



Project Navigator, Ltd.

Prepared for

**Project Navigator, Ltd. and
the Ascon Landfill Site RPs**

INTERIM REMOVAL MEASURE HEALTH AND SAFETY PLAN

**ASCON LANDFILL SITE
HUNTINGTON BEACH, CALIFORNIA**

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HEALTH AND SAFETY PLAN

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ATTACHMENTS

Attachment HASP-1: MSDSs

ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
BEIs	Biological Exposure Indices
Cal-OSHA	California Department of Industrial Relations, Division of Occupational Safety and Health
COC	Constituent of Concern
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CGM	Combustible Gas Meter
CPR	Cardiopulmonary Resuscitation
DTSC	(California) Department of Toxic Substances Control
HASP	Health and Safety Plan
HMIS	Hazardous Materials Information System
IRM	Interim Removal Measure
LEL	Lower Explosive Limit
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration/Act
PAH	Polycyclic Aromatic Hydrocarbon

PCBs	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RP	Responsible Party
SCAQMD	Southern California Air Quality Management District
SOP	Standard Operating Procedure
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
STEL	Short-Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average
UEL	Upper Explosive Limit
VOC	Volatile Organic Compound

KEY DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

Cal-OSHA is the California Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

Carcinogen is a substance that causes cancer.

Combustible substance is a solid, liquid or gas that will burn.

Corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

Flammable substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

Flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

mg/m³ means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

PEL the maximum level that a worker can be exposed to for an 8 hour workday without health effects, an OSHA enforceable exposure limit.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

1 SITE BACKGROUND

1.1 Site Location and Operations

The Ascon Landfill Site (Site) is located at 21641 Magnolia Street in Huntington Beach in an area of residential, recreational, commercial, and industrial land use. The adjacent land uses are:

- North: Edison Community Park;
- Northeast: Edison High School;
- East: single family homes;
- South: fuel oil storage tanks;
- Southwest: Huntington Beach flood control channel, fuel oil tanks, light industry, and AES Huntington Beach power generation station;
- West: light industry and the Huntington Beach channel; and
- Northwest: single family homes.

Other land uses in the vicinity of the Site include additional tracts of detached single-family homes, recreation areas (parks and Huntington Beach State Park), wetlands (Talbert Marsh and proposed wetlands), recreational vehicle storage, mobile home trailer park, light industry, and an elementary school (Eader).

The Site was operated as a disposal facility from approximately 1938 through 1984. Wastes disposed at the Site include oil production wastes and construction debris. Oil production wastes such as drilling mud, slag, fuel oils, styrene, and other wastes (such as acids) were disposed on the Site up until 1971. From 1971 to 1984, construction solid wastes such as concrete were disposed on the Site. These materials were used to cover portions of the Site. Since 1984, the Site has not received waste.

Historical aerial photographs of the Site indicate that at various times in the past most of the Site was covered by lagoons. For this reason, most of the Site area that is not currently identified as a pit, lagoon, or perimeter berm is identified as a former lagoon area. The former lagoon areas also received concrete debris, drilling muds, brines, and other oil production wastes prior to being covered with fill soil. In summary, current Site features include:

- Lagoons (1-5),

- Perimeter berms,
- Pits (A-G), and
- Former lagoon areas (remainder of Site).

1.2 Preparation and Applicability

This Health and Safety Plan (HASP) was prepared to specify health and safety rules and procedures to be implemented during the Interim Removal Measure (IRM) and the sampling activities identified in the Interim Removal Measure Sampling Plan Technical Memorandum at the Ascon Landfill Site. The HASP is intended to meet, but not replace, the guidelines set forth in various regulations by the State of California, Department of Industrial Relations, Division of Occupational Safety and Health (Cal-OSHA), and Southern California Air Quality Management District (SCAQMD), such as; Title 8 of California Code of Regulations (8 CCR), Section (§) 1532.1 Lead; 8 CCR, §5192, Hazardous Waste Operations and Emergency Response; 8 CCR, §3203 Injury & Illness Prevention Program; 8 CCR, §3204 Access To Employee Exposure; SCAQMD Rule 1150, “Excavation of Landfill Sites” and Rule 1166, “Volatile Organic Compound Emissions from Decontamination of Soil” and other applicable Federal, State, and local rules and regulations. As such, this HASP is intended to inform personnel and subcontractors of the potential hazards at the Site and to provide specific work practices and procedures for reducing and/or controlling these hazards. The provisions of this HASP are mandatory for personnel engaging in waste sampling and emissions testing operations at the Site.

The guidelines and requirements contained herein are based on a review of available information and an evaluation of the potential hazards. This document presents the health and safety procedures and equipment necessary to minimize safety hazards, chemical exposure potentials, and risks for personnel and subcontractors during expected operations. Should unexpected hazards be encountered during operations at the Site, or site activities performed by site personnel change significantly, work shall halt temporarily so that new hazard potentials can be evaluated and appropriate additional precautions can be implemented.

1.3 Interim Removal Measure Workplan (IRM Workplan)

The objective of work under the IRM Workplan is estimated to involve the removal and recycling or disposal of the tarry liquids from Lagoons 1 and 2 to allow for further

assessment of the materials beneath the tarry liquids. The proposed tasks to meet the objectives are as follows:

- Site preparation activities which include net and fence removal around Lagoons 1 and 2;
- Tarry liquid removal and recycling to the extent feasible;
- Tarry liquids sampling for waste profiling purposes;
- Excavation and stockpiling of onsite soils and potential crushing of concrete debris;
- Mixing onsite soil with unrecyclable tarry liquid material from Lagoons 1 and 2;
- Excavation of Lagoons 1 and 2 materials and offsite hauling;
- Regrading Site; and
- Decontamination of excavation equipment.

The scope of work for this HASP is limited to the scope of work described in Section 1.3 above and Section 1.1 of the *Ascon Landfill Site Interim Removal Measure Sampling Plan Technical Memorandum* which includes initial sampling and testing activities.

1.4 HASP Organization

This HASP is presented in the following sections:

- 2.0 - Key Personnel and Responsibilities
- 3.0 - Job Hazard Analysis and Summary
- 4.0 - Employee Training
- 5.0 - Personnel Protection
- 6.0 - Medical Surveillance
- 7.0 - Air Surveillance
- 8.0 - Site Control
- 9.0 - Decontamination
- 10.0 - Contingency Planning
- 11.0 - Confined Space Operations
- 12.0 - Spill Containment
- 13.0 - Sanitation
- 14.0 - Illumination

2 KEY PERSONNEL AND RESPONSIBILITIES

2.1 Regulatory Authority

The Department of Toxic Substances Control (DTSC) is the lead regulatory authority and is responsible for the review of this HASP.

2.2 Responsible Parties

The IRM is being performed on behalf of the Responsible Parties (RPs), as described in Section 1 of the IRM Workplan submitted to DTSC on 19 November 2008.

2.3 Project Coordinator

The RPs selected Project Navigator, Ltd., specifically Tamara Zeier, as the Project Coordinator, who acts as liaison between the RPs and DTSC. The Project Coordinator serves as the primary point of contact for the Subcontractor.

2.3.1 Project Manager and Principal-in-Charge: Mark Grivetti

Responsibilities:

- Approve the appointment of the Site Safety Officer (SSO);
- Assess that a HASP is prepared and reviewed by the SSO;
- Evaluate whether required health and safety equipment and supplies are available and recommend changes, if appropriate;
- Confirm that all field team members receive Site-specific health and safety training;
- Confirm that all field personnel submit the documentation of employee participation in a medical monitoring program and health and safety training program;

- Promote and maintain a heightened awareness of health and safety among project team members; and
- Communicate regularly with the SSO and conduct onsite audits as required.

2.3.2 Corporate Safety Director: Dale Prokopchak, C.I.H., C.S.P.

Responsibilities:

- Promote and maintain health and safety consciousness among project team members;
- Assess that all field team members receive health and safety training;
- Confirm that all personnel submit the documentation of employee participation in a medical monitoring program and health and safety program;
- Perform field audits to monitor the effectiveness of the HASP and to assure compliance to the HASP by the field team; and
- Communicate regularly with the SSO.

2.3.3 Site Safety Officer: Marlene Duffy

The SSO is authorized to enforce the HASP and stop operations if personnel or community safety and health may be jeopardized.

Responsibilities:

- Promote and maintain a heightened awareness of health and safety among project team members;
- Assess the implementation of and compliance with the HASP;
- Maintain and control HASP amendments that may be necessary due to new tasks or a change in Site conditions;

- Assess that general safe work practices and Site-specific work requirements are followed;
- Conduct daily tailgate safety meetings;
- Coordinate and see that all field personnel submit the documentation of participation in a medical monitoring program and health and safety training program;
- Confirm that all health and safety instruments are calibrated;
- Perform and document the required environmental monitoring on a task by task and day by day basis;
- Review work activities for proper monitoring of all work areas and perimeter of the Site;
- Evaluate when to upgrade or downgrade PPE;
- Set up, maintain, and operate the decontamination area;
- Conduct incident investigations and prepare incident reports;
- Observe personnel for signs of onsite exposure or stress;
- Maintain an adequate stock of and control all first aid supplies and other safety equipment to insure their immediate availability and make sure there are an adequate number of first aid trained personnel on the project at all times;
- Initiate and direct emergency response efforts during field activities, including contact with local emergency personnel prior to initiation of field activities;
- Contact local emergency personnel during field activities if conditions warrant;

- Be onsite at all times, or designate a replacement, when field activities are being conducted;
- Perform field audits to monitor the effectiveness of the HASP and to evaluate compliance with the HASP by field workers;
- Assess proper monitoring of all work areas and perimeter of the Site, as well as communication with all individuals immediately adjacent to the Site;
- Effect evacuation of the Site and surrounding areas, if necessary; and
- Communicate regularly with the Project Manager and Emergency Responders.

2.4 Subcontractors

This HASP will be submitted to subcontractors prior to beginning work onsite in accordance with OSHA's Hazard Communication Program requirements (29 CFR §1910.1200). Subcontractors selected to work on the tasks outlined in this HASP shall:

- At a minimum, comply with procedures set forth in this HASP and all applicable federal, state, and local government regulations;
- Develop their own HASP for review and approval by the SSO;
- Be responsible for the Health and Safety of their employees and provide the required information related to safety issues to all others present on the Site during implementation of their activities;
- Take direction from and report directly to the SSO;
- Review this HASP and sign the associated HASP Distribution Record;
- Act in a safe manner and take all reasonable precautions to prevent injury or illness to themselves or fellow employees;

- Report any injuries, incidents, or unsafe conditions to the designated SSO immediately; and
- Report any deviations from this HASP or any unanticipated conditions or hazards to the designated SSO immediately.

3 JOB HAZARD ANALYSIS AND SUMMARY

3.1 Health and Safety Evaluation

This section provides the hazard assessment for activities on this Site.

Potential chemical hazards in soil and waste at the Site, based on previous investigations, include:

VOCs:

- 1,1,1-Trichloroethane;
- 1,2,4-Trimethylbenzene;
- 1,2-Dichloroethane;
- 1,3-Butadiene;
- Acetone;
- Benzene;
- Chlorobenzene;
- Chloroform;
- Ethylbenzene;
- Freon 11 (Trichlorofluoromethane);
- n-Hexane;
- Methylene Chloride;
- Naphthalene;
- Styrene; and
- Toluene.

SVOCs:

- 1-Methylnaphthalene;
- 2-Methylnaphthalene;
- 2,4-Dichlorophenol;
- 2,4-Dimethylphenol;
- 2,4,6-Trichlorophenol;
- Benzidine;
- Benzo(a)pyrene;
- bis(2-ethylhexyl)phthalate;
- Di-n-butyl phthalate;

- Dibenzofuran
- Fluoranthene
- Indeno(1,2,3-cd)pyrene;
- Phenanthrene;
- Phenol; and
- Pyrene

Metals:

- Antimony;
- Arsenic;
- Barium;
- Cadmium;
- Copper;
- Lead;
- Mercury;
- Nickel;
- Silver;
- Thallium;
- Vanadium; and
- Zinc.

Pesticides / PCBs:

- Aldrin;
- Aroclor 1248;
- Aroclor 1260; and
- Endosulfan II.

The chemicals listed above have been detected in soil and/or waste samples from the Site and have been previously identified as Site soils and waste constituents of concern (COCs) [PNL/Geosyntec, 2007]. Site groundwater COCs have not been included because activities described in this HASP are not expected to come in contact with Site groundwater. The possibility for employees and subcontractors to be exposed to Soil/Waste COCs during Site activities exists. The information contained in this HASP is important because the substances identified herein have been identified as regulated hazardous substances and/or carcinogens, and, as such, they may cause harm to individuals who may come in contact with them unless specific precautions are taken. The effects of exposure to any hazardous substance depends on the dose, the duration

(time), method of exposure, personal traits and habits such as smoking, the form of the chemicals present (solid, liquid, gas), and whether other chemicals are present. MSDSs for the soils and waste COCs are included in **Attachment HASP-1**.

The following exposure potentials for Site personnel involved with the tasks outlined in this HASP include:

1. Skin contact with impacted soil and/or waste;
2. Inhalation of vapors or dust; and
3. Ingestion of impacted materials.

Potential chemical hazards that may be encountered during anticipated activities performed by Site personnel are not expected to represent a serious concern provided that the provisions of this HASP are implemented. These provisions are outlined in the sections Chemical Hazard Mitigation discussed in Section 3.1.2 and Standard Safe Work Practices included in Section 5.1.2.

3.1.1 Task-Specific Potential Safety Hazards

The following sections describe hazards that are known or suspected to exist at the Site. All Site-specific tasks have the potential to expose personnel to the hazards listed below. During Site activities, if additional hazardous constituents, materials, or conditions are discovered onsite, the field personnel will alert the SSO so that the HASP can be re-evaluated and updated to ensure that all potential hazards and potential routes of exposure are properly evaluated and the necessary controls are implemented.

The hazard analysis of anticipated tasks to be conducted at the Site is presented in **Table HASP 3-1**.

3.1.2 Task Hazard Mitigation

Site-specific hazards have been identified through a hazard analysis, presented in **Table HASP 3-1**. Suggestions to mitigate potential Site hazards are presented below. For all hazard classifications, all onsite personnel have authority to stop work when unsafe conditions or practices are observed.

3.1.2.1 Chemical Hazard Mitigation

Skin contact

Skin contact with hazardous or potentially hazardous materials shall be minimized as follows:

- Be aware of COCs that can directly injure (corrode, burn, dehydrate) the skin or that can be absorbed into the bloodstream and subsequently transported to other organs from dust, liquid or vapor sources;
- Know that skin absorption is enhanced by abrasions, cuts, heat, and moisture;
- Do not wear contact lenses in contaminated atmospheres (since they may trap chemicals against the eye surface). The eye is particularly vulnerable because airborne chemicals can dissolve in its moist surface and be carried to the rest of the body through the bloodstream (capillaries are very close to the surface of the eye);
- Keep hands away from face;
- Through the use of appropriate work practices; and
- Through the use of appropriate gloves and protective clothing, as outlined in Section 5 of this plan.

