

Corporate Emergency Response Plan

August 2016

AltaGas
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Calgary, Alberta T2P 0J1
Telephone: 403-691-7575
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online copy

ERP REVISION REQUEST FORM

ERP Name: _____

ERP Date: _____

| No. | Sect | Page | Requested Revision |
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Revisions requested by (print name): _____

Date: _____

Send to:
<name and email removed>
Fax: 403-691-7576

CONTENTS

ERP Revision Request Form

Page

Section 1 Introduction

| | |
|--|----|
| Overview..... | 1 |
| Emergency Equipment..... | 3 |
| Definition of an Emergency | 5 |
| Assessment Matrices for Classifying Incidents..... | 7 |
| Emergency Planning and Response Zones | 10 |
| ERP Distribution List..... | 12 |
| Revision Log | 14 |

Section 2 Emergency Contacts

| | |
|---|----|
| AltaGas Corporate Personnel | 1 |
| Field Gathering & Processing Sites..... | 2 |
| Extraction Sites | 8 |
| Power Sites..... | 9 |
| Storage Sites | 10 |
| Alberta Government..... | 11 |
| British Columbia Government | 13 |
| Saskatchewan Government | 14 |
| Canada/NWT Government..... | 15 |
| USA/Washington Government | 16 |
| Local Governments..... | 17 |
| Ambulance Services | 20 |
| Medical Services..... | 21 |
| Fire Services..... | 23 |
| Police Services | 24 |
| Oil Spill Services | 26 |
| Aboriginal Areas | 28 |
| Support Services..... | 29 |

Section 3 Response Guidelines

| | |
|--------------------------------------|----|
| Communications | 1 |
| Injuries | 5 |
| Fatalities | 6 |
| Fires & Explosions | 7 |
| Motor Vehicle Accidents..... | 8 |
| Threats | 9 |
| Wildlife | 10 |
| Pandemic..... | 11 |
| Environmental Damage..... | 13 |
| Release Reporting Requirements | 14 |
| Gas Releases | 21 |
| Air Quality Monitoring..... | 24 |
| Ignition Criteria..... | 27 |
| Ignition Decision Flowchart | 29 |
| Ignition Procedure Flowchart | 30 |

| | | |
|------------------|--|----|
| | Shelter Procedure | 31 |
| | Evacuation Procedure..... | 32 |
| | Downgrading an Emergency | 34 |
| Section 4 | Roles & Responsibilities | |
| | AltaGas Personnel..... | 1 |
| | Government of Alberta..... | 16 |
| | Government of British Columbia | 22 |
| | Government of Saskatchewan | 27 |
| | Government of the Northwest Territories | 31 |
| | Government of Canada..... | 33 |
| | Government of Washington | 39 |
| | Government of the United States | 42 |
| | Oil Spill Services | 47 |
| | Mutual Assistance..... | 48 |
| Section 5 | Hazardous Substances | |
| | Natural Gas SDS | |
| | Butane SDS | |
| | Propane SDS | |
| | Molten Sulphur SDS | |
| | Sour Natural Gas SDS | |
| | Natural Gas Condensate SDS | |
| | Natural Gas Liquids SDS | |
| | Produced Water SDS | |
| | Crude Oil SDS | |
| | Methanol SDS | |
| | Naturally Occurring Radioactive Materials SDS | |
| | Ethane SDS | |
| | Used Motor Oil SDS | |
| Section 6 | Forms | |
| | Initial Notification Report | 1 |
| | Key Responder Role Log | 2 |
| | Incident Log | 3 |
| | Ambient Air Monitoring Log..... | 4 |
| | Threat Report..... | 5 |
| | Preliminary Media Announcement | 6 |
| | Roadblock Log..... | 7 |
| | Resident Contact Log | 8 |
| | Evacuation Notification | 9 |
| | Shelter Notification..... | 10 |
| | Reception Centre Check-In Sheet..... | 11 |
| | Evacuation Expenses Compensation Request..... | 12 |
| | OGC Minor Incident Notification Form & Incident Classification Matrix..... | 13 |
| Section 7 | Resident Information | |
| | Residents..... | 1 |
| | Reception Centre | 2 |

Section 8 Maps

AltaGas Gas Division (Canada)
Aboriginal Areas Impacted by AltaGas Operations
Saskatchewan ECON-PNG Area Boundaries
WCSS Cooperative Boundaries
Saskatchewan Spill Co-op Boundaries

Quick Reference Pull-Out

| | |
|---|----|
| Initial Response | i |
| AltaGas Corporate Personnel Phone Numbers | ii |
| Emergency Response Checklist | |

Environmental ERP (*select AltaGas copies only*)

<Parkland Gas Plant Environmental Emergency Response Plan removed>

Appendices (*select copies only*)

Kahntah Pipeline ERP Supplement
John Lake Pipelines ERP Supplement

OVERVIEW

AltaGas is a North American energy company with operations across Canada and the northwestern United States. There are two operating divisions within AltaGas that make use of this Corporate ERP. The Gas Division gathers, processes, extracts and transports natural gas. The Power Division produces electricity by natural gas engine driven generators, wind turbine driven generators and hydro (river run) driven generators.

Introduction to emergency response at AltaGas

It is the policy of AltaGas that:

- an up-to-date Emergency Response Plan (ERP) will be maintained for all company operations,
- workers who may be expected to respond to emergencies will be provided with the appropriate training and equipment, and
- when required by legislation, accidents and incidents will be reported to the appropriate federal, provincial, territorial, state or municipal government agencies on a timely basis.

AltaGas believes that having procedures readily available will lead to a more effective response in an emergency. It is the policy of AltaGas that workers will report all work-related injuries, illnesses, environmental damage, property damage, and near-misses to their supervisor as soon as reasonably practicable. The supervisor will conduct an incident investigation for all incidents, with the exception of incidents where the injury or damage or potential injury or damage was minor.

AltaGas has a **24-hour emergency telephone number for Canada (1-866-826-3830)** which is posted at the primary entrance to all Canadian AltaGas sites. Dialing the 24-hour emergency telephone number will connect the caller to a manned switchboard. The switchboard staff has a list of the business, home and cellular telephone numbers for AltaGas personnel. Telephone numbers for AltaGas staff available to assist when requested by the *Incident Commander* are listed in Section 2.

Potential Emergency Events

Based on Hazard, Risk, Vulnerability and Capability Assessments (HRVCAs) being completed on AltaGas operating areas, the following is a list of the possible hazards that were identified and pose a degree of risk with the potential to become an emergency:

- § Fire: industrial/facility, wildland/grass/forest
- § Sour Gas Release
- § Transportation/Vehicle Incident: on-site, off-site involving AltaGas personnel
- § Flood
- § Critical Infrastructure Failure: pipelines and valves
- § Medical Event: on site
- § Sabotage
- § Chemical Release
- § Sweet Gas Release
- § Landslide
- § Weather: severe winter storm/blizzard, lightning strike, extreme cold, extreme heat, tornado
- § Explosion
- § Pipeline Strike
- § Prolonged Power Outage
- § Excessive Runoff from Facility
- § Bomb/Terrorism Threat
- § Liquid Product Release
- § Disgruntled Landowner/Employee/Contractor/Vendor
- § Pipeline Rupture
- § Vandalism
- § Wildlife Attack
- § Radiological Incident
- § Intruder
- § Infectious Disease: Epidemic/Pandemic
- § Seismic Event: earthquake
- § Control Systems Security Threat
- § Theft of Sensitive Information

EMERGENCY EQUIPMENT

Depending on the site-specific hazards, the following emergency equipment is generally available at AltaGas facilities:

First Aid Kits (Portable and Fixed)

- § Vehicles
- § Offices
- § Process Areas

Fire Extinguishers (Multiple Sizes and Types)

- § Vehicles
- § Offices
- § Process Areas

Portable Gas Detection Equipment

- § Vehicles
- § Offices

Fire Blankets

- § Process Areas

Breathing Apparatus (SCBA)

- § SCBA units (at all sour facilities and some sweet facilities)

Vehicles

- § Standard 4x4 trucks available at all facilities for emergency use

Eye Wash Bottles (Portable and Fixed)

- § Offices
- § Process Areas

Burn Kits

- § Offices

Communication Equipment

- § Vehicles
- § Offices

Fixed Equipment

- § Warning Alarms
- § Fire Detectors
- § Gas Monitors

AltaGas Operators carry in their Trucks the following emergency equipment:

Gas Detection

- § Personal monitor (Multi Gas)
- § Optional portable monitor (Multi Gas) – usually kept at facility

First Aid Kits

- § Normally a portable vehicle #1 Kit
- § Optional larger kit for remote facilities

Fire Extinguishers

- § Normally a portable 30 lb dry chemical

Communications

- § Normally a cellular telephone
- § Optional 2-way Radios when cell phones are not viable

Roadblock Kits

- § Normally equipment which would include:
 - Road barricade with flashing light
 - Stop/Slow paddle
 - Hi-Visibility vest
 - Flashlight
 - Map of the area and checklist/control log

Personal Protective Equipment

- § Regular PPE, which may include respiratory protection such as cartridge style ½ masks or breathing air (SCBA)

Emergency Equipment

- § Normally equipment which would include:
 - Towing hitches (c/w clevis's) and recovery ropes or straps
 - Booster cables
 - Reflective flares
 - Snow shovel / tire chains

DEFINITION OF AN EMERGENCY

Definition of an Emergency

An emergency is defined as any situation that threatens the health or safety of employees, contractors or the general public, or that may cause harm to the environment or major property damage. There are three levels of emergencies based upon the degree of risk to people and the environment. AltaGas has also included an “Alert” status in this section.

Alert

An **Alert** is defined as a minor incident in which immediate control of a hazard is obtainable with progressive resolution of the situation. Control and relief systems are functioning correctly and the impact to public/worker safety and the environment is limited to the site only. Notification to the public may be provided as a courtesy if appropriate. If notification of the public takes place, the appropriate regulatory agency will also be notified.

Please refer to the following table for a discussion of the three levels of an emergency.

| INITIAL EMERGENCY LEVEL APPROPRIATE FOR THE MAGNITUDE OF THE INCIDENT | | |
|---|--|---|
| Emergency Level | Criteria | Action |
| 1 Low Impact | <p>A LOWER LEVEL EMERGENCY forces normal operations to be temporarily suspended or shut down. There is no immediate hazard to the public/environment and the situation can be controlled by on-site personnel and equipment. The following conditions constitute a Level 1 Emergency:</p> <ul style="list-style-type: none"> § Public concern; § Minor injury or accident; § Small, on-site spill or release; § Small contained fire or explosion; § Major field office disruption; or § Minor damage to public property. <p>If there is any doubt as to whether a Level 1 Emergency should be declared, consult with the appropriate regulatory agency.</p> | <ul style="list-style-type: none"> § Alert the Response Team Members (company, contract, and local authority and government agency personnel) required to implement the plan. § Notify transients, area operators and members of the public within the Emergency Planning Zone (EPZ) by telephone or visitation and inform them of the potential emergency situation. Priority will be directed to those located immediately downwind and those deemed sensitive or requiring assistance. § Alert a mobile air monitoring unit to deploy into area. § Mobilize company personnel to the Reception Centre if applicable. § Alert and mobilize emergency support services as required. <p>AT THIS LEVEL, EVACUATION OF THE EPZ IS A VOLUNTARY ACTION.</p> |
| 2 Moderate Impact | <p>A MEDIUM LEVEL EMERGENCY causes a potential or limited hazard to the public/environment or has the potential to extend beyond the boundaries of company property. Operational control is maintained but the emergency could worsen and threaten the general public or the environment. The following conditions constitute a Level 2 Emergency:</p> <ul style="list-style-type: none"> § Controlled gas or liquid hydrocarbon release; § Bomb threat; § Serious fire or explosion; § Serious injury or accident; § Significant damage to public property; or § Significant media interest. | <ul style="list-style-type: none"> § Inform the Response Team Members of the change to a Level 2 Emergency condition. § Notify residents and members of the public within the EPZ and request evacuation of the area, providing assistance as required. § Perform surveys of the EPZ and request all persons evacuate the area. § Ensure a mobile air monitoring unit is in the area and has commenced ambient air quality monitoring at the nearest downwind, unevacuated area. § Establish roadblocks to restrict access into the area. § Assemble the ignition equipment and team(s). <p>EVACUATION OF THE PUBLIC WITHIN THE EPZ MUST BE INITIATED AT THIS LEVEL.</p> |
| 3 High Impact | <p>A HIGH LEVEL EMERGENCY occurs when safe operating control has been lost, cannot be controlled immediately by on-site personnel and equipment, has extended beyond the boundaries of company property or poses an immediate or major hazard to the public/environment. The following criteria constitutes a Level 3 Emergency:</p> <ul style="list-style-type: none"> § Uncontrolled gas or liquid hydrocarbon release; § Major fire or explosion; § Accident involving a fatality; or § Regional or national media interest. | <ul style="list-style-type: none"> § Inform the Response Team Members previously contacted of the change to a Level 3 Emergency condition. § Perform surveys of the EPZ to verify evacuations have been completed. § Verify roadblocks have been established. § Continue air monitoring downwind of the release. § Ignite the uncontrolled or partially controlled H₂S flow if the ignition criteria have been met. <p>EVACUATION AT THIS LEVEL IS MANDATORY.</p> |

