

Section 1: IDENTIFICATION

Product Name: Liquefied Natural Gas

Synonyms: Liquefied Methane; LNG.

Product Use: Fuel.

Restrictions on Use: Not available.

Manufacturer/Supplier: FortisBC
16705 Fraser Highway
Surrey, BC V3S 2X7

Phone Number: Tilbury: (604) 946-4818 , Mt. Hayes: (236) 933-2060

Emergency Phone: FortisBC Gas Emergency: 1-800-663-9911
LNG Transportation Emergency: 1-877-889-2002

Date of Preparation of SDS: January 7, 2019

Section 2: HAZARD(S) IDENTIFICATION**GHS INFORMATION**

Classification: Flammable Gases, Category 1
Gases Under Pressure - Refrigerated Liquefied Gas
Simple Asphyxiant, Category 1

LABEL ELEMENTS**Hazard****Pictogram(s):**

Signal Word: Danger

Hazard Extremely flammable gas.

Statements: Contains refrigerated gas; may cause cryogenic burns or injury.
May displace oxygen and cause rapid suffocation.

Precautionary Statements

Prevention: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Wear cold insulating gloves and either face shield or eye protection.

Response: Get immediate medical advice/attention.
Thaw frosted parts with lukewarm water. Do not rub affected area.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
In case of leakage, eliminate all ignition sources.

Storage: Store in a well-ventilated place.

Disposal: Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients with Unknown Toxicity: None.

This material is considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200). This material is considered hazardous by the Hazardous Products Regulations.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	Common name / Synonyms	CAS No.	% vol./vol.
Methane	Not available.	74-82-8	85 - 95
Ethane	Not available.	74-84-0	2 - 10
Propane	Not available.	74-98-6	0.5 - 5
Butane	Not available.	106-97-8	0.1 - 1
Isobutane	Not available.	75-28-5	0.1 - 1
Pentane	Not available.	109-66-0	< 0.1
Isopentane	Not available.	78-78-4	< 0.1
Carbon dioxide	Not available.	124-38-9	< 0.1

Section 4: FIRST-AID MEASURES

Inhalation:	<p>If inhaled: Call a poison center or doctor if you feel unwell.</p> <p>Acute and delayed symptoms and effects: May displace oxygen and cause rapid suffocation. Central nervous system depression can occur if product is present in concentrations that will reduce the oxygen content of air below 18 % (vol). Symptoms may include headache, lightheadedness, drowsiness, disorientation, vomiting and seizures. Unconsciousness and death may occur with severe oxygen deprivation.</p>
Eye Contact:	<p>Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. If in eyes: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.</p> <p>Acute and delayed symptoms and effects: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result.</p>
Skin Contact:	<p>Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. If on skin: Wash with plenty of water. Get immediate medical advice/attention. Thaw frosted parts with lukewarm water. Do not rub affected area. Do not remove adherent material or clothing.</p> <p>Acute and delayed symptoms and effects: Contains refrigerated gas; may cause cryogenic burns or injury. Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.</p>
Ingestion:	<p>Not a normal route of exposure.</p> <p>Acute and delayed symptoms and effects: Not a normal route of exposure.</p>
General Advice:	<p>In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).</p>
Note to Physicians:	<p>Symptoms may not appear immediately.</p>

Section 5: FIRE-FIGHTING MEASURES**FLAMMABILITY AND EXPLOSION INFORMATION**

Extremely flammable gas. Contains refrigerated gas; may cause cryogenic burns or injury. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. Methane is lighter than air and will rise. Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. **ALWAYS** stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Sensitivity to Mechanical Impact: This material is not sensitive to mechanical impact.

Sensitivity to Static Discharge: This material is sensitive to static discharge.

MEANS OF EXTINCTION

Suitable Extinguishing Media: Dry chemical, water spray or fog. High expansion foam may be used to help control the vapourization rate. Move containers from fire area if you can do it without risk.

