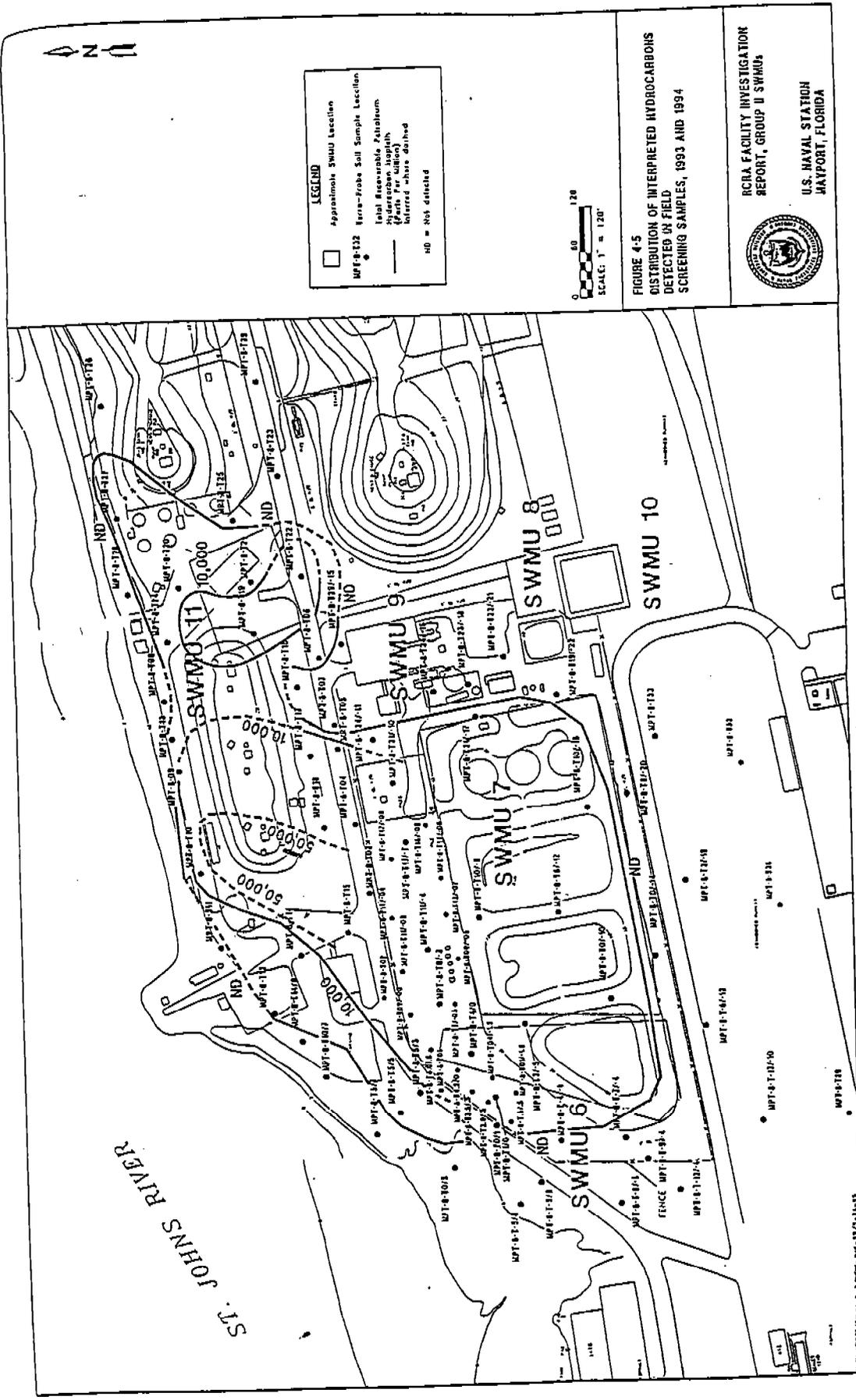


Figure 3. NAVSTA Mayport, Florida Site Map

13.3 Fire or Explosion

Minor fires will be extinguished by site personnel using fire extinguishers located on site. The reason for fire will be determined before continuing site activities. In the event of a large fire or explosion, the Naval Station Fire Department will be notified immediately. Base Safety personnel and the Project Manager will be notified in the event of a fire.

14.0 REFERENCES

Battelle, 1996. *Test Plan for Bioslurping Pilot-Scale Test and Design at Naval Station Mayport, Florida.*
Prepared by Battelle Columbus Operations.

