



PLAINS

Marketing, L.P.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Natural Gas Sour
SYNONYMS: Solution Gas, Associated Gas
CHEMICAL NAME: Petroleum
CHEMICAL FAMILY: Petroleum Hydrocarbon
PRODUCT USE: Chemical feedstock and fuel
MANUFACTURER: Plains Marketing Canada L.P. and affiliates
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2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name	%	CAS #	ACGIH TLV
Natural Gas Sour	100	8006-14-2	
Methane	50 to 60	74-82-8	TWA= 1000 ppm
Ethane	10 to 20	74-84-0	TWA= 1000 ppm
Propane	10 to 20	74-98-6	TWA= 1000 ppm
Iso-Butane	3 to 7	75-28-5	TWA= 1000 ppm
n-Butane	3 to 7	106-97-8	TWA= 1000 ppm
Iso-Pentane	1 to 3	78-78-4	TWA= 600 ppm
n-Pentane	1 to 3	109-66-0	TWA= 600 ppm
Nitrogen	1 to 3	7727-37-9	None (Asphyxiant)
Carbon Dioxide	1 to 3	124-38-9	TWA= 5000 ppm STEL= 30 000 ppm
Hydrogen Sulphide	1 to 3	7783-06-4	TWA= 10 ppm STEL= 15 ppm
n-Hexane	< 1	110-54-3	TWA= 50 ppm (skin)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW DANGER!!

EXTREMELY FLAMMABLE- MAY EVOLVE TOXIC AND FLAMMABLE HYDROGEN SULPHIDE GAS - EYE, SKIN AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD.

Extremely Flammable; Very toxic by inhalation.

Keep locked up and out of reach of children; Keep container in a well-ventilated place; Keep away from sources of ignition - No smoking; After contact with skin, wash immediately with plenty of water; Wear suitable protective clothing and gloves; In case of accident or if you feel unwell, seek medical advice immediately; Avoid release to the environment; Refer to special instructions/Safety data sheets; Take precautionary measures against static discharge.

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

HYDROGEN SULPHIDE (toxic gas) may be released. High concentration may cause immediate unconsciousness - death may result unless victim is promptly and successfully resuscitated.

Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

POTENTIAL HEALTH EFFECTS

ROUTE(S) OF ENTRY

Eyes: Yes Skin: Yes Inhalation: Yes Ingestion: No

EYES

This product is a moderate eye irritant. Direct contact with rapidly escaping gas may cause cryogenic (freezer) burns or frostbite. Vapours may cause irritation to the eyes. Conjunctiva and mucous membranes resulting in redness and tearing.

SKIN

This product is a slight skin irritant. Direct contact with rapidly escaping gas may cause cryogenic (freezer) burns or frostbit. The appearance of injury may be delayed for a few hours, but may cause tissue to become swollen, discolored and extremely painful; permanent damage or death may result with adequate medical treatment.

INGESTION

Natural gas is extremely unlikely to be swallowed and much more likely to be inhaled since it is in the form of a gas.

INHALATION

Vapors may cause nose and throat irritation, anesthetic effects and central nervous system (CNS) depression. Inhalation may result in nausea, dizziness, drowsiness, headaches, loss of appetite, vomiting, loss of consciousness and even death. Certain ingredients may produce systemic effects to the blood, liver, kidneys, central nervous system and cardiovascular system. Inhalation of high concentrations can cause rapid CNS depression, cardiac arrhythmia, unconsciousness, coma, and possibly death resulting from respiratory failure.

WARNING: Irritating and toxic hydrogen sulphide gas may be released. At high concentrations (500 - 1000 ppm), hydrogen sulphide acts as a systemic poison, causing unconsciousness and death. In lower concentrations (50 - 500 ppm), hydrogen sulphide acts as a respiratory irritant, and may cause fluid in the lungs or bronchial pneumonia. The rotten egg odor of hydrogen sulphide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm.

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.

CHRONIC EFFECTS/CARCINOGENICITY

Hematologic, hepatotoxic, renal, neuropsychiatric, neurologic, and carcinogenic effects. Anoxia, polyneuropathy characterized by muscle weakness, loss of sensation, and impaired gait.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash) conditions. Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 20 minutes. Hold eyelids open to ensure adequate flushing. Seek medical attention immediately.

SKIN

This material can cause drying and redness of the skin. High-pressure releases may inject gas under the skin and requires immediate medical attention.

INGESTION

Rinse mouth with water. DO NOT induce vomiting. If conscious, give 1-2 glasses of milk or water to drink. Never administer liquids to an unconscious person. If spontaneous vomiting occurs lean victim forward to reduce the risk of aspiration into the lungs. Seek medical attention immediately and monitor for breathing difficulty.

