A Valero Company

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS NUMBER: 5103

MSDS DATE: April 1, 2010

PRODUCT NAME: HEAVY FUELS

TRANSPORTATION EMERGENCIES: **CALL CANUTEC AT (613) 996-6666**

Ontario Regional Poison Information Center
1-800-267-1373 (Ottawa)
1-800-268-9017 (Toronto)

Nova Scotia / PEI Poison Control Center:
1-800-565-8161

Quebec Poison Control Center
1-800-463-5060
New Brunswick Poison Information Center
(506) 857-5555
Newfoundland Poison Control Center
(709) 722-1110

MSDS ASSISTANCE: **888-871-4404**

SUPPLIER'S NAME/ADDRESS:
ULTRAMAR LTD
2200 McGill College
Montreal, Quebec H3A 3L3
(514) 499-6111

CHEMICAL NAME: Complex Hydrocarbon Mixture **CAS NUMBER:** Mixture

SYNONYMS/COMMON NAMES: This Material Safety Data Sheet applies to the following product descriptions for Hazard Communication purposes only. Technical specifications vary greatly depending on the product and are not reflected in this document. Consult specification sheets for technical information.

Bunker Fuel #4 **Bunker Fuel #5** **Marine Fuel Oil**
Bunker Fuel #6C

2. COMPOSITION, INFORMATION ON INGREDIENTS

PRODUCT USE: This product is intended for use as fuel in boilers and heaters, or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.

DESCRIPTION: Heavy fuel is a complex mixture of hydrocarbons from a variety of chemical processes blended to meet standardized product specifications. Composition varies greatly and includes C20 and heavier hydrocarbons with a boiling range above 660°F. The following is a non-exhaustive list of common components, typical percentage ranges in product, and occupational exposure limits for each. Functional and performance additives may also be present at concentrations below reporting thresholds.

Component or Material Name	%	CAS Number	ACGIH Limits TLV	STEL	Units	OSHA Exposure Limits PEL	STEL	C/P	Units
Cat Cracked Distillate, light	0-30	64741-59-9	NA	NA	NA	NA	NA	NA	NA
Light Vacuum Gas Oil	0-70	70592-77-7	NA	NA	NA	NA	NA	NA	NA
Distillate residuum	0-70	68334-31-6	NA	NA	NA	NA	NA	NA	NA
Light Gas Oil	0-50	64741-44-2	NA	NA	NA	NA	NA	NA	NA
Heavy Gas Oil	0-70	68915-96-8	NA	NA	NA	NA	NA	NA	NA
Cat Cracked Clarified Oil	0-70	64741-62-4	NA	NA	NA	NA	NA	NA	NA
Fuel Oil No. 2	0-50	68476-30-2	100	NA	mg/m3	NA	NA	NA	NA

Product is a mixture of one or more of these components

Basis for LD_{50} and LC50 values	LD_{50} value	Species & route	LC_{50} Value	Species and route
Cat Cracked Clarified Oil	4.3 g/kg	Rat- oral		
Fuel Oil No. 2	14.5 g/kg	Rat- oral	5 g/m^3/ 4H	Rat by inhalation
Light Gas Oil ingredient			1.7 g/m^3 /4 H	Rat by inhalation

3. HAZARDS IDENTIFICATION

HEALTH HAZARD DATA:

1) The major effects of this product are sensitization of the skin and skin irritation.
2) Due to the presence of sulphur in the product, formation of Hydrogen sulphide and sulphur dioxide is possible. **Hydrogen Sulphide** has a rotten egg odour and is Immediately Dangerous to Life and Health (IDLH) at concentrations exceeding 100 ppm. It can cause pulmonary edema at concentrations exceeding 250 ppm. Odour is not a good indication of concentration due to olfactory fatigue at concentrations greater than 20 ppm. Exposure can result in irritation to the eyes and respiratory system, dizziness, headaches, and fatigue at concentrations above 10 ppm. **Sulphur dioxide** has an irritating pungent odour and has an IDLH value of 100 ppm. The gas can cause irritation of eyes, nose and throat, choking, coughing, and broncho constriction. At high concentrations, sulphur dioxide can cause skin and eye burns.
3) Product may contain low levels of polycyclic aromatic hydrocarbons (PAH), some of which have been shown to initiate or promote cancer growth in humans and animals. Among these, chrysene, benzo(a)pyrene, benz(a)anthracene, and benzo(b)fluoranthene may cause skin or lung cancer, and are classified as suspect or probable human carcinogens or confirmed animal carcinogens by ACGIH (A2 or A3), EPA (B2), NTP (2A or 2B) and IARC (2A or 2B). Increased frequency of skin cancer has been observed in workers exposed to PAH containing coal gas, cigarette, roofing tar, and coke oven emissions. Epidemiological studies have shown a correlation between exposure to benzo(a)pyrene and lung cancer mortality. Animal studies show benzo(a)pyrene to be carcinogenic at low doses. Animal studies (mice) have indicated that chrysene is a skin tumour initiator. Animal studies show benz(a)anthracene to be skin tumour initiator, but less potent than benzo(a) pyrene.