ASSESSMENT MATRICES FOR CLASSIFYING INCIDENTS

| | | Likelihood of Incident Escalating | | | |
|--|--------------|---|--|--|---|
| | | Unlikely | Moderate | Likely | Almost certain or currently occurring |
| Matrix for Incidents within Alberta regulated by the AER | | The incident is contained or controlled and it is unlikely that the incident will escalate. There is no chance of additional hazards. Ongoing monitoring is required. | Control of the incident may have deteriorated but imminent control of the hazard by AltaGas is probable. It is unlikely that the incident will further escalate. | Imminent and/or intermittent control of the incident is possible. AltaGas has the capability of using internal and/or external resources to manage and bring the hazards under control in the near term. | Incident is uncontrolled and there is little chance that AltaGas will be able to bring the hazard under control in the near term. AltaGas will require assistance from outside parties to remedy the situation. |
| Incident Consequence | Minor | No worker injuries | ALERT | ALERT | LEVEL 1 |
| | | Liquid release contained on lease | | | |
| | | Gas release impact on lease only | | | |
| | | No or low interest | | | |
| | Moderate | First aid treatment required for on-lease worker(s) | ALERT | LEVEL 1 | LEVEL 2 |
| | | Liquid release extends beyond lease – contained | | | |
| | | Gas release impact has potential to extend beyond lease | | | |
| | | Local and possible regional interest | | | |
| | Major | Worker(s) requires hospitalization | LEVEL 1 | LEVEL 1 | LEVEL 3 |
| | | Liquid release extends beyond lease – not contained | | | |
| | | Gas release impact extends beyond lease – public health/safety could be jeopardized | | | |
| | | Regional and national interest | | | |
| | Catastrophic | Fatality | LEVEL 1 | LEVEL 2 | LEVEL 3 |
| | | Liquid release off lease not contained – potential for, or is, impacting water or sensitive terrain | | | |
| | | Gas release impact extends beyond lease – public health/safety jeopardized | | | |
| | | National and international interest | | | |

Probability (Likelihood of Incident Escalating)

| Matrix for Incidents <i>outside of Alberta or regulated by the NEB</i> | | (0) | Unlikely (1) | Moderate (2) | Likely (3) | Almost certain or occurring (4) |
|---|-------------------|--|---|---|---|--|
| | | Will not escalate. No hazard. No monitoring required. | Escalation highly unlikely. Controlled or imminent control. | Escalation unlikely. Controlled or likely imminent control. | Escalation possible. Under or imminent control. | Uncontrolled with control unlikely in the near term. |
| Consequence | (0) | No consequential impact | N/A | ALERT/MINOR* | ALERT/MINOR* | LEVEL 1 |
| | Minor (1) | Moderate on site equipment damage | ALERT/MINOR* | ALERT/MINOR* | LEVEL 1 | LEVEL 2 |
| | | Reportable liquid/gas release on site | | | | |
| | | Security breach – gas asset impact | | | | |
| | | Earthquake felt on surface within 3km radius or magnitude ≥ 4.0 earthquake within 3km of gas operations** | | | | |
| | Moderate (2) | Major on site equipment damage | ALERT/MINOR* | LEVEL 1 | LEVEL 1 | LEVEL 2 |
| | | Security breach with potential to impact people, property or environment | | | | |
| | | Reportable liquid/gas release potentially or beyond site, not affecting people, property or env. | | | | |
| | Major (3) | Threats of violence, sabotage or terrorism | LEVEL 1 | LEVEL 1 | LEVEL 2 | LEVEL 3 |
| | | Reportable liquid/gas release beyond site, potentially affecting public safety, property or environment | | | | |
| | | HAZMAT worker exposure exceeding allowable | | | | |
| | | Major on site equipment failure | | | | |
| | Catas-trophic (4) | Major on site equipment or infrastructure loss | LEVEL 1 | LEVEL 2 | LEVEL 2 | LEVEL 3 |
| | | Major violence/sabotage/terrorism impacting assets | | | | |
| | | Reportable liquid spill beyond site, uncontained & affecting environment | | | | |
| | | Gas release beyond site, affecting public safety | | | | |

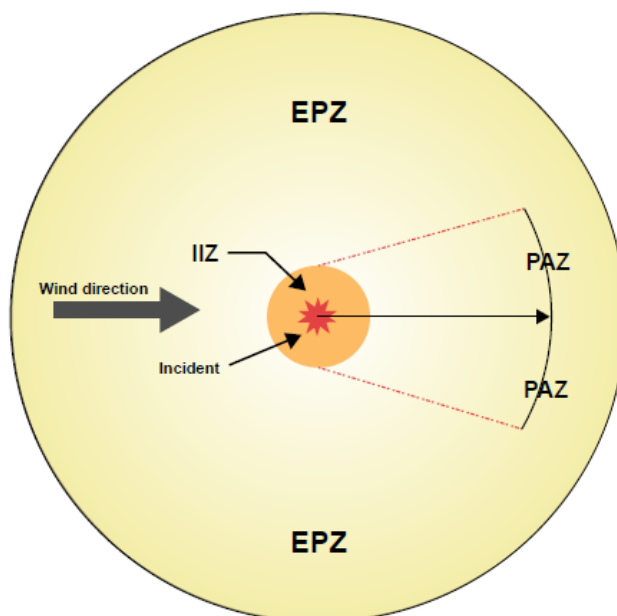
*See Section 6 – *OGC Minor Incident Notification Form* for reporting of Minor Incidents in British Columbia

**For this consequence criteria, a Level 1 Emergency or higher must be declared (probability of 2 or higher)

Incident Response

| | | Incident Classification | | | |
|-----------|-----------------------|---|--|---|---|
| | | Alert / Minor | Level 1 emergency | Level 2 emergency | Level 3 emergency |
| Responses | Communications | | | | |
| | Internal | Discretionary, depending on AltaGas policy. | Notification of off-site management. | Notification of off-site management. | Notification of off-site management. |
| | External Public | Courtesy, at AltaGas discretion. | Notification of affected members to the public as necessary. | Planned and instructive in accordance with the ERP communication plan. | Planned and instructive in accordance with the ERP communication plan. |
| | Media | Reactive, as required. | Reactive, as required. | Proactively work with the media, as required. | Proactively work with the media, as required. |
| | Government | Reactive, as required. Notify lead government agency if public or media is contacted. Notify OGC (for incidents in BC) within 24 hours. | Notify lead government agency immediately. Notify local and aboriginal authority (based on planning arrangement) and health authority if public or media is contacted. | Notify lead government agency immediately and local, aboriginal and health authorities. | Notify lead government agency immediately and local, aboriginal and health authorities. |
| | Actions | | | | |
| | Internal | On site, as required by AltaGas. | On site, as required AltaGas. Initial response undertaken in accordance with the ERP. | Predetermined public safety actions are under way. Corporate management team alerted and may be appropriately engaged to support on-scene responders. | Full implementation of incident management system. |
| | External | On site, as required by AltaGas. | Potential for multi-agency (municipal, provincial or federal) response. | Potential for multi-agency (municipal, provincial or federal) response. | Immediate multi-agency (municipal, provincial or federal) response. |
| | Resources | | | | |
| | Internal | Immediate and local. No additional personnel required. | Establish what resources would be required. | Establish additional resources and personnel required. | Significant resources required. |
| | External | None | Begin to establish resources that may be required. | Possible assistance from government agencies and external support services, as required. | Assistance from government agencies and external support services, as required. |

EMERGENCY PLANNING AND RESPONSE ZONES



Initial Isolation Zone (IIZ)

The Initial Isolation Zone (IIZ) defines an area in close proximity to an emergency incident, such as a continuous hazardous gas release. Indoor sheltering may provide temporary protection due to the proximity of the release.

Protective Action Zone (PAZ)

The Protective Action Zone (PAZ) is the downwind danger area from an emergency incident. This concept is illustrated in the figure above. The estimated size of the PAZ for sour gas facilities is calculated based on the amount of H_2S that could potentially be released. Immediately following an emergency incident, the approximate size and direction of the PAZ can be determined using conditions at the time. Once monitoring equipment arrives, the actual size of the PAZ can be determined based on monitored conditions.

The *On-Scene Commander* at the incident site will review the details of the emergency with on-duty staff who shall assist in determining the actual size and location of the PAZ using monitored conditions and the information contained on the area map. The size of the PAZ will be related to the type and magnitude of the hazard.

The initiation of public protection measures in the PAZ is a coordinated response from the local authority and AltaGas. The local authority response in the PAZ may be limited to what is contained in the municipal emergency plan and their response capability.

Emergency Planning Zone (EPZ)

The Emergency Planning Zone (EPZ) is a geographical area surrounding each AltaGas facility which could become hazardous to people, property or the environment.

ERP DISTRIBUTION LIST

| Name | Title | Location | # of Copies | Manual No. |
|---|-------------------------------------|-------------------------------------|-------------|------------|
| AltaGas Calgary Office | | | | |
| Corporate Emergency Operations Centre (CEOC) | | Calgary | 1 | 1 |
| Operations | 16 th Floor | Calgary | 1 | 2 |
| EOH&S | 17 th Floor | Calgary | 1 | 3 |
| <name removed> | Div VP Eng & Construction | Calgary | 1 | 4 |
| <name removed> | President & Chief Operating Officer | Calgary | 1 | 5 |
| <name removed> | Director Operations - Extraction | Calgary | 1 | 6 |
| <name removed> | Manager Engineering – E&T | Calgary | 1 | 7 |
| AltaGas Regional Offices | | | | |
| <name removed> | VP Energy Exports | Vancouver | 1 | 8 |
| <name removed> | President Heritage Gas | Dartmouth | 1 | 9 |
| <name removed> | Manager EOH&S, AltaGas Utilities | <i>Electronic</i> | 1 | 10 |
| <name removed> | VP of Operations - Power | <i>Electronic</i> | 1 | 11 |
| External | | | | |
| Emerg. Manag. Compliance | National Energy Board | Calgary & <i>Electronic</i> | 1 | 12 |
| Emergency Response Unit | BC Oil & Gas Commission | Ft. St. John & <i>Electronic</i> | 1 | 13 |
| Emergency Services | Peace River Regional District, BC | <i>Electronic</i> | 1 | 14 |
| Chief & Council | Samson Cree Nation | Hobbema | 1 | 15 |
| AltaGas Extraction & Transmission (Field Operations) | | | | |
| <name removed> | Operations Manager, EEEP/JEEP | Edmonton | 1 | 16 |
| EEEP | Control Room | Edmonton | 1 | 17 |
| <name removed> | Operations Manager | Harmattan | 1 | 18 |
| <name removed> | Operations Manager | Younger Plant | 1 | 19 |
| <name removed> | Operations Superintendent | Younger Plant | 1 | 20 |

| Name | Title | Location | # of Copies | Manual No. |
|--|-----------------------------------|----------------|-------------|------------|
| AltaGas FG&P (Field Offices) | | | | |
| <name removed> | Ops Supervisor - Cold Lake | Bonnyville | 1 | 21 |
| Cold Lake Area | Operators | Bonnyville | 8 | 22-29 |
| <name removed> | Superintendent Field Op & Process | Bonnyville | 1 | 30 |
| <name removed> | Supervisor Construction | Bonnyville | 1 | 31 |
| <name removed> | Administration | Bonnyville | 1 | 32 |
| <name removed> | Ops Supervisor – Central Border | Camrose | 1 | 33 |
| <name removed> | Ops Supervisor - Blair/Townsend | Townsend | 1 | 34 |
| <name removed> | Ops Supervisor - Gordondale | Gordondale | 1 | 35 |
| <name removed> | Operations Manager - South | Turin | 1 | 36 |
| <name removed> | Ops Supervisor - BPN | Turin | 1 | 37 |
| AltaGas FG&P Facilities | | | | |
| Clear Hills (Lathrop Creek) | | 13-07-88-12-W6 | 1 | 38 |
| Clear Prairie Plant | | 07-33-90-12-W6 | 1 | 39 |
| Coleville Plant | | 12-11-31-22-W3 | 1 | 40 |
| John Lake North Plant | | 11-35-56-01-W4 | 1 | 41 |
| Marianna Plant | | 06-06-81-13-W4 | 1 | 42 |
| Milton | | 13-18-30-27-W3 | 1 | 43 |
| Parkland Plant | | 07-11-15-27-W4 | 1 | 44 |
| Thornbury North Gas Plant | | 08-13-80-14-W4 | 1 | 45 |
| Townsend Plant | | a-33-J/94-B-9 | 1 | 46 |
| AltaGas Hydro Projects | | | | |
| Forrest Kerr | | Field | 1 | 47 |
| Bear Mountain Wind Park | | | | |
| <name removed> | Operations Supervisor | Dawson Creek | 1 | 48 |
| AltaGas Ferndale Storage Terminal | | | | |
| Ferndale Control Room | | Ferndale | 1 | 49 |
| <name removed> | Operations Supervisor | Ferndale | 1 | 50 |

Note: Each facility's Corporate ERP Manual must remain on site.

