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: CH₄ (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

EMERGENCY OVERVIEW

Appearance/Odour: Colourless gas at room temperature and pressure
Odourless unless odourized with Mercaptan (rotten egg smell)

Flammable: Yes. Can cause flash fire

Potential Health Effects: See Section 11 for more information

Potential Environmental Effects: See Section 12 for more information

Likely Routes of Exposure: Inhalation

Acute Inhalation: At high concentrations, natural gas can displace oxygen causing asphyxiation and cause central nervous system depression and cardiac sensitization.

Eye and Skin Contact: None

Chronic-Inhalation: None

Ingestion: None

Skin Absorption: None
SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>% by Volume</th>
<th>Occupational Exposure Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane</td>
<td>92</td>
<td>Asphyxiant if breathed in place of air (refer to Section 4)</td>
</tr>
<tr>
<td>Ethane &amp; Heavier Hydrocarbons</td>
<td>5</td>
<td>Asphyxiant if breathed in place of air (refer to Section 4)</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>2</td>
<td>Asphyxiant if breathed in place of air (refer to Section 4)</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>1</td>
<td>Asphyxiant if breathed in place of air (refer to Section 4)</td>
</tr>
<tr>
<td>Sulphur Compounds</td>
<td>Trace amounts (varies in odourized gas)</td>
<td></td>
</tr>
</tbody>
</table>

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

SECTION 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): 5% - 15%
Fire Extinguishing Media: Dry Chemical (most effective) or carbon dioxide (CO₂) 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 extinguish 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 atmosphere
Sensitivity to Static Discharge: Flammable
Section 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protection recommended in Section 8
Environmental Precautions: None
Leak and Spill Procedures: Evacuate area
Leak/Line Break Occurs: Contact emergency number (refer to Section 1)
Do not activate any source 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 vaporize 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 limits: Natural gas is not toxic, however; if gas escapes in a confined area, it may displace oxygen. Lack of oxygen will asphyxiate anyone remaining in that gas filled space.

Personal Protective Equipment: Ensure use of proper personal protective equipment (PPE) at all times when handling this product. CSA/ANSI Safety Equipment must be available and worn as required to protect ears, feet, hands, head, remaining body area. Work around with natural gas must be performed by individuals qualified to work with natural gas

Eye/face: Eye protection (e.g., safety glasses) and/or face shields.
Skin: Safety work boots. Chemical resistant gloves are not required but recommended as good practice when handling chemicals. Flame retardant clothing should be worn in potentially flammable areas.
Respiratory: If engineering controls and work practices are not effective in controlling exposure to natural gas, then wear suitable respiratory protection. Supplied air or SCBA.
Other Considerations: None
Engineering Controls: All installations (i.e., mechanical ventilation) must conform to code requirements. Provide adequate ventilation to maintain below exposure limits and explosive
Section 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Gas

**Colour:** Colourless

**Odour:** Gas 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):** 0.584 to 0.610

**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 (by volume)

**Upper Explosion Limit (%):** 15 (by volume)

**Auto-ignition Temperature (°C):** 537

SECTION 10. STABILITY AND REACTIVITY

**Stability**
Natural Gas/Methane is stable

**Conditions to Avoid**
Uncontrolled explosive mixtures
Open flame and spark source
High heat
Strong oxidants

**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**
CO₂, trace amounts of oxides of sulphur and nitrogen (SO₂ and NOₓ)
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

LD50: Not applicable
LC50: 20,000 ppm
Acute Effects
   Acts as an asphyxiant by displacing oxygen in the air. Displacement of air by the gas may lead to shortness of breath, unconsciousness, and death from hypoxemia. Incomplete combustion may produce carbon monoxide and aldehydes.

Chronic Effects: None
Carcinogenicity: Not considered carcinogenic by OSHA.
Reproductive Effects: Not available
Teratogenicity: Not available
Mutagenicity: Not available
Irritant: Not available
Sensitizer: Not available
Synergistic Effects: 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.

PREPARATION DATE OF MSDS (September 13, 2017)

Prepared by: The Health and Safety Section of ATCO Gas
For further information or MSDS update requests, please contact Health and Safety at (780) 420-7953.

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.