Inhalation

Inhalation exposure to hazardous materials shall be minimized as follows:

- Through the use of appropriate engineering controls including use of dust suppression during excavation or other intrusive activities and during work being conducted on windy days;
- Through the use of appropriate work practices; and

- Through the use of respiratory protection, as outlined in Section 5 of this plan, where appropriate work practices and engineering controls are not sufficient to reduce the hazard to an acceptable level.

Ingestion

Ingestion of contaminated or potentially contaminated materials shall be minimized through the use of appropriate decontamination and hygiene procedures, as outlined in Section 9 of this plan.

3.1.2.2 Mechanical Hazard Mitigation

Vehicles and Heavy Equipment

Information on controlling hazards for general vehicle safety is listed below.

- Obey all applicable traffic rules;
- During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory;
- All posted traffic signs and directions must be observed;
- Maintain speeds within work zones of 10 miles per hour or less;
- Maintain crossing distance of 100 feet when crossing in front of heavy equipment;
- Seatbelts must be worn at all times;
- Pull vehicle off roadways to converse on cellular telephones or two-way radios;
- Only authorized individuals are allowed to operate construction vehicles;
- Inspect and check brakes, horns, steering, tires, lights, back-up alarms, and other items daily;

- Inspect heavy equipment daily and document the inspections;
- Never carry more passengers than the vehicle is designed for;
- Never carry passengers in areas that are not specifically designed for them (e.g. truck bumpers, pickup truck beds, or in excavator buckets);
- Ensure that heavy equipment is equipped with an operational back up alarm;
- Always look before backing, utilizing back up alarm (heavy equipment) or horn (other vehicles) while backing, and utilize a spotter if performing tasks that require looking forward while backing;
- Stay out of areas where heavy equipment is operating;
- Wear high-visibility traffic vests when working near roadways or heavy equipment; and
- Ensure that proper lock out / block out procedures, in compliance with applicable federal, state, and local regulations, are enforced during field maintenance and/or repair activities on vehicles, machinery, or equipment.

3.1.2.3 Fire Hazard Mitigation

The following will help minimize fire hazards:

- Keep all fire extinguishers in workable condition and accessible at all times. Access to or visibility of extinguishers shall not be obstructed;
- Control static electricity (e.g., ground equipment);
- Do not store gasoline, flammable solvents, and liquids inside a building unless the structure has been approved for flammable storage containers. Only OSHA-approved storage cabinets shall be used for all flammable liquids, paints, or solvents;
- Do not permit smoking, striking of matches, or other sources of ignition outside of designated “SMOKING” areas;

- Discard cigarette butts, matches, or other similar materials in non-combustible containers. No open fires will be allowed on the project. ;
- All stationary or mobile equipment, except for motor trucks, tractors, buses and passenger vehicles, shall have spark arresters that meet applicable standards;
- Equipment servicing areas, parking areas, and gas and oil storage areas shall be located a minimum of 60 feet away from any flame sources (e.g., smoking area). No flammable materials shall be stored within 16 feet of a small mobile or stationary vehicle; and
- A pickup truck and driver shall be available for fire control during all working hours. The truck shall be equipped with fire suppression equipment.

3.1.2.4 Electrical Hazard Mitigation

- Only a fully qualified and authorized electrical technician shall make electrical connections or work on electrical equipment;
- Electrical cords shall be checked before use and repaired or replaced if defective;
- Avoid standing in water when operating electrical equipment;
- Be familiar with specific operating instructions for each piece of equipment;
- Cords to electric tools and other portable equipment shall be checked before using, and replaced or repaired, if defective. All such tools, equipment and extension cords shall be grounded;
- Water shall not be used on electrical equipment fires. When possible, electrical equipment shall be de-energized before fire fighting;
- Extreme care shall be exercised when construction, transportation, or handling equipment with long booms or of extensive heights are operated near high-voltage lines or equipment. If feasible, lines or equipment shall be de-energized temporarily during such operations;

- Personnel shall avoid working on electrical circuits or equipment while clothing or shoes are wet, or while hands or feet are immersed in water. Wet areas on which personnel must stand shall be covered with dry wooden boards or rubber matting;
- Personnel shall not wear rings or watches, or carry keys, lighters or similar metallic objects while working on electrical systems or in strong microwave radiation fields;
- Tape measures used to measure distances near energized equipment shall not be of metal or contain any metallic reinforcement;
- Lamps used in any circuit or equipment shall not exceed the specified voltage for that fixture. Lamps shall be screwed firmly into their sockets;
- All activities involving electrical energy will be conducted in compliance with all applicable federal, state, and local regulations; and
- Proper lock out / tag out procedures, in compliance with all applicable federal, state, and local regulations, will be enforced.

3.1.2.5 Temperature Hazard Mitigation

The heat illness prevention program was developed to be in compliance with 8CCR 3395. At elevated ambient temperatures, workers, particularly those wearing protective clothing, may experience varying degrees of heat stress if prudent precautions are not taken. Recognized forms of heat stress and the associated symptoms are:

- Heat Rash can be caused by continuous exposure to hot and/or humid air. The condition is characterized by a localized red skin rash and reduced sweating;
- Heat Cramps can be caused by profuse perspiration with inadequate fluid intake and electrolyte replacement. This condition is characterized by muscle spasm and pain in the extremities and abdomen;
- Heat Exhaustion, a mild form of shock, can be caused by substantial physical activity in heat and profuse perspiration without adequate fluid and electrolyte replacement. The symptoms include weak pulse; shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; and fatigue; and
- Heat Stroke, the most severe form of heat stress, can be fatal. The symptoms include red, hot, dry skin; body temperature of 105°F or greater; no perspiration; nausea; dizziness and confusion; strong rapid pulse; coma; and death.

When temperatures exceed 85°F, employees shall be allowed to take frequent breaks in a shaded area, and frequent breaks shall be mandatory when temperatures exceed 100°F. If coveralls or other protective clothing is worn, they should be unzipped or removed during breaks. Cool water and Gatorade (or other electrolyte replacement beverage) shall be provided, and employees should be encouraged to drink small amounts frequently to avoid dehydration. Workers shall be encouraged to salt their food more liberally and to avoid drinking alcoholic beverages after work hours. Additionally, a buddy system shall be implemented, to enable workers to monitor each other for signs and symptoms of heat stress. A worker's exposure to heat stress should be discontinued if the worker's body temperature is greater than 101.3°F (as measured with a thermometer) or if there are symptoms of sudden and severe fatigue, nausea,

dizziness, or lightheadedness. If these symptoms appear, the worker should be removed for rest in a cool location with rapidly circulating air and kept under observation. The SSO shall be notified immediately if any person starts to show signs or symptoms of heat stress (ACGIH, 2002 TLVs and BEIs).

3.1.2.6 Acoustic Hazard Mitigation

Elevated noise levels shall be assumed to be present in the vicinity of all heavy equipment operations. For workers who will be exposed to elevated noise levels due to heavy equipment operation, a dosimeter shall be worn by a representative worker for an 8-hour shift to determine the 8-hour time-weighted average (TWA). The use of a dosimeter for determining noise levels as well as monitoring, assessment, and other elements of exposure to noise will be in compliance with 8 CCR, Article 105.

Hearing protectors will be made available to all employees exposed to an 8-hour TWA of 85 decibels or greater at no cost to the employees, as required under 8 CCR, §5098. Hearing protectors shall be replaced as necessary.

Hearing protectors shall be worn by all employees:

- Who are required by 8 CCR, §5096(b) to wear personal protective equipment; or
- Who are exposed to an 8-hour TWA of 85 decibels or greater; or
- Are required by 8 CCR, §5097 to wear hearing protectors because baseline audiograms have not yet been established; or
- Have experienced a standard threshold shift.

For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposures to an 8-hour TWA of 85 decibels or below.

3.1.2.7 Biological Hazard Mitigation

Bees or Stinging Insects

- Be aware of potential hive/nest locations, which may include culverts, drainage pipes, junk piles, or dense shrubbery.
- Advise the SSO if you are allergic to stinging insects prior to engaging in any field activities.
- Include the following controls:
 - Do not agitate stinging insects or disrupt their hive/nest.
 - Keep the area quiet and calm.
 - Wear light-colored clothes.
 - Avoid wearing perfumes, hair spray, or scented lotions in the wilderness.
- If attacked:
 - Do not scream or wave arms.
 - Cover your face with your hands.
 - Run for shelter in a building or vehicle. Do not seek shelter in water.
 - Remove stingers as quickly as possible to lessen the amount of venom entering the body. Remove the stinger by raking your fingernail across it. Don't pinch or pull the stinger out. Put ice on the sting to reduce the swelling.
- Report any stings to the SSO and seek first aid or emergency medical care immediately if stung several times.

Other Biological Hazards

- Review the identification and habitat characteristics of rodents, snakes, spiders (black-widow), and bees/hornets to avoid bites and stings. Identify Site personnel with a known reaction to any such bites and/or insect stings.

Avoid nesting areas and habitats, when possible and wear protective clothing, hard hat, and safety goggles. Always wear protective gloves when reaching into enclosed spaces where animals and/or insects are likely to hide;

- Keep all piping off the ground unless the ends are sealed against animals and insects;
- Review the identification characteristics of poison oak and poison ivy. Avoid contact with these plants, and any unknown plants when possible, and wear protective clothing; and
- Avoid animal and bird droppings. These materials often contain mold, fungus, or bacteria that can cause respiratory problems such as lung diseases and allergies. When entering nesting areas, wear protective clothing and use a dust mask or a respirator equipped with dust cartridges.

3.1.2.8 Physical Hazard Mitigation

Compressed Gas Cylinders

- Keep cylinder valve caps screwed on at all times when regulators and gauges are not attached to the cylinder and when the cylinder is being moved;
- Do not use force to remove valve cap if stuck;
- Protect cylinders from cuts and abrasions;
- Use extreme care not to drop cylinders;
- Secure cylinders in an upright position using chains or other approved restraints;
- Do not use cylinders for rollers or support;
- Do not tamper with cylinder valves or safety devices;
- Do not lift cylinders using the protective valve caps;

- Do not substitute oxygen for compressed air;
- Store all oxygen cylinders at least 20 feet from all fuel gas cylinders and gasoline or diesel storage tanks;
- Keep cylinders away from exposure to open flame;
- Do not use oil or grease on oxygen cylinders or regulator connections to avoid an explosion;
- All cylinders must be labeled and indicate when they have been emptied;
- Check all valves and fittings on a cylinder for leaks with each use. If leakage is found, place a tag on the cylinder indicting the defect, and report it to the SSO;
- Leak test all connections using soap solution where possible;
- Be certain that the second stage of the regulator is closed, after attaching the regulator to the cylinder, but before opening the cylinder valve;
- Stand to one side of the regulator gauge while you slowly open the cylinder valve 1/4 of a turn;
- Keep wrench on the valve stem of an acetylene cylinder when in use;
- Close the cylinder valve and bleed the pressure off hoses on cylinders when not in use; and
- Use a cylinder cart to transport cylinders distances greater than 2 feet.

Dust Control

Dusty conditions may increase the potential of contaminated and non-contaminated particulate inhalation; dry, windy weather and erodible surface soils or wastes may potentially expose Site personnel to significant quantities of airborne particulates. When work is being conducted, dust control measures (e.g. water spray) may be

implemented as needed during excavation and grading activities or during windy days to prevent or minimize dust emissions. Dust/particulate air monitoring shall be conducted using an aerosol monitor in accordance with Section 7.0 below if dusty conditions exist.

Slip and Trip Hazards

To avoid injury due to slips and trips:

- Wear the proper foot wear and clothing for the task at hand;
- Pay attention to the work environment and become aware of all equipment and vehicles active on the Site and use caution when moving about;
- Use caution when walking on sloped areas (especially geosynthetics), particularly when moisture is present. Use caution when walking on soft or uneven surfaces; e.g., marsh areas. Watch for icy conditions in cold weather;
- Follow the established designated safe paths for travel and keep these areas free from debris. Avoid steep or slippery slopes and paths near operation vehicles and equipment;
- Follow good housekeeping procedures. Never assume that someone else will clean up a spill or put away an object;
- Remove or clearly mark objects that pose tripping hazards;
- Prevent water accumulation where practicable;
- Cables and/or wiring should be taped down, when possible. Locate cables and/or wiring out of the commonly used areas;
- Mark or repair any opening or hole in the floor;
- Carry objects in a manner that allows you to see in the area you are moving. Do not carry objects that are too large or bulky. Do not carry more weight than you can balance and keep stable. Understand that PPE can reduce or limit your field of vision and mobility;
- Never jump over or into a trench or excavation; and
- Walk, do not run.

Hand, Foot, and Head Hazards

Appropriate PPE shall be worn to prevent hand, foot, or head injuries that may result from contact with structural components, heavy equipment, or debris.

Excavation/Trenching

- Remove or brace trees, boulders, etc., adjacent to the work area that could fall into the work area before excavation begins;
- Check for the presence of underground and aboveground utilities before conducting any intrusive work. Support, protect, or remove utility lines as appropriate;
- Store and retain all equipment/material and excavated soil/rock/waste (spoil(s)) at least 2 feet or more from the edge of the excavation/trench;
- Confirm that an OSHA competent person is available. An OSHA competent person is someone with training to identify soil types and other excavation hazards and authority to take prompt corrective actions;
- Examine all excavation work areas and faces for unsafe conditions prior to work activities conducted near excavations. If unsafe conditions are found, all work in that immediate area shall cease until the necessary precautions have been taken to eliminate the hazardous condition;
- Use diversion ditches or dikes to prevent water from entering an excavation, and to provide adequate drainage of the area adjacent to the excavation. Prevent water from accumulating in an excavation;
- If it is necessary to place or operate trucks, materials, or other heavy objects on a level above and near an excavation, pile, shore, and/or brace sides of excavations to resist the extra pressure due to such superimposed loads;
- Install substantial stop logs or barricades when mobile equipment is used or allowed adjacent to excavations;

- Use flagmen or warning devices for all mobile equipment using reverse and forward motion;
- Put up barricades – flagging tape, fencing to prevent falls into the excavation; and
- Cover or secure trench/excavation if left open overnight.

3.2 Hazard Communication

The following procedures must be followed for all chemicals brought onsite (i.e., decontamination solution, sampling preservatives, Bentonite, etc.):

- Labels on incoming primary chemical containers must not be defaced;
- Chemical containers must be stored in appropriate storage cabinets;
- Secondary containers and storage cabinets must be correctly and clearly labeled using the Hazardous Materials Identification System (HMIS);
- Incompatible chemicals must not be stored together;
- Workers have received training on the hazards of these chemicals as indicated in Sections 4.1 and 4.3 of this HASP; and
- A MSDS for each chemical must be included in **Attachment HASP-1**.

When chemicals are used onsite, workers must adhere to the company's Hazard Communication Program (29 CFR §1910.1200 and 8 CCR Section 5194).

The following lists the chemicals that will be brought onsite for which MSDSs are included.

- Alconox,
- Bentonite,
- Diesel Fuel Oil No.2-D,

- Hexane Gas
- Isobutylene Gas,
- Portland Cement, and
- Unleaded Gasoline

The SSO will obtain MSDS for any other chemicals brought onsite.

