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SAFETY DATA SHEET - NATURAL GAS

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

ATCO Gas 10035 – 105 Street Edmonton, Alberta T5J 2V6 1-800-511-3447 (toll-free) for information	**Emergency Telephone : (24 –hr)** CANUTEC: 1-613-996-6666 (Call Collect) or (*666 on a cellular phone)

PRODUCT IDENTIFICATION

Manufacturer	Various Suppliers, Pipeline/Distribution quality
Trade Name	Natural Gas
Chemical Name	Methane
Synonyms	Natural Gas/high Methane content
Chemical Family	Alkanes
Molecular Formula	CH_4 (Methane)
Product Use	Natural Gas is used primarily for space and water heating and for industrial processing applications
Method of Transport	Pipeline (under pressure) or high pressure cylinders attached to mobile vehicles

Transportation of Dangerous Goods Regulations

UN 1971; Class 2.1	**Shipping Name and Description: METHANE, COMPRESSED**
WHMIS Classification	**Compressed Gas (Class A)** **Flammable Gas (Class B1)**

SECTION 2. HAZARDOUS IDENTIFICATION

2.1 Classification of the Substance or Mixture

Simple Asphyxiant	Simple Asphyxiants – Category 1; A gas that is a simple asphyxiant
Gases Under Pressure	Gases under pressure / Compressed gas
Flam Gas 1	Flammable gases - Category 1
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

2.2 Label Elements **Hazard Pictograms** :

Signal Word : Danger

Hazard Statements : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
H380 - May displace oxygen and cause rapid suffocation.

Precautionary Statements : P210 - Keep away from heat, sparks, open flames, hot surfaces. No smoking.
P377 - Leaking gas fire: Do not extinguish unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3 Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Asphyxiant gas, can be fatal. May cause damage to the blood, central nervous system, and cardiovascular system. High concentrations of gas can cause unconsciousness and death. Mercaptan is added (rotten egg odour) to the gas, however this smell should not be relied on as a good indicator of the presence of gas as olfactory fatigue (loss of smell) occurs rapidly. Being under the influence of alcohol may enhance the effects of this product.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition			
Hazardous Ingredients	**Common Name/Synonyms**	**CAS No.**	**% Vol./Vol.**
Natural Gas	**N/A**	**8006-14-2**	**100**
Methane	**N/A**	**74-82-8**	**90-99**
Ethane	**N/A**	**74-84-0**	**0-6**
Propane	**N/A**	**74-98-6**	**0-3**
Butane	**N/A**	**106-97-8**	**0-3**
Propane, 2-methyl-	**Isobutane**	**75-28-5**	**0-3**
Pentane	**N/A**	**109-66-0**	**0-3**
Butane, 2-methyl-	**Isopentane**	**78-78-4**	**0-3**
Nitrogen	**N/A**	**7727-37-9**	**0-3**
Carbon dioxide	**N/A**	**124-38-9**	**0-3**
Helium	**N/A**	**744-59-7**	**0-3**

*typically contains <5 ppm mercaptans

SECTION 4. FIRST AID

Skin Contact: First aid is not normally required

Eye Contact: If irritation/redness develops, move victim away from exposure into fresh air
And flush eyes with clean water.

Inhalation: Do not enter a contaminated area unless properly protected (refer to Section 8)
Move victim to uncontaminated area to fresh air
Perform artificial respiration if necessary

	Seek medical assistance
Note to Physicians:	Symptoms may not appear immediately

5. FIRE AND EXPLOSION HAZARD DATA (See Note, Section 11)

Flammability	In the presence of oxygen and in the presence of an ignition source
Flammability Limits (percent in air)	4% - 15%
Fire Extinguishing Media	Dry Chemical (most effective) or carbon dioxide (CO_2) or Halon
Special Procedures:	Shut off flow of gas from a safe location. (if properly trained). Use full protective equipment and Self -contained breathing apparatus (SCBA). Do not extinguise flame until gas flow is shut off. Use gas detectors in confined spaces.
Ignition Temperature	Approximately 630°C (varies with temperature pressure and oxygen concentration)
Auto Ignition Temperature in Air	Range 482°C - 649°C
Upper Explosive Limit	15% gas in air (approximately)
Product of Combustion:	Carbon dioxide and carbon Monoxide
Protection of Firefighters:	Firefighters should wear SCBA in case of oxygen deficient atmostphere. Do not extinguish unless leak can be stopped safety. In case of leakage, eliminate all ignition sources.
Sensitivity to Static Discharge:	Flammable