APPENDIX A
MATERIAL SAFETY DATA SHEETS FOR
DIESEL FUEL AND MINERAL SPIRITS

MATERIAL SAFETY DATA SHEET

GULF OIL

DOCUMENT NUMBER  6794

RECEIVED DEC 13 1988

GULF OIL DIVISION
Cumberland Farms, Inc.
165 Flanders Road
Westboro, Massachusetts 01581

EMERGENCY: 800-424-9300
Chemtrec

COMPANY: 617-366-4445

IMPORTANT: Read this MSDS before handling and disposing of this product and pass this information on to employees, customers, and users of this product. This product is considered a hazardous substance under the OSHA Hazard Communication Rule. (29CFR 1910.1200)

I. General

Trade Name: **#2 FUEL OIL/#2 DIESEL**

Other Names: Home Heating Oil; #2 Home Heating Oil; Heating Oil (Medium); Number Two; Diesel Fuel; Truck Diesel; Industrial Diesel; #2 Utility

Chemical Family: PETROLEUM HYDROCARBONS

DOT Hazardous Materials

Proper Shipping Name: FUEL OIL, #2 or FUEL OIL, diesel

Generic Name: PETROLEUM DISTILLATE FUEL

DOT Hazard Class: COMBUSTIBLE LIQUID

CAS No.: 68476-30-2

UN/NA ID No.: NA 1993

II. Summary of Hazards

WARNING

MAY CAUSE IRRITATION OR MORE SERIOUS SKIN DISORDERS!
AVOID PROLONGED OR REPEATED LIQUID, MIST AND VAPOR CONTACT WITH EYES, SKIN, AND RESPIRATORY TRACT. LONG-TERM TESTS SHOW THAT SIMILAR PETROLEUM DISTILLATES HAVE PRODUCED SKIN TUMORS ON LABORATORY ANIMALS. WASH THOROUGHLY AFTER HANDLING.

MAY BE HARMFUL IF INHALED! (SEE SECTIONS IV. & V.)

June 3, 1988

Eye Contact: MILD EYE IRRITATION MAY RESULT FROM CONTACT WITH LIQUID, MIST, AND/OR VAPORS.

Skin

Absorption: NO SIGNIFICANT SYSTEMIC EFFECTS ARE EXPECTED UNDER CONDITIONS OF ANTICIPATED USE.

Skin

Irritation: THIS MATERIAL IS LIKELY TO BE A MODERATE SKIN IRRITANT. IRRITATION LEADING TO DERMATITIS MAY RESULT FROM PROLONGED OR REPEATED EXPOSURES. (SEE CHRONIC HAZARDS BELOW.)

Ingestion: THIS MATERIAL CAN IRRITATE THE MOUTH, THROAT AND STOMACH, AND CAUSE NAUSEA, VOMITING, DIARRHEA AND RESTLESSNESS. ASPIRATION INTO THE LUNGS WILL CAUSE CHEMICAL PNEUMONIA.

Summary of Chronic Hazards and Special Health Effects: THIS PRODUCT CONTAINS PETROLEUM DISTILLATES SIMILAR TO THOSE SHOWN TO PRODUCE SKIN TUMORS ON LABORATORY ANIMALS. AVOID PROLONGED OR REPEATED SKIN CONTACT. CAUTION IS RECOMMENDED FOR PRE-EXISTING CENTRAL NERVOUS SYSTEM DISEASE, SKIN DISORDERS, OR CHRONIC RESPIRATORY DISEASES SHOULD AVOID EXPOSURE TO THIS PRODUCT.

Primary Route(s): SKIN CONTACT AND INHALATION

V. Protective Equipment
and
Other Control Measures

Respiratory: THIS MATERIAL IS NOT EXPECTED TO PRESENT RESPIRATORY HAZARD BECAUSE OF ITS LOW VAPOR PRESSURE. BUT, IF EXCESSIVE MIST OR VAPORS RESULT FROM CONDITIONS OF USE, WEAR PROPER NIOSH/MSHA-APPROVED RESPIRATORY EQUIPMENT.

Eye: EYE PROTECTION SHOULD BE WORN WHENEVER THERE IS A LIKELIHOOD OF SPLASHING OR SPRAYING LIQUID. CONTACT LENSES SHOULD NOT BE WORN. SUITABLE EYE WASH WATER SHOULD BE AVAILABLE.