4 EMPLOYEE TRAINING

4.1 Training Requirements For Onsite Personnel

All employees working at the Site who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors and managers responsible for onsite activities must have met the training requirements of 8 CCR 5192(e), OSHA 29 CFR 1910.120, and all other applicable federal, state, and local regulations prior to the start of operations at the Site. These requirements include, but are not limited to:

1. 40-hour OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) course;
2. 24 hours of supervised on-the-job training;
3. An eight (8) hour minimum refresher course if the 40-hour training was acquired more than one year prior to the start of operations.

Workers onsite only occasionally for a specific limited task (such as land surveying or geographical surveying) and who are unlikely to be exposed over permissible and published exposure limits shall be escorted by a trained person at all times.

Onsite management and supervisors directly responsible for or who supervise employees engaged in Site operations shall have also received eight (8) hours minimum training in managing such Site operations prior to the start of Site activities.

Visitors onsite only occasionally for inspections or limited Site visits or specialty contractors who are unlikely to be exposed over permissible and published exposure limits shall have the appropriate PPE and shall be escorted at all times by the SSO or other appropriately trained field personnel. Site visitors will participate in a tailgate safety meeting to be held prior to being escorted at the Site.

Personnel who have been designated as responsible or responding to onsite emergencies shall have received additional training (e.g., Incident Command training) in how to respond to such expected emergencies prior to the start of Site operations.

Personnel who have not received the required training prior to the start of Site operations are not to engage in Site operations until such training has been completed.

Subcontractors working onsite will be required to provide proof of training to the SSO before beginning work on the Site. A list of all trained and authorized personnel for each contractor involved in surface soil- or waste-disturbing activities will be submitted to the SSO before commencement of field activities. Only those personnel whose names appear on the list, and only those with the required documentation, will be admitted onsite.

4.2 Employee Training Program

The contractor shall make available to DTSC upon request a summary of the hazardous materials safety and health training program and a list of elements and topics covered. Documentation of training shall be readily available for review at the Site office by DTSC representatives.

4.3 Site-Specific Training

The SSO shall perform pre-entry Site-specific safety training for personnel prior to participation in field activities. Additionally, safety briefings must be performed with adequate frequency to provide an awareness of planned operations and HASP requirements.

4.4 First Aid/CPR

At least one person with current basic first aid and cardio-pulmonary resuscitation (CPR) training and certification shall be on the Site at all times.

5 PERSONNEL PROTECTION

5.1 Engineering and Work Practice Controls

Air monitoring and personal protective equipment (PPE) is fundamental to the safety of the personnel conducting the field activities falling within the scope of this HASP. All Site personnel must wear appropriate PPE when Site activities involve exposure to hazards that cannot be adequately or feasibly controlled by engineering or administrative controls. Respiratory protection, skin, hand, and foot protection are required when Site activities are known or suspected to result in chemical hazards such as atmospheric contamination in excess of action levels in the form of dusts, mists, fumes, vapors, and gases, or when direct contact with them may be a health hazard.

Air monitoring will be conducted to determine the presence and concentration of chemicals to assess the hazard to personnel and to determine the level of PPE required. The results of the air monitoring will be used to upgrade or downgrade the level of personal protection required. PPE and respiratory protection that would be used is presented in this section.

Additional personal monitoring using pumps and sampling media is not considered necessary at this time. The use of direct measuring air-monitoring equipment such as a photoionization detector (PID) to monitor the breathing zone and the use of appropriate air-purifying cartridges, if necessary, along with personal protective clothing are considered sufficient for worker protection.

5.1.1 Engineering Controls

When practical, engineering controls shall be implemented to reduce and maintain employee exposure to safe levels for those tasks demonstrating known or suspected hazards. Engineering controls that may be used for the tasks applicable to this HASP include the use of dust suppression techniques during excavation, other intrusive activities, or during work conducted on windy days.

5.1.2 Standard Safe Work Practices

In addition to the specific requirements of this HASP, the following standard safe work practices and safety rules will be practiced during the field operations.

- All onsite personnel have authority to stop work when unsafe conditions or practices are observed.
- The Site will be suitably marked or barricaded as necessary to prevent entry by unauthorized personnel; this will be done in a manner that will not hinder emergency services personnel and equipment.
- Unauthorized personnel will remain outside the exclusion zone at all times.
- All open holes, trenches, and obstacles will be properly barricaded and lighted in accordance with applicable regulations.
- Prior to conducting subsurface activities, underground utility locations will be identified. Note that no utilities have been identified at the project area of the Site.
- The movement and use of vehicles and heavy equipment will be planned and performed with consideration for the location, height, and position of fixtures and structures and natural features.
- Each sample and all waste will be treated and handled as though it were hazardous, until sample analysis indicates otherwise.
- Minimize contact with chemicals and chemically impacted materials and surfaces.
- Smoking, eating, drinking, and chewing gum or tobacco will not be permitted within the exclusion zone and the contamination reduction zone.
- Personnel will keep track of weather conditions and wind direction to the extent they could affect potential exposure. Work will be limited to daylight hours and during normal weather conditions. Extremes in temperature and weather conditions may restrict working hours.
- Personnel will be alert to any abnormal behavior on the part of other coworkers that might indicate distress, disorientation, or other ill effects.

- Personnel should never ignore symptoms that could indicate potential exposure to chemical contaminants. Any symptoms or ill effects will be immediately reported to the SSO.
- Personnel with long hair will secure it in a safe manner; loose-fitting clothing that could become entangled in power equipment will not be permitted in the work zones.
- Personnel with beards and other facial hair that interfere with respirator fit will not be allowed to work within the exclusion zone. This is necessary because all intrusive workers may be called upon to use respirator protection in some situations, and beards do not allow for proper respirator fit.
- Horseplay is prohibited on the Site.
- Working while under the influence of intoxicants, narcotics, or controlled substances is prohibited. Persons deemed under the influence of alcohol or drugs will be prohibited from working at the Site.
- Personnel will not be permitted to engage in work operations alone (applicable to Hazardous Waste Operations as defined by 29 CFR Part 1910.120, Part A and 8 CCR, §5192, Hazardous Waste Operations and Emergency Response), or as is necessary for safe operations.
- Hands and face should be thoroughly washed and wiped before leaving the work area or Site before eating, drinking, and at the end of the work day.
- Personnel should shower as soon as possible after leaving the Site.

Work practice controls shall be applied when engineering controls are impractical and shall be incorporated as Site-specific standard operating procedures (SOPs) for personal precautions and routine operations.

5.2 Air Monitoring

Organic vapor levels associated with air monitoring for field activities will be monitored by the SSO using PID instruments, one PID calibrated using hexane and

used for environmental monitoring of stockpiles and excavation working faces and one PID with 11.7 ev lamp and calibrated using isobutylene for health and safety air monitoring of personal air space. All operating personnel will be informed of separately labeled PIDs to ensure correct usage. Particulate matter (dust) will be monitored by the SSO with a particulate matter aerosol monitor. A Combustible Gas Meter (CGM) will be used to monitor for methane and other potentially explosive vapors that may emanate from the soil or waste. A description of respirator type, cartridge type, rationale, and action levels is presented in detail in Section 7.0. The calibration, maintenance, and use of all the monitoring equipment will be conducted in accordance with the manufacturer recommendations. Calibration, maintenance, and monitoring results will be documented for all instruments utilized. Air monitoring and the respiratory protection program will be conducted in compliance with all applicable federal, state, and local regulations.

FREQUENCY AND DURATION OF AIR MONITORING

An average background level will be established daily by taking the arithmetic average of six 1-minute readings obtained at various upwind perimeter locations on the Site, consistent with prior background air measurement programs. Additional measurements may be taken during the day at the discretion of the SSO based on activity location, wind direction, and temperature.

At a minimum, one breathing zone (one foot radius from nose and mouth), as well as one excavation trench, one borehole, and one soil stockpile measurement will be taken with the appropriate PID during excavation activities; and combustible gas measurements may be taken at the discretion of the SSO.

The average background level will be subtracted from sustained air measurements taken in the breathing zone for 5 minutes and compared to the action levels established for the various levels of personal protection.

5.3 Personal Protective Equipment

5.3.1 Levels of Protection

There are four designated levels of protection offered by PPE. These are described from the highest level of protection to the lowest level of protection as follows:

- Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.
- Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed.
- Level C: Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.
- Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

The type of chemical protective ensemble (*i.e.*, material, format) will depend upon the constituents and degrees of contact.

The level of protection selected for a task will be based on the following:

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

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be better identified. Appropriate PPE will be selected in accordance with all applicable federal, state, and local regulations.

5.3.2 Specific Levels of Protection Planned For the Site

Level D PPE will initially be appropriate for the work performed as part of the IRM, based on evaluation of previous investigations (groundwater assessment and the soil and waste characterization, emissions and excavation testing program). However, the potential for upgrading to Level C PPE exists based on Site conditions. All

subcontractors will be responsible for providing their employees with the proper PPE during work activities. The SSO will determine if upgrading to Level C is appropriate based on Site conditions and in accordance with the action levels described in Section 7.0.

PPE Requirements

Level D PPE	Level C PPE
Work clothing/coveralls	Full face air purifying respirator with appropriate cartridges (see Section 7.0)
Steel-toed boots	Work clothing/coveralls
Hard hat	Steel-toed boots
Safety glasses	Hard hat
High visibility safety vest	High visibility safety vest
Outer gloves	Outer gloves
Hearing protection (as necessary)	Inner gloves (as necessary)
	Hearing protection (as necessary)

During operations, the SSO will verify that all PPE is properly stored, cleaned/decontaminated, and replaced when damaged or defective.

5.3.3 Reassessment of Protection Program

The level of protection provided by PPE selection shall be upgraded or downgraded based upon changes in Site conditions or results of appropriate personal and ambient air monitoring conducted onsite. The SSO has the authority to change PPE requirements at any time.

When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- The commencement of a new work task, or the start of sampling or work in an unfamiliar portion of the Site;
- A change in job tasks during a work phase;
- A change in the season/weather;
- Individual medical considerations;

- Encountering contaminants other than those previously prepared for;
- A change in ambient levels of contaminants; and
- A change in work scope, which affects the degree of contact with contaminants.

Action levels for upgrading or downgrading PPE are described in detail in Section 7.0.

5.3.4 Standard Operating Procedures for PPE

The primary inspection of PPE in use for activities at the Site will occur prior to immediate use and will be conducted by the user. This ensures that the user has checked the specific device or article and that the user is familiar with its use and limitations. Any damaged or defective PPE noted by the user should be reported to the SSO, who will make a determination if replacement of the item warrants replacement or repair prior to use. Proper inspection of PPE includes:

- Inspection and operational testing of equipment received from the factory or distributor;
- Inspection of equipment as it is issued to workers;
- Inspection after use or training and prior to maintenance;
- Periodic inspection of stored equipment; and
- Periodic inspection when a question arises concerning the applicability of the selected equipment, or when problems with similar equipment arise.

6 MEDICAL SURVEILLANCE

Medical surveillance shall be conducted in compliance with all applicable federal, state, and local regulations. A project-specific medical monitoring program will not be necessary for the scope of work under the IRM.

7 AIR SURVEILLANCE

The purpose of air monitoring described in this section is to identify and quantify airborne contaminants in order to determine or verify the appropriate level of worker protection and to determine compliance with applicable OSHA standards.

7.1 Air Monitoring Strategy

Direct reading instruments will be used for personal monitoring. A PID calibrated to isobutylene¹ and with an 11.7 ev lamp will be dedicated to monitoring of work space, perimeter air, and for all other health and safety monitoring. All PID operators will be made aware of the separate, dedicated PID instruments for health and environmental monitoring. The following tables contain Site Action Levels for personal air monitoring.

7.1.1 PID Readings for Total VOCs (TVOC) in Work Area

Action Levels (Readings in Parts Per Million)	Required Action
Less than or equal to 0.5	Continue periodic monitoring
Greater than 1 and less than 5	Use colorimetric detector tubes to define benzene and 1,2-dichloroethane concentrations
Greater than 5 and less than 25	Halt activities and upgrade PPE to full-face air purifying respirator equipped with combination organic vapor / P-100 filter cartridges if appropriately trained (respirator trained and fit-tested) or leave the work area. Do not resume work until equipped with upgraded PPE or concentrations are reduced.
Greater than 25	Halt activities and leave the work area. Do not resume work until concentrations in the work area are reduced.

¹ A PID calibrated to hexane will be dedicated to environmental monitoring of stockpiles and excavation faces.

7.1.2 Colorimetric Tubes (Benzene and 1,2-Dichloroethane) in Work Area

Action Levels (Reading in Parts Per Million)	Required Action
<i>Benzene-Specific</i>	
Less than or equal to 0.5	Continue periodic monitoring
Greater than 0.5 and less than 5	Halt activities and upgrade PPE to full-face air purifying respirator equipped with combination organic vapor / P-100 filter cartridges if appropriately trained (respirator trained and fit-tested) or leave the work area. Do not resume work until equipped with upgraded PPE or concentrations are reduced. Respiratory protection will be consistent with 8 CCR Section 5218 (g) (3) (B), Table 1 and applicable federal, state, and local regulations.
Greater than 5 and personnel already equipped with full-face air purifying respirators	Halt activities and leave the work area - Do not resume work until concentrations are reduced
<i>1,2-Dichloroethane-Specific</i>	
Less than or equal to 2 (the lowest detectable limit of the industry's colorimetric tubes for 1,2-dichloroethane)	Continue periodic monitoring
Greater than 2	Halt activities and leave the work area – Do not resume work until concentrations are reduced

7.1.3 CGM Readings for Methane in Work Area

Action Levels (Readings in %LEL)	Required Action
Less than or equal to 10%	Continue periodic monitoring with caution
Greater than 10%	Halt activities and leave the work area. Do not resume work until concentrations in the work area are reduced to below 10% LEL.

7.1.4 Aerosol Monitor for Particulate Matter in Work Area

If climatic conditions, surface soil, waste conditions, and/or activities cause airborne particulate matter to contaminate the ambient air for extended periods of time (5 minutes or greater), dust monitoring may be deemed necessary. Initially, however, dust controls (e.g. use of water) should be implemented as necessary. In the event such controls are not effective in reducing dust levels, monitoring shall be conducted as follows:

Results above baseline level	Duration	Required Action
Less than 5 mg/m ³ (Based on ½ Cal-OSHA Regulated Level for Total Dust)	N/A	Continue periodic monitoring
Greater than 5 mg/m ³ (Based on ½ Cal-OSHA Regulated Level for Total Dust)	Greater than 5 minutes	Perform dust suppression
Greater than 10 mg/m ³ (Based on Cal-OSHA Regulated Level for Total Dust)	Greater than 5 minutes following dust suppression activities	Halt activities and leave the work area or use full-face air purifying respirators equipped with HEPA cartridges until dust levels are reduced

A direct reading MIE brand Miniram portable aerosol monitor, or equivalent, shall be used to record dust levels, if necessary, in employee breathing zones. Baseline measurements shall initially be recorded, and measurements shall then be recorded regularly, every five to 10 minutes, throughout the duration in which dusty conditions persist. If the action levels outlined in Section 7.1 of the HASP are exceeded, Site work shall be halted until a proper evaluation of Site conditions can be made.