Section 6. ACCIDENTAL RELEASE MEASURES

Personal Precations:	Use personal protection recommended in Section 8
Enviromental Precautions:	None
Leak and Spill Procedures:	Evacuate area
Leak/Line Break Occurs	Contact emergency number (refer to Section 1) Attempt to keep area clear Do not activate any sorce of ignition such as electrical switches, vehicles, telephones, cellular phone, two way radios or door bells. Eliminate ignition sources such as open flame or sparks.
Methods for Containment	Stay away and upwind of spill/release
Waste Disposal	Vent to outside atmosphere
Other information	Allow to vapourize and dispense to atmosphere

Section 7. HANDLING AND STORAGE

Handling	Observe handling regulations for compressed gases and flammable materials. To be handled by trained personnel only and followed with approved operating procedures.
Storage:	Comply with storage regulations for compressed gases and flammable materials. No smoking or open flames in storage area.
Precautions to be Taken	Avoid personal body contact (skin/eye contact, etc.) with high pressure gas stream
Other Precautions	Avoid all possible sources of accidental ignition (i.e., static electricity or any other explosive source) Test for hazardous concentrations prior to entering meter stations

Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines
Component

Natural gas [CAS No. 8006-14-2]
ACGIH: Simple asphyxiant; Explosion hazard
OSHA: No PEL established.

Methane [CAS No. 74-82-8]
ACGIH: Simple asphyxiant; Explosion hazard
OSHA: No PEL established.

Ethane [CAS No. 74-84-0]
ACGIH: Simple asphyxiant; Explosion hazard
OSHA: No PEL established.

Propane [CAS No. 74-98-6]
ACGIH: Simple asphyxiant; Explosion hazard
OSHA: 1000 ppm (TWA), 1800 mg/m^3 (TWA);

Butane [CAS No. 106-97-8]
ACGIH: 1000 ppm (STEL); Explosion hazard (2012)
OSHA: 800 ppm (TWA) [Vacated];

Isobutane [CAS No. 75-28-5]
ACGIH: 1000 ppm (STEL); Explosion hazard (2012)
OSHA: No PEL established.

Pentane [CAS No. 109-66-0]
ACGIH: 1000 ppm (TWA); (2013)
OSHA: 1000 ppm (TWA), 2950 mg/m^3 (TWA);
600 ppm (TWA); 750 ppm (STEL) [Vacated];

Isopentane [CAS No. 78-78-4]
ACGIH: 1000 ppm (TWA); (2013)
OSHA: No PEL established.

Nitrogen [CAS No. 7727-37-9]
ACGIH: Simple asphyxiant
OSHA: No PEL established.

Carbon dioxide [CAS No. 124-38-9]
ACGIH: 5000 ppm (TWA); 30000 ppm (STEL); (1983)
OSHA: 5000 ppm (TWA), 9000 mg/m^3 (TWA);

Helium [CAS No. 7440-59-7]
ACGIH: Simple asphyxiant
OSHA: No PEL established.

PEL: Permissible Exposure Limit
TLV: Threshold Limit Value
TWA: Time-Weighted Average
STEL: Short-Term Exposure Limit

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

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye/Face Protection:	Wear safety glasses. 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.
Engineering Controls:	All installations (i.e., mechanical ventilation) must conform to code requirements. Provide adequate ventilation to maintain below exposure limits and explosive

FLAMMABILITY AND EXPLOSION INFORMATION

Extremely flammable gas. Contains gas under pressure; may explode if heated. 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:	Small Fire: Dry chemical or CO2. Large Fire: Water spray or fog. Move containers from fire area if you can do it without risk.
Unsuitable Extinguishing Media:	Not available.

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 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Gas
Colour:	Colourless
Odour:	Naturally odourless, although Mercaptan is added to all distribution systems and some transmission systems to give a “rotten egg” sulfur odour.
Specific	Gravity (Water = 1): Not applicable
Odour Threshold (**ppm**):	Less than 10,000 ppm in air
Vapour Pressure (mm Hg):	Gaseous state at normal conditions
Vapour Density (**Air = 1):**	0.6 (Air+1) at 20 °**C** (68 °F) (Methane)
Evaporation Rate (**nButAC = 1):**	Not applicable (gas at room temperature)
Boiling Point (°C):	-161.5°C (as Methane)
Freezing Point (°C):	-182.5°C
Solubility in water:	0.0022% (as Methane)
Percent Volatile (**by volume**):	100%
pH:	Not available
Density (**g/ml**):	N/A
Partition Coefficient (**water/oil**):	Not available
Flash Point (°C):	-188 °C
Flammability (solid, **gas):**	Flammable gas
Lower Explosion Limit (%):	4 (Methane)
Upper Explosion Limit (%):	15 (Methane)
Auto-ignition Temperature (°**C**):	537