Skin: AVOID PROLONGED AND/OR REPEATED SKIN CONTACT. IF CONDITIONS OR FREQUENCY OF USE MAKE CONTACT SIGNIFICANT, CLEAN AND IMPERVIOUS PROTECTIVE CLOTHING SUCH AS GLOVES, APRON, BOOTS, AND FACIAL PROTECTION SHOULD BE WORN.

VIII. Spill and Disposal

Precautions if Material is Spilled or Released: CONTAIN SPILL. REMOVE ALL IGNITION SOURCES AND SAFELY STOP FLOW OF SPILL. SPILL MAY CREATE SLIPPING HAZARDS. PREVENT FROM ENTERING ALL WATER BODIES, IF POSSIBLE. EVACUATE ALL NON-ESSENTIAL PERSONNEL. IN URBAN AREAS, CLEANUP AS SOON AS POSSIBLE; IN NATURAL ENVIRONMENTS, CLEANUP ON ADVICE FROM ECOLOGISTS. THIS MATERIAL WILL FLOAT ON WATER. ABSORBENT MATERIAL AND PADS CAN BE USED. COMPLY WITH ALL APPLICABLE LAWS. SPILLS MAY NEED TO BE REPORTED TO THE NATIONAL RESPONSE CENTER (800/424-8802). THE SPILLED MATERIAL AND ANY WATER OR SOIL WHICH IT HAS CONTACTED MAY BE HAZARDOUS TO ANIMAL/AQUATIC LIFE.

Waste Disposal Method: MAXIMIZE PRODUCT RECOVERY FOR REUSE OR RECYCLING. UNUSED LIQUID PRODUCT IS LIKELY AN EPA "IGNITABLE HAZARDOUS WASTE" (D001). USE APPROVED TREATMENT, TRANSPORTERS, AND DISPOSAL SITES IN COMPLIANCE WITH ALL APPLICABLE LAWS. IF SPILL IS INTRODUCED INTO A WASTEWATER SYSTEM, THE CHEMICAL AND BIOLOGICAL OXYGEN DEMAND WILL LIKELY INCREASE. SPILL MATERIAL IS BIODEGRADABLE IF GRADUALLY EXPOSED TO MICROORGANISMS. POTENTIAL DISPOSAL METHODS INCLUDE INCINERATION AND LAND DISPOSAL, IF PERMITTED.

IX. Components

(This may not be a complete list of components)

Component Name	CAS No.	Carcinogen*	Composition amount (Vol.) (See Qualification on Page 4)
----------------	---------	-------------	--

HYDROCARBONS WITH A BOILING POINT RANGE OF 325°F, TO 700°F.	--	N/A	≈100 PERCENT
---	----	-----	--------------

Compositions given are typical values, not specifications.

* Listed By: 1=NTP; 2=IARC; 3=OSHA; 4=OTHER

X. Physical & Chemical Data

Boiling Point: 348° TO 680°F

Viscosity Units, Temp. (Method): ≈ 1 - 4 cSt. AT 100°F (D-445)

Dry Point: No Data Available

Freezing Point: ≈ -40°F

Vapor Pressure: (REID-PSIA at 100°F) < 0.1

PERMISSIBLE EXPOSURE LIMITS ARE NOT SHOWN IN SECTION VI, BECAUSE THEY ARE LESS RESTRICTIVE THAN THE ACGIH EXPOSURE LIMITS ALREADY LISTED. SINCE SPECIFIC EXPOSURE STANDARDS/CONTROL LIMITS HAVE NOT BEEN ESTABLISHED FOR THIS MATERIAL, THE EXPOSURE LIMITS SHOWN IN SECTION IV, ARE SUGGESTED AS MINIMUM CONTROL GUIDELINES.

MATERIALS SIMILAR TO SOME COMPONENTS IN THIS PRODUCT WERE FOUND TO BE MUTAGENIC IN "IN VITRO" AND "IN VIVO" TESTS. THE EXACT RELATIONSHIP BETWEEN THESE RESULTS AND POSSIBLE HUMAN EFFECTS IS NOT KNOWN.

"PETROLEUM DISTILLATE" -- 16 CFR 1500.14 (B) (3). USE SPECIAL FEDERAL LABELING IF INTENDED, OR PACKAGED, FOR USE IN THE HOUSEHOLD OR BY CHILDREN.

SOME OF THE INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE MIXTURE ITSELF.

Disclaimer of Liability

The information on this MSDS was obtained from sources which we believe are reliable. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

MATERIAL SAFETY
DATA SHEET



ASHLAND CHEMICAL, INC.