7.2 Sample Handling

Samples that require laboratory analysis will be collected, handled, and analyzed per the appropriate analytical method. These samples will be shipped to a laboratory using appropriate methods. The laboratory selected for sample analysis will be accredited by the American Industrial Hygiene Association for the analysis required. Sampling and analytical methods of NIOSH or OSHA will be used preferentially when such methods are available for the samples collected and all appropriate quality assurance/quality control (QA/QC) provisions regarding sample collection, transport and holding times

must be followed. Standard chain-of-custody procedures will be used for samples sent to the laboratory.

Any personal or area sampling will be in compliance with federal, state, and local regulations.

7.2.1 Air Sampling Train

The air sampling devices, collection media, and any necessary support equipment shall be appropriately assembled into a sampling train, and each resultant sampling train shall be flow-calibrated as a complete system before and after each day's use against a primary standard.

7.2.2 Sampling Records

Daily sampling records will be maintained as part of the air-sampling program. The record will include as a minimum, the following:

1. Name of person collecting the sample,
2. Time sample was collected,
3. Collection date,
4. Sample identification number,
5. Location sampled,
6. Task sampled,
7. Duration of each sample collected,
8. Ambient temperature and humidity of sampling period,
9. Pre- and post-sampling train flow calibration, and
10. Any pertinent comments

7.3 Records Retention and Data Reporting

A daily air-monitoring log will be maintained and will include the following information:

1. Monitoring date,
2. Location and/or task monitored,
3. Wind speed, ambient temperature and humidity,
4. Instrument used and settings,

5. Instrument readings,
6. Pertinent comments or information,
7. Instrument calibration checks,
8. Identification of equipment changes during the work shift, and
9. Rationale for any equipment changes throughout the work shift

8 SITE CONTROL

Operations at the Site will be conducted in a controlled fashion to reduce the possibility of contact with any contaminants and to prevent the spread of contaminants by personnel or equipment leaving the Site.

8.1 Site Access

Access to the Site must be controlled. A sign in / sign out log will be maintained by the SSO in the Site trailer. Each employee, contractor, and visitor is required to sign in and sign out on a daily basis. When necessary, Site security will be used to control access to the Site.

8.2 Work Zones

Three work zones will be established for each intrusive work task. The Exclusion Zone (EZ) is defined as the area of the Site where contamination is suspected and tasks are to be performed. The Contamination Reduction Zone (CRZ) is defined as the area where equipment and workers are to be decontaminated. The Support Zone is defined as the command area and serves as a storage area for supplies. The exact location and extent of the work zones will be modified as necessary to suit each work task.

The exclusion zone can be mobile and will be set at a 50-foot radius around the excavation location(s). Areas inside that radius will be restricted areas. The SSO or other trained personnel will verbally and visually monitor the exclusion zone. Decontamination may take place at the excavator equipment. The boundaries of work zones will be marked using warning tape, traffic cones, signs, fence, or marking device.

8.3 Buddy System

The buddy system is required in all field activities performed at the Site. The buddy system includes maintaining regular contact with other Site personnel and/or contractors. In situations where the work does not require the buddy system (previously approved by the SSO), Site personnel must have appropriate communication devices (radio and/or cell phone) available at all times, and shall maintain contact with SSO, at a minimum, upon arriving, during lunch, and when departing from the Site on a daily basis. If a prescribed call-in is not received, the SSO will first attempt to contact the individual by phone. If the individual does not respond, the SSO or appropriate

designee will respond to the Site to investigate and take appropriate actions for the missed call-in.

8.4 Documentation

The HASP Distribution Record, HASP Meeting Record, and Site Visitor Record are shown in **Tables HASP 8-1, 8-2 and 8-3**, respectively.

9 DECONTAMINATION

The SSO will determine the type and level of decontamination procedures for both personnel and equipment based on an evaluation of specific work activities in the controlled work zones.

9.1 Level D

- Step 1. Remove outer boots and dispose of them (if used).
- Step 2. Remove outer gloves and suit and dispose of them (if used).
- Step 3. Remove hard hat and wipe clean.

9.2 Level C (If Necessary)

- Step 1. Remove outer boots and dispose of them.
- Step 2. Remove outer gloves and dispose of them.
- Step 3. Remove hard hat and wipe clean.
- Step 4. Remove outer suit and dispose of it.
- Step 5. Remove respirator and discard cartridges; clean and disinfect respirator; rinse and then air-dry respirator.
- Step 6. Remove inner gloves and dispose of them.
- Step 7. Depart CRZ in work clothes and boots.

Supplies for supplemental personal decontamination will be available and utilized as necessary in compliance with federal, state, and local regulations.

9.3 Equipment

Disposable PPE and decontamination wash solutions will be collected in 55-gallon drums or other approved waste containers for disposal at a licensed waste facility. Hand tools and other sampling equipment shall be decontaminated, if not disposed of, as needed by washing in decontamination basins with appropriate solutions. Large

equipment will be pressure washed, and wash water will be stored in lagoons for eventual evaporation, provided odors are not significant.

10 CONTINGENCY PLANNING

This section describes possible contingencies and emergency procedures to be implemented at the Site.

10.1 Pre-Emergency Planning

Prior to commencing with monitoring and/or remediation activities and during Site daily tail-gate safety meetings, all employees will be trained in and reminded of provisions of the HASP, emergency response plan, communication systems, and evacuation routes. In addition to this, the SSO is responsible for notifying appropriate offsite emergency responders (e.g. fire department, police, etc.) about the remedial activities being undertaken and their roles in response to emergencies at the Site. At a minimum, these responders should be informed about the Site-specific hazards, appropriate response techniques, Site emergency procedures, and decontamination procedures. The SSO will also coordinate notification procedures with industrial facilities that may impact the Site. The HASP will be reviewed periodically and revised as necessary by the SSO to ensure that the HASP is adequate and consistent with the prevailing Site conditions.

10.2 Emergency Personnel Roles and Lines of Authority

During an emergency on the Site, the SSO is ultimately responsible for and authorized to initiate response activities to correct the emergency situations. This includes taking any and all appropriate measures necessary to ensure the safety of Site personnel and the public. Possible actions may involve evacuation of personnel from the Site area or of adjacent residents. The SSO is also responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. Subcontractors are responsible for assisting the SSO within the parameters of their scope of work. In addition to these specified roles, other onsite personnel and offsite agencies or entities may need to be identified as responders to Site emergencies. These designations may include rescue teams, a decontamination station officer, a 24-hour medical team, communication personnel, environmental scientists, hazardous chemical experts, firefighters, meteorologists, public safety personnel, public evacuation personnel, and/or on-scene coordinators.

10.3 Site Topography, Layout and Prevailing Weather Conditions

The Site is located in coastal California with an elevation of approximately ten to fifteen feet above sea level. This Site occupies approximately 38 acres of land and is enclosed by a perimeter chain link fence with three 20-foot-wide locked gates. The gate at the northwest corner of the Site provides access from Hamilton Avenue and the northernmost southeast gate provides access from Magnolia Street. A third gate provides egress for trucks near the southeast corner of the Site.

The Site is located in an arid environment, with average rainfall of approximately 11.9 inches per year. Average temperature is 61 degrees. Wind direction is typically onshore from the west at an average speed of up to 4 to 6 miles per hour.

10.4 Training

Since immediate, informed response is essential in an emergency, all Site personnel and others entering the Site (visitors, subcontractors, offsite emergency response groups and other agency representatives) must have some level of emergency training. Initial training will be completed before coming onto the Site, and refresher training will be scheduled annually or as required.

Everyone entering the Site will be made aware of the predominant hazards and of prohibited actions such as smoking only in designated areas. Visitors will be briefed on basic emergency procedures such as hazard recognition, standard operating procedures (e.g. decontamination, emergency signals, summoning help, etc), and evacuation routes. The extent of training received will be based primarily on the duties and function to be performed by each responder, irrespective of position. However, Site personnel who have emergency roles also must have a minimum level of training, which includes:

- Emergency chain of command;
- Communication methods and signals;
- How to call for help;
- Emergency equipment and its use;
- Emergency evacuation while wearing protective equipment,
- Emergency rescue protocols;

- Decontamination procedures;
- Removing injured personnel from confined spaces;
- Offsite support and how to use it;
- Recognition of cold and heat stress; and
- Recognition of physical and chemical injuries.

These personnel should also obtain certification in first aid and CPR, and practice these treatment techniques regularly.

10.5 Communication

In an emergency, crucial messages must be conveyed quickly and accurately in order to communicate information such as the location of injured personnel, orders to evacuate the Site, and notice of blocked evacuation routes. Field emergencies will be communicated using an audible air horn blast. Further communications will be conducted using handheld radios and/or telephones (land lines and cellular) to alert workers of the exact danger, convey safety information, and maintain Site control.

The SSO will coordinate with nearby industrial facilities to ensure that the Site is notified (by alarm or direct communication) of releases that could impact the Site.

Emergency notification of outside entities will be performed using telephones (land lines or cellular). If there is a failure with the primary alarm system (air horn), they will employ handheld radios or telephones to convey the emergency to the rest of the Site.

The internal emergency signals that were determined during the pre-emergency planning period will be rehearsed daily. External communication systems and procedures will be made clear and accessible to all workers.

10.6 Emergency Recognition/Prevention

All personnel entering the Site (e.g. visitors, subcontractors, offsite emergency response groups, etc.) must be made aware of the identified Site hazards and become familiar with techniques of hazard recognition from pre-assignment training and Site-specific briefings. These minimums are described in detail above.

10.7 Safe Distances and Places of Refuge

To reduce the risk of Site emergency, safe distances will be identified as a part of routine work and emergency response procedures. Safe distances can only be decided at the time of emergency depending on severity and the chemical involved in the incident.

However, certain scenarios can be developed as a pre-planning tool to familiarize personnel with important considerations for determining safe distances. These factors may include toxicity and physical state of hazardous substances, quantities of release, wind direction, wind speed, temperature, barriers, and others.

In general, a minimum safe distance at this Site for non-essential personnel for any emergency situation will be 50 feet upwind of the emergency activity. Whenever visitors are present on the Site, the SSO will determine the safe distances for each situation.

Onsite places of refuge will be designated for emergencies that do not require Site evacuation. These refuges (Safety Stations) will be used only for essential needs, such as short rest breaks, emergency response strategy meetings, or for temporary relief during a muscle strain and heat stroke. These areas may include such things as a resting area, potable or non-potable water for drinking, cleaning and decontamination, first aid supplies, or emergency response tools.

10.8 Site Security and Control

Site access control is essential in any emergency situation to prevent additional or more serious injuries or exposures. In an emergency, the SSO must know who is onsite and must be able to control the entry of personnel into hazardous areas to prevent additional injury and exposure. Only necessary rescue and response personnel should be allowed in the Exclusion Area.

One control technique that can be used is a checkpoint at the entrance gate or a series of checkpoints that all personnel entering or exiting the Site must pass through, e.g. a Support Zone checkpoint and an Exclusion Zone checkpoint.

The individual designated as the Checkpoint Control Manager will check identification or authorization as follows:

- Name (and affiliation if offsite personnel);
- Status (in or out);
- Time of entry;
- Anticipated exit time;
- Zones or areas to be entered;
- Team or “buddy”;
- Task being performed;
- Location of task;
- Protective equipment worn; air time left (if applicable); and
- Rescue and response equipment used.

The emergency area Checkpoint Manager will inform the SSO if a person remains in the emergency area beyond his or her anticipated time.

A passive locator system, which uses a Site map with flags or color headed pins identifying each worker, might also be used.

Active locator systems can also be used. These will be worn or carried by individual personnel and will be activated by actions such as flipping a switch in the event of a decrease in air supply or a fall. These have the advantage of precisely locating individuals.

10.9 Evacuation Routes/Procedures

The gate to Hamilton Avenue at the northwest corner of the Site would serve as evacuation routes in case of emergency. In the event of an emergency that necessitates an evacuation of the Site, the following procedures will be implemented:

- Personnel will be expected to proceed with their buddy to the pre-designated evacuation muster area (Edison Park).
- In the case of an air release, the evacuation route should be crosswind or upwind of the source.
- All personnel are to remain at the muster area until the SSO provides further instructions.

If the emergency may affect the public, the SSO or his designee, is responsible for notifying the appropriate authorities, who will in turn notify the surrounding communities.

10.10 Emergency Contact/Notification System

Table HASP 10-1 provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the SSO and notify the appropriate emergency organization. Standard Procedures for reporting emergencies are listed in **Table HASP 10-2**. Directions and a map to the nearest medical facilities are provided in **Figures HASP 10-1** and **HASP 10-2**. In the event of a fire or spill, the SSO, or his designee, will notify the appropriate local, state, and federal agencies.

Any time a notification is made, the SSO will provide an incident report to the Project Coordinator and Project Manager describing the following:

- The event (including date and time) that necessitated the notification and the basis for that decision;
- Sequence of events;
- Date, time, and names of all persons/agencies notified and their response; and
- Resolution of the incident (including duration) and the method/corrective action involved.

This report will be initiated within 72 hours of the event. A final report shall be submitted to the project coordinator and project manager within 10 business days.

10.11 Emergency Medical Treatment Procedures

When an incident occurs, a preliminary evaluation should be made. If the incident is serious or life-threatening, immediate medical attention at the hospital / ER (**Figure HASP 10-1**) should be sought by the SSO or designated alternate. The incident will be

reported to the employee's supervisor, the project coordinator, and the project manager immediately (**Table HASP 10-1**).

If the incident is not serious or life-threatening, the employee will travel to the nearest occupational medical clinic (**Figure HASP 10-2**) with the SSO or appropriate designee. The non-life threatening incident will be reported to their supervisor, project coordinator, and project manager immediately.

Any person who becomes ill or injured in an affected area must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, gross contamination should be removed, the victim wrapped with a blanket and "tagged" as contaminated. First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must be immediately reported to the SSO, who will notify the appropriate project and regulatory representatives.

Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the Site. Any vehicle used to transport contaminated personnel will be decontaminated as necessary.

10.12 Fire or Explosion

In the event of a fire or explosion, the Huntington Beach Fire Department should be summoned immediately. Upon their arrival, the SSO or designated alternate will advise the fire commander of the location, nature, and identification of hazardous materials, if any, at the Site.

10.13 Spill or Leak

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

- Inform the SSO immediately;
- Locate the source of the spill and stop the flow if it can be done safely; and
- Begin containment and recovery of the spilled materials.

10.14 Emergency Equipment/Facilities

Emergency equipment and facilities will be described and located before the beginning of work operations at the Site. All personnel involved in the operation will be informed of the location and use of emergency equipment and emergency facilities at the Site.

10.15 Emergency Response Critique and Follow-Up

Following an Emergency Response, a critique and follow-up will be conducted by the Project Coordinator in order to assess the effectiveness of the response and to identify areas of improvement.

11 CONFINED SPACE OPERATIONS

Confined Space Operations are not applicable for the scope of work described in this HASP.

12 SPILL CONTAINMENT

For the IRM as described in the IRM Workplan, individual areas for spill containment will be established by using plastic sheeting and berms, as appropriate, placed on the ground surface in areas where a potential spill exists. The size of the area shall be sufficient to accommodate the required number of drums, testing equipment, and personnel. These areas will be established prior to the initiation of sampling activities.