SECTION 10. STABILITY AND REACTIVITY

Stability	Natural Gas/Methane is stable under normal storage conditions
Conditions to Avoid	Uncontrolled explosive mixtures Open flame and spark source High heat Strong oxidants Sources of ignition
Incompatibility	Natural Gas readily mixes with air when released and creates a combustible atmosphere. Some other strong oxidizing agents with which it can burn or explode in confined areas are: chlorine, bromine pentafluoride, oxygen difluoride and nitrogen trifluoride. It will ignite spontaneously when mixed with chlorine dioxide.
Hazardous Polymerization	May not occur
Hazardous Decomposition Products	CO_2, trace amounts of oxides of sulphur and nitrogen (SO_2 and NO_X) CO if starved of oxygen during combustion
Unusual Fire and Explosion Hazards	Could be potentially hazardous if uncontrolled in a confined space
Hazardous Combustion Products:	Carbon Monoxide, Carbon Dioxide, Nitrogen Oxides, Sulphur Dioxide, Aldehydes

Sensitivity to Static Discharge: Yes

NOTE: Natural Gas is lighter than air and will dissipate to atmosphere. Natural Gas **without sufficient** or **with too much** air will not burn or explode. A hazard from re-ignition or explosion exists if the flame is extinguished without stopping the flow of gas and/or cooling surroundings and eliminating ignition sources. Water spray can be used to cool the surroundings.

SECTION 11. TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE

Product Toxicity

Oral: Not available.
Dermal: Not available.
Inhalation: Not available

Component Toxitcity

Component	CAS NO.	LD50 Oral	LD50 dermal	LC50
Natural gas	8006-14-2	N/A	N/A	N/A
Methane	74-82-8	N/A	N/A	N/A
Ethane	74-84-0	N/A	N/A	N/A
Propane	74-98-6	N/A	N/A	N/A
Butane	106-97-8	N/A	N/A	658000mg/m ^{3} (rat); 4H
Isobutane	75-28-5	N/A	N/A	570000 ppm (rat); 15M
Pentane	109-66-0	400mg/kg (rat)	N/A	364000 mg/m ^{3} (rat); 4H
Isopentane	78-78-4	N/A	N/A	N/A
Nitrogen	7727-37-9	N/A	N/A	N/A
Carbon Dioxide	124-38-9	N/A	N/A	N/A
Helium	7440-59-7	N/A	N/A	N/A

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation.
Target Organs: Skin. Eyes. Respiratory system. Cardiovascular system. Bone marrow. Liver. Kidneys. 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. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

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: 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 Aggravated By Exposure	Not available.

EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)

Target Organs:	Skin. Eyes. Respiratory system. Cardiovascular system. Bone marrow. Liver. Kidneys. Central nervous system.
Chronic Effects:	Prolonged exposure to Natural gas can lead to hypoxia, bluish colouration to the skin, numbness, damage to the nervous system, heart sensitization, reduced consciousness and death. Prolonged or repeated inhalation of Isopentane may cause dizziness, weakness, weight loss, anemia, nervousness, pains in the limbs and peripheral numbness.
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 Effect Teratogenicity:	Not available.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity:	Not available
Persistence/ Degradability:	Not available
Bioaccumulation/ Accumulation:	Not available There is no information available on the ecotoxicological effects of natural gas. Because of the high volatility of natural gas, it is unlikely to cause ground or water pollution. Natural gas released into the environment will disperse rapidly into the atmosphere and undergo photochemical degradation.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal:	Allow to dissipate to the atmosphere (if permitted by federal/provincial/municipal requirements). Dispose in a safe location, preferably by burning with a flare. If disposal of natural gas cannot be flared, care must be taken to ensure complete dissipation of the gas to a concentration below its flammable limits.

SECTION 14. TRANSPORT INFORMATION

TDG Classification:	Class 2.1 Flammable Gases
UN/PIN Number:	1971
TDG Shipping Description:	Natural gas, compressed with high methane content
Special Shipping Information:	Handle as extremely flammable gas. Precaution should be taken to minimize inhalation of natural gas.

SECTION 15. REGULATORY INFORMATION

15.1 Canadian Regulations

Natural Gas (8006-14-2)

WHMIS 2015 Classification	Simple Asphyxiant Flammable Gas – Category 1 Gas Under Pressure	

SECTION 16: Other information, including date of preparation or last revision

Last Revision Date: April 2, 2019

Prepared by: Gas Specification Management

NOTE: The physical and hazard data provided is specific to the typical natural gas composition that has been provided. As a naturally occurring product, natural gas samples may have compositions that vary slightly from the typical composition. If required, the exact gas sample composition can be determined by gas chromatography analysis. For more information, contact ATCO Gas, Gas Specification Management at (403) 245-7591.