REVISION LOG

| DATE | COMMENTS |
|-------------------|--|
| October 30, 1999 | First issued |
| May 16, 2000 | Revised |
| May 30, 2001 | Revised |
| March 28, 2003 | Revised |
| August 1, 2003 | Revised |
| August 20, 2004 | Revised |
| December 12, 2005 | Revised |
| December 1, 2006 | Revised |
| September 2007 | Revised |
| November 2008 | Revised |
| April 2009 | Revisions – Quick Reference, Sections 2 & 5 |
| October 2009 | Revised |
| April 2010 | Revisions – Quick Reference, Sections 1, 2, 3, 4 |
| August 2011 | Revised |
| April 2012 | Revisions – NEB updates |
| August 2012 | Revised |
| August 2013 | Revised |
| May 2014 | Revisions – Ferndale added |
| August 2014 | Revised |
| August 2015 | Revised |
| August 2016 | Revised |

ALTAGAS CORPORATE PERSONNEL

| Name | Position | Telephone Business | Telephone Residence | Telephone Cellular |
|--|--------------------------------------|--------------------|---------------------|--------------------|
| Potential Incident Commanders – Field Gathering & Processing (FG&P) | | | | |
| <name removed> | Ops Manager, Central & NE | <# removed> | n/a | <# removed> |
| <name removed> | Director Ops – FG&P & Trans. | <# removed> | n/a | <# removed> |
| <name removed> | Operations Manager, NW | <# removed> | n/a | <# removed> |
| <name removed> | Div VP Operations - Gas | <# removed> | n/a | <# removed> |
| <name removed> | Operations Manager, South | <# removed> | <# removed> | <# removed> |
| Potential Incident Commanders – Extraction | | | | |
| <name removed> | Director Operations - Extraction | <# removed> | n/a | <# removed> |
| <name removed> | Div VP Operations - Gas | <# removed> | n/a | <# removed> |
| Potential Incident Commanders – Power Canada | | | | |
| <name removed> | Director Business Development | <# removed> | <# removed> | <# removed> |
| | | Calgary office: | Vancouver office: | |
| <name removed> | Div VP Eng & Construction | <# removed> | <# removed> | <# removed> |
| <name removed> | President & COO | <# removed> | <# removed> | <# removed> |
| Potential Incident Commanders – Major Projects | | | | |
| | | Calgary office: | Vancouver office: | |
| <name removed> | President & COO | <# removed> | <# removed> | <# removed> |
| Potential Incident Commanders – Ferndale | | | | |
| <name removed> | Div VP Operations - Gas | <# removed> | <# removed> | <# removed> |
| | | Calgary office: | Vancouver office: | |
| <name removed> | Div VP Eng & Construction | <# removed> | <# removed> | <# removed> |
| <name removed> | President & COO | <# removed> | <# removed> | <# removed> |
| AltaGas Media / Communications Personnel | | | | |
| <name removed> | VP, Stakeholder Relations | <# removed> | n/a | <# removed> |
| <name removed> | Senior Advisor, External Comm. | <# removed> | n/a | <# removed> |
| <name removed> | Senior Advisor, External Comm. | <# removed> | n/a | <# removed> |
| Other AltaGas Personnel | | | | |
| <name removed> | Process Safety Manager, EHS | <# removed> | n/a | <# removed> |
| <name removed> | VP EHS, Security & Sust., Compliance | <# removed> | n/a | <# removed> |
| <name removed> | Executive Vice President | <# removed> | n/a | <# removed> |
| <name removed> | Stakeholder | <# removed> | n/a | n/a |
| 24 Hour Emergency (Canada): 1-866-826-3830 | | | | |
| 24 Hour Emergency (Washington): 1-360-384-1701 | | | | |

FIELD GATHERING & PROCESSING SITES

Northwest - Blair Creek / Townsend

<name removed> (Operations Supervisor) Cellular: <# removed>

Townsend Plant

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|---|---------------------------------|----------------|------------------|
| Blair Creek Plant I | d-58-F94-B16 | 3482 | <# removed> |
| Blair Creek Plant II | a-58-F/94-B-16 | 3482 | <# removed> |
| Townsend Plant | a-33-K/94-B-9 | | |
| Kahntah Pipeline (<i>deactivated</i>) | d-93-D94-I-02 to 13-6-104-12 W6 | | |

Northwest - Gordondale / Clear Prairie / Pouce Coupe

<name removed> (Operations Supervisor) Office: <# removed>

Gordondale Plant Cellular: <# removed>

Residence: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|-----------------------------------|-----------------|----------------|------------------|
| Clear Prairie Plant | 07-33-090-12 W6 | Shut-in | <# removed> |
| Clear Hills (Lathrop Creek) Plant | 13-07-088-12 W6 | Shut-In | <# removed> |
| Gordondale Plant | 16-31-78-11 W6 | 10855 | <# removed> |
| Pouce Coupe Plant | 03-03-81-13 W6 | 1574 | <# removed> |
| Pouce Coupe Doe Creek | 16-11-81-13 W6 | Shut-in | n/a |

East - Cold Lake

<name removed> (Operations Supervisor) Office: <# removed>
Bonnyville, Alberta Cellular: <# removed>
Residence: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|-----------------------------|-----------------|----------------|------------------|
| Alexander | 09-35-62-03 W4 | Shut-in | n/a |
| Bonnyville South | 10a-29-60-05 W4 | 1274 | <# removed> |
| Cedar Energy Boost | 06-21-55-25 W3 | Shut-In | n/a |
| Chandler | 10-22-59-02 W4 | 1379 | n/a |
| Charlotte/Reita | 05-35-60-03 W4 | 6403 | <# removed> |
| Cherry Grove | 05-12-62-01 W4 | Shut-in | n/a |
| Cold Lake | 08-12-63-03 W4 | 6406 | n/a |
| East Angling | 03-28-60-02 W4 | 1381 | n/a |
| Fort Kent | 9c-29-61-04 W4 | Shut-in | n/a |
| Fort Pitt | 03-25-55-26-W3 | Shut-In | n/a |
| Horidi | 06-10-64-03 W4 | n/a | n/a |
| Jessie Lake | 07-01-61-06 W4 | 1037 | <# removed> |
| John Lake North | 11-35-56-01 W4 | 1250 | <# removed> |
| John Lake South | 07-11-56-01 W4 | Shut-in | n/a |
| John Lake Border Compressor | 08-01-56-01 W4 | Shut-in | n/a |
| Kehiwin | 05-36-59-07 W4 | 1297 | n/a |
| Kehiwin South | 16-28-58-07 W4 | Shut-in | n/a |
| Kent | 15-13-62-03 W4 | Shut-in | n/a |
| Lakewood Booster | 15-28-61-03 W4 | Shut-in | n/a |
| Lindbergh | 07-21-58-05 W4 | 1363 | <# removed> |
| Lloydminster Plant | 02-25-49-28 W3 | Shut-in | n/a |
| Moonshine | 08-34-58-03 W4 | 1069 | n/a |
| Moose Mountain | 11-23-58-06 W4 | Shut-in | n/a |
| Muriel Lake South | 07-20-59-04 W4 | 6401 | n/a |
| Primrose | 09-26-63-03 W4 | 1473 | n/a |
| Sage | 13-29-60-04 W4 | 1461 | n/a |
| Soars | 06-19-59-02 W4 | Shut-in | n/a |
| Soars South | 14-18-59-02 W4 | 1317 | n/a |
| Soars West | 06-34-59-03 W4 | Shut-in | n/a |
| South Angling | 12-07-60-02 W4 | Shut-in | n/a |
| Thompson | 09-22-60-02 W4 | Shut-in | n/a |

East - Central Border

<name removed> (Operations Supervisor) Office: <# removed>
Camrose, Alberta Cellular: <# removed>
Residence: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|----------------------|----------------------------------|----------------|------------------|
| Acadia Valley Plant | 13-12-26-02 W4 | Shut-in | <# removed> |
| Acadia West Plant | 02-15-26-03 W4 | Shut-in | <# removed> |
| Battle Creek Battery | 12-24-31-22 W3 | n/a | n/a |
| Coleville Plant | 12-11-31-22 W3 | n/a | <# removed> |
| Dan Oil Battery | 16-17-31-20 W3 | n/a | n/a |
| Enerplus Battery | 12-21-31-21 W3 | Shut-in | n/a |
| Esther Plant | 04-14-31-02 W4 | n/a | <# removed> |
| Fusilier Booster | 05-27-31-28 W3 | 4334 | n/a |
| Fusilier Booster | 09-06-32-28 W3 | n/a | n/a |
| Kirkpatrick Plant | 05-30-32-10 W4 | Shut-in | <# removed> |
| Kirkpatrick Booster | 06-27-32-11 W4 | Shut-in | n/a |
| Kirkpatrick Booster | 10-32-32-11 W4 | Shut-in | n/a |
| Kirkpatrick Booster | 16-03-32-11 W4 | Shut-in | n/a |
| Loverna Plant | 16-25-31-29 W3 | 4333 | <# removed> |
| Marengo | 16-25-28-28 W3 | Shut-in | n/a |
| Marengo | 12-34-29-28 W3 | Shut-in | n/a |
| Marengo North Plant | 12-22-30-26 W3 | Shut-in | <# removed> |
| Marengo South | 07-28-28-27 W3 | Shut-In | n/a |
| Milton | 13-18-30-27 W3 | n/a | n/a |
| Milton Booster | 10-10-30-28 W3 | Shut-In | n/a |
| Rattlesnake | 10-35-29-01 W4 | Shut-In | n/a |
| Timber Wolf Battery | 09-17-31-22 W3 | Shut-in | n/a |
| Viking Battery | 04-15-31-22 W3 | n/a | n/a |
| Summerdale Pipeline | 03-04-60-03 W5 to 07-15-59-05 W5 | | |

Idle

<name removed> (Operations Supervisor) Office: <# removed>
 Camrose, Alberta Cellular: <# removed>
 Residence: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|-----------------------|-----------------|----------------|------------------|
| Corbett Creek Plant | 09-02-63-07 W5 | Shut-In | n/a |
| Mitsue Overlea Plant | 16-11-72-04 W5 | Shut-in | n/a |
| Prairie River Plant | 06-24-72-18 W5 | Shut-in | n/a |
| Prairie River Booster | 06-06-72-16 W5 | Shut-in | n/a |
| Prairie River Booster | 14-24-71-15 W5 | Shut-in | n/a |
| Prairie River 08-15 | 08-15-21-15 W5 | Shut-in | n/a |
| Prairie River Booster | 11-11-071-15 W5 | Shut-in | n/a |
| Rock Island Plant | 12-23-75-23 W4 | Shut-in | n/a |
| Rock Island Booster | 06-35-75-23 W4 | Shut-in | n/a |
| Sedgewick Gas Plant | 06-27-41-13 W4 | Shut-in | n/a |
| Sedgewick Booster | 14-32-39-13 W4 | Shut-in | n/a |
| Thunder Lake Plant | 09-20-59-06 W5 | Shut-in | n/a |

East - Thornbury

<name removed> (Operations Supervisor) Office: <# removed>
 Bonnyville, Alberta Cellular: <# removed>
 Residence: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|----------------------------|-----------------|----------------|------------------|
| Beaver Lake Plant | 13-05-66-13 W4 | Shut-in | <# removed> |
| Hangingstone | 07-09-82-12 W4 | Shut-in | <# removed> |
| Hangingstone Booster | 05-16-82-12 W4 | Shut-in | <# removed> |
| Marianna | 06-06-81-13 W4 | 7036 | <# removed> |
| Marianna Booster | 11-36-80-15 W4 | Shut-in | n/a |
| Marianna Booster | 12-31-80-15 W4 | Shut-in | n/a |
| McGuffin Plant | 16-29-65-11 W4 | Shut-in | <# removed> |
| Thornbury Burnt Pine | 04-20-83-11 W4 | Shut-in | <# removed> |
| Thornbury Burnt Pine North | 11-34-83-11 W4 | Shut-in | n/a |
| Thornbury Burnt Pine South | 13-31-82-11 W4 | Shut-in | n/a |
| Thornbury East | 15-12-80-13 W4 | Shut-in | <# removed> |
| Thornbury North | 08-13-80-14 W4 | 7034 | <# removed> |
| Thornbury South | 02-29-79-13 W4 | 7035 | <# removed> |
| Thornbury West | 05-28-79-14 W4 | Shut-in | n/a |

South District - Bantry / Princess / Shaunavon

<name removed> (Operations Supervisor) Office: <# removed>
 Bantry Plant Cellular: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|---|-----------------|----------------|------------------|
| Bantry Plant | 04-33-17-12 W4 | 7039 | <# removed> |
| Bantry Booster | 04-32-18-13 W4 | 7046 | n/a |
| Bantry Injection Well | 13-33-17-12 W4 | n/a | n/a |
| Namaka North Plant | 01-09-23-24 W4 | Shut-In | n/a |
| Namaka South Plant | 13-29-22-24 W4 | Shut-In | n/a |
| Namaka Compressor | 09-36-22-24 W4 | Shut-In | n/a |
| Princess Plant | 16-14-20-12 W4 | Shut-in | <# removed> |
| Princess Injection Well | 01-14-20-12 W4 | Shut-in | n/a |
| Shaunavon Main Plant | 15-15-07-20-W3 | n/a | <# removed> |
| Shaunavon North Plant | 15-33-09-18-W3 | n/a | n/a |
| Suffield Pipeline (<i>operated by Cenovus Energy</i>) | | SIRC: | <# removed> |

South District - Turin / Robin / Parkland

<name removed> (Operations Manager) Office: <# removed>
 Turin, Alberta Cellular: <# removed>
 Residence: <# removed>
 Emergency: <# removed>

| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
|---|----------------------------------|----------------|------------------|
| Enchant Plant | 11-35-13-17 W4 | Shut-in | <# removed> |
| Enchant Booster | 03-02-13-17 W4 | Shut-in | n/a |
| Mosquito Creek | 07-05-15-26 W4 | Shut-in | <# removed> |
| Parkland Booster | 09-04-15-26 W4 | 7040 | n/a |
| Parkland Plant | 07-11-15-27 W4 | 7044 | <# removed> |
| Parkland Booster | 01-12-14-27 W4 | 7041 | n/a |
| Retlaw Plant | 12-02-13-19 W4 | Shut-in | <# removed> |
| Robin Booster | 01-31-13-20 W4 | n/a | <# removed> |
| Turin Plant | 12-19-12-18 W4 | n/a | <# removed> |
| Turin Booster (K-26) | 11-10-12-18 W4 | Shut-in | n/a |
| Turin Booster | 06-12-10-18 W4 | n/a | n/a |
| Turin Booster | 13-16-11-17 W4 | n/a | n/a |
| Turin Booster | 06-08-12-17 W4 | n/a | n/a |
| Turin Booster | 16-13-13-18 W4 | n/a | n/a |
| Porcupine Hills Pipeline (<i>Shut-in</i>) | 13-17-04-30 W4 to NW-06-12-02 W5 | | |

| Ikhil Joint Venture | | |
|-----------------------------------|-------------------------------|-------------|
| <name removed> (Dir. Ops. - FG&P) | Office: | <# removed> |
| Calgary, Alberta | Cell: | <# removed> |
| Operated by: | Inuvik Gas Ltd. | <# removed> |
| | Inuvik, Northwest Territories | 68° |
| Ikhil Gas Plant Location: | 45' North and 134° 10' West | |