13 SANITATION

A portable toilet with washing facilities (in accordance with OSHA 29 CFR Part 1910.120 (n)(1) and 8 CCR Section 1524) will be located near the Magnolia entrance within the support zone in the eastern portion of the Site.

14 ILLUMINATION

All planned field activities are to be conducted during daylight hours and not within any structures at the Site.

Tables

TABLE HASP 3-1
TASK HAZARD ANALYSIS

Task	Mechanical	Electrical	Chemical	Temperature	Acoustic	Biological	Confined Space	Physical
Site Preparation	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Tarry Liquid Removal	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Soil Sampling	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Excavation and Stockpiling	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Mixing Soil and Tarry Liquids	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Excavation and Offsite Hauling	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Regrading Site	Heavy equipment	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	Traffic, dust, debris
Decon of Heavy Equipment	NA	NA	Potentially in soil, waste, & groundwater	Heat stress	Equipment noise	Bees	NA	NA

Notes: NA – Not Applicable

TABLE HASP 8-1

HEALTH AND SAFETY PLAN DISTRIBUTION RECORD

Contractors and Subcontractors

Before beginning any work on the Site, a copy of this HASP will be provided for review to contractors and subcontractors who may be affected by activities under this HASP. All contractors and subcontractors also must comply with applicable federal, state and local government regulations.

Name of Firm	Contact Person (print)	Date Distributed

TABLE HASP 8-2

HEALTH AND SAFETY MEETING RECORD

All personnel working at the Site will receive an initial health and safety orientation before working onsite. Thereafter, a required tailgate safety meeting will be held daily before the start of work, or more frequently as deemed necessary by the Site Safety Officer.

Date	Name of Attendee (Print)	Name of Firm (Print)	Signature

TABLE HASP 8-3

SITE VISITOR RECORD

All visitors are required to sign the visitor log and comply with the HASP requirements.

Date	Name of Visitor (Print)	Name of Firm (Print)	Purpose of Visit	Arrival Time	Departure Time

TABLE HASP 10-1

EMERGENCY TELEPHONE NUMBERS

Name	Telephone Numbers	
	Office	Alternate
Fire Department	911	911
Hospital – Hoag Memorial Hospital	(714) 760-2372	911
Medical Clinic – Pro Care	(714) 964-4448	911
Police Department	911	911
Ascon Site Project Manager – Tamara Zeier	(714) 388-1804	(714) 863-0017
Project Manager and Principal-in-Charge – Mark Grivetti	(805) 897-3800	(805) 844-5546
Site Safety Officer – Marlene Duffy	(714) 969-0800	(714) 392-7994
Director of Environment, Health & Safety – Dale Prokopchak	(804) 332-6376	(804) 349-8067

TABLE HASP 10-2

STANDARD PROCEDURES FOR REPORTING EMERGENCIES

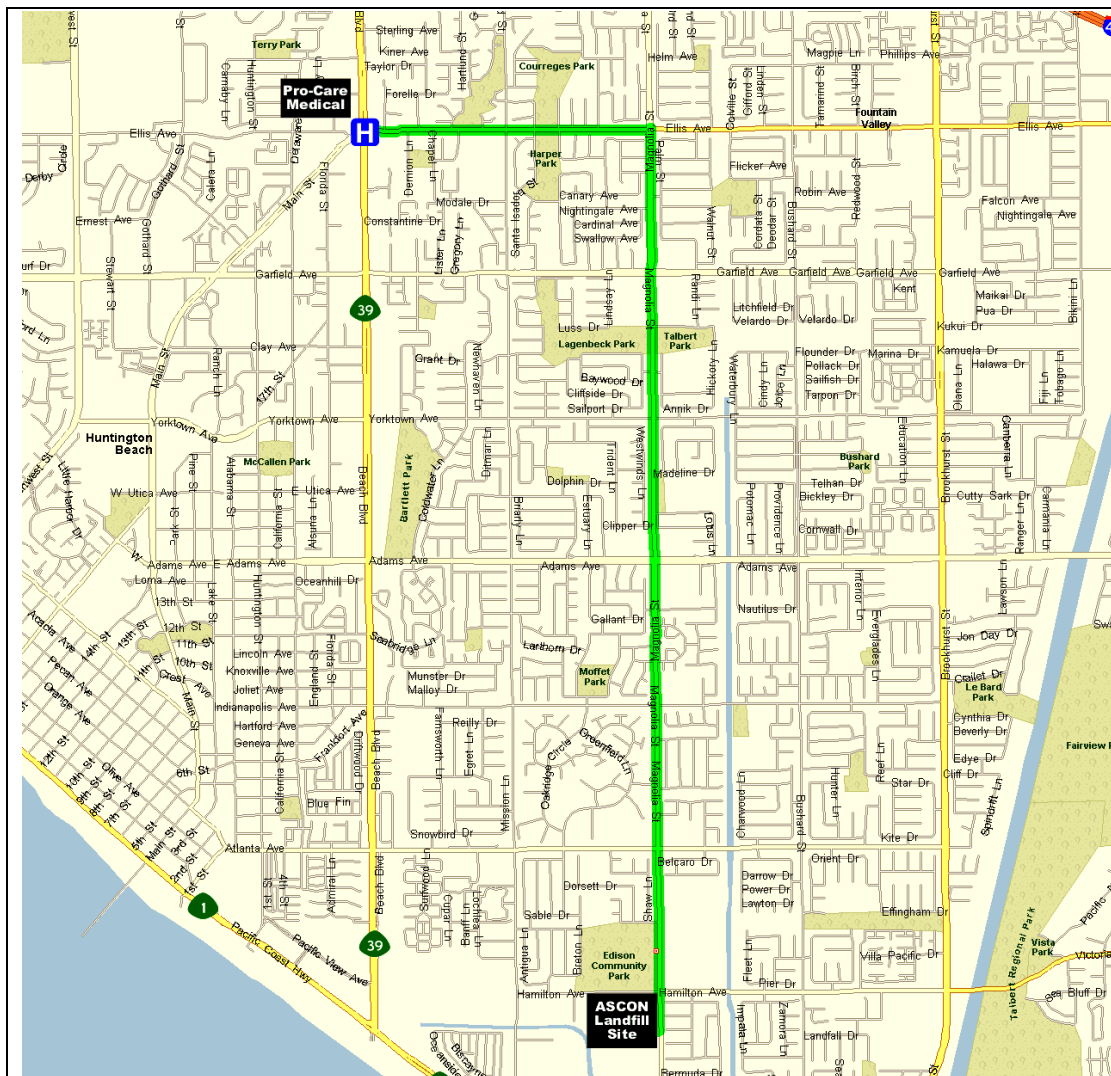
When calling for emergency assistance, provide the following information:

- Your name
- Your location
- The telephone number at your location
- The nature of the emergency
- The names of all exposed or injured persons
- Actions already taken

IMPORTANT: The recipient of the call should hang up first, NOT the caller.

Figures





Medical Clinic Directions:

Head north on Magnolia, Turn left on Ellis Ave, Turn left on Beach Blvd, Arrive at Pro Care Medical on the left.

18561 Beach Blvd
Huntington Beach, CA 92648
(714) 964-4448

**Figure HASP 10-2: Medical Clinic Route Map
Ascon Landfill Site
Huntington Beach, California**

Geosyntec
consultants

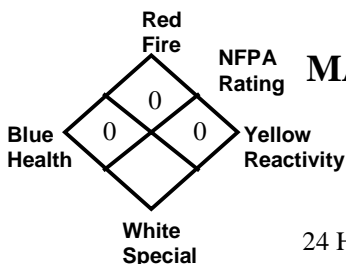
engineers | scientists | innovators

Project Navigator, Ltd.

Attachments HASP-1

MSDS

Alconox®



MATERIAL SAFETY DATA SHEET

Alconox, Inc.
30 Glenn Street, Suite 309
White Plains, NY 10603

24 Hour Emergency Number – Chem-Tel (800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 1999
Chemical Family:	Anionic Powdered Detergent
Manufacturer Catalog Numbers for sizes	1104, 1125, 1150, 1101, 1103 and 1112

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

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

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO ₂ , foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO ₂ on burning

VI. HEALTH HAZARD DATA

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

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

International Chemical Safety Cards

BENTONITE

ICSC: 0384

<p style="text-align: center;">BENTONITE Wilkinite</p> <p>CAS # 1302-78-9 RTECS # CT9450000 ICSC # 0384</p>			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
• INHALATION		Avoid inhalation of fine dust and mist.	
• SKIN		Protective gloves.	
• EYES		Safety spectacles.	
• INGESTION			
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting (extra personal protection: P1 filter respirator for inert particles).			
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0384		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

BENTONITE

ICSC: 0384

<p>I M P O R T A N T D A T A</p>	<p>PHYSICAL STATE; APPEARANCE: ODOURLESS GRANULES OR POWDER IN VARIABLE COLOUR.</p> <p>PHYSICAL DANGERS:</p> <p>CHEMICAL DANGERS: The substance is a weak base in suspension in water.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of dust.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: The substance may have effects on the lungs , resulting in silicosis due to the presence of crystalline silica (see ICSC # 0808).</p>
<p>PHYSICAL PROPERTIES</p>	<p>Relative density (water = 1): 2.5 Solubility in water: none</p>	
<p>ENVIRONMENTAL DATA</p>		
<p>NOTES</p>		
<p>Bentonites are aluminate silicate and can contain crystalline silica. The content varies widely from less than 1% to about 24%.</p>		
<p>ADDITIONAL INFORMATION</p>		
<p>ICSC: 0384 BENTONITE</p> <p style="text-align: center;">© IPCS, CEC, 1993</p>		
<p>IMPORTANT LEGAL NOTICE:</p>	<p>Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.</p>	



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Schenectady, NY 12304-4690
(518) 377-8854

Material Safety Data Sheet Collection

Diesel Fuel Oil No. 2-D

MSDS No. 470

Date of Preparation: 10/81

Revision: B, 3/98

Section 1 - Chemical Product and Company Identification

51

Product/Chemical Name: Diesel fuel oil no. 2-D

Chemical Formula: Unspecified or variable

CAS Number: 68334-30-5

Synonyms: automotive diesel oil; diesel fuel; diesel oil (medium); diesel oil no. 2; diesel oil (petroleum); diesel oils; diesel test fuel; fuels, diesel; no. 2 diesel oil; olej napeladowy III (Polish)

Derivation: Fuel oil may be a distilled fraction of petroleum, a residuum from refinery operations, a crude petroleum or a blend of two or more of these.

General Use: This medium viscosity residual fuel oil has both light and heavy grades, and is used in furnaces and boilers of utility and industrial power plants, ships, locomotives, and metallurgical operations.

Vendors: Consult the latest *Chemical Week Buyers' Guide*. (73)

Section 2 - Composition / Information on Ingredients

Diesel fuel oil no. 2-D, ca 100% vol; diesel fuels consist primarily of aliphatic (64% vol), aromatic (35% vol), and olefinic (1-2% vol) hydrocarbons.

Trace Impurities: May contain sulfur (< 0.5), benzene (<100 ppm), and additives such as sulfurized esters.

OSHA PEL

As petroleum distillates

8-hr TWA: 500 ppm (2000 mg/m³)

ACGIH TLV

As diesel fuel

Notice of impending change (1997):

TWA: 100 mg/m³, *Skin*

NIOSH REL

As petroleum distillates

10-hr TWA: 350 mg/m³

Ceiling (15 min): 1800 mg/m³

IDLH Level

As petroleum distillates

1,100 ppm

DFG (Germany) MAK

None established

Section 3 - Hazards Identification

ANSI Signal Word: Caution

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Diesel fuel oil no. 2-D is a brown, slightly viscous liquid with a kerosene-like odor. It is irritating to the skin and respiratory tract. Inhalation of mist or vapor may result in headache, nausea, vomiting, diarrhea, central nervous system (CNS) depression, tachycardia (rapid heart beat), cyanosis (blue coloration of skin due to oxygen deficiency), pulmonary edema (fluid in the lungs), and liver or kidney injury. Diesel fuel oil no. 2-D is an environmental hazard when spilled. When exposed to heat or flame, this flammable liquid is a fire hazard. When heated to decomposition, diesel fuel oil no. 2-D will emit acrid smoke and irritating vapors.

Potential Health Effects

Primary Entry Routes: Inhalation, ingestion, skin contact/absorption

Target Organs: Skin, CNS, cardiovascular system (CVS), respiratory system, liver, kidneys

Acute Effects

Inhalation: Euphoria, respiratory irritation, cardiac dysrhythmia, increased respiration rates, cyanosis, pulmonary edema, hemoptysis (spitting up blood from the respiratory tract), respiratory arrest, renal (kidney) and liver injury, and CNS toxicity can result from inhalation of diesel fuel oil no. 2-D mist or vapor.

Eye: Contact may result in irritation.

Skin: Contact may cause irritation, systemic effects (see Inhalation), and block the sebaceous (oil) glands, resulting in a rash of acne-like pimples and spots, usually on the arms and legs.

Ingestion: Gastrointestinal irritation, vomiting, diarrhea, and in severe cases, CNS depression progressing to coma and death and other systemic effects (see Inhalation) can result. Aspiration can result in transient CNS depression or excitement, hypoxia, infection, pneumatocele (abnormal cavities in lungs) formation, and chronic lung dysfunction.

Carcinogenicity: IARC lists occupational exposure in petroleum refining as Group 2A (Probable human carcinogen) and distillate light (diesel) fuels as Group 3 (Not classifiable as to carcinogenicity to humans). ACGIH lists a notice of impending change for diesel fuels as TLV-A3 (Animal carcinogen). NTP and OSHA do not list diesel fuel oil no. 2-D as a carcinogen.

Wilson Risk Scale

R 1

I 2

S 2*

K 2

*Skin
absorption

HMIS

H 1*

F 2

R 0

PPE†

*Chronic
effects

†Sec. 8

Medical Conditions Aggravated by Long-Term Exposure: None reported.

Chronic Effects: Prolonged or repeated skin contact causes dermatitis and possible systemic toxicity. Prolonged or repeated inhalation can cause CNS and peripheral nervous system damage.

Section 4 - First Aid Measures

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Eye Contact: *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water for at least 15 minutes. Consult a physician or ophthalmologist if pain and/or irritation develops.

Skin Contact: Quickly remove contaminated clothing. Rinse with flooding amounts of water followed by washing the exposed area with soap and water. For reddened or blistered skin, consult a physician.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. Have the *conscious and alert* person drink 1 to 2 glasses of water. Contact a poison control center. Because of aspiration risk, *do not* induce vomiting unless the poison control center advises otherwise.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Gastric lavage is contraindicated due to aspiration risk. Instead, consider administration of charcoal or milk. If ingestion amount is large, gastric emptying in the alert patient can be accomplished through administration of Syrup of Ipecac. Treat overexposure symptomatically and supportively.

Section 5 - Fire-Fighting Measures

Flash Point: 100.4 °F (38 °C)

Flash Point Method: CC

Autoignition Temperature: 351-624 °F (177-329 °C)

LEL: 1.3% v/v

UEL: 75% v/v

Flammability Classification: OSHA Class II Combustible Liquid

Extinguishing Media: Use dry chemical, carbon dioxide, foam, low velocity water fog or spray. Use a smothering technique to extinguish fire. Water may be ineffective in putting out a fire involving diesel fuel oil no. 2-D, and a solid water stream may spread the flames; however, a water spray may be used to cool fire-exposed containers, and flush spills away from ignition sources.

