MATERIAL SAFETY DATA SHEET
No. 6 Fuel Oil

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Global Companies LLC
Water Mill Center
800 South St.
Waltham , MA 02454-9161

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800) 424-9300**
COMPANY CONTACT (business hours): Corporate Safety (800) 542-0778

SYNONYMS: #6 Fuel Oil; 6 Oil; Bunker C; Bunkers; High Sulfur Residual Fuel Oil; Low Sulfur Residual Fuel Oil; Residual Fuel Oil
See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS

INGREDIENT NAME	EXPOSURE LIMITS	CONCENTRATION PERCENT BY WEIGHT
Fuel Oil, Residual	OSHA PEL-TWA: 5 mg/m~ as mineral oil mist	100
CAS NUMBER: 68476-33-5	ACGIH TLV-TWA: 5 mg/m 3 as mineral oil miW	
	*1997 NOIC: sum of 15 NTP-listedpolynuclear aromatic hydrocarbons 0.005 mg/m , A1	
Hydrogen Sulfide (H2S)	OSHA PEL-Ceiling/Peak: 20 / 50 ppm	< trace - see below >
CAS NUMBER: 7783-06-4	ACGIH TLV-TWA/STEL: 10 / 15 ppm	

A complex combination of heavy (high boiling point) petroleum hydrocarbons. The amount of sulfur varies with product specification and does not affect the health and safety properties as outlined in this Material Safety Data Sheet. Hydrogen Sulfide (H2S) may be present in trace quantities (by weight), but may accumulate to toxic concentrations such as in tank headspace. The presence of H2S is highly variable, unpredictable and does not correlate with sulfur content. Studies with similar products have shown that 1 ppm H2S by weight in liquid may produce 100 ppm or more H2S in the vapor headspace of the storage tank .

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
CAUTION!
COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation. Long-term, repeated exposure may cause skin cancer. Hot liquid may cause thermal burns. If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).
HYDROGEN SULFIDE (toxic gas) may accumulate in tank vapor space. High concentration may cause immediate unconsciousness - death may result unless victim is promptly and successfully resuscitated. Hydrogen sulfide causes eye irritation.

EYES
Contact with eyes may cause mild to moderate irritation.
SKIN
May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. May cause dermal sensitization. Liquid may be hot (typically 110 - 140 'F) which could cause 1st, 2nd, or 3rd degree thermal burns.

INGESTION
This material has a low order of acute toxicity. If large quantities are ingested, nausea, vomiting and diarrhea may result. Ingestion may also cause effects similar to inhalation of the product. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

INHALATION
Because of its low vapor pressure, this product presents a minimal inhalation hazard at ambient temperature. Upon heating, fumes may be evolved. Inhalation of fumes or mist may result in respiratory tract irritation and central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

WARNING: Irritating and toxic hydrogen sulfide gas may be found in confined vapor spaces. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness, loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid or immediate unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated.
The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

CHRONIC and CARCINOGENICITY
Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11, Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

FUEL OIL COMBUSTION ASH
Trace amounts of nickel, vanadium, and other metals in slurry oil can become concentrated in the oxide form in combustion ash deposits. Vanadium is a toxic metal affecting a number of organ systems. Nickel is a suspect human carcinogen (lung, nasal, sinus), an eye, nose, and throat irritant, and can cause allergic skin reaction in some individuals. See Section 7 for appropriate work practices.

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	> 140 °F (60 C) (minimum) ASTM D-93
AUTOIGNITION TEMPERATURE:	> 765 °F (>407 OC)
OSHA/NFPA FLAMMABILITY CLASS:	IIIA (COMBUSTIBLE)
LOWER EXPLOSIVE LIMIT	N/D
UPPER EXPLOSIVE LIMIT	N/D

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

CAUTION: flammable vapor production at ambient temperature in the open is expected to be minimal unless the oil is heated above its flash point. However, industry experience indicates that light hydrocarbon vapors can build up in the headspace of storage tanks at temperatures below the flash point of the oil, presenting a flammability and explosion hazard. Tank headspaces should be regarded a potentially flammable, since the oil's flash point can not be regarded as a reliable indicator of the potential flammability in tank headspaces.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, C02, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.
Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.
Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.
See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPCC,SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.
Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Do not touch or walk-through spilled material. Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors.
Take up with dry earth, sand or other non-combustible, inert oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container with clean, non-sparking tools for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8). Local and / or Federal notification may be required if this material is released to the environment (see Section 15 for additional information).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

Product is generally transported and stored hot (typical 110 - 120 'F). Handle as a combustible liquid.
Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.
Store in a well-ventilated area. Protect containers from damage and vehicular traffic. Post “No Smoking” signs in product storage areas. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".
Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated prior to entry.

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use gasoline or solvents (naphtha, kerosene, etc.) for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

OTHER/GENERAL PROTECTION

Petroleum industry experience indicates that a program providing for good personal hygiene, proper use of personal protective equipment, and minimizing the repeated and prolonged exposure to liquids and fumes, as outlined in this MSDS, is effective in reducing or eliminating the carcinogenic risk of high boiling aromatic oils (polynuclear aromatic hydrocarbons) to humans.