EXTRACTION SITES

| Edmonton Ethane Extraction Plant (EEEP) | | |
|---|---|-------------|
| <name removed> (Operations Manager) | Office: | <# removed> |
| Edmonton, Alberta | Cellular: | <# removed> |
| Facility Main: | <# removed> | |
| Emergency: | <# removed> | |
| Location: | 10001 - 29 Ave, Edmonton, AB | |
| STARS #: | 1539 | |
| Harmattan Plant | | |
| <name removed> (Operations Manager) | Office: | <# removed> |
| Sundre, Alberta | Cellular: | <# removed> |
| Facility Main: | <# removed> | |
| Location: | NE(09)-27-31-04 W5M | |
| STARS #: | | |
| Joffre Ethane Extraction Plant (JEEP) | | |
| <name removed> (Operations Manager) | Office: | <# removed> |
| Edmonton, Alberta | Cellular: | <# removed> |
| Facility Main: | <# removed> | Ext. 0 |
| Emergency: | <# removed> | |
| Location: | 02-29-38-25 W4M | |
| STARS #: | 11870 | |
| Younger Plant | | |
| <name removed> (Operations Manager) | Office: | <# removed> |
| Taylor, British Columbia | Cellular: | <# removed> |
| | Residence: | <# removed> |
| Facility Main: | <# removed> | |
| Control Room: | <# removed> | |
| Emergency: | <# removed> | |
| Office Location: | 9961 – 100A Street, Taylor, BC | |
| Plant Location: | SE36-82-18 W6M (10855 – NGL Road, Taylor, BC) | |
| STARS #: | | |

POWER SITES

| Power Division – Conventional – Peaking Plants | | | |
|--|----------------------|---|------------------|
| <name removed> (VP of Ops - Power) | | Office: | <# removed> |
| Dallas, Texas, USA | | Cellular: | <# removed> |
| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
| Bantry Peaking Plant | 04-33-17-12 W4 | 7039 | <# removed> |
| Parkland Peaking Plant | 06-11-15-27 W4 | 4702 | <# removed> |
| Power Division – Renewable - Wind | | | |
| <name removed> (Operations Supervisor) | | Office: | <# removed> |
| Dawson Creek, British Columbia | | Cellular: | <# removed> |
| | | Residence: | <# removed> |
| <u>Facility</u> | <u>Location</u> | <u>STARS #</u> | <u>Telephone</u> |
| Bear Mountain Wind Park | N55.39.43 W120.22.49 | 3100 | <# removed> |
| | N55.42.12 W120.25.41 | 3195 | <# removed> |
| Forrest Kerr Site | | | |
| Facility Main: | | <# removed> | |
| Northwest Hydro Operations Facility: | | <# removed> | |
| Location: | | Highway 27, Bob Quinn, British Columbia | |

STORAGE SITES

Ferndale Storage Terminal

<name removed> (Operations Supervisor) Office: <# removed>

Ferndale, Washington Cell: <# removed>

Facility Main: <# removed>

Fax: <# removed>

Location: 4100 Unick Road, Ferndale, WA, USA 98248

ALBERTA GOVERNMENT

| Alberta Government Agency | Telephone | Other |
|---|----------------|---------------------------------------|
| Alberta Energy Regulator (AER) | | |
| • Energy & Environmental Emergency Response Line | 1-800-222-6514 | 780-422-4505 (outside of AB,BC,SK) |
| • Bonnyville Field Centre | 780-826-5352 | |
| • Drayton Valley Field Centre | 780-542-5182 | |
| • Grande Prairie Field Centre | 780-538-5138 | |
| • High Level Field Centre | 780-926-5399 | |
| • Medicine Hat Field Centre | 403-527-3385 | |
| • Midnapore Field Centre (Calgary) | 403-297-8303 | |
| • Red Deer Field Centre | 403-340-5454 | |
| • Slave Lake Field Centre | 780-843-2050 | |
| • Wainwright Field Centre | 780-842-7570 | |
| Alberta Environment & Parks | | |
| • Energy & Environmental Emergency Response Line | 1-800-222-6514 | |
| • Wildfire Reporting | 1-800-310-3473 | #3473 (Telus Mobility) |
| • Wildlife Reporting | 1-877-944-0313 | |
| Occupational Health & Safety | | |
| • Incident Reporting / Contact Centre | 1-866-415-8690 | |
| Alberta Boilers Safety Association (ABSA) | | |
| • Edmonton (Head Office & After Hours #) | 780-437-9100 | |
| • Calgary | 403-291-7070 | |
| • Grande Prairie | 780-538-9922 | |
| • Lethbridge | 403-394-1011 | |
| • Medicine Hat | 403-529-3514 | |
| • Red Deer | 403-341-6677 | |
| • Fort McMurray | 780-714-3067 | |
| Workers' Compensation Board (WCB) | | |
| • Incident Reporting | 1-866-922-9221 | |
| • Calgary | 403-517-6000 | |
| • Edmonton | 780-498-3999 | |
| Provincial Poison Control | | |
| • PADIS: Poison and Drug Information Service | 1-800-332-1414 | |
| Alberta Transportation | | |
| • Coordination & Information Centre (CIC) | 1-800-272-9600 | |
| Alberta Emergency Management Agency (AEMA) | | |
| • Provincial Operations Centre (POC) | 1-866-618-2362 | |
| • Head Office (Edmonton) | 780-422-9000 | |

| Alberta Government Agency | Telephone | Other |
|--------------------------------------|----------------|-----------------------------------|
| Alberta Health Services (AHS) | | |
| • Edmonton Zone (Edmonton) | 780-735-1800 | 780-493-1963 (after hrs emerg) |
| • Calgary Zone (Calgary) | 403-264-5615 | (MOH on Call) |
| • Central Zone (Red Deer) | 1-866-654-7890 | Option 2 (24 hour emergency) |
| 24 Hour Manager on Call | 1-855-420-6042 | |
| • North Zone (Grande Prairie) | 1-800-732-8981 | (ask for Director EPH) |
| • South Zone (West - Lethbridge) | 403-388-6111 | (ask for Public Health Inspector) |
| South Zone (East - Medicine Hat) | 403-502-8300 | (ask for Public Health Inspector) |

BRITISH COLUMBIA GOVERNMENT

| BC Government Agency | Telephone | Other |
|---|----------------|------------------------|
| Oil and Gas Commission (OGC) | | |
| • Emergency Management BC (EMBC) | 1-800-663-3456 | |
| • Emergency Response Unit (Fort St. John) | 250-794-5200 | |
| • Director, Public Protection & Safety (<name removed>) | <# removed> | |
| • Emergency Response Coordinator (<name removed>) | <# removed> | |
| • ER Analyst (<name removed>) | <# removed> | |
| Ministry of Environment | | |
| • Emergency Management BC (EMBC) - spill reporting | 1-800-663-3456 | |
| • Peace Region (Fort St. John) | 250-787-3411 | |
| • Omineca Regional Office (Prince George) | 250-565-6135 | |
| • Wildlife Reporting | 1-877-952-7277 | #7277 (Telus Mobility) |
| Ministry of Forests, Land & Natural Resource Operation | | |
| • Wildfire Reporting | 1-800-663-5555 | *5555 (via cell) |
| Ministry of Transportation & Infrastructure | | |
| • Peace District (Fort St John) | 250-787-3237 | |
| • DriveBC (check road conditions) | 1-800-550-4997 | |
| BC Safety Authority | | |
| • 24 Hour Incident Reporting (technical systems & equipment) | 1-866-566-7233 | www.safetyauthority.ca |
| WorkSafe BC | | |
| • After Hours Emergency | 1-866-922-4357 | |
| • Emergencies During Business Hours | 1-888-621-7233 | |
| BC Poison Control | | |
| • Drug & Poison Information Centre (DPIC) | 1-800-567-8911 | |
| Health Authority | | |
| • Northern Health Authority | | |
| MHO on Call (after hours emergency) | 250-565-2000 | |
| Fort St. John (Environmental Health Office) | 250-263-6000 | |
| Dawson Creek (Environmental Health Office) | 250-719-6500 | |
| Terrace (Environmental Health Office) | 250-631-4222 | |
| • Vancouver Coastal Health Authority | 604-736-2033 | |

SASKATCHEWAN GOVERNMENT

| Saskatchewan Government Agency | Telephone | Other |
|---|----------------|--|
| Saskatchewan Ministry of the Economy (ECON) | | |
| • Emergency & Incident Reporting | 1-844-764-3637 | (state PNG Operating Area - see Sect 8 Maps) |
| Saskatchewan Ministry of the Environment | | |
| • Environmental Assessment Branch (Regina) | 306-787-6132 | |
| • Spill Control Centre | 1-800-667-7525 | |
| • Firewatch | 1-800-667-9660 | |
| • Wildlife Reporting | 1-800-667-7561 | |
| Technical Safety Authority of Saskatchewan (TSASK) | | |
| • Boilers and Pressure Vessel Safety (Incident Reporting) | 1-866-530-8599 | |
| Workers' Compensation Board (WCB) | | |
| • Head Office (Regina) | 306-787-4370 | |
| • Injury Reporting | 1-800-787-9288 | |
| SK Emergency Management & Fire Safety | | |
| • Government Emergency Coordination | 306-787-3774 | proveoc@gov.sk.ca |
| WorkSafe Saskatchewan (OHS) | | |
| • Incident Reporting | 1-800-567-7233 | |
| Provincial Poison Control | | |
| • PADIS | 1-866-454-1212 | |
| Ministry of Highways & Infrastructure | | |
| • Northern Region | 306-953-3500 | |
| • Central Region | 306-933-8333 | |
| • Southern Region | 306-787-4969 | |
| Health Authority | | |
| • Cypress Health Region (Swift Current) | 306-778-5100 | |
| • Heartland Health Region (Rosetown) | 306-882-2672 | |
| • Prairie North Health Region (North Battleford) | 306-446-6606 | |
| • Medical Health Officer (MHO) | 306-446-6400 | x 6426 |
| • HealthLine (province-wide) | 1-877-800-0002 | 811 |

CANADIAN & NWT GOVERNMENTS

| Canadian Government Agency | Telephone | Other |
|---|----------------|-----------------------|
| National Energy Board (NEB) | | |
| • Emergency Management Compliance (Calgary) | 403-292-4800 | |
| • 24 Hour Incident Line (non-pipeline incidents) | 403-807-9473 | |
| • Pipeline Emergency (TSB) | 819-997-7887 | |
| Indian Oil and Gas Canada (<i>notify of incidents on Reserves</i>) | 403-292-5625 | |
| Health Canada | | |
| • Head Office (Ottawa) | 1-866-225-0709 | 613-957-2991 |
| • Alberta First Nations & Inuit Health Branch (FNIHB) | 780-495-2703 | |
| FNIHB - Alberta Health Protection 24/7 Cell | 780-218-9929 | |
| Transport Canada | | |
| • CANUTEC (Dangerous Goods emergency) | 613-996-6666 | *666 (via cell) |
| • CANUTEC (Dangerous Goods information) | 613-992-4624 | |
| • Transportation Safety Board (Pipeline/Rail Incident Hotline) | 819-997-7887 | |
| • Canadian Pacific Railway Police | 1-800-716-9132 | |
| Environment Canada | | |
| • Head Office | 1-800-668-6767 | |
| • Prairies & Northern Region | 780-951-8951 | |
| • Pacific & Yukon Region | 604-666-9862 | |
| Fisheries and Oceans Canada | | |
| • Coast Guard Marine Spill Response (BC,AB,SK,MB,YK,NT) | 1-800-889-8852 | |
| Northwest Territories Government Agency | Telephone | Other |
| NWT Environment & Natural Resources | | |
| • General (Yellowknife) | 867-767-9231 | |
| • Forest Fire Reporting | 1-877-698-3473 | |
| • Spill Reporting (NWT & Nunavut) | 867-920-8130 | |
| • Wildlife Reporting | 867-678-0289 | |
| NWT Workers' Safety & Compensation Commission (WSCC) | | |
| • 24 hour Accident Reporting | 1-800-661-0792 | |
| NWT Public Works & Services | | |
| • Boiler, Pressure Vessel & Gas Safety (Yellowknife) | 867-920-8801 | |
| • Boiler, Pressure Vessel & Gas Safety (Inuvik) | 867-777-7347 | |
| NWT Municipal & Community Affairs - Emergency Measures Office | | |
| • 24 Hour Emergency Call Line | 867-920-2303 | 867-767-9161 (office) |
| Beaufort-Delta Health & Social Services Authority | | |
| • Emergency # / Switchboard | 867-777-8000 | |