Unusual Fire or Explosion Hazards: Vapor or mist can form explosive mixtures in air. In still air, the heavier-than-air vapors of diesel fuel oil no. 2-D from a large source may travel along low-lying surfaces to distant sources of ignition and flash back to the material source. Containers may explode in heat of fire.

Hazardous Combustion Products: Heating diesel fuel oil no. 2-D to decomposition can produce acrid smoke and irritating vapors.

Fire-Fighting Instructions: *Do not* release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.



Section 6 - Accidental Release Measures

Spill /Leak Procedures: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Ground all equipment used when handling this product. *Do not* touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A fire fighting foam may be used to suppress vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material.

Small Spills: Absorb diesel fuel oil no. 2-D with vermiculite, earth, sand or similar material.

Large Spills

Containment: For large spills, consider downwind evacuation of at least 1000 ft (300 m). Dike far ahead of liquid spill for later disposal. *Do not* release into sewers or waterways.

Cleanup: Ground all equipment. Use non-sparking tools. Spills can be absorbed with materials such as peat, activated carbon, polyurethane foam, or straw. Sinking agents, gelling agents, dispersants, and mechanical systems can also be use to treat oil spills.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid vapor or mist inhalation, and skin and eye contact. Use only with ventilation sufficient to reduce airborne concentrations to non-hazardous levels (see Sec. 2). Wear protective gloves (or use barrier cream), and clothing (see Sec. 8). Keep away from heat and ignition sources. Ground and bond all containers during transfers to prevent static sparks. Use non-sparking tools to open and close containers.

Storage Requirements: Store in tightly closed container in cool, well-ventilated area, away from heat, ignition sources and incompatibles (see Sec. 10). Periodically inspect stored materials. Equip drums with self-closing valves, pressure vacuum bungs, and flame arrestors.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.106) for Class II Combustible Liquid.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations.

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations as low as possible. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls: Enclose operations and/or provide local exhaust ventilation appropriately designed for flammable mist and vapor at the site of chemical release. Where possible, transfer diesel fuel oil no. 2-D from drums or other storage containers directly to process containers. Minimize sources of ignition in surrounding low-lying areas.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), use an SCBA.

Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets. Wear protective eyeglasses, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance and Odor: Brown, slightly viscous; kerosene-like odor

Odor Threshold: 0.7 ppm

Vapor Pressure: < 0.1 mm Hg at 68 °F (20 °C)

Vapor Density (Air=1): > 6

Formula Weight: N/A

Specific Gravity (H₂O=1, at 4 °C): < 0.86

Water Solubility: Insoluble

Boiling Point: 340-676 °F (171-358 °C)

Freezing Point: -29.2 °F (-34 °C)

Viscosity: 1.9-4.1 centistoke at 104 °F (40 °C)

Surface Tension: 23-32 dynes/cm at 68 °F (20 °C)

Section 10 - Stability and Reactivity

Stability: Diesel fuel oil no. 2-D is stable at room temperature in closed containers under normal storage and handling conditions.

Polymerization: Hazardous polymerization cannot occur.

Chemical Incompatibilities: Include strong oxidizing agents.

Conditions to Avoid: Exposure to heat and ignition sources.

Hazardous Decomposition Products: Thermal oxidative decomposition of diesel fuel oil no. 2-D can produce low molecular weight hydrocarbons, hydrocarbon derivatives, carbon oxides (CO_x), and sulfur oxides (SO_x).

Section 11- Toxicological Information

Acute Oral Effects:

Rat, oral, LD₅₀: 7500 mg/kg

Acute Dermal Effects:

Rabbit, skin, LD: > 5 mL/kg

Skin Effects:

Rabbit, skin, standard Draize test: 500 µL/24 hr, resulted in severe reaction.

Toxicity Data:*

Other Multiple Dose Toxicity Data:

Rat, inhalation: 2 g/m³/6 hr/3 weeks, intermittently, resulted in changes in blood erythrocyte (RBC) count, and focal fibrosis (pneumoconiosis) and other changes in the lung, thorax or respiration.
Rat, inhalation: 400 µg/m³/16 hr/2.5 years, intermittently, caused other changes in the blood, and biochemical effects - transaminases.
Rabbit, skin: 80 mL/kg/12 days, continuously, resulted in other changes in the liver, kidney, ureter, and bladder, and death.

* See NIOSH, RTECS (HZ1800000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Juvenile American shad, salt water TLm: 204 mg/L/24 hr; mallard duck, LD₅₀=20 mg/kg.

Environmental Fate: Diesel fuel oil no. 2-D will evaporate from water or soil. In surface water, it may partition from the water column to suspended sediments.

Environmental Degradation: Biodegradation may occur in soil and water.

Section 13 - Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Section 14 - Transport Information**DOT Transportation Data (49 CFR 172.101):**

Shipping Name: Diesel fuel

Shipping Symbols: D

Hazard Class: 3

ID No.: NA1993

Packing Group: III

Label: None

Special Provisions (172.102): B1

Packaging Authorizations

a) **Exceptions:** 173.150

b) **Non-bulk Packaging:** 173.203

c) **Bulk Packaging:** 173.242

Quantity Limitations

a) **Passenger, Aircraft, or Railcar:** 60 L

b) **Cargo Aircraft Only:** 220 L

Vessel Stowage Requirements

a) **Vessel Stowage:** A

b) **Other:** –

Section 15 - Regulatory Information**EPA Regulations:**

Classified as RCRA Hazardous Waste (40 CFR 261.21): Characteristic of Ignitability

RCRA Hazardous Waste Number: D001

Listed as a CERCLA Hazardous Substance (40 CFR 302.4), Unlisted Hazardous Waste, Characteristic of Ignitability per RCRA Sec. 3001

CERCLA Final Reportable Quantity (RQ): 100 lb (45.4 kg)

SARA Toxic Chemical (40 CFR 372.65): Not listed

SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed

OSHA Regulations:

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A, as petroleum distillates)

Section 16 - Other Information

References: 73, 103, 136, 190, 209, 222, 230, 231

Prepared By HM Spliethoff, MS

Industrial Hygiene Review PA Roy, MPH, CIH

Medical Review T Thoburn, MD, MPH

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

CAS # 68334-30-5

Warning!

1 3

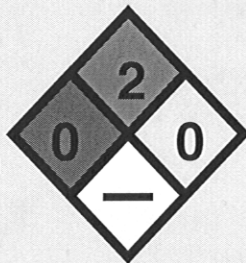


Flammable

Diesel Fuel Oil No. 2-D

diesel fuel

Brown, slightly viscous liquid; kerosene-like odor. Irritating to eyes/skin/respiratory tract. Also Causes: increased respiration rate, rapid heart beat, cyanosis; GI irritation, vomiting, diarrhea, CNS depression. Chronic Effects: dermatitis. Flammable.



Target Organs

3 9 10



Skin



Respiratory
System



Nervous
System



Liver



Kidneys



Cardio-
vascular

Personal Protective Equipment

8



Goggles



Gloves



Apron



is respirator
required

Emergency Procedures

First Aid

4

Inhalation: Remove to fresh air and support breathing as needed. Eyes/Skin: Remove contaminated clothing. Flush eyes with plenty of water. Thoroughly wash skin with soap and water. Ingestion: Do not induce vomiting. Consult physician.

Fire

5

Flammable. Can form explosive mixtures in the air. Use water as fog, dry chemical, or carbon dioxide. Do not use water spray as it may scatter fire.

Spills & Leaks

6

Notify safety personnel, isolate and ventilate area, deny entry, stay upwind. Shut off ignition sources. Absorb with inert material, such as sand or vermiculite. Cleanup crew should protect against exposure.

Consult **MSDS 0470** for more information



MATERIAL SAFETY DATA SHEET - CALIBRATION CHECK GAS

PRODUCT NAME: HEXANE (0 – 0.48%) IN AIR

MSDS NO: 262

Version:3

Date: January, 2004

1. Chemical Product and Company Identification

Gasco Affiliates, LLC
1933 Whitfield Park Loop
Sarasota, FL 34243

TELEPHONE NUMBER: (941) 755-8806
FAX NUMBER: (941) 755-8920
E-MAIL: info@gascogas.com

24-HOUR EMERGENCY NUMBER: 1-800-424-9300

PRODUCT NAME: HEXANE (0- 0.48%) IN AIR
CHEMICAL NAME: Hexane in air
COMMON NAMES/ SYNONYMS: None
TDG (Canada) CLASSIFICATION: 2.2
WHIMIS CLASSIFICATION: A

2. COMPOSITION/ INFORMATION ON INGREDIENTS

INGREDIENT	%VOLUME	PEL-OSHA	TLV-ACGIH	LD ₅₀ or LC ₅₀ Route/Species
Hexane FORMULA: C ₆ H ₁₄	0 to 0.48%	500 ppm TWA	50 ppm	N/A
Air FORMULA: Mixture	99.52 to 99.999%	N/A	N/A	N/A

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product is a colorless gas mixture which is either odorless or has a faint solvent like odor. Hexane can cause anesthetic or peripheral neuropathy effects.

ROUTE OF ENTRY:

Skin Contact No	Skin Absorption No	Eye Contact No	Inhalation Yes	Ingestion No
HEALTH EFFECTS:				
Exposure Limits No	Irritant Yes	Sensitization No	Reproductive Hazard Yes	Mutagen No

Carcinogenicity: --NTP: No IARC: No OSHA: No

EYE EFFECTS:
N/A

SKIN EFFECTS:
N/A



MATERIAL SAFETY DATA SHEET - CALIBRATION CHECK GAS

PRODUCT NAME: HEXANE (0 – 0.48%) IN AIR

INGESTION EFFECTS:

Ingestion unlikely. Gas at room temperature.

INHALATION EFFECTS:

Due to the small size of this cylinder, no health hazards are anticipated if used in normal circumstances.

Irritations of the respiratory tract, nausea and headache have been observed at 1,500 ppm Hexane. Dizziness and drowsiness can occur at 5,000 ppm. Long term over-exposure can result in a numbing sensation of the fingers and toes. More serious exposures can cause damage to the nerves in the hands and feet (peripheral neuropathy).

NFPA HAZARD CODES

Health: 1
Flammability: 0
Reactivity: 0

HMIS HAZARD CODES

Health: 1
Flammability: 0
Reactivity: 0

RATING SYSTEM

0= No Hazard
0= Slight Hazard
2= Moderate Hazard
3= Serious Hazard
4= Severe Hazard

4. FIRST AID MEASURES

EYES:

N/A

SKIN:

N/A

INGESTION:

Not required

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH THE SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

5. FIRE-FIGHTING MEASURES

These containers hold gas under pressure, with no liquid phase. If involved in a major fire, they should be sprayed with water to avoid pressure increases, otherwise pressures will rise and ultimately they may distort or burst to release the contents. The gases will not add significantly to the fire, but containers or fragments may be projected considerable distances - thereby hampering fire fighting efforts.

6. ACCIDENTAL RELEASE MEASURES

In terms of weight, these containers hold very little contents, such that any accidental release by puncturing etc. will be of no practical concern.

7. HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Use only in well-ventilated areas. Do not heat cylinder by any means to increase rate of product from the cylinder. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C).



MATERIAL SAFETY DATA SHEET - CALIBRATION CHECK GAS

PRODUCT NAME: HEXANE (0 – 0.48%) IN AIR

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Use adequate ventilation for extended use of gas.

9. PHYSICAL AND CHEMICAL PROPERTIES

PARAMETER:	VALUE:
Physical state	: Gas
Evaporation point	: N/A
pH	: N/A
Odor and appearance	: Colorless, odorless or faint solvent like odor

10. STABILITY AND REACTIVITY

Stable under normal conditions. Expected shelf life 24 months.

11. TOXICOLOGICAL INFORMATION

No toxicological damage caused by this product.

12. ECOLOGICAL INFORMATION

No ecological damage caused by this product.

13. DISPOSAL INFORMATION

Do not discharge into any place where its accumulation could be dangerous. Used containers are acceptable for disposal in the normal waste stream as long as the cylinder is empty and valve removed or cylinder wall is punctured; but GASCO encourages the consumer to return cylinders.

14. TRANSPORT INFORMATION

	<u>United States DOT</u>	<u>Canada TDG</u>
PROPER SHIPPING NAME:	Compressed Gas N.O.S. (Hexane in Air)	Compressed Gas N.O.S. (Hexane in Air)
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN1956	UN1956
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. REGULATORY INFORMATION

Hexane is subject to the reporting requirements of CFR 29 1910.1000. This chemical is listed on Table Z.1.

16. OTHER INFORMATION

This MSDS has been prepared in accordance with the Chemicals (Hazard Information and Packaging for Supply (Amendment) Regulation 1996. The information is based on the best knowledge of GASCO, and its advisors and is given in good faith, but we cannot guarantee its accuracy, reliability or completeness and therefore disclaim any liability for loss or damage arising out of use of this data. Since conditions of use are outside the control of the Company and its advisors we disclaim any liability for loss or damage when the product is used for other purposes than it is intended.

**AIR LIQUIDE**

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas:
Oxygen 0-23.5%; Isobutylene, 0.0005-0.9%

SYNONYMS: Not Applicable

CHEMICAL FAMILY NAME: Not Applicable

FORMULA: Not Applicable

Document Number: 50054

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME:	AIR LIQUIDE AMERICA CORPORATION
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
	General MSDS Information 1-713/868-0440
	Fax on Demand: 1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Oxygen	7782-44-7	0 - 23.5%	There are no specific exposure limits for Oxygen.					
Isobutylene	115-11-7	0.0005 - 0.9%	There are no specific exposure limits for Isobutylene.					
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established.

C = Ceiling Limit.

See Section 16 for Definitions of Terms Used.

NOTE : All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless gas. Releases of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated. Isobutylene, a component of this gas mixture, may cause drowsiness and other central nervous system effects in high concentrations ; however, due to its low concentration in this gas mixture, this is unlikely to occur.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. The chief health hazard associated with this gas mixture is when this product contains less than 19.5% Oxygen and is released in a small, poorly-ventilated area (i.e. an enclosed or confined space). Under this circumstance, an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN

OBSERVED EFFECT

12-16% Oxygen:	Breathing and pulse rate increase, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death .

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. The most significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color. Additionally, Isobutylene, a component of this gas mixture, may cause drowsiness or central nervous system effects in high concentrations ; however, due to its low concentration in this gas mixture, this is unlikely to occur.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas mixture.

TARGET ORGANS: Respiratory system.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
See Section 8			
For routine industrial applications			

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

4. FIRST-AID MEASURES (Continued)

Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT, (method): Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

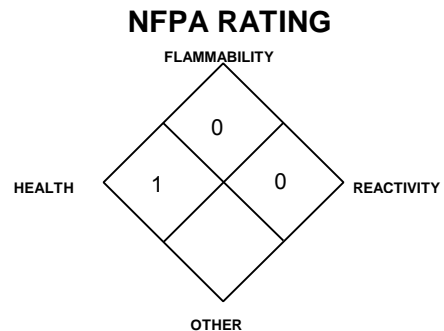
FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen. Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly-ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C; 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of oxygen.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if oxygen levels are below 19.5 % or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: No special protection is needed under normal circumstances of use.