FUEL OIL ASH PRODUCTS Personnel exposed to ash should wear appropriate protective clothing (example, DuPont Tyvek fl, wash skin thoroughly, launder contaminated clothing separately, and wear respiratory protection approved for use against toxic metal dusts (such as HEPA filter cartridges). Wetted-down combustion ash may evolve toxic hydrogen sulfide (H2S) - confined spaces should be tested for H2S prior to entry if ash is wetted.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying

SKIN PROTECTION

Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont Tyvek QC@, Saranex@, TyChem@ or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information

RESPIRATORY PROTECTION

If a hydrogen sulfide hazard is present (that is, exposure potential above H2S permissible exposure limit), use a positive-pressure SCBA or Type C supplied air respirator with escape bottle.

Where it has been determined that there is no hydrogen sulfide exposure hazard (that is, exposure potential below H2S permissible exposure limit), a NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

Black, viscous liquid

ODOR

Heavy, petroleum/asphalt-type odor

Hydrogen sulfide (H2S) has a rotten egg "sulfurous" odor. This odor should not be used as a warning property of toxic levels because H2S can overwhelm and deaden the sense of smell. Also, the odor of H2S in heavy oils can easily be masked by the petroleum-like odor of the oil. Therefore, the smell of H2S should not be used as an indicator of a hazardous condition - a H2S meter or colorimetric indicating tubes are typically used to determine the concentration of H2S-

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	> 500 °F (> 260 OC)
VAPOR PRESSURE:	<0.1 psia @ 70 °F (21 OC)
VAPOR DENSITY (air = 1):	NA
SPECIFIC GRAVITY (H20 = 1):	AP 0.97 (varies)
PERCENT VOLATILES:	Negligible
EVAPORATION RATE:	negligible
SOLUBILITY (H20):	negligible

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

INCOMPATIBLE MATERIALS

Keep away from strong acids and oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS:

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute dermal LD50 (rabbits): > 5 ml/kg Acute oral LD50 (rats): 5.1 ml/kg
Primary dermal irritation: slightly irritating (rabbits) Draize eye irritation: mildly irritating (rabbits)
Guinea pig sensitization: mildly sensitizing

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: **OSHA:** NO 1ARC: 2B (animal) NTP: YES **ACGIH:** 1997 NOIC: Al
This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation. The presence of carcinogenic PNAs indicates that precautions should be taken to minimize repeated and prolonged inhalation of fumes or mists.

MUTAGENICITY (genetic effects)

Materials of similar composition have been positive in mutagenicity studies.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage and waterways. Report spills and releases, as applicable, under Federal and State regulations. (See Section 15 for additional information).

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options. Combustion ash may be a characteristic hazardous waste. If disposed, this product would be considered a hazardous waste under RCRA with an EPA waste code of D001 for the characteristic of ignitibility.

14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME: Combustible liquid, n.o.s. (No. 6 Fuel Oil)
HAZARD CLASS and PACKING GROUP: Combustible Liquid , PG III
DOT IDENTIFICATION NUMBER: NA 1993
DOT SHIPPING LABEL: none
EMERGENCY RESPONSE GUIDEBOOK GUIDE NUMBER: 128

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1 -800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X		

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product does not contain any chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. However, Polycyclic Aromatic Compounds (PACs) are coincidentally manufactured from the combustion of various fuel oils and other petroleum products. Under SARA Section 313, the de minims exemption has been eliminated for PACs and other listed persistent bio-accumulative and toxic chemicals (PBTs). Refer to EPA guidance for additional reporting information.

EPA NOTIFICATION (OIL SPILLS)

If the there is a discharge of more than 1,000-gallons of oil into or upon navigable waters of the United States, or if it is the second spill event of 42 gallons or more of oil into water within a twelve (12) month period, a written report must be submitted to the Regional Administrator of the EPA within sixty days of the event.

CANADIAN REGULATORY INFORMATION (WHMIS)
Class B, Division 3 (Combustible Liquid)

16. OTHER INFORMATION

NFPA@ HAZARD RATING	HEALTH:	0	Negligible
	FIRE:	2	Moderate
	REACTIVITY:	0	Negligible
HMIS@) HAZARD RATING	HEALTH:	1*	Slight
	FIRE:	2	Moderate
	REACTIVITY:	0	Negligible
	*Chronic		

SPECIAL HAZARDS: Container vapor space may contain hydrogen sulfide (poison gas).

ABBREVIATIONS:

AP = Approximately	< = Less than	>= Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	OSHA	U.S. Occupational Safety & Health Administration
API	American Petroleum Institute	PEL	Permissible Exposure Limit (OSHA)
AIHA	American Industrial Hygiene Association	RCRA	Resource Conservation and Recovery Act
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	REL	Recommended Exposure Limit (NIOSH)
ANSI	American National Standards Institute	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
DOT	U.S. Department of Transportation	SCBA	Self-Contained Breathing Apparatus
EPA	U.S. Environmental Protection Agency	SPCC	Spill Prevention, Control, and Countermeasures
HMIS	Hazardous Materials Information System	STEL	Short-Term Exposure Limit (generally 15 minutes)
IARC	International Agency For Research On Cancer	TLV	Threshold Limit Value (ACGIH)
MSHA	Mine Safety and Health Administration	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average (8 hr.)
NIOSH	National Institute of Occupational Safety and Health	WEEL	Workplace Environmental Exposure Level (AIHA)
NOIC	Notice of Intended Change	WHMIS	Canadian Workplace Hazardous Materials Information System
NTP	National Toxicology Program		
OPA	Oil Pollution Act of 1990		

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