USA & WASHINGTON GOVERNMENTS

| USA Government Agency | Telephone | Other |
|---|----------------|----------------|
| National Response Centre (NRC) | | |
| • Spill / Pipeline Accident Reporting | 1-800-424-8802 | |
| U.S. Coast Guard (USCG) | | |
| • Puget Sound Sector - Emergency (Seattle) | 206-217-6001 | |
| • Bellingham Station | 360-734-1692 | |
| U.S. Environmental Protection Agency (EPA) | | |
| • Region 10 (Pacific Northwest) | 206-553-1200 | |
| U.S. Department of Transportation (DOT) | | |
| • 24-hour Crisis Management Center | 202-366-1863 | |
| Pipeline and Hazardous Materials Safety Administration (PHMSA) | | |
| • Office of Pipeline Safety (OPS) - emergency support | 202-366-4439 | |
| • OPS Western Region | 720-963-3160 | |
| U.S. Fish & Wildlife Service (FWS) | | |
| • North Pacific Landscape Conservation Cooperative Office | 360-753-9440 | |
| U.S. National Marine Fisheries Service (NMFS) | | |
| • Northwest Regional Office (Seattle) | 206-526-6150 | |
| Occupational Safety & Health Administration (OSHA) | | |
| • Incident Reporting | 1-800-321-6742 | |
| Washington State Government Agency | Telephone | Other |
| Washington State Military Emergency Management Division | | |
| • Alert & Warning Center (spills into waterways) | 1-800-258-5990 | |
| Washington Utilities and Transportation Commission (UTC) | | |
| • Emergency Notification Line (pipeline incidents) | 1-888-321-9144 | 1-888-321-9146 |
| • Head Office (Olympia) | 360-664-1160 | |
| Washington Department of Ecology | | |
| • Northwestern Regional Office (hazardous spill reporting on land) | 425-649-7000 | |
| Washington State Department of Health (DOH) | | |
| • Office of Emergency Preparedness & Response | 360-236-4068 | |
| • Environmental Public Health | 360-236-3000 | |
| Washington State Dept. of Labor & Industries (L&I) | | |
| • Fatality & Serious Injury Reporting | 1-800-423-7233 | |
| • Bellingham Regional Office | 360-647-7300 | |
| Washington Northwest Clean Air Agency (NWCAA) | | |
| • Head Office (Mount Vernon) | 360-428-1617 | |

LOCAL GOVERNMENTS

| Alberta | Telephone | Other |
|---|--------------|------------------------|
| Acadia, M.D. | 403-972-3808 | |
| Barrhead, County | 780-674-3331 | |
| Bonnyville, M.D. | 780-826-3171 | |
| Bonnyville, Town | 780-826-3496 | |
| Calgary, City | 311 | |
| Camrose, County | 780-672-4446 | |
| Clear Hills, County (Worsley) | 780-685-3925 | |
| Clearwater County (Rocky Mountain House) | 403-845-4444 | 403-844-8500 (emerg) |
| Cypress, County (Dunmore) | 403-526-2888 | |
| Edmonton, City | 311 | |
| Fairview, M.D. | 780-835-4903 | |
| Flagstaff County (Sedgewick) | 780-384-4100 | |
| Foothills, M.D. (High River) | 403-652-2341 | 1-888-808-3722 (emerg) |
| Forty Mile County (Foremost) | 403-867-3530 | |
| Lac Ste. Anne County (Sangudo) | 780-785-3411 | |
| Lacombe County | 403-782-6601 | 403-357-1210 (emerg) |
| Leduc County (Nisku) | 780-955-3555 | |
| Lesser Slave River, M.D. (Slave Lake) | 780-849-4888 | |
| Lethbridge, County | 403-328-5525 | |
| Mackenzie County (Fort Vermilion) | 780-927-3718 | 1-888-511-6323 (emerg) |
| Mountain View County (Didsbury) | 403-335-3311 | |
| Newell, County (Brooks) | 403-362-3266 | |
| Northern Lights, County (Manning) | 780-836-3348 | |
| Opportunity, M.D. (Wabasca) | 780-891-3778 | |
| Paintearth, County (Castor) | 403-882-3211 | |
| Pincher Creek, M.D. | 403-627-3130 | 403-627-5333 (emerg) |
| Ponoka County | 403-783-3333 | |
| Ranchland, M.D. (Nanton) | 403-646-3131 | |
| Red Deer County | 403-350-2150 | |
| Saddle Hills County (Spirit River) | 780-864-3760 | |
| Special Areas Board (Disaster Services – Youngstown) | 403-779-3733 | |
| St. Paul, County | 780-645-3301 | |
| Taber, M.D. | 403-223-3541 | |
| Vermilion River, County (Kitscoty) | 780-846-2244 | 780-846-2929 (emerg) |

| Alberta | Telephone | Other |
|--|--------------|----------------------|
| Vulcan County | 403-485-2241 | |
| Wainwright, M.D. | 780-842-4454 | |
| Warner, County | 403-642-3635 | |
| Wetaskiwin, County | 780-352-3321 | 780-352-0005 (emerg) |
| Willow Creek, M.D. (Claresholm) | 403-625-3351 | |
| Woodlands County (Whitecourt) | 780-778-8400 | |

| British Columbia | Telephone | Other |
|---|----------------|-------|
| Kitimat-Stikine Regional District (Terrace) | 250-615-6100 | |
| Peace River Regional District (Dawson Creek) | 250-784-3200 | |
| Emergency 24Hr # | 1-800-670-7773 | |
| Vancouver, City | 311 | |

| Saskatchewan Rural Municipalities | Telephone | Other |
|--|--------------|-------|
| Antelope Park (Marengo) | 306-968-2922 | |
| Arlington (Shaunavon) | 306-297-2108 | |
| Beaver River (Pierceland) | 306-839-2060 | |
| Bone Creek (Shaunavon) | 306-297-2570 | |
| Chesterfield (Eatonia) | 306-967-2222 | |
| Deer Forks (Burstall) | 306-679-2000 | |
| Frenchman Butte (Paradise Hill) | 306-344-2034 | |
| Happyland (Leader) | 306-628-3800 | |
| Kindersley | 306-463-2524 | |
| Loon Lake | 306-837-2076 | |
| Milton (Marengo) | 306-968-2922 | |
| Oakdale (Coleville) | 306-965-2281 | |

| Northwest Territories | Telephone | Other |
|--|--------------|----------------------|
| Inuvik, Town | 867-777-8601 | 867-777-2222 (emerg) |
| Inuvialuit Regional Corporation | | |
| Head Office (Inuvik) | 867-777-7000 | |
| Inuvialuit Land Administration | 867-977-7100 | |

| Washington State | | Telephone | Other |
|--|--|--------------|-------|
| Whatcom Unified Emergency Management (WUEM) | | | |
| Whatcom County Sheriff Dept. of Emergency Management | | 360-676-6681 | |
| Whatcom County Health Department (Environmental Health) | | 360-778-6000 | |

AMBULANCE SERVICES

| Ambulance Service | Telephone | Other |
|-----------------------------------|----------------|------------------|
| | 911 | |
| STARS (Western Canada) | 1-888-888-4567 | #4567 (via cell) |
| Blue Ice EMS (Inuvik, NWT) | 867-777-4444 | |

MEDICAL SERVICES

| Medical Service | Telephone | Other |
|--|--------------|-------|
| 911 | | |
| Alberta | | |
| • Athabasca Healthcare Centre | 780-675-6000 | |
| • Barrhead Healthcare Centre | 780-674-2221 | |
| • Beaverlodge Municipal Hospital | 780-354-2136 | |
| • Black Diamond (Oilfields Hospital) | 403-933-2222 | |
| • Bonnyville Healthcare Centre | 780-826-3311 | |
| • Brooks Health Centre | 403-501-3232 | |
| • Calgary (Foothills Medical Centre) | 403-944-1110 | |
| • Camrose (St. Mary's Hospital) | 780-679-6100 | |
| • Claresholm General Hospital | 403-682-3700 | |
| • Cold Lake Healthcare Centre | 780-639-3322 | |
| • Coronation Hospital & Care Centre | 403-578-3803 | |
| • Edmonton (U of A Hospital) | 780-407-8822 | |
| • Fairview Health Complex | 780-835-6100 | |
| • Fort Macleod Health Centre | 403-553-5311 | |
| • Fort McMurray (Northern Lights Regional Health Centre) | 780-791-6161 | |
| • Grande Prairie (QEII Hospital) | 780-538-7100 | |
| • High Level (Northwest Health Centre) | 780-841-3200 | |
| • Innisfail Health Centre | 403-227-7800 | |
| • Killam Health Care Centre | 780-385-3741 | |
| • Lac La Biche (William J. Cadzow–Lac La Biche Centre) | 780-623-4404 | |
| • Lethbridge (Chinook Regional Hospital) | 403-388-6111 | |
| • Mayerthorpe Healthcare Centre | 780-786-2261 | |
| • Medicine Hat Regional Hospital | 403-529-8000 | |
| • Milk River Health Centre | 403-647-3500 | |
| • Oyen (Big Country Hospital) | 403-664-4300 | |
| • Pincher Creek Health Centre | 403-627-1234 | |
| • Raymond Health Centre | 403-752-4561 | |
| • Red Deer Regional Hospital Centre | 403-343-4422 | |
| • Spirit River (Central Peace Health Complex) | 780-864-3993 | |
| • St. Paul (St. Therese-St. Paul Healthcare Centre) | 780-645-3331 | |
| • Taber Health Centre | 403-223-7211 | |
| • Vulcan Community Health Centre | 403-485-3333 | |

| Medical Service | Telephone | Other |
|---|--------------|-------|
| British Columbia | | |
| • Dawson Creek & District Hospital | 250-782-8501 | |
| • Fort Nelson Hospital | 250-774-2344 | |
| • Fort St. John Hospital | 250-262-5200 | |
| • Vancouver (St Paul's Hospital) | 604-682-2344 | |
| Saskatchewan | | |
| • Eatonia Primary Health Care Clinic | 306-967-2591 | |
| • Eston Health Centre | 306-962-3667 | |
| • Kerrobert Integrated Health Centre | 306-834-2646 | |
| • Kindersley & District Health Centre | 306-463-1000 | |
| • Leader Hospital | 306-628-3845 | |
| • Shaunavon Hospital & Care Centre | 306-297-2644 | |
| Northwest Territories | | |
| • Inuvik Regional Hospital | 867-777-8000 | |
| Washington | | |
| • Bellingham Fire & Medical (Whatcom Medic One) | 360-778-8400 | |
| • PeaceHealth St Joseph Medical Center (Bellingham) | 360-734-5400 | |

FIRE SERVICES

| Fire Service | Telephone | Other |
|--|----------------|------------------|
| 911 | | |
| · Alberta Forest Fire Reporting | 1-800-310-3473 | |
| · BC Forest Fire Reporting | 1-800-663-5555 | *5555 (via cell) |
| · Saskatchewan Forest Fire Reporting | 1-800-667-9660 | |
| · Northwest Territories Forest Fire Reporting | 1-877-698-3473 | |
| · Whatcom County Fire Dept. – District 7 (Ferndale) | 360-384-0303 | |

POLICE SERVICES

| Police Service | Telephone | Other |
|----------------------------------|--------------|-----------------|
| 911 | | |
| Alberta | | |
| • Athabasca | 780-675-5122 | |
| • Barrhead | 780-674-4848 | |
| • Bonnyville | 780-343-7200 | |
| • Brooks | 403-794-4400 | |
| • Calgary | 403-266-1234 | |
| • Camrose | 780-672-3342 | |
| • Claresholm | 403-625-4445 | |
| • Cold Lake | 780-594-3302 | |
| • Consort | 403-577-3001 | |
| • Edmonton | 780-423-4567 | #377 (via cell) |
| • Elk Point | 780-724-3964 | |
| • Fairview | 780-835-4031 | |
| • Fort Macleod | 403-553-7200 | |
| • High Prairie | 780-523-3378 | |
| • Killam | 780-385-3509 | |
| • Lac La Biche | 780-623-4012 | |
| • Manning | 780-836-3769 | |
| • Milk River | 403-647-2427 | |
| • Oyen | 403-664-3505 | |
| • Pincher Creek | 403-627-6010 | |
| • Raymond/Magrath | 403-752-4747 | |
| • Redcliff | 403-548-2288 | |
| • Rocky Mountain House | 403-845-2882 | |
| • Spirit River | 780-864-3525 | |
| • St. Paul | 780-645-8870 | |
| • Sundre | 403-638-3675 | |
| • Taber/Vauxhall | 403-223-4447 | |
| • Turner Valley | 403-933-7227 | |
| British Columbia | | |
| • Dawson Creek | 250-784-3700 | |
| • Fort Nelson (Northern Rockies) | 250-774-2700 | |
| • Fort St. John | 250-787-8140 | |
| • Hudson's Hope | 250-783-5241 | |

| Police Service | Telephone | Other |
|--|--------------|---------------------------------|
| • Stewart | 250-636-2233 | |
| • Vancouver | 604-717-3321 | |
| Saskatchewan | | |
| • Estevan | 306-637-4400 | |
| • Eston | 306-962-8530 | |
| • Kerrobert | 306-834-6550 | |
| • Kindersley | 306-463-4642 | |
| • Leader | 306-628-4600 | |
| • Lloydminster | 306-825-6350 | |
| • Shaunavon | 306-297-5550 | |
| Northwest Territories | | |
| • Inuvik | 867-777-1111 | |
| Washington | | |
| • Ferndale Police Dept. | 360-676-6911 | (dispatch) |
| • Bellingham Police Dept. | 360-778-8800 | (administration) |
| • Whatcom County Sheriff | 360-676-6681 | (emergency management division) |
| • State Patrol (Bellingham Detachment) | 360-676-2007 | |