BODY PROTECTION: No special protection is needed under normal circumstances of use.

9. PHYSICAL and CHEMICAL PROPERTIES

Unless otherwise specified, the following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: 0.072 lbs/ ft³ (1.153 kg/m³)

BOILING POINT: -195.8°C (-320.4 °F)

FREEZING/MELTING POINT @ 10 psig -210°C (-345.8°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

pH: Not applicable.

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

MOLECULAR WEIGHT: 28.01

EVAPORATION RATE (nBuAc = 1): Not applicable.

EXPANSION RATIO: Not applicable.

ODOR THRESHOLD: Not applicable.

SPECIFIC VOLUME (ft³/lb): 13.8

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is for this gas mixture.

APPEARANCE AND COLOR: This product is a colorless, odorless gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Isobutylene include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. A component of this product (Isobutylene) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

ISOBUTYLENE:
LC₅₀ (inhalation, rat) = 620,000 mg/kg/4 hours
LC₅₀ (inhalation, mouse) = 415,000 mg/kg

11. TOXICOLOGICAL INFORMATION (Continued)

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Not applicable.

SENSITIZATION TO THE PRODUCT: This gas mixture is not known to cause sensitization in humans.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for this gas mixture.

Embryotoxicity: No embryotoxic effects have been described for this gas mixture.

Teratogenicity: No teratogenicity effects have been described for this gas mixture.

Reproductive Toxicity: No reproductive toxicity effects have been described for gas mixture.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this product.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary; treat symptoms; eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

OXYGEN: Water Solubility = 1 volume Oxygen/32 volumes water at 20 °C. Log K_{ow} = -0.65

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0 °C. 1.6 volumes Nitrogen/100 volumes water at 20 °C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plant and animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (Nitrogen, Oxygen)

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

DOT LABEL(S) REQUIRED: Non-Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

14. TRANSPORTATION INFORMATION (Continued)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: This product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Nitrogen	NO	NO	NO
Isobutylene	NO	NO	NO

SARA THRESHOLD PLANNING QUANTITY: Not applicable.

TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS:

- No component of this product is subject to the requirements of CFR 29 1910.1000 (under the 19 89 PELs).
- Isobutylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds.
- The regulations of the Process Safety Management of Highly Hazardous Chemicals are not applicable (29 CFR 1910.119).
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Isobutylene is listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,553 kg) or greater.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: No.

California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen.

Florida - Substance List: Oxygen, Isobutylene.

Illinois - Toxic Substance List: No.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: Oxygen, Isobutylene.

Michigan - Critical Materials Register: No.

Minnesota - List of Hazardous Substances: No.

Missouri - Employer Information/Toxic Substance List: No.

New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Isobutylene.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Oxygen, Nitrogen, Isobutylene.

Rhode Island - Hazardous Substance List: Oxygen, Nitrogen.

Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: : No.

CALIFORNIA PROPOSITION 65: No component of this product is on the California Proposition 65 lists.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 *"Safe Handling of Compressed Gases in Containers"*
AV-1 *"Safe Handling and Storage of Compressed Gases"*
 "Handbook of Compressed Gases"

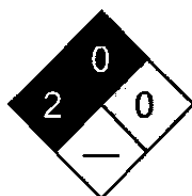
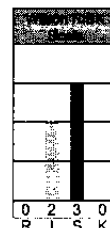
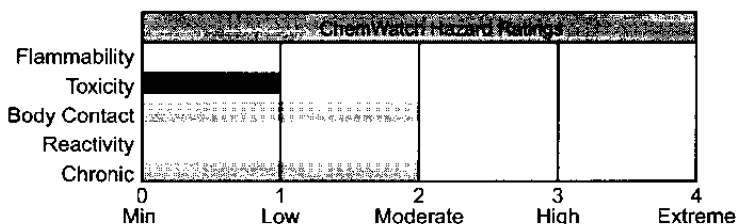
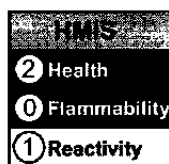
PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
 9163 Chesapeake Drive, San Diego, CA 92123-1002
 619/565-0302
 Fax on Demand: 1-800/231-1366



This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

**Section 1 - Chemical Product and Company Identification****54.1****Material Name:** Portland Cement**CAS Number:** 65997-15-1**Chemical Formula:** Unspecified or Variable**Synonyms:** CEMENT; HYDRAULIC CEMENT; PORTLAND CEMENT; PORTLAND CEMENT SILICATE**General Use:** Hydraulic binder used for mixing concrete, concrete masonry, mortars and grouts; also soil stabilization.**Section 2 - Composition / Information on Ingredients**

Name	CAS	%
portland cement	65997-15-1	varies
OSHA PEL TWA: 15 mg/m ³ ; total dust.	NIOSH REL No data found.	DFG (Germany) MAK TWA: 5 mg/m ³ .
OSHA PEL Vacated 1989 Limits TWA: 10 mg/m ³ ; total. Other Values: respirable mg/m ³ ; 5.	IDLH Level 5000 mg/m ³ .	
ACGIH TLV TWA: 10 mg/m ³ .		

Section 3 - Hazards Identification

Fire Diamond

ANSI Signal Word

Caution**☆☆☆☆☆ Emergency Overview ☆☆☆☆☆**

Gray powder; odorless. Irritating to eyes/skin/respiratory tract. Also causes (on contact with wet cement): corneal edema, dermatitis, cracked skin. Chronic: bronchitis, dermatitis.

Potential Health Effects**Primary Entry Routes:** inhalation, ingestion, skin contact**Target Organs:** respiratory system, skin, eyes**Acute Effects****Inhalation:** Generated dust may be highly discomforting if inhaled and may even cause in some cases, sensitization.

Respiratory sensitization may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping.

Effects on lungs are significantly enhanced in the presence of respirable particles.

Eye: The solid/dust is highly discomforting, may be abrasive to the eyes and capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/or other transient eye damage/ulceration.**Skin:** The dust is extremely discomforting to the skin and is capable of causing skin reactions which may lead to dermatitis.

Handling wet cement can cause dermatitis. Cement when wet is quite alkaline and this alkali action on the skin contributes strongly to cement contact dermatitis since it may cause drying and defatting of the skin which is followed by hardening, cracking, lesions developing, possible infections of lesions and penetration by soluble salts. Cement contact dermatitis (CCD) may occur when contact shows an allergic response, which may progress to sensitization. Sensitization is due to soluble chromates (chromate compounds) present in trace amounts in some cements, cement products. Soluble chromates readily penetrate intact skin.

Cement dermatitis can be characterized by fissures, eczematous rash, dystrophic nails, and dry skin; acute contact with highly alkaline mixtures may cause localized necrosis.

Ingestion: Considered an unlikely route of entry in commercial/industrial environments.

The material is harmful if swallowed.

The dust is discomforting to the gastrointestinal tract.

Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Chronic Effects: Cement eczema may be due to chromium in feed stocks or contamination from materials of construction. Sensitization to chromium may be the leading cause of nickel and cobalt sensitivity and the high alkalinity of cement is an important factor in cement dermatoses.

Repeated, prolonged severe inhalation exposure may cause pulmonary edema and rarely, pulmonary fibrosis. Workers may also suffer from dust-induced bronchitis with chronic bronchitis reported in 17% of a group occupationally exposed to high dust levels.

Data suggests that occupational exposure to Portland cement dust may lead to a higher incidence of chronic respiratory symptoms and a reduction of ventilatory capacity.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air.

Encourage patient to blow nose to ensure clear breathing passages.

Ask patient to rinse mouth with water but to not drink water.

Seek immediate medical attention.

Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water.

Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.

Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water).

Wash affected areas thoroughly with water (and soap if available).

Seek medical attention in event of irritation.

Ingestion: Contact a Poison Control Center.

Do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Treat symptomatically as for strong alkaline material.

Section 5 - Fire-Fighting Measures

Flash Point: Noncombustible

Autoignition Temperature: Not applicable

LEL: Not applicable

UEL: Not applicable

Extinguishing Media: If small amounts are involved in a fire, there is no restriction on the type of extinguisher. Otherwise, use LARGE AMOUNTS of water to absorb heat generated.

General Fire Hazards/Hazardous Combustion Products: Noncombustible.

Not considered to be a significant fire risk; however, containers may burn.

Decomposes on heating and produces toxic fumes of caustic compounds.

Fire Incompatibility: No known incompatibility with normal range of industrial materials.

Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard.

Wear breathing apparatus plus protective gloves for fire only. Prevent, by any means available, spillage from entering drains or waterways.

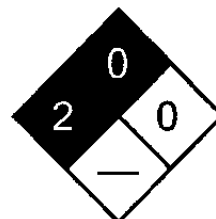
Use fire fighting procedures suitable for surrounding area.

Do not approach containers suspected to be hot.

Cool fire-exposed containers with water spray from a protected location.

If safe to do so, remove containers from path of fire.

Equipment should be thoroughly decontaminated after use.



Fire Diamond

Section 6 - Accidental Release Measures

Small Spills: Clean up all spills immediately. Avoid contact with skin and eyes.

Wear protective clothing, gloves, safety glasses and dust respirator.

Use dry clean-up procedures and avoid generating dust.

Vacuum up or sweep up. Place in clean drum then flush area with water.

Large Spills: Clear area of personnel and move upwind.

Use dry clean-up procedures. Avoid generating dust.

If inhalation risk of exposure exists, wear NIOSH-approved dust respirator.

Collect recoverable product into labeled containers for recycling.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid generating and breathing dust. Limit all unnecessary personal contact.

Wear protective clothing when risk of exposure occurs.

Use in a well-ventilated area. Atmosphere should be checked against exposure standards to ensure safe working conditions are maintained.

Avoid contact with incompatible materials.

When handling, DO NOT eat, drink or smoke.

Always wash hands with soap and water after handling.

Use good occupational work practices.

Observe manufacturer's storing and handling recommendations.

Recommended Storage Methods: Packaging as recommended by manufacturer.

Check that containers are clearly labeled.

Metal pail or Paper bag with sealed plastic liner.

Multi-ply woven plastic or paper bag with sealed plastic liner.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use in a well-ventilated area.

If exposure to workplace dust is not controlled, respiratory protection is required; wear NIOSH-approved dust respirator.

General exhaust is adequate under normal operating conditions.

If risk of overexposure exists, wear NIOSH-approved dust respirator.

Correct fit is essential to obtain adequate protection.

Personal Protective Clothing/Equipment

Eyes: Safety glasses with side shields; or as required, chemical goggles.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Barrier cream and Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

Respiratory Protection:

Exposure Range >5 to 50 mg/m³: Air Purifying, Negative Pressure, Half Mask

Exposure Range >50 to 500 mg/m³: Air Purifying, Negative Pressure, Full Face

Exposure Range >500 to <5000 mg/m³: Supplied Air, Constant Flow/Pressure Demand, Full Face

Exposure Range 5000 to unlimited mg/m³: Self-contained Breathing Apparatus, Pressure Demand, Full Face

Cartridge Color: dust/mist filter (use P100 or consult supervisor for appropriate dust/mist filter)

Other: Overalls. Eyewash unit. Ensure there is ready access to a safety shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Finely divided grey to off-white colored powder with no odor. Hardens after reaction with water. A finely ground mixture of cement clinker and gypsum, surface area 300-500 m²/kg (Blaine Method).

Physical State: Divided solid

Vapor Pressure (kPa): Not applicable

Vapor Density (Air=1): Not applicable

Formula Weight: Not applicable.

Specific Gravity (H₂O=1, at 4 °C): 3.0-3.2

Water Solubility: Insoluble

Evaporation Rate: Not applicable

pH: alkaline

Boiling Point Range: No data found.

Freezing/Melting Point Range: > 1200 °C (2192 °F)

Decomposition Temperature (°C): Not applicable

Section 10 - Stability and Reactivity

Stability/Polymerization: Product is considered stable. Hazardous polymerization will not occur.

Storage Incompatibilities: Segregate from strong oxidizers and strong acids.

Section 11 - Toxicological Information

No relevant toxicological data found at time of research.

See NIOSH, RTECS VV 8770000, for additional data.

Section 12 - Ecological Information

Environmental Fate: No data found.

Ecotoxicity: No data found.

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible or consult manufacturer for recycling options.

Follow applicable federal, state, and local regulations.

Bury residue in an authorized landfill.

Recycle containers where possible, or dispose of in an authorized landfill.

Section 14 - Transport Information**DOT Transportation Data (49 CFR 172.101):**

Shipping Name: NONE

Additional Shipping Information:

Hazard Class: None

ID No.: None

Packing Group: None

Label: No class label assigned

Section 15 - Regulatory Information**EPA Regulations:**

RCRA 40 CFR: Not listed

CERCLA 40 CFR 302.4: Not listed

SARA 40 CFR 372.65: Not listed

SARA EHS 40 CFR 355: Not listed

TSCA: Listed

Section 16 - Other Information

Research Date:1999-11 **Review Date:**2000-07

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CAS # 65997-15-1

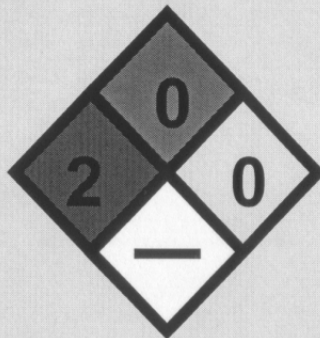
Caution

13

Portland Cement

hydraulic cement; portland cement silicate

Gray powder; odorless. Irritating to eyes/skin/respiratory tract. Also Causes (on contact with wet cement): corneal edema, skin burns, dermal necrosis, first/second/third degree burns, esophagus/stomach burns. Chronic: bronchitis, dermatitis.



Target Organs



Eyes



Skin



Respiratory
System

3910

Personal Protective Equipment

8



Goggles



Gloves



Apron



is respirator
required?

Emergency Procedures



First Aid

4

Inhalation: Remove to fresh air and support breathing.
Eyes/Skin: Flush with flooding amounts of water. Thoroughly wash skin with soap and water. Ingestion: Do not induce vomiting. Contact physician immediately.



Fire

5

Noncombustible. Use agent suitable for surrounding fire.



Spills & Leaks

6

Notify safety personnel, isolate and ventilate area, deny entry, and stay upwind. DO NOT SWEEP! Carefully scoop up or vacuum (with a HEPA filter). Cleanup crew should protect against exposure.

Consult MSDS 0718 for more information

Section 1 - Chemical Product and Company Identification

54.1

Material Name: Unleaded Gasoline

CAS Number: 8006-61-9

Chemical Formula: Mixture of hydrocarbons

Synonyms: AUTOMOTIVE GASOLINE, LEAD-FREE; GASOLINE; MOTOR FUEL; MOTOR SPIRITS; NATURAL GASOLINE; PETROL; UNLEADED PETROL

General Use: Lead free motor fuel for internal combustion engines, 2-stroke and 4-stroke.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
gasoline	8006-61-9	>90
benzene	71-43-2	5 max.

OSHA PEL

No data found.

NIOSH REL

No data found.