HAZARDS OF COMBUSTION PRODUCTS: This product may contain small amounts (<0.5%) of sulphur. Products of combustion potentially may contain sulphur dioxide. Symptoms of exposure to sulphur dioxide at lower concentrations of 50 ppm include severe eye and upper respiratory irritation. NIOSH has established an IDLH exposure level of 100 ppm, based on maximum tolerable concentration data in humans.
MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: Medical conditions which have the same symptoms and effects as those outlined under the health hazard information section can be aggravated by exposure to this product.
MEDICAL LIMITATION: N/A

ROUTES OF EXPOSURE

INHALATION: May cause mild irritation of the upper respiratory tract but may become more severe several hours after exposure. Under extremely high concentration, central nervous system stimulation may occur possibly

followed by depression, dizziness, headache, discoordination, anaesthesia, and respiratory arrest.
SKIN CONTACT: Defatting may occur with continued or prolonged contact. Irritation and a burning sensation may occur on exposure to liquid or vapours.
SKIN ABSORPTION: Not significant.
EYE CONTACT: Severe burning sensation with temporary irritation and swelling of lids.
INGESTION: Irritation of mucous membranes of throat, esophagus, and stomach, which may result in nausea and vomiting; depression may occur if absorbed. Aspiration into lungs may result in chemical pneumonitis. (See Notes To Physician)

CARCINOGENICITY STATEMENT: Bunker Fuel Oil is listed as a possible human carcinogen (2B) by IARC. This product is not listed as a human carcinogen by NTP, OSHA, and ACGIH. This product contains a small percentage of polycyclic aromatic hydrocarbons (PAH), some of which are recognized as having carcinogenic potential in humans.

EFFECTS OF OVEREXPOSURE
ACUTE: May cause skin and upper respiratory tract irritation**.**
CHRONIC: PAH in product may cause skin cancer.

MUTAGENICITY/TERATOGENICITY/ REPRODUCTIVE TOXICITY INFORMATION
Mutagenicity: No information available.
Teratogenicity: No teratogenic effects observed in animal studies.
Reproductive Toxicity: No information available.

4. FIRST AID MEASURES

EYES: Immediately flush eyes with large amount of water for at least 15 minutes holding lids apart to ensure flushing of the entire eye surface. SEEK MEDICAL ATTENTION**.**
SKIN: Wash contaminated areas with plenty of soap and water. A soothing ointment may be applied to irritated skin after thoroughly cleansing. Remove contaminated clothing and footwear. SEEK MEDICAL ATTENTION.
INHALATION: Get person out of contaminated area to fresh air. If breathing has stopped resuscitate and administer oxygen if readily available. **SEEK MEDICAL ATTENTION IMMEDIATELY**.
INGESTION: Never give anything by mouth to an unconscious person. If swallowed, do not induce vomiting. If vomiting occurs spontaneously, keep airway clear. **SEEK MEDICAL ATTENTION IMMEDIATELY.**
NOTES TO PHYSICIAN: Do not induce vomiting, use gastric lavage only. Aspiration of liquid into the lungs could result in Chemical pneumonitis. Use of adrenaline is not advised. Treat symptomatically.