OIL SPILL SERVICES

| Area | Telephone | Other |
|---|-----------------------|--------------|
| Western Canada Spill Services (WCSS)* | | |
| 24 Hour # | 1-866-541-8888 | |
| <u>Zone 1:</u> | | |
| Area P | | |
| • Joel Block (SWAT - Calgary) | 1-866-610-7928 | 403-390-4550 |
| Area Q | | |
| • Dan Janicki (Crescent Point Energy - Turner Valley) | 403-558-3757 | 403-312-3617 |
| • Greg Hallett (Shell – Pincher Creek) | 403-627-4200 | 403-606-8436 |
| Area S | | |
| • Adrian Schuurman (MidWest Pumps - Lethbridge) | 403-329-0427 | 403-795-9985 |
| • Rob Drader (Absolute SAFETY – Brooks) | 403-362-7100 | 403-362-1945 |
| <u>Zone 2:</u> | | |
| Area H | | |
| • Ryan Cederstrand (HSE Integrated – Sylvan Lake) | 1-866-347-3911 | 403-506-5993 |
| • Clint or Rick (Challand Excavating – Rocky Mtn House) | 403-845-2469 | 403-845-0018 |
| Area M | | |
| • Bonavista Energy | 1-866-971-8317 | |
| Area N | | |
| • See Area I/J or Area O | | |
| Area O | | |
| • Performance Steam Ltd. (Drumheller) | 403-820-0582 | |
| Area U | | |
| • Gary Bromby (Bromby Welding - Hardisty) | 780-888-1095 | |
| <u>Zone 3:</u> | | |
| Area G | | |
| • Contact Number | 780-621-7141 | |
| Area I/J | | |
| • Ric Fairclough (DWC Oilfield Construction - Acheson) | 780-983-3416 | 780-962-1503 |
| <u>Zone 4:</u> | | |
| Area D | | |
| • Ken Bolan (Slave Lake Safety - Slave Lake) | 780-849-4214 | 780-849-1111 |
| • Allen Fournier (Latigo Trucking - Slave Lake) | 780-516-2317 | 780-843-8800 |
| Area W | | |
| • KMC Oilfield Maintenance (Swan Hills) | 780-333-4300 | |
| • Peer Brothers Industries (Whitecourt) | 780-778-6149 | |

| Area | Telephone | Other |
|--|------------------|---------------------------|
| <u>Zone 5:</u> | | |
| Area VR1 | | |
| • Doug Simpson (Husky Pipeline - Lloydminster) | 780-871-6621 | |
| • Cenovus (La Corey) | 780-573-7375 | |
| Area Y | | |
| • Warren Petten/Tim Mottle (Ft. McMurray & Conklin) | 780-743-0222 | 780-598-5281 |
| <u>Zone 6:</u> | | |
| Area A | | |
| • James Barnhill (Husky – Rainbow Lake) | 780-956-8052 | 780-956-1814 |
| • Bruce Muzichuk (Zama City) | 780-683-2242 | 780-926-9797 |
| Area C | | |
| • Dwayne Stone (Clean Harbors - Fort St. John) | 250-785-8500 | |
| • Eric Pike (Clean Harbors - Fort Nelson) | 250-233-8811 | |
| Area E | | |
| • Dwayne Jones (Pembina - Valleyview) | 780-524-8877 | 780-524-3392 x2844 |
| • Teifion Evans (Penn West - Fox Creek) | 780-778-8502 | |
| • Dean Smith (Formula Powell - Edson) | 780-723-6110 | |
| Area T | | |
| • Clean Harbors (Clairmont) | 780-532-4331 | 780-897-0065 |
| • CNRL Chinchaga Gas Plant | 780-836-3364 x25 | |
| Saskatchewan Area Spill Co-ops* | | |
| Area I – see WCSS Area VR1 | | |
| Area II | 306-846-2088 | 306-460-8340 |
| Area III | 1-844-561-8444 | |
| Marine Spill Response Corporation (United States) | | |
| MSRC | 1-800-645-7745 | 360-733-3774 (Bellingham) |

*See Section 8 – Maps for spill area boundaries

ABORIGINAL AREAS

| Reserve/Settlement | Telephone | Other |
|--|-------------------|-------------------|
| Aboriginal Areas Impacted by AltaGas Operations | | |
| Beaver Lake Cree Nation Reserve 131 | 780-623-4549 | 1-877-610-3110 |
| Cold Lake First Nations Reserves 149 | 780-594-7183 | |
| East Prairie Metis Settlement | 780-523-2594 | |
| Elizabeth Metis Settlement | 780-594-5026 | |
| Ermineskin Cree Nation Reserve 138 | 780-585-3941 | |
| Fishing Lake Metis Settlement | 780-943-2202 | |
| Gwich'in Settlement Region | 867-777-7900 | |
| Louis Bull Tribe Reserve 138B | 780-585-3978 | |
| Montana First Nation Reserve 139 | 780-585-3744 | |
| Onion Lake Cree First Nation Reserve 119-2 | 306-344-4200 (SK) | 780-847-2200 (AB) |
| Samson Cree Nation Reserves 137,137A | 780-585-3793 | 780-421-4926 |
| Siksika Nation Reserve 146 | 403-734-5100 | |
| Hay Lake Reserve 209 (Dene Tha' First Nation) | 780-321-3775 | |

See Section 8 – Maps for the locations of the Aboriginal Areas listed above

SUPPORT SERVICES

| Service | Telephone | Other |
|---|----------------|--------------------|
| Air Monitoring | | |
| • Maxxam Analytics (Canada) | 1-800-386-7247 | |
| Construction Companies | | |
| • Corvet Construction (1977) Ltd. (Red Deer) | 1-888-578-3535 | |
| • Big Country Energy Services (Canada & USA) | 403-225-8867 | |
| • Pronghorn Controls (Western Canada) | 403-720-2526 | |
| Dangerous Goods | | |
| • LPGERC (Canada) | 1-800-265-0212 | |
| • CANUTEC (Canada) | 613-996-6666 | *666 (via cell) |
| • CHEMTREC (USA & Canada) | 1-800-424-9300 | |
| Environmental | | |
| • Secure Energy | 1-877-663-9769 | |
| • Matrix Solutions Inc. (Canada) | 1-877-774-5525 | |
| Firefighters - Oilfield Specialists | | |
| • Safety Boss | 1-800-882-4967 | |
| • HSE Integrated | 1-888-346-8260 | |
| • Firemaster Oilfield Services (Western Canada) | 403-342-7500 | |
| Helicopters | | |
| • Alpine Helicopters Ltd. (Canada) | 403-291-3100 | |
| • Canadian Helicopters (Western Canada) | 780-429-6900 | |
| One-Call | | |
| • Alberta 1 Call | 1-800-242-3447 | albertaonecall.com |
| • British Columbia 1 Call | 1-800-474-6886 | www.bconeall.bc.ca |
| • Saskatchewan 1 st Call | 1-866-828-4888 | www.sask1call.com |
| • Washington Utility Notification Center | 1-800-424-5555 | 811 |
| Communications Consultants | | |
| • Lovink Media Inc. (Calgary) | 403-620-5810 | <email removed> |
| • MediaReady International (Calgary) | 403-815-3393 | |

COMMUNICATIONS

If the ERP is activated, various company communication centres shall be established:

- § **On-Site Command Post (OSCP):** An incident command centre established at the incident site by the *On-Scene Commander* to manage production/well control procedures and coordinate air monitoring, evacuation and roadblock procedures within the emergency planning and response zones.
- § **Regional Emergency Operations Centre (REOC):** Should conditions at the emergency site warrant, an REOC will be established at a more appropriate location to support personnel at the OSCP. Depending on the severity of the emergency, representatives from the lead regulatory agency and other government agencies may be present at the REOC to support company personnel.
- § **Corporate Emergency Operations Centre (CEOC):** A CEOC will be established at the Corporate Head Office location to accommodate the corporate emergency response team including the *Incident Commander* and other essential response personnel.
- § **Reception Centre:** A reception centre will be established by company representatives. It will be established outside of the EPZ to receive evacuees should evacuation procedures be implemented.
- § In addition to the above company communication centres, the municipal government may establish a **Municipal Emergency Coordination Centre (MECC)** and the lead regulatory agency may establish their own **Emergency Coordination Centre(s) (ECC)**. The ECCs are government control centres set up at suitable locations to manage the larger aspects of the emergency including public relations and the provision of information and advice to affected citizens, agencies and the media. AltaGas may provide representatives to the ECCs to liaise between the company and government officials and to assist with public and media communications.

The Emergency Response Initial Communications Flowchart following shows the sequence of initial emergency notifications to company and contract personnel, government agencies and emergency support services when activating the ERP.

All odour complaints, public concerns or abnormal operating situations reported to, or observed by, company/contract personnel shall be documented on the Initial Notification Report (Section 6 – FORMS) and investigated and acted upon without delay. The most senior on-site personnel will investigate the initial report. They must follow safe work practices and procedures and record all pertinent information on the Incident Log (Section 6 – FORMS).

Approach a hazardous condition with a second person and with the proper Personal Protective Equipment (e.g. breathing apparatus [SCBA] and handheld H₂S detector). Always employ the buddy system and, if necessary, await the arrival of additional personnel and equipment.

Once the location and magnitude of the problem has been determined, the most senior on-site AltaGas representative will assume the duties of the *On-Scene Commander*. They will consult with the *Incident Commander* and activate the ERP if the situation warrants. Additional contacts are then made to fully implement the ERP.

AltaGas will supply the communication systems and equipment required to provide effective communications between the OSCP and:

- § Evacuation Personnel/Rover(s) and Roadblock Personnel
- § Mobile Air Monitoring Unit(s)
- § REOC
- § CEOC
- § MECC
- § ECC
- § Reception Centre

Mobile telephones will be located in the facility offices and key on-site personnel vehicles. Base radio stations will be located at the OSCP and REOC (if established). Portable radios with long range capabilities and on a common frequency with the base stations will be available for use by roadblock, evacuation and air monitoring personnel.

Company and contract employees and sub-contractors must not volunteer information or opinions regarding any emergency situation. If approached by the public or media, refer individuals to the designated *Media & Communications Coordinator*.

The media should be advised a statement will be issued once all information has been received, reviewed and verified.

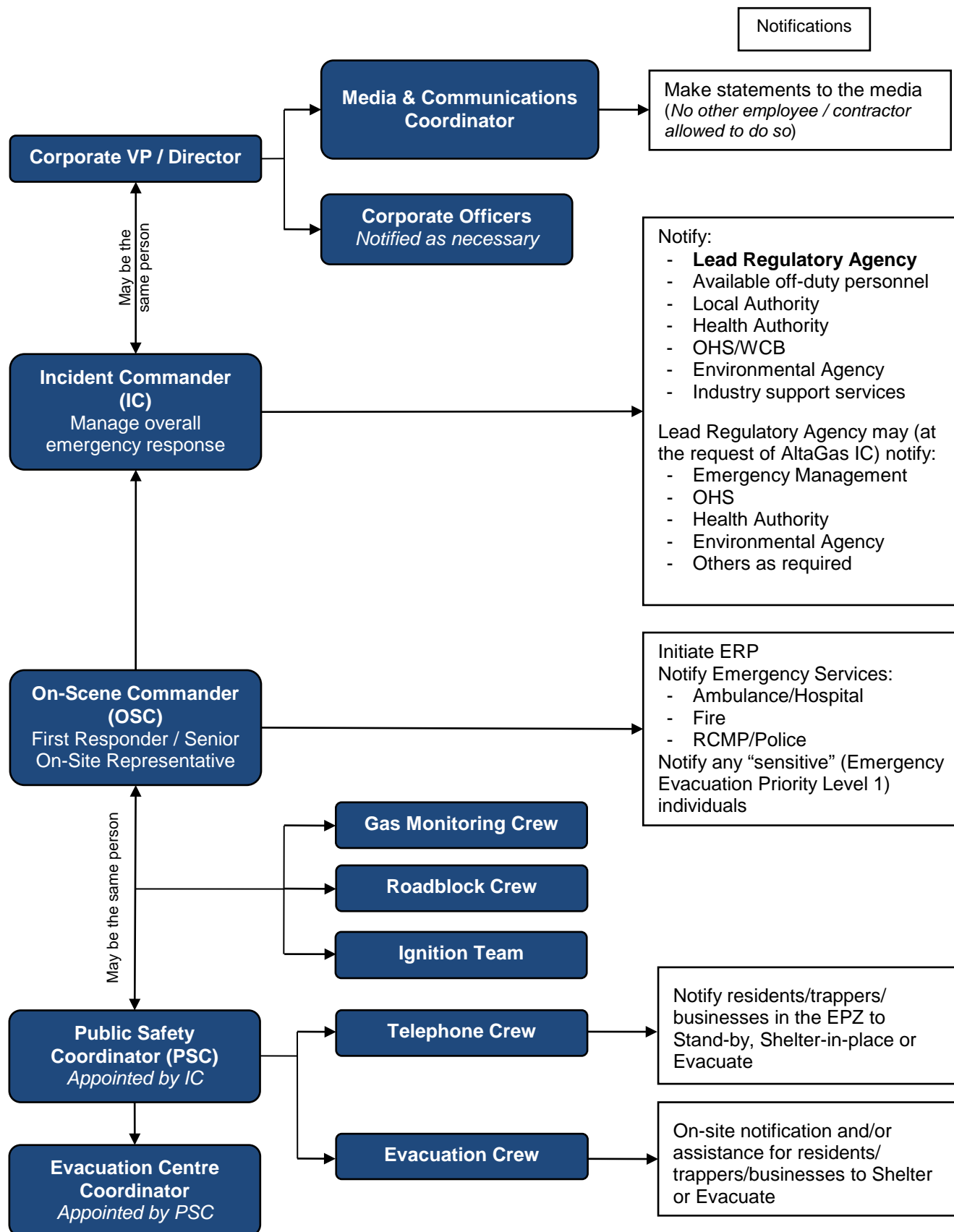
Prior to any media release, AltaGas will coordinate with the appropriate regulatory agency in order to provide consistent and accurate information to the public.