INHALATION

Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an

uncontaminated area. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get medical attention.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	-156°C (-249°F) (Tagliabue CC) Flammable Gas
AUTO IGNITION:	537°C (1000 °F)
LOWER EXPLOSIVE LIMIT:	5%
UPPER EXPLOSIVE LIMIT:	15%

FIRE AND EXPLOSION HAZARDS

This product is **EXTREMELY FLAMMABLE**. DO NOT ATTEMPT TO EXTINGUISH A LEAKING GAS UNLESS THE LEAK CAN BE STOPPED. Vapours will ignite easily in the presence of any source of ignition over a wide range on concentrations and even at very low temperatures. Containers may explode when heated. Ruptured cylinders may rocket.

EXTINGUISHING MEDIA

SMALL FIRES: Dry chemical or CO₂.

LARGE FIRES: Water spray or fog.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Fire fighting activities that may result in potential exposure to high heat, smoke or toxic byproducts of combustion should require approved self-contained breathing apparatus (SCBA) with full-facepiece and full protective firefighting clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. If leak or spill has not ignited, ventilate area and determine if water spray would assist in dispersing gas or vapor to protect personnel attempting to stop leak. Water may be useful in flushing spills away from ignition sources; however, do NOT flush petroleum products down public sewers or other drainage systems.

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. Refer to NAERG Guide 115.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE YOUR FACILITY'S SITE SPECIFIC EMERGENCY RESPONSE PLAN if available.

Evacuate nonessential personnel and remove or secure all ignition sources for 800m (1/2 mile). Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Hydrogen sulphide may be evolved during a release, ensure response personnel are adequately protected - see Section 8 for personal protection.

Carefully contain and stop the source of the spill, if safe to do so. Do not flush down sewer or drainage systems. Protect bodies of water by diking, if possible. The use of fire fighting foam may be useful in certain situations to reduce vapors.

SMALL SPILLS: Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Cleanup crews must be properly trained and must utilize proper protective equipment.

LARGE SPILLS: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Isolate spill or leak area immediately for at least 50 to 100 metres (160 to 330 feet) in all directions. Keep unauthorized personnel away and stay upwind. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks, etc.). keep out of low areas. The proper use of water spray may effectively disperse product vapours, preventing contact with ignition sources or areas / equipment that require protection. Consider initial downwind evacuation for

at least 800m (1/2 mile). Refer to NAERG Guide 115.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Handle as a flammable gas. Keep away from all sources of heat, sparks, open flame or any sources of ignition as well as flammable materials or oxidizers. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Use only with adequate ventilation and avoid breathing vapours. Ground and bond all lines and equipment. Use intrinsically safe electrical equipment.

STORAGE PRECAUTIONS

Outside storage is recommended. Store in a cool, dry and well ventilated area out of sunlight and away from all sources of ignition. Avoid storage in low, confined locations or near incompatible materials such as other flammable materials, oxidizers or materials that support combustion. This storage area should comply with NFPA 30 ("Flammable and Combustible Liquid Code"). 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".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the vicinity of any 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 eat, drink or smoke in areas of use or storage. Do not use gasoline or solvents (naphtha, kerosene, etc) for washing this product from exposed skin areas. Waterless hand cleansers are effective.

Promptly remove contaminated clothing and laundry 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Ensure adequate ventilation to keep vapour and gas concentrations of this product below occupational exposure and flammable limits, particularly in confined spaces. Ventilation systems and other equipment must be intrinsically safe. Quick drench facilities and/or eyewash fountains should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids that are extremely cold or rapidly evaporating.

EYE/FACE PROTECTION

Wear safety glasses with slide shields, chemical goggles or a full-face shield to avoid burns or tissue damage from frostbite.

SKIN PROTECTION

Avoid repeated or prolonged skin contact. Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of poly-coated or equivalent recommended based on degree of exposure.

Note: The resistance of specific materials may vary from product to product as well as degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

For hydrogen sulphide hazard (above H₂S permissible exposure limits): SCBA or a supplied air respirator must be used.

If exposure assessment indicates NO reduced oxygen content or hydrogen sulphide hazard (below H₂S exposure limit): 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 and should not be considered especially when odor cannot be used to determine respirator effectiveness. Use a positive pressure, air-

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

Refer to CSA Standard "Selection, Use and Care of Respirators" (Z94.4-02) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

BASIC PHYSICAL PROPERTIES

APPEARANCE

Colourless gas

ODOR

A slight hydrocarbon odor. If present Hydrogen Sulphide (H₂S) has a rotten egg odor, but should not be used as warning property of toxic levels because H₂S can overwhelm and deaden the sense of smell. The smell of H₂S should not be used as an indicator of a hazardous condition - a calibrated H₂S meter can be used to determine the concentration of H₂S.

PHYSICAL STATE:	Gas
BOILING POINT:	-164°C (-263 °F)
VAPOR PRESSURE:	47000 mmHg (6266 kPa) @ 25°C; 1850 in Hg; 91 psi @ 77 °F,
VAPOR DENSITY (Air = 1):	0.554
SPECIFIC GRAVITY:	0.7168
SOLUBILITY (H ₂ O):	Slightly Soluble
PARTITION COEFFICIENT:	log Kow = 1.09

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID (STABILITY)

Material is stable under normal conditions. Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers, ignition sources and heat.

HAZARDOUS DECOMPOSITION PRODUCTS

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

HAZARDOUS POLYMERIZATION

Will Not Occur.