Unsuitable Extinguishing Media: Do not direct water spray directly at LNG pool; this will only increase rate of vapourization. Do not use carbon dioxide or low expansion foams. Cold vapour is heavier than air and will not readily disperse until warmed up.

Products of Combustion: Oxides of carbon.

Protection of Firefighters: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. Vapors may cause dizziness or asphyxiation without warning. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Section 6: ACCIDENTAL RELEASE MEASURES

Emergency Procedures: As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Many gases are heavier than air and will spread along ground and collect in low or

confined areas (sewers, basements, tanks). Keep out of low areas. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded.

Exclusion Zones and Evacuation (ERG 2016):

- Small Spill (Small vapour cloud or visible vapour plumes): Downwind exclusion zone of at least 100 metres.
- Large Spill (Large vapour cloud): Consider initial downwind evacuation up to 800 metres (1/2 mile). Stay out of vapour cloud.
- Large Spill with Ignition (Large vapour cloud, possible fire and smoke): Evacuate area on a 1600 metres (1 mile) radius.

Personal Precautions: Do not touch or walk through spilled material. Use personal protection recommended in Section 8.

Environmental Precautions: Not normally required.

Methods for Containment: Stop leak if you can do it without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak. Prevent LNG from entering culverts/ drains by diverting LNG away from drains or culverts with absorbent booms.

Methods for Clean-Up: Prevent spreading of vapors through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

Other Information: Allow spilled product to vapourize and disperse to atmosphere. Conventional combustible gas indicators can be used to determine the extent of the gas envelope, but if available, a Laser Gas Detector should be used in order to maintain personnel safety.

Section 7: HANDLING AND STORAGE

Handling:

Use in well ventilated areas. Avoid breathing gas. Avoid breathing the combustion products of gas. Gas can accumulate in confined spaces and may reduce oxygen concentrations in these environments to hazardous levels. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Do not smoke when handling. Electrostatic charges may accumulate with use. Refer to appropriate NFPA and API standards for bonding and grounding requirements. See Section 8 for information on Personal Protective Equipment.

Storage:

Store in cool, dry, well ventilated areas. Store only in vessels designed for LNG storage and follow approved operating procedures. Refer to appropriate NFPA and API standards for the design, operation and maintenance of storage facilities and associated loading, unloading and transfer systems. Protect from direct sunlight. Empty containers may contain residual amounts of liquids or gas. Do not braze, cut, drill, grind, pierce, pressurize, solder or weld used

containers, cylinders and vessels. See Section 10 for information on Incompatible Materials.
Keep out of the reach of children.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure Guidelines****Component**

Methane [CAS No. 74-82-8]

ACGIH: Simple asphyxiant; Explosion hazard

OSHA: No PEL established.

British Columbia: Simple asphyxiant; Explosion hazard

Ethane [CAS No. 74-84-0]

ACGIH: Simple asphyxiant; Explosion hazard

OSHA: No PEL established.

British Columbia: Simple asphyxiant; Explosion hazard

Propane [CAS No. 74-98-6]

ACGIH: Simple asphyxiant; Explosion hazard

OSHA: 1000 ppm (TWA), 1800 mg/m³ (TWA);

British Columbia: Simple asphyxiant; Explosion hazard

Butane [CAS No. 106-97-8]

ACGIH: 1000 ppm (STEL); Explosion hazard (2012)

OSHA: 800 ppm (TWA) [Vacated];

British Columbia: 1000 ppm (STEL); Explosion hazard

Isobutane [CAS No. 75-28-5]

ACGIH: 1000 ppm (STEL); Explosion hazard (2012)

OSHA: No PEL established.

British Columbia: 1000 ppm (STEL); Explosion hazard

Pentane [CAS No. 109-66-0]

ACGIH: 1000 ppm (TWA); (2013)

OSHA: 1000 ppm (TWA), 2950 mg/m³ (TWA);
600 ppm (TWA); 750 ppm (STEL) [Vacated];

British Columbia: 1000 ppm (TWA)

Isopentane [CAS No. 78-78-4]

ACGIH: 1000 ppm (TWA); (2013)

OSHA: No PEL established.