5. FIRE AND EXPLOSION DATA

FLASH POINT: > 40°C (ASTM D93)
AUTOIGNITION TEMPERATURE: > 400 °C (Estimated)
FLAMMABLE LIMITS IN AIR: UEL: 7 %
LEL: 0.9%
EXTINGUISHING MEDIA: Use dry chemical, carbon dioxide, foam or water spray. Water may be ineffective in fighting fires of liquids with low flash points, but water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect persons attempting to stop a leak.
SPECIAL FIRE FIGHTING PROCEDURES: Pressure-demand, self contained, breathing apparatus should be provided for fire fighters in buildings or confined areas where product is stored.
UNUSUAL FIRE AND EXPLOSION HAZARD: None
SENSITIVITY TO STATIC DISCHARGE /MECHANICAL IMPACT: May accumulate static discharge. No sensitivity to impact.

6. ACCIDENTAL RELEASE MEASURES

If material is spilled or released to the atmosphere, steps should be taken to contain liquid and prevent discharges to streams or sewer systems; and control or stop the loss of volatile materials to the atmosphere. Spills or releases should be reported, if required to the appropriate local, state and federal regulatory agencies.

SMALL SPILLS: Remove ignition sources. Absorb spilled material with non-combustible materials such as cat litter, dirt, sand, or petroleum sorbent pads/pillows. Do not use combustible materials like rags, wood chips, or saw dust. Remove contaminated materials to an appropriate disposal container.
LARGE SPILLS: Remove ignition sources. Dike spill area with sand or dirt to contain material and cover sewers/drains. Remain upwind and keep unnecessary people away. Contact trained emergency response team for cleanup. Remove liquid using grounded suction pumps, isolate hazard area and deny entry.

7. HANDLING AND STORAGE INFORMATION

Store only in approved containers. Protect containers against physical damage. Outside or detached storage is preferred. Separate from oxidizing materials. Store in cool, well ventilated area of non-combustible construction away from possible sources of ignition. Keep away from incompatible materials and follow NFPA 30 for storage requirements.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION REQUIREMENTS: Work in well ventilated areas; use good engineering to process, transfer and store; special ventilation is not required unless product is sprayed or heated; good engineering controls are required in high volume uses.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY: Respiratory protection is not required unless product is sprayed or heated. Use NIOSH certified respiratory protection where spray, mists, vapours may be generated; following manufacturer's recommendations. Supplied air respiratory protection is required for IDLH areas.
EYE: Face shield and goggles or chemical goggles should be worn where mist or spray may be generated.
GLOVES: Impermeable protective gloves (nitrile) should be worn during routine handling of this product.
OTHER CLOTHING AND EQUIPMENT: Clothing contaminated with this product should be removed, washed in soap and water and dried before reuse. Shoes which have been contaminated with this product and can not be decontaminated should be discarded. Shower and eyewash facilities should be accessible.

EXPOSURE MONITORING

BIOLOGICAL: No applicable procedure, breath analysis for hydrocarbons has been suggested.
PERSONAL/AREA: Monitoring for exposure to polycyclic aromatic hydrocarbon (PAH) particulates is recommended where product is heated or used in large quantities with no local exhaust. Collect air samples on PTFE filters in series with XAD-2 sorbent tubes, in accordance with NIOSH Method 5515.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Black or dark brown viscous liquid with sulphurous, tar-like odour.
BOILING RANGE @ 760 mm Hg: NA
VAPOR DENSITY (Air=1): 5
EVAPORATION RATE (BuAc=1): Slow
SPECIFIC GRAVITY (H_2O=1): 0.98
SOLUBILITY IN H_2O % BY WT.: Insoluble
COEFFICENT OF WATER/OIL DISTRIBUTION: NA
VISCOSITY: NA
FREEZING POINT: NA
VAPOR PRESSURE: < 5 mmHg @ 20 °C
% VOLATILES BY VOL.: 0- 50
pH: NA

10. STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY: Under normal conditions, the material is stable.
INCOMPATIBILITY: Avoid contact with oxidizers and sources of ignition.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, sulphur dioxide, hydrogen sulphide, and other toxic combustion products.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: None

11. TOXICOLOGICAL INFORMATION

For further information, contact MSDS Assistance.

12. ECOLOGICAL INFORMATION

For further information, contact MSDS Assistance.

13. DISPOSAL CONSIDERATIONS

Shipment, storage, disposal, and cleanup actions of waste materials are regulated under local, provincial, and federal rules. Contact the appropriate agencies if uncertain of applicability.