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS

Potential short-term effects of exposure are: irritation eyes, skin, nose, mucous membrane, respiratory system. Simple asphyxiants displace oxygen from the breathing atmosphere primarily in enclosed spaces and result in hypoxia effects including decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision, headache.

ACUTE ORAL EFFECTS

Ingredient	CAS No.	LD 50	LC 50
Methane	74-82-8	Not available	Mouse ihl 326g/m ³ 2hour
Ethane	74-84-0	Not available	Rat ihl 658 mg/L 4hour
Propane	74-98-6	Not available	Rat ihl 658 mg/L 4hour
Iso-Butane	75-29-5	Not available	Mouse ihl 52 mg / kg / 1hour
n-Butane	106-97-8	Not available	Rat ihl 658 mg / L / 4 hour
Iso-Pentane	78-78-4	Not available	Rat ihl 280 g/m ³ 4 hour
n-Pentane	109-66-0	Mouse iv 446 mg / kg	Rat ihl 364 g/m ³ / h hour
Nitrogen	7727-37-9	Not available	if displaces oxygen below 19.5%
Carbon dioxide	124-38-9	Not available	100,000 ppm/min

Hydrogen Sulfide	7783-06-4	Not available	Mouse ihl 1500 mg / m ³ / 18 min
n-Hexane	110-54-3	Rat oral 28710 mg / kg	Rat ihl 48000 ppm / 4 hour

CHRONIC EFFECTS

Chronic exposure to hydrogen sulfide of 50 ppm or greater may include bronchitis and inflammation of the mucous membrane of the respiratory system. At 250 ppm hydrogen sulfide, chronic effects may include bronchial pneumonia and pulmonary edema. Other chronic effects of this product are:

Hematologic, hepatotoxic, renal, neuropsychiatric, neurologic, and carcinogenic effects. Anoxia, Polyneuropathy characterized by muscle weakness, loss of sensation, and impaired gait.

SENSITIZATION

Methane, ethane, propane and butane are considered cardiac sensitizers.

MUTAGENIC

Not mutagenic.

REPRODUCTIVE EFFECTS

Spontaneous abortion may occur to women exposed to pentane during pregnancy. Possible sequelae of oxygen deprivation in the unborn are controversial. Cerebral palsy, previously thought to be due to acute hypoxia during labour and/or childbirth, remains poorly understood. Malformations of the fetus. Risk factor for Prader-Willi syndrome in the offspring. Reported to affect female and male reproductive capacity. Decreased weight gain in offspring.

CARCINOGENICITY

Ingredients are not identified as carcinogen y IARC, NTP, or ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewage, drainage and waterways. Report spills and releases, as applicable, under federal, provincial and local regulations.

13. DISPOSAL CONSIDERATIONS

Preferred waste management priorities are recycle, reprocess, or incinerate with heat recovery. Dispose of waste in accordance with all applicable federal, provincial, and/or local regulations.

14. TRANSPORT INFORMATION

PROPER SHIPPING NAME:	Natural gas, compressed
TDG CLASS:	2.1
TDG IDENTIFICATION NUMBER:	UN1971
TDG SHIPPING LABEL:	Natural gas, compressed
SHIPPING DESCRIPTION:	Natural gas, compressed, 2.1, UN1971

15. REGULATORY INFORMATION**WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)**

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR.

Class A - Compressed Gas

Class B, Division 1 – Flammable Gas

Class D, Division 1, Subdivision A - Very Toxic Material Causing Immediate and Serious Toxic Effects

Class D, Division 2, Subdivision B – Materials Causing Other Toxic Effects.

This substance is listed on the Canadian Domestic Substances List (DSL).

16. OTHER INFORMATION

Issued by: Health and Safety Department, Plains Marketing Canada Telephone 403-261-7457
 Technical Development by Deerfoot Consulting Inc. Telephone 403-720-3700

NFPA HAZARD RATING -	HEALTH:	3	High
	FIRE:	3	High
	REACTIVITY:	0	Negligible

Acronyms:

ANSI	=	American National Standards Institute
ACGIH	=	American Conference of Governmental Industrial Hygienists
API	=	American Petroleum Institute
CEPA	=	Canadian Environmental Protection Act
HMIS	=	Hazardous Materials Information System
ihl	=	inhalation
L EL (%)	=	LOWER EXPLOSIVE LIMIT (% by volume)
m ³	=	cubic meter
MSHA	=	Mine Safety and Health Administration
NAERG	=	North American Emergency Response Guide
NFPA	=	National Fire Protection Association
NIOSH	=	National Institute of Occupational Safety and Health
NTP	=	National Toxicology Program
OSHA	=	U.S. Occupational Safety & Health Administration
ppm	=	parts per million (by volume)
SCBA	=	Self-Contained Breathing Apparatus
UEL	=	UPPER EXPLOSIVE LIMIT (% by volume)
WHMIS	=	Workplace Hazardous Materials Information System - Canadian

Disclaimer of Expressed and Implied Warranties

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