British Columbia: 1000 ppm (TWA)

PEL: Permissible Exposure Limit

TWA: Time-Weighted Average

STEL: Short-Term Exposure Limit

OEL: Occupational Exposure Limit

Engineering Controls:

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

SAFETY DATA SHEET

PERSONAL PROTECTIVE EQUIPMENT (PPE)



- Eye/Face Protection:** Wear face shield and eye protection. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3-92 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.
- Hand Protection:** Wear protective gloves. Wear cold insulating gloves. Consult manufacturer specifications for further information.
- Skin and Body Protection:** Wear protective clothing. Flame resistant clothing that meets the NFPA 2112 and CAN/CGSB 155.20 standards is recommended in areas where material is stored or handled.
- Respiratory Protection:** If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4-11, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.
- General Hygiene Considerations:** Handle according to established industrial hygiene and safety practices. Consult a competent industrial hygienist to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

- Appearance:** Colourless gas.
- Colour:** Colourless.
- Odour:** Odourless (may contain trace amounts of odourant).
- Odour Threshold:** Not available.
- Physical State:** Gas.
- pH:** Not available.
- Melting Point / Freezing Point:** -182.5 °C (-296.5 °F)
- Initial Boiling Point:** -161.5 °C (-258.7 °F)
- Boiling Range:** Not available.
- Flash Point:** -187.8 °C (-306.04 °F)
- Evaporation Rate:** Rapid.
- Flammability (solid, gas):** Extremely flammable gas.
- Lower Flammability Limit:** 5 % (by volume, gas phase)

SAFETY DATA SHEET

Upper Flammability Limit:	15 % (by volume, gas phase)
Vapor Pressure:	466,000 mmHg at 25 °C (77 °F)
Vapor Density:	> 1 (Air = 1) at -112 °C (-169.6 °F)
Relative Density:	0.610 to 0.630 (Air = 1)
Solubilities:	Solubility in water (20 °C): 24.4 parts per million (wt).
Partition Coefficient: n-Octanol/Water:	log Kow: 1.09
Auto-ignition Temperature:	537 °C (998.6 °F) (Gas phase)
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Percent Volatile, wt. %:	100
VOC content, wt. %:	Not available.
Density:	0.45 g/mL (at boiling point)
Coefficient of Water/Oil Distribution:	Not available.

Section 10: STABILITY AND REACTIVITY

Reactivity:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Chemical Stability:	Stable under normal storage conditions.
Possibility of Hazardous Reactions:	None known.
Conditions to Avoid:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Incompatible Materials:	Oxidizers.
Hazardous Decomposition Products:	Not available.

Section 11: TOXICOLOGICAL INFORMATION
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EFFECTS OF ACUTE EXPOSURE
Product Toxicity

Oral: This product is a gas; ingestion is not likely.

Dermal: Not available.

Inhalation: This product is a simple asphyxiant.

Component Toxicity

Component	CAS No.	LD₅₀ oral	LD₅₀ dermal	LC₅₀
Methane	74-82-8	Not available.	Not available.	Not available.
Ethane	74-84-0	Not available.	Not available.	Not available.
Propane	74-98-6	Not available.	Not available.	Not available.
Butane	106-97-8	Not available.	Not available.	658000 mg/m ³ (rat); 4H

SAFETY DATA SHEET

Date of Preparation: January 7, 2019

Isobutane	75-28-5	Not available.	Not available.	57000 ppm (rat); 15M
Pentane	109-66-0	400 mg/kg (rat)	Not available.	364000 mg/m ³ (rat); 4H
Isopentane	78-78-4	Not available.	Not available.	Not available.
Carbon dioxide	124-38-9	Not available.	Not available.	Not available.