If an ECC is established by the lead regulatory agency, all public and media inquiries are to be directed to the AltaGas representative and government personnel located at the ECC.

Reporting and Recordkeeping

- § All information relating to the emergency will be documented and retained.
- § Key responders will be provided with instructions on proper reporting and recordkeeping, including contacting the lead regulatory agency by telephone.
- § Notification and reporting of emergencies is the responsibility of the *Incident Commander*.
- § For Level 1, 2 and 3 emergencies, notification will be made to the appropriate government agencies and the local government should their assistance be required to contain the emergency or aid with evacuation of those individuals within the EPZ deemed “sensitive” (Emergency Evacuation Priority Level 1).
- § In British Columbia, minor incidents (Alerts) must be reported to the BC Oil & Gas Commission (OGC) within 24 hours (see OGC Minor Incident Notification Form in Section 6). If the minor incident involves a pipeline, a Permit Holder Post Incident Report must be submitted to the OGC within 60 days.

Emergency Response Initial Communications Flowchart



INJURIES

- § The first responder is the *On-Scene Commander* until relieved by a more senior AltaGas employee.
- § Secure the area to prevent further injuries.
- § If the injuries are serious the *On-Scene Commander* will contact an *Incident Commander* from the AltaGas Corporate Personnel list in Section 2.
- § If necessary, the *On-Scene Commander* or *Incident Commander* will contact local emergency services such as an ambulance or the police in order to request assistance.
- § The *On-Scene Commander* is authorized to contact the police and emergency services before an *Incident Commander* is established if circumstances require immediate action.
- § Do not move a seriously injured person unless it is necessary to prevent further injury. Administer first aid and wait for medical aid to arrive.
- § Do not leave an injured person alone.
 - In serious cases, the *Incident Commander* will notify the appropriate government agencies.
- § The next-of-kin should be notified in person when someone is seriously injured. If possible, two people should do the notification.
- § The Operations Supervisor will conduct an incident investigation and submit a written report to the Operations Manager.

FATALITIES

Fatalities will be treated as serious injuries until a medical doctor has declared the victim to be deceased. The police and other government agencies will investigate workplace fatalities. AltaGas employees will cooperate fully with these investigations. It is essential that the accident scene be left undisturbed until the investigation is complete unless it is necessary to move something in order to rescue an accident victim or prevent further injuries.

- § The first responder is the *On-Scene Commander* until relieved by a more senior AltaGas employee. The *On-Scene Commander* is authorized to contact the police and emergency services before an *Incident Commander* is established if circumstances require immediate action.
- § The *On-Scene Commander* will contact an *Incident Commander* from the AltaGas Corporate Personnel list in Section 2.
- § Do not move a seriously injured person unless it is necessary to prevent further injury. Administer first aid and wait for medical aid to arrive. Do not leave an injured person alone. The *Incident Commander* will notify the appropriate government agencies.
- § The next-of-kin must be notified in person and this must be coordinated with the AltaGas *Media & Communications Coordinator* and the police. The *Incident Commander* will notify the appropriate government agencies.
- § Notification in cases where the victim is a member of the general public will be referred to the local police. If the victim is an employee of a contractor, the contractor should handle notification.

FIRES & EXPLOSIONS

Natural gas is highly flammable. Sparks, open flame, welding, lightning and hot surfaces can ignite it. Natural gas liquids (NGLs) may be stored on site in bullets until they are picked up by truck. NGLs are highly flammable and potentially explosive if ignited in a closed space. Depending on the circumstances, fires may be considered **Level 1, Level 2 or Level 3** emergencies. The Emergency Response Plan must be activated for **Level 2 or Level 3** emergencies:

- § The senior person on-site becomes the *On-Scene Commander*.
- § Contact an AltaGas representative who becomes the *Incident Commander*.
- § The *On-Scene Commander* is authorized to contact the police and emergency services before an *Incident Commander* is established if circumstances require immediate action.
- § DO NOT attempt to fight a fire that cannot be managed with the available equipment.
- § Firefighting equipment is available on site and typically includes portable as well as wheeled extinguishers

MOTOR VEHICLE ACCIDENTS

Depending on the circumstances, motor vehicle accidents may be considered **Level 1**, **Level 2** or **Level 3** emergencies. The police must be contacted and the Emergency Response Plan activated for serious accidents involving company employees or vehicles.

- § The first responder is the *On-Scene Commander* until relieved by a more senior AltaGas employee. If there are serious injuries, the *On-Scene Commander* will contact an *Incident Commander* from the AltaGas Corporate Personnel list in Section 2.
- § If necessary, the *On-Scene Commander* or *Incident Commander* will contact local emergency services such as an ambulance or the police and request assistance.
- § The *On-Scene Commander* is authorized to contact the police and emergency services before an *Incident Commander* is established if circumstances require immediate action.
- § All accidents where there is an injury, fatality or damage that appears to be in excess of \$1,000 must be reported to the police.
- § Ask for and record the following information for non-AltaGas vehicles involved in the accident:
 - driver's name
 - telephone number
 - address
 - driver's license number
 - insurance company and insurance policy number
 - year, make and model of vehicle
 - vehicle license number
- § Record the name, address and telephone number of witnesses.
- § Injuries resulting from company vehicle accidents must be reported to the provincial/territorial/state workers' compensation if the worker requires medical attention or misses work beyond the day of the accident. This does not apply if the worker was using the vehicle for personal business.
- § An AltaGas Incident Investigation Report must be completed for all motor vehicle accidents, with the exception of accidents where the injury or damage was minor.

THREATS

Although many threats have proven to be hoaxes, it is company policy that if a threat is received at any of its operations it will be assumed that the threat is real until the police have investigated and determined otherwise. Depending on the circumstances, threats will be considered **Level 2 or Level 3** emergencies. The police must be contacted and the Emergency Response Plan activated if a threat is received. If a threat is received by telephone:

- § Remain calm.
- § Be courteous to the caller.
- § Listen carefully to everything you are told.
- § Do not interrupt the caller.
- § Obtain as much information as possible from the caller.
- § Record the information on the Threat Report (see Section 6 - FORMS).
- § The senior person on site becomes the *On-Scene Commander*.
- § Contact a senior management representative, who becomes the *Incident Commander*.
- § The *On-Scene Commander* is authorized to evacuate the site or contact the local police before contacting an *Incident Commander* if he or she believes that circumstances require immediate action.

Bomb Threats

- § Never try to move or disarm an object that may be a bomb. This is a job for experts.
- § Workers may be asked to assist the police if a bomb threat is received. Generally, this assistance would be limited to searching the site for suspicious objects and unlocking doors and cabinets. The decision to assist the police in the search for a bomb is voluntary. The company does not expect its employees to assist if they prefer not to do so.

WILDLIFE

While in areas where there may be wildlife, take the following precautions to avoid contact:

- § Be aware of your surroundings. Ensure that natural sounds, like flowing water, do not mask the sound of your approach. Make plenty of noise when approaching blind corners, dense shrubs and streams, and when walking into the wind.
- § Leave the area immediately if you come across any type of animal kill.
- § Keep fences closed to prevent wildlife from entering the site.
- § Ensure all food refuse is in an animal-proof container if not fenced-in.
- § Do not feed wildlife.
- § While outdoors, consider having available insect repellant, sunscreen, bear spray and an EpiPen.

During a wildlife encounter:

- § Stay calm. DO NOT RUN. Back away slowly. If your vehicle is nearby, get in as quickly as possible.
- § For predatory animals (such as cougars, wolves or coyotes), make yourself appear as large as possible, yell, stomp your feet and throw objects at it (not food). If the animal makes contact, fight back and use bear spray if available.
- § For bear encounters, back away slowly, talk softly and don't look it in the eye. If there are cubs in the area, move away from them. Make every effort to leave the bear an escape route. Climbing a tree is an option but offers no guarantee of safety (black bears are excellent climbers, and grizzlies have also been known to climb trees).
- § During a bear charge, stand your ground and identify yourself as human by speaking in a calm voice. Avert your eyes – a direct stare is perceived as a threat. If the bear continues its charge and gets closer, you can try to intimidate it by making direct eye contact, jumping up and down and shouting. Use bear spray if available.
- § While driving, pay attention to all wildlife warning signs and drive accordingly. Scan the road and ditches ahead for animals, especially when travelling at dawn or dusk. Follow the response guidelines for motor vehicle accidents, found in this section, if you hit an animal with your vehicle.
- § Follow the response guidelines for injuries or fatalities, found in this section, if an encounter with wildlife leads to either.
- § Contact the appropriate wildlife office if you encounter an aggressive animal.

PANDEMIC

An *epidemic* occurs when a disease outbreak spreads rapidly to many people in a community or region or during a season, such as the SARS epidemic in 2003. A *pandemic* is a global disease outbreak which affects a large proportion of the population, such as the 2009 H1N1 (Swine Flu) pandemic. For the purposes of emergency response planning, the terms epidemic and pandemic may be used interchangeably.

Pandemics are potentially disruptive situations which can occur at any time and affect normal business processes. By keeping a close eye on alerts and messages from emergency organizations and local media reports, sufficient advance warnings should be possible. The focus here is on the level of operational disruption which could arise from a pandemic. Depending on the circumstances, a pandemic may be considered a **Level 1, Level 2 or Level 3** emergency.

Key trigger issues that would lead to activation of the ERP are:

- Escalating loss of staff due to illness, and
- The inability to adequately handle operations

The ERP must be activated for a **Level 2 or Level 3** emergency:

- § Contact appropriate medical and emergency services as well as the AltaGas head office.
- § The *Incident Commander* and other AltaGas Corporate Officers should assess the extent of the pandemic and its potential impact on business operations.
- § Establish and manage a pandemic support team to preserve and protect vital business operations and facilitate the return to normal operation.
- § Ensure employees and external organizations are notified, and assigned responsibilities and activities as required.

Recovering from a pandemic will rely principally on key members of management and staff who will provide the managerial and technical skills necessary to achieve and maintain uninterrupted business operations during a pandemic. Suppliers of critical goods and services, and other key supply chain organizations, must be regularly contacted to determine how the pandemic is

affecting their ability to deliver goods and services. Alternate suppliers may need to be contacted to provide backup resources.

In a pandemic, it is essential that all critical business functions are backed up in case assigned staff cannot perform their duties due to illness. Cross-training of employees within departments is highly recommended, and an inventory of all staff and their primary and backup skills should be maintained by department management.

Pandemic Support Team

The team will be assembled by the *Incident Commander*. Team responsibilities are to:

- § Assess the evolving situation and determine what impact there might be to the business.
- § Arrange to track the status of employees calling in sick.
- § Contact individual departments regularly to assess the impact of loss of staff.
- § Determine what level of backup staff will be needed.
- § Brief key senior management on the pandemic status regularly.
- § Notify appropriate emergency organizations of the situation (e.g. health services).
- § Maintain regular contact with affected staff to assess their condition.
- § Contact other relevant organizations, including other area operators, and brief them on the situation.
- § Monitor operations, infrastructure and systems to ensure they operate as usual.
- § Coordinate activities with other relevant teams.
- § Determine when affected staff may be able to work from home.
- § Based on staff returning to work, estimate the continued duration of the emergency.

Preventative Maintenance

Viruses can live up to 8 hours on soft surfaces and 2 days on hard surfaces. Basic rules of hygiene are best followed for the prevention of a pandemic. This includes washing your hands with soap and/or hand sanitizer frequently, and coughing into your elbow instead of your hand.

ENVIRONMENTAL DAMAGE

Depending on the circumstances, environmental spills and releases may be considered **Level 1, Level 2 or Level 3** emergencies. The Emergency Response Plan must be activated for **Level 2 and Level 3** environmental emergencies.

- § The senior person on-site becomes the *On-Scene Commander*.
- § Contact an AltaGas representative, who becomes the *Incident Commander*.
- § The *On-Scene Commander* is authorized to contact regulatory agencies and support services before an *Incident Commander* is established if circumstances require immediate action.
- § Generally, any release that may cause, is causing or has caused an adverse effect to the environment, must be reported to the appropriate government agencies. Specific release reporting requirements for different regions can be found in the following section.
- § Planned flaring and venting must be reported 24 hours in advance to the region's energy regulator.
- § Unplanned flaring and venting events should be reported to the to the region's energy regulator without delay.
- § Flaring and venting volumes must be reported to Production Accounting.
- § AltaGas is a member of Western Canada Spill Services.
- § Cleanup of spills is to be done without delay.

RELEASE REPORTING REQUIREMENTS

It is AltaGas policy that all spills and releases be immediately reported to the appropriate government agencies. Spills and releases should also be reported to the AltaGas EOH&S group and affected landowners.