OSHA PEL Vacated 1989 Limits

TWA: 300 ppm; 900 mg/m³;

STEL: 500 ppm; 1500 mg/m³.

ACGIH TLV

TWA: 300 ppm; 890 mg/m³;

STEL: 500 ppm; 1480 mg/m³.

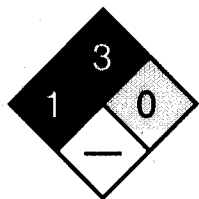
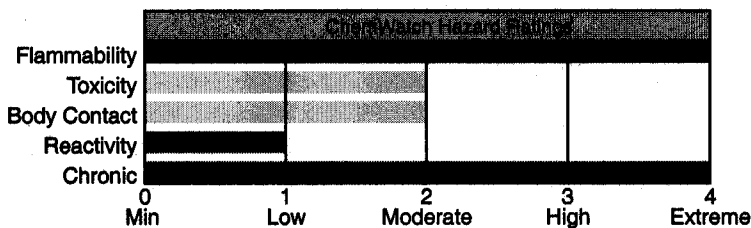
Section 3 - Hazards Identification

HMIS

2 Health

3 Flammability

1 Reactivity



Fire Diamond

ANSI Signal Word

Danger!



Flammable

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Clear liquid; distinctive odor. Irritating to eyes/skin/respiratory tract. Also causes: dizziness, drunkenness, unconsciousness. Absorbed through skin. Chronic: dermatitis. Possible cancer hazard. Flammable. Can form explosive mixtures in air.

Potential Health Effects

Primary Entry Routes: inhalation, ingestion, skin contact

Target Organs: skin, eye, respiratory system, central nervous system (CNS)

Acute Effects

Inhalation: The vapor is discomforting to the upper respiratory tract and may be harmful if exposure is prolonged.

Inhalation hazard is increased at higher temperatures. Acute effects from inhalation of high concentrations of vapor are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterized by headache and dizziness, increased reaction time, fatigue and loss of coordination. If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death.

WARNING: Intentional misuse by concentrating/inhaling contents may be lethal. High inhaled concentrations of mixed hydrocarbons may produce narcosis characterized by nausea, vomiting and lightheadedness. Inhalation of aerosols may produce severe pulmonary edema, pneumonitis and pulmonary hemorrhage. Inhalation of petroleum hydrocarbons consisting substantially of low molecular weight species may produce irritation of mucous membranes, incoordination, giddiness, nausea, vertigo, confusion, headache, appetite loss, drowsiness, tremors and anesthetic stupor. Massive exposures may produce central nervous system depression with sudden collapse and deep coma; fatalities have been recorded. Irritation of the brain and/or apneic anoxia may produce convulsions. Although recovery following overexposure is generally complete, cerebral micro-hemorrhage of focal post-inflammatory scarring may produce eleptiform seizures some months after the exposure. Pulmonary episodes may include chemical pneumonitis with edema and hemorrhage. The lighter hydrocarbons may produce kidney and neurotoxic effects. Liquid paraffins may produce anesthesia and depressant actions leading to weakness, dizziness, slow and shallow respiration, unconsciousness, convulsions and death. C_{5-7} paraffins may also produce polyneuropathy. Aromatic hydrocarbons accumulate in lipid-rich tissues (typically the brain, spinal cord and peripheral nerves) and may produce functional impairment manifested by nonspecific symptoms such as nausea, weakness, fatigue, vertigo; severe exposures may produce inebriation or unconsciousness. Many of the petroleum hydrocarbons are cardiac sensitizers and may cause ventricular fibrillations.

Eye: The liquid may produce eye discomfort and is capable of causing temporary impairment of vision and/or transient eye inflammation, ulceration. The vapor is discomforting to the eyes. Petroleum hydrocarbons may produce pain after direct contact with the eyes. Slight, but transient, disturbances of the corneal epithelium may also result. The aromatic fraction may produce irritation and lachrymation. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Skin: The material is moderately discomforting to the skin if exposure is prolonged. The material contains a component that may be absorbed through the skin and may cause drying of the skin, which may lead to dermatitis from repeated exposures over long periods. Toxic effects may result from skin absorption. Open cuts, abraded or irritated skin should not be exposed to this material. The material may accentuate any pre-existing dermatitis condition.

Ingestion: Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis. Ingestion of petroleum hydrocarbons may produce irritation of the pharynx, esophagus, stomach and small intestine with edema and mucosal ulceration. Resulting symptoms include a burning sensation in the mouth and throat. Large amounts may produce narcosis with nausea and vomiting, weakness or dizziness, slow and shallow respiration, swelling of the abdomen, unconsciousness and convulsions. Myocardial injury may produce arrhythmias, ventricular fibrillation and electrocardiographic changes. Central nervous system depression may also occur. Light aromatic hydrocarbons produce a warm, sharp, tingling sensation on contact with taste buds and may anesthetize the tongue. Aspiration into the lungs may produce coughing, gagging, and a chemical pneumonitis with pulmonary edema and hemorrhage.

Carcinogenicity: NTP - Not listed; IARC - Group 2B, Possibly carcinogenic to humans; OSHA - Not listed; NIOSH - Listed as carcinogen; ACGIH - Class A3, Animal carcinogen; EPA - Not listed; MAK - Not listed.

Chronic Effects: Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. Prolonged or continuous skin contact with the liquid may cause defatting with drying, cracking, irritation and dermatitis following. Chronic poisoning may occur from vapor inhalation or skin absorption. The most significant toxic effect is insidious and irreversible injury to the blood-forming tissue by benzene. Leukemia may develop. Chronic exposure may cause headache, fatigue, loss of appetite and lassitude with incipient blood effects including anemia and blood changes. Gasoline "sniffing" has caused severe nerve damage. Repeated or prolonged exposure to mixed hydrocarbons may produce narcosis with dizziness, weakness, irritability, concentration and/or memory loss, tremor in the fingers and tongue, vertigo, olfactory disorders, constriction of visual field, paresthesias of the extremities, weight loss and anemia and degenerative changes in the liver and kidney. Chronic exposure by petroleum workers to the lighter hydrocarbons has been associated with visual disturbances, damage to the central nervous system, peripheral neuropathies (including numbness and paresthesias), psychological and neurophysiological deficits, bone marrow toxicities (including hypoplasia, possibly due to benzene) and hepatic and renal involvement. Chronic dermal exposure to petroleum hydrocarbons may result in defatting which produces localized dermatoses. Surface cracking and erosion may also increase susceptibility to infection by microorganisms.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. Lay patient down. Keep warm and rested.

If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital, or doctor.

Eye Contact: Immediately hold the eyes open and wash continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids. Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water). Wash affected areas thoroughly with water (and soap if available). Seek medical attention in event of irritation.

Ingestion: Contact a Poison Control Center. If swallowed, do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:

1. Primary threat to life from pure petroleum distillate ingestion and/or inhalation is respiratory failure.
2. Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases ($pO_2 < 50$ mm Hg or $pCO_2 > 50$ mm Hg) should be intubated.
3. Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
4. A chest x-ray should be taken immediately after stabilization of breathing and circulation to document aspiration and detect the presence of pneumothorax.
5. Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitization to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
6. Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients.

Section 5 - Fire-Fighting Measures

Flash Point: -43 °C

Autoignition Temperature: 280 °C

LEL: 1.4% v/v

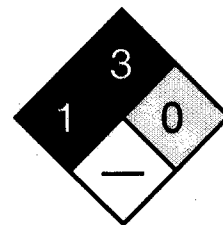
UEL: 7.6% v/v

Extinguishing Media: Foam. Dry chemical powder. Bromochlorodifluoromethane (BCF) (where regulations permit). Carbon dioxide.

General Fire Hazards/Hazardous Combustion Products: Liquid and vapor are highly flammable. Severe fire hazard when exposed to heat, flame and/or oxidizers. Vapor forms an explosive mixture with air. Severe explosion hazard, in the form of vapor, when exposed to flame or spark. Vapor may travel a considerable distance to source of ignition. Heating may cause expansion/decomposition with violent rupture of containers. On combustion, may emit toxic fumes of carbon monoxide (CO).

Fire Incompatibility: Avoid contamination with oxidizing agents, i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc., as ignition may result.

Fire-Fighting Instructions: Alert fire department and tell them location and nature of hazard. May be violently or explosively reactive. Wear breathing apparatus plus protective gloves. Prevent, by any means available, spillage from entering drains or water ways. If safe, switch off electrical equipment until vapour fire hazard removed. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. Do not approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire.



Fire Diamond

Section 6 - Accidental Release Measures

Small Spills: Remove all ignition sources. Clean up all spills immediately. Avoid breathing vapors and contact with skin and eyes. Control personal contact by using protective equipment. Contain and absorb small quantities with vermiculite or other absorbent material. Wipe up. Collect residues in a flammable waste container.

Large Spills: Clear area of personnel and move upwind. Alert fire department and tell them location and nature of hazard. May be violently or explosively reactive. Wear breathing apparatus plus protective gloves. Prevent, by any means available, spillage from entering drains or water ways. No smoking, naked lights or ignition sources. Increase ventilation. Stop leak if safe to do so.

Water spray or fog may be used to disperse/absorb vapor. Contain spill with sand, earth or vermiculite. Use only spark-free shovels and explosion proof equipment. Collect recoverable product into labeled containers for recycling. Absorb remaining product with sand, earth or vermiculite. Collect solid residues and seal in labelled drums for disposal. Wash area and prevent runoff into drains.

If contamination of drains or waterways occurs, advise emergency services.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid generating and breathing mist. Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked. Avoid smoking, bare lights, heat or ignition sources. When handling, DO NOT eat, drink or smoke. Vapor may ignite on pumping or pouring due to static electricity. DO NOT use plastic buckets. Ground and secure metal containers when dispensing or pouring product. Use spark-free tools when handling. Avoid contact with incompatible materials. Keep containers securely sealed. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practices. Observe manufacturer's storing and handling recommendations. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

Recommended Storage Methods: Metal can, metal drum. Packing as recommended by manufacturer. Check all containers are clearly labeled and free from leaks.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: CARE: Use of a quantity of this material in confined space or poorly ventilated area, where rapid build-up of concentrated atmosphere may occur, could require increased ventilation and/or protective gear. Use in a well-ventilated area. If inhalation risk of overexposure exists, wear a NIOSH approved organic-vapor respirator. Correct respirator fit is essential to obtain adequate protection. In confined spaces where there is inadequate ventilation, wear full-face air supplied breathing apparatus. Provide adequate ventilation in warehouse or closed storage areas.

Personal Protective Clothing/Equipment

Eyes: Safety glasses with side shields; or as required, chemical goggles.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Barrier cream with polyethylene gloves or PVC gloves. Safety footwear. Do NOT use this product to clean the skin.

Respiratory Protection:

Exposure Range >300 to 1000 ppm: Air Purifying, Negative Pressure, Half Mask

Exposure Range >1000 to 15,000 ppm: Air Purifying, Negative Pressure, Full Face

Exposure Range >15,000 to 300,000 ppm: Supplied Air, Constant Flow/Pressure Demand, Full Face

Exposure Range >300,000 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face
Cartridge Color: black

Other: Overalls. Ensure that there is ready access to eye wash unit. Ensure there is ready access to an emergency shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Purple, highly flammable, volatile liquid with characteristic sharp odor. Floats on water. Consists of a complex mixture of hydrocarbons with small amounts of residual benzene from the refining operations.

Physical State: Liquid

Vapor Pressure (kPa): 53.33 at 20 °C

Vapor Density (Air=1): > 2

Formula Weight: Not applicable.

Specific Gravity (H₂O=1, at 4 °C): 0.72-0.735 at 15 °C

Water Solubility: Insoluble

Evaporation Rate: Fast

pH: Not applicable

pH (1% Solution): Not applicable.

Boiling Point Range: 38.89 °C (102 °F)

Freezing/Melting Point Range: Not available

Volatile Component (% Vol): 100

Decomposition Temperature (°C): Not available.

Section 10 - Stability and Reactivity

Stability/Polymerization: Presence of incompatible materials. Product is considered stable. Hazardous polymerization will not occur.

Storage Incompatibilities: Avoid storage with oxidizers.

Section 11 - Toxicological Information

Unless otherwise specified, data extracted from RTECS - Registry of Toxic Effects of Chemical Substances

TOXICITY

Oral (rat) LD50: 18800 mg/kg

IRRITATION

Skin (rabbit): 500 mg/24h mild

Section 12 - Ecological Information

Environmental Fate: No data found.

Ecotoxicity: No data found.

Biochemical Oxygen Demand (BOD): 8%, 5 days

Section 13 - Disposal Considerations

Disposal: Consult manufacturer for recycling options and recycle where possible. Follow all applicable federal, state, and local laws. Incinerate residue at an approved site. Recycle containers where possible, or dispose of in an authorized landfill.

BEWARE: Empty solvent, paint, lacquer and flammable liquid drums present a severe explosion hazard if cut by flame torch or welded. Even when thoroughly cleaned or reconditioned, the drum seams may retain sufficient solvent to generate an explosive atmosphere in the drum.

Section 14 - Transport Information**DOT Transportation Data (49 CFR 172.101):**

Shipping Name: MOTOR SPIRIT OR
GASOLINE OR PETROL

Additional Shipping Information: PETROL

Hazard Class: 3.1

ID No.: 1203

Packing Group: II

Label: Flammable Liquid[3]

Section 15 - Regulatory Information**EPA Regulations:**

RCRA 40 CFR: Not listed

CERCLA 40 CFR 302.4: Not listed

SARA 40 CFR 372.65: Not listed

SARA EHS 40 CFR 355: Not listed

TSCA: Listed

Section 16 - Other Information

Research Date:1999-11 **Review Date:**2000-07

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CAS # 8006-61-9

Danger!

1 3

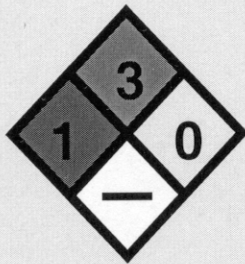


Flammable

Gasoline

gasolene; motor spirits; natural gasoline; petrol

Clear liquid; distinctive odor. Irritating to eyes/skin/respiratory tract. Also Causes: dizziness, drunkenness, unconsciousness. Absorbed through skin. Chronic: dermatitis. Possible cancer hazard. Flammable. Can form explosive mixtures in air.



Target Organs



Eyes



Skin



Respiratory
System



Nervous
System



Liver



Kidneys

3 9 10

Personal Protective Equipment

8



Goggles



Gloves



Apron



is respirator
required?

Emergency Procedures



First Aid

4

Inhalation: Remove to fresh air and support breathing as needed. Eyes/Skin: Remove contaminated clothing. Flush with plenty of water for at least 15 min. Thoroughly wash skin with soap and water. Ingestion: Do not induce vomiting! Consult physician.



Fire

5

Flammable. Can form explosive mixtures in the air. Use dry chemical, carbon dioxide, or foam. Water may be ineffective for extinguishment, but should be used to knock-down vapors and cool containers.



Spills & Leaks

6

Notify safety personnel, isolate and ventilate area. Shut off ignition sources. Take up with inert material such as sand or vermiculite. Do not release to sewers or waterways. Cleanup crew should protect against exposure.

Consult MSDS 0467 for more information