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation.**Target Organs:** Skin. Eyes. Respiratory system. Central nervous system.**Symptoms (including delayed and immediate effects)****Inhalation:** May displace oxygen and cause rapid suffocation. Central nervous system depression can occur if product is present in concentrations that will reduce the oxygen content of air below 18 % (vol). Symptoms may include headache, lightheadedness, drowsiness, disorientation, vomiting and seizures. Unconsciousness and death may occur with severe oxygen deprivation.**Eye:** Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result.**Skin:** Contains refrigerated gas; may cause cryogenic burns or injury. Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.**Ingestion:** Not a normal route of exposure.**Skin Sensitization:** Not available.**Respiratory Sensitization:** Not available.**Medical Conditions** Not available.**Aggravated By Exposure:****EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)****Target Organs:** Skin. Eyes. Respiratory system. Central nervous system.**Chronic Effects:** Not available.**Carcinogenicity:** This product does not contain any carcinogens or potential carcinogens as listed by ACGIH, IARC, OSHA, or NTP.**Mutagenicity:** Not available.**Reproductive Effects:** Not available.**Developmental Effects****Teratogenicity:** Not available.**Embryotoxicity:** Not available.**Toxicologically Synergistic Materials:** Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity:	Not available.
Persistence / Degradability:	Not available.
Bioaccumulation / Accumulation:	Not available.
Mobility in Environment:	Not available.
Other Adverse Effects:	Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions: Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

Section 14: TRANSPORT INFORMATION**U.S. Department of Transportation (DOT)**

Proper Shipping Name: UN1972, METHANE, REFRIGERATED LIQUID, 2.1
Class: 2.1
UN Number: UN1972
Packing Group: Not applicable.
Label Code:

**Canada Transportation of Dangerous Goods (TDG)**

Proper Shipping Name: UN1972, METHANE, REFRIGERATED LIQUID, 2.1
Class: 2.1
UN Number: UN1972
Packing Group: Not applicable.
Label Code:

**Section 15: REGULATORY INFORMATION****Chemical Inventories****US (TSCA)**

The components of this product are in compliance with the chemical notification requirements of TSCA.

Canada (DSL)

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

SAFETY DATA SHEET

Federal Regulations

United States

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Methane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Ethane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Propane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Butane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Isobutane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Pentane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Isopentane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000

State Regulations

Massachusetts

US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Component	CAS No.	RTK List
Methane	74-82-8	Listed.
Ethane	74-84-0	Listed.
Propane	74-98-6	Listed.
Butane	106-97-8	Listed.
Isobutane	75-28-5	Listed.
Pentane	109-66-0	Listed.
Isopentane	78-78-4	Listed.
Carbon dioxide	124-38-9	Listed.

New Jersey

US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Component	CAS No.	RTK List
Methane	74-82-8	SHHS
Ethane	74-84-0	SHHS
Propane	74-98-6	SHHS
Butane	106-97-8	SHHS
Isobutane	75-28-5	SHHS
Pentane	109-66-0	SHHS
Isopentane	78-78-4	SHHS
Carbon dioxide	124-38-9	Listed.

Note: SHHS = Special Health Hazard Substance

Pennsylvania

US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Component	CAS No.	RTK List
Methane	74-82-8	Listed.
Ethane	74-84-0	Listed.
Propane	74-98-6	Listed.
Butane	106-97-8	Listed.
Isobutane	75-28-5	Listed.
Pentane	109-66-0	Listed.
Isopentane	78-78-4	Listed.
Carbon dioxide	124-38-9	Listed.

California**California Prop 65:** This product does not contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.**Section 16: OTHER INFORMATION****Disclaimer:**

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for their own particular use.

Date of Preparation of SDS: January 7, 2019**Version:** 2.0**GHS SDS Prepared by:** **Deerfoot Consulting Inc.****Phone: (403) 720-3700**