Subsidiary of Ashland Oil, Inc.
P.O. BOX 2219
COLUMBUS, OHIO 43216
(614) 889-3333

24-HOUR
Emergency
Telephone
1(800) 274-5263 or
1(800) ASHLAND

RECEIVED JUN 20 1990
000792

DOCUMENT NUMBER 753 Page: 1

MINERAL SPIRITS ODORLESS

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

Product Name: MINERAL SPIRITS ODORLESS
CAS NUMBER: 64742-88-7

05 50 006 0859370-

Data Sheet No: 0000594-004
Prepared: 05/31/89
Supersedes: 03/04/86

BATTELLE MEMORIAL INSTITUTE
505 KING AVE
COLUMBUS OH 43201

PRODUCT: 2560000
INVOICE: 105755
INVOICE DATE: 05/22/90
TO: SAME

ATTN: PLANT MGR./SAFETY DIR.

SECTION I - PRODUCT IDENTIFICATION

General or Generic ID: ALIPHATIC HYDROCARBON
DOT Hazard Classification: COMBUSTIBLE (173.115)

SECTION II - COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION. SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	% (by WT)	PEL	TLV	Note
ALIPHATIC PETROLEUM DISTILLATES CAS #: 64742-88-7	100	100 PPM	100 PPM	(1)

Notes:

(1) NIOSH RECOMMENDS A LIMIT OF 350 MG/CUM - 8 HOUR TIME WEIGHTED AVERAGE, 1800 MG/CUM AS DETERMINED BY A 15 MINUTE SAMPLE.

SECTION III - PHYSICAL DATA

Boiling Point	for PRODUCT	340.00 - 400.00 Deg F (171.11 - 204.44 Deg C) @ 760.00 mm Hg
Vapor Pressure	for PRODUCT	@ 2.00 mm Hg (68.00 Deg F 20.00 Deg C)
Specific Vapor Density	AIR = 1	4.9
Specific Gravity		@ .759 (60.00 Deg F 15.55 Deg C)
Percent Volatiles		100.00%
Evaporation Rate	(ETHER = 1)	70.00

SECTION IV - FIRE AND EXPLOSION INFORMATION

FLASH POINT 120.0 Deg F (48.9 Deg C)
EXPLOSIVE LIMIT (PRODUCT) LOWER - .7%
EXTINGUISHING MEDIA: REGULAR FOAM OR CARBON DIOXIDE OR DRY CHEMICAL
HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS: CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, ETC.
FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.
SPECIAL FIRE & EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE GROUND OR BE MOVED BY VENTILATION AND IGNITED BY HEAT, PILOT LIGHTS, OTHER FLAMES AND IGNITION 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.
NFPA CODES: HEALTH- 0 FLAMMABILITY- 2 REACTIVITY- 0

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL 100 PPM
THRESHOLD LIMIT VALUE 100 PPM
EFFECTS OF ACUTE OVEREXPOSURE: FOR 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, CENTRAL NERVOUS SYSTEM EFFECTS INCLUDING DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE AND POSSIBLE UNCONSCIOUSNESS, AND EVEN DEATH.
SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