14. TRANSPORT INFORMATION

This product is not regulated under the Canadian TDG act

United States

DOT PROPER SHIPPING NAME	Combustible liquid, NSA (heavy fuel)
DOT HAZARD CLASS	3
DOT PACKING GROUP	III
I.D. NUMBER	NA 1993

15. REGULATORY INFORMATION

WHMIS CLASS:
Class D2A: Materials Causing Other Toxic Effects- Carcinogenicity
Class D2B: Materials Causing Other Toxic Effects- Mutagenicity
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. PREPARER & OTHER INFORMATION

MSDS Prepared By:
ULTRAMAR LTD

NFPA (National Fire Protection Association) Hazard Ratings Codes

Fire	Health	Reactivity	Other
2	1	0	Blank

Based on "Standard System for the Identification of the Fire Hazards of Materials, NFPA No. 704 M

This Material Safety Data Sheet was prepared by Ultramar Ltd in accordance with SOR/88-66. All information, recommendations and suggestions appearing herein concerning this product are based upon tests and data believed to be reliable, however, it is the user's responsibility to determine the safety, toxicity and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantee expressed or implied is made by Ultramar Ltd as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does Ultramar Ltd assume any liability arising out of use by others of the product referred to herein. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or Desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

Definitions of Material Safety Data Sheet Terminology

GOVERNMENT AGENCIES AND PRIVATE ASSOCIATIONS

ACGIH - American Conference of Governmental Industrial Hygienists, (private association)
CSA- Canadian Standards Association
IARC - International Agency for Research on Cancer, (private association)
NFPA - National Fire Protection Association, (private association)
NIOSH - National Institute of Occupational Safety and Health, U.S. Department of Health and Human Services
NTP - National Toxicology Program, (private association)
WHMIS- Workplace Hazardous Material Information System
TDG – Canadian Regulations for the Transportation of Dangerous Goods

HAZARD AND EXPOSURE INFORMATION

Acute Hazard - An adverse health effect which occurs rapidly as a result of short term exposure.
CAS # - American Chemical Society's Chemical Abstract service registry number which identifies the product and/or ingredients.
Ceiling - The concentration that should not be exceeded during any part of the working exposure
Chronic Hazard - An adverse health effect which generally occurs as a result of long term exposure or short term exposure with delayed health effects and is of long duration
Fire Hazard - A material that poses a physical hazard by being flammable, combustible, phyrophoric or an oxidizer as defined by 29 CFR 1910.1200
Hazard Class - DOT hazard classification
Hazardous Ingredients - Names of ingredients which have been identified as health hazards
IDLH- Immediately Dangerous to Life and Health, the airborne concentration below which a person can escape without respiratory protection and exposure up to 30 minutes, and not suffer debilitating or irreversible health effects. Established by NIOSH.
mg/m^3 - Milligrams of contaminant per cubic meter of air, a mass to volume ratio
N/A - Not available or no relevant information found
NA - Not applicable
PEL - OSHA permissible exposure limit; an action level of one half this value may be applicable
ppm - Part per million (one volume of vapour or gas in one million volumes of air)
Pressure Hazard - A material that poses a physical hazard due to the potential of a sudden release of pressure such as explosive or a compressed gas as defined by 29 CFR 1910.1200
Reactive Hazard - A material that poses a physical hazard due to the potential to become unstable reactive, water reactive or that is an organic peroxide as defined by 29 CFR 1910.1200.
STEL - The ACGIH Short-Term Exposure Limit, a 15-minute Time-Weighted Average exposure which should not be exceeded at any time during a workday, even if the 8-hour TWA is less than the TLV.
TLV - ACGIH Threshold Limit Value, represented herein as an 8-hour TWA concentration.
8-hour TWA - The time weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.
~~W~~ - DO NOT ADD WATER - water reactive materials may produce toxic gas, extreme heat, or chemical reaction on contact with water.
LD_{50} – Single dose of a substance that, when administered by a defined route in an animal assay, is expected to the cause the death of 50% of the defined animal population.
LC_{50} - The concentration of a substance in air that, when administered by means of inhalation over a specified length of time in an animal assay, is expected to cause the death of 50% of a defined animal population.