APPENDIX B
MEDICAL EMERGENCY INFORMATION FORM

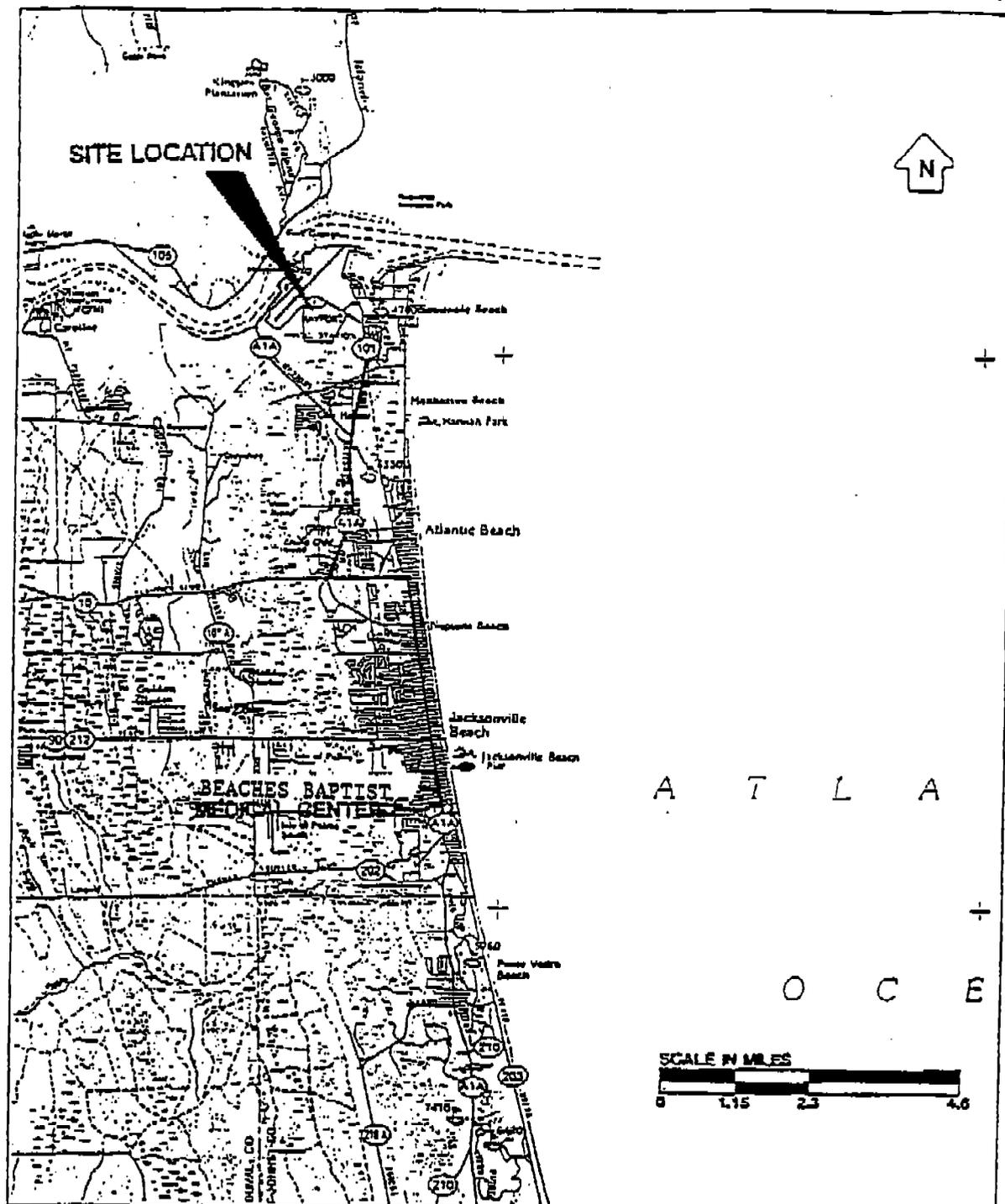
EMERGENCY INFORMATION FORM

Emergency Contacts	Name	Telephone Number
Hospital: NAVSTA Mayport Clinic		
Beaches Baptist Medical Center	Emergency Center	(904) 247-2999
Fire Department	Emergency Switchboard	911/Base (0) 5333
Ambulance and Paramedics	Emergency Switchboard	911/Base (0) 5444
Police Department	Emergency Switchboard	911/Base (0) 5111
Poison Control	Emergency Switchboard	(800) 362-0101
Battelle Health Services		(614) 424-6337
Other		

Program Contacts	Name	Telephone Number
Navy (Southern Division)	Dave Driggers	(803) 820-5501
Battelle	G.B. Wickramanayake	(614) 424-4698
	Steve Rosansky	(614) 424-7289
NAVSTA Mayport	Cheryl Mitchell	(904) 270-6730
ABB Environmental Services	Terry Hansen	(904) 656-1293
	Frank Lesesne	

Emergency Routes
<p>Hospital (map attached, Figure B-1).</p> <p style="text-align: right;">From main gate at NAVSTA Mayport turn right on Mayport Rd. Follow Mayport Rd. to Atlantic Blvd. and turn left. Follow Atlantic Blvd. to Third St. and turn right. Follow Third St. to 13th Ave. South, then turn right. Beaches Baptist Medical Center is located on the left side of the street at 1350 13th Ave. South, Jacksonville Beach, Florida.</p>

Other



FIGURE

**ROUTE TO BEACHES BAPTIST
MEDICAL CENTER, 1350 13TH AVENUE
SOUTH, JACKSONVILLE BEACH**



**U.S. NAVAL STATION
MAYPORT, FLORIDA**

Figure B-1. Map of Route from NAVSTA Mayport to Beaches Baptist Medical Center.