Canadian Federal and NWT Requirements

| Chemical Class (as per TDG Act) | Examples | TDG Reporting Requirements (only applies to road, rail, marine & air transport including transporting, loading or unloading; <i>does not apply to pipelines</i>) AB: 1-800-272-9600 BC: 1-800-663-3456 SK: 1-800-667-7525 NWT: 867-920-8130 For an accidental release from a cylinder that has suffered a catastrophic failure, report to CANUTEC: 613-996-6666 | Federal Reporting Requirements (for NEB-regulated facilities & pipelines) NEB / TSB Reporting Hotline: 819-997-7887 & OERS: https://apps.neb-one.gc.ca/ERS/Home/Index/ | Northwest Territories Reporting Requirements Spill Line: 867-920-8130 Report any release that is near or in an open water body or a designated sensitive environment/habitat, or poses an imminent threat to human health/safety or to a listed species at risk. |
|---|--|---|---|---|
| Class 2.1 Flammable Gases | § Natural Gas (NG) § Methane § Butane § Propane § H ₂ S § Ethane | § Any quantity that could pose a danger to public safety § Any sustained release of ≥ 10 minutes | § A release resulting in a significant adverse effect on people, property or the environment § Unintended or uncontrolled release of LVP hydrocarbons $> 1.5 \text{ m}^3$ § Unintended or uncontrolled release of gas or HVP hydrocarbons | Any release of gas from a container with a capacity greater than 100 L |
| Class 2.2 Non-Flammable Gases | § Compressed Air § CO ₂ § N ₂ § O ₂ | § Any quantity that could pose a danger to public safety § Any sustained release of ≥ 10 minutes | § A release resulting in a significant adverse effect on people, property or the environment | Any release of gas from a container with a capacity greater than 100 L |
| Class 2.3 Toxic Gases | § SO ₂ § Hydrogen Cyanide § Nitric Acid | § Any quantity that could pose a danger to public safety § Any sustained release of ≥ 10 minutes | § A release resulting in a significant adverse effect on people, property or the environment | Any amount |
| Class 3 Flammable Liquids | § Methanol § Diesel § Gasoline | 200 L | § A release resulting in a significant adverse effect on people, property or the environment | $\geq 100 \text{ L}$ |

| Chemical Class (as per TDG Act) | Examples | TDG Reporting Requirements (only applies to road, rail, marine & air transport including transporting, loading or unloading; <i>does not apply to pipelines</i>) AB: 1-800-272-9600 BC: 1-800-663-3456 SK: 1-800-667-7525 NWT: 867-920-8130 For an accidental release from a cylinder that has suffered a catastrophic failure, report to CANUTEC: 613-996-6666 | Federal Reporting Requirements (for NEB-regulated facilities & pipelines) NEB / TSB Reporting Hotline: 819-997-7887 & OERS: https://apps.neb-one.gc.ca/ERS/Home/Index/ | Northwest Territories Reporting Requirements Spill Line: 867-920-8130 Report any release that is near or in an open water body or a designated sensitive environment/habitat, or poses an imminent threat to human health/safety or to a listed species at risk. |
|---|---|---|---|---|
| Class 3 Flammable Liquids | § NG Liquids/ Condensate § Crude Oil § Crude Emulsions | 200 L | § A release resulting in a significant adverse effect on people, property or the environment § Pipeline rupture | ≥ 20 L |
| Class 4 Flammable Solids | § Molten Sulphur § Activated Carbon § Calcium Carbide § Sodium | 25 kg | § A release resulting in a significant adverse effect on people, property or the environment | ≥ 25 kg |
| Class 5.1 Oxidizing Substances | § Ammonium Nitrate § Bleaches § Calcium Nitrate | 50 kg or 50 L | § A release resulting in a significant adverse effect on people, property or the environment | ≥ 50 L or 50 kg |
| Class 5.2 Organic Peroxides | § Methylene Ketone Peroxide § Succinic Acid Peroxide | 1 kg or 1 L | § A release resulting in a significant adverse effect on people, property or the environment | ≥ 1 L or 1 kg |
| Class 6.1 Poisonous Toxic Substances | § Methanol § Arsenic § Lead Acetate § Mercuric Chloride | 5 kg or 5 L | § A release resulting in a significant adverse effect on people, property or the environment | ≥ 5 L or 5 kg |
| Class 6.2 Infectious Substances | § Infectious substances affecting humans/animals | § Any quantity that could pose a danger to public safety § 1 kg or 1 L Also report to CANUTEC | § A release resulting in a significant adverse effect on people, property or the environment | Any amount |

| Chemical Class (as per TDG Act) | Examples | TDG Reporting Requirements (only applies to road, rail, marine & air transport including transporting, loading or unloading; <i>does not apply to pipelines</i>) AB: 1-800-272-9600 BC: 1-800-663-3456 SK: 1-800-667-7525 NWT: 867-920-8130 For an accidental release from a cylinder that has suffered a catastrophic failure, report to CANUTEC: 613-996-6666 | Federal Reporting Requirements (for NEB-regulated facilities & pipelines) NEB / TSB Reporting Hotline: 819-997-7887 & OERS: https://apps.neb-one.gc.ca/ERS/Home/Index/ | Northwest Territories Reporting Requirements Spill Line: 867-920-8130 Report any release that is near or in an open water body or a designated sensitive environment/habitat, or poses an imminent threat to human health/safety or to a listed species at risk. |
|---|--|---|---|---|
| Class 7 Radioactive Substances | § NORM | § Any quantity that could pose a danger to public safety § Emission level > emission level established in Section 20 of <i>Packing & Nuclear Substances Regulations</i> (substances with radioactivity < 70Bq/g are not subject to TDG regulations) | § A release resulting in a significant adverse effect on people, property or the environment | Any amount |
| Class 8 Corrosives | § Acids § Amines § Bases § Batteries § Caustics | 5 kg or 5 L | § A release resulting in a significant adverse effect on people, property or the environment | ≥ 5 L or 5 kg |
| Class 9 Misc. Products, Substances or Organisms | § Gas Plant Filters § Used Motor Oil § Asbestos § Wastes that can release Hazardous Substances through Leaching | 25 kg or 25 L | § A release resulting in a significant adverse effect on people, property or the environment | § 1 L or 1 kg (hazardous waste) § 5 L or 5 kg (miscellaneous) § 0.5 L or 0.5 kg (PCB mixture of ≥ 5 ppm) |
| Produced Water (not a defined chemical class) | § Produced Water | 200 L | § A release resulting in a significant adverse effect on people, property or the environment | ≥ 100 L or 100 kg |

Western Canada Requirements

| Chemical Class (as per TDG Act) | Examples | Alberta Reporting Requirements Energy & Environmental Emergency Line: 1-800-222-6514 | British Columbia Reporting Requirements EMBC: 1-800-663-3456 | Saskatchewan Reporting Requirements ECON: 1-844-764-3637 (for reporting pipeline incidents and releases of upstream petroleum products) ENV Spill Line: 1-800-667-7525 (for reporting release into water bodies, or releases which are causing or may cause an adverse effect) |
|--|--|--|--|---|
| Class 2.1 Flammable Gases | <ul style="list-style-type: none"> § Natural Gas (NG) § Methane § Butane § Propane § H₂S § Ethane | <ul style="list-style-type: none"> § Any amount that may cause, is causing or has caused an adverse effect § Any release or break from a pipeline § Pipeline hits § Uncontrolled gas release >30 e³m³ | <ul style="list-style-type: none"> § A spill or release of any amount of materials which impacts water ways § 10 kg § NG: 10 kg or 15 m³ by volume where operating pressure is >100 PSI | <p>ECON:</p> <ul style="list-style-type: none"> § NG: release of >28,000 m³ on lease, or within a road/railway right of way, or within 150 m of any dwelling § Any release of H₂S that poses a danger to humans, domestic animals, wildlife or the environment § Any release of H₂S >1000ppm § Contact damage to a pipeline <p>ENV:</p> <ul style="list-style-type: none"> § Any quantity that could pose a risk to the public or environment § Any sustained release of ≥10 minutes § H₂S: 1000 ppm or 1 mol/kmol |
| Class 2.2 Non-Flammable Gases | <ul style="list-style-type: none"> § Compressed Air § CO₂ § N₂ § O₂ | <ul style="list-style-type: none"> § Any amount that may cause, is causing or has caused an adverse effect § Any release or break from a pipeline § Pipeline hits § Uncontrolled gas release >30 e³m³ | <ul style="list-style-type: none"> § A spill or release of any amount of materials which impacts water ways § 10 kg | <p>ENV:</p> <ul style="list-style-type: none"> § Any quantity that could pose a risk to the public or environment § Any sustained release of ≥10 minutes (non-Halocarbon containing) § 100 kg (Halocarbon containing) |
| Class 2.3 Toxic Gases | <ul style="list-style-type: none"> § SO₂ § Hydrogen Cyanide § Nitric Acid | <ul style="list-style-type: none"> § Any amount that may cause, is causing or has caused an adverse effect § Any release or break from a pipeline § Pipeline hits § Uncontrolled gas release >30 e³m³ | <ul style="list-style-type: none"> § A spill or release of any amount of materials which impacts water ways § 5 kg | <p>ENV: All releases</p> |

| Chemical Class (as per TDG Act) | Examples | Alberta Reporting Requirements Energy & Environmental Emergency Line: 1-800-222-6514 | British Columbia Reporting Requirements EMBC: 1-800-663-3456 | Saskatchewan Reporting Requirements ECON: 1-844-764-3637 (for reporting pipeline incidents and releases of upstream petroleum products) ENV Spill Line: 1-800-667-7525 (for reporting release into water bodies, or releases which are causing or may cause an adverse effect) |
|---|---|---|---|---|
| Class 3 Flammable Liquids | § Methanol § Diesel § Gasoline | § Any amount that may cause, is causing or has caused an adverse effect § 200 L into the environment | § A spill or release of any amount of materials which impacts water ways § 100 L | ECON: § Release >2 m ³ on lease § Any release off lease ENV: § Any subsurface loss § 500 L on lease § 200 L off lease |
| Class 3 Flammable Liquids | § NG Liquids/ Condensate § Crude Oil § Crude Emulsions | § Any amount that may cause, is causing or has caused an adverse effect § >2 m ³ on lease § Any release off lease § Any release from a pipeline | § A spill or release of any amount of materials which impacts water ways § 100 L | ECON: § Any pipeline or flowline failure § Release >2 m ³ on lease § Any release off lease ENV: § Any subsurface loss § 500 L on lease § 200 L off lease |
| Class 4 Flammable Solids | § Molten Sulphur § Activated Carbon § Calcium Carbide § Sodium | § Any amount that may cause, is causing or has caused an adverse effect § 25 kg into the environment | § A spill or release of any amount of materials which impacts water ways § 25 kg | ENV: § 100 kg on lease § 25 kg off lease |
| Class 5.1 Oxidizing Substances | § Ammonium Nitrate § Bleaches § Calcium Nitrate | § Any amount that may cause, is causing or has caused an adverse effect § 50 kg into the environment | § A spill or release of any amount of materials which impacts water ways § 50 kg or 50 L | ENV: Groups I and II: § 50 kg or 50 L on lease § 2.5 kg or 2.5 L off lease Group III: § 100 kg or 100 L on lease § 100 kg or 100 L off lease |
| Class 5.2 Organic Peroxides | § Methylethyl Ketone Peroxide § Succinic Acid Peroxide | § Any amount that may cause, is causing or has caused an adverse effect § 1 kg into the environment | § A spill or release of any amount of materials which impacts water ways § 1 kg or 1 L | ENV: § 2.5 kg or 2.5 L on lease § 1 kg or 1 L off lease |

| Chemical Class (as per TDG Act) | Examples | Alberta Reporting Requirements Energy & Environmental Emergency Line: 1-800-222-6514 | British Columbia Reporting Requirements EMBC: 1-800-663-3456 | Saskatchewan Reporting Requirements ECON: 1-844-764-3637 (for reporting pipeline incidents and releases of upstream petroleum products) ENV Spill Line: 1-800-667-7525 (for reporting release into water bodies, or releases which are causing or may cause an adverse effect) |
|---|--|--|---|---|
| Class 6.1 Poisonous Toxic Substances | § Methanol § Arsenic § Lead Acetate § Mercuric Chloride | § Any amount that may cause, is causing or has caused an adverse effect § 5 kg into the environment | § A spill or release of any amount of materials which impacts water ways § 5 kg or 5 L | ENV: Packing Group I: § 2.5 kg or 2.5 L on lease § 1 kg or 1 L off lease Packing Groups II and III: § 10 kg or 10 L on lease § 5 kg or 5 L off lease |
| Class 6.2 Infectious Substances | § Infectious substances affecting humans/ animals | Any amount that may cause, is causing or has caused an adverse effect | § Any quantity that poses a danger to public safety or the environment § 1 kg or 1 L | ENV: All releases |
| Class 7 Radioactive Substances | § NORM | Any amount that may cause, is causing or has caused an adverse effect | § Any quantity that could pose a danger to public safety or the environment § Emission level > emission level established in Section 20 of <i>Packing & Nuclear Substances Regulations</i> | ECON: § Any quantity ENV: § Any quantity that could pose a risk to human health or the environment, on lease § Emission level > emission level established in Section 20 of <i>Packing & Nuclear Substances Regulations</i> , off lease |
| Class 8 Corrosives | § Acids § Amines § Bases § Batteries § Caustics | § Any amount that may cause, is causing or has caused an adverse effect § 5 kg into the environment | § A spill or release of any amount of materials which impacts water ways § 5 kg or 5 L | ENV: § 10 kg or 10 L on lease § 5 kg or 5 L off lease |

| Chemical Class (as per TDG Act) | Examples | Alberta Reporting Requirements Energy & Environmental Emergency Line: 1-800-222-6514 | British Columbia Reporting Requirements EMBC: 1-800-663-3456 | Saskatchewan Reporting Requirements ECON: 1-844-764-3637 (for reporting pipeline incidents and releases of upstream petroleum products) ENV Spill Line: 1-800-667-7525 (for reporting release into water bodies, or releases which are causing or may cause an adverse effect) |
|---|--|---|---|---|
| Class 9 Misc. Products, Substances or Organisms | <ul style="list-style-type: none"> § Gas Plant Filters § Used Motor Oil § Asbestos § Wastes that can release Hazardous Substances through Leaching | Any amount that may cause, is causing or has caused an adverse effect | <ul style="list-style-type: none"> § A spill or release of any amount of materials which impacts water ways § 25 kg or 25 L | ECON: <ul style="list-style-type: none"> § Release >2 m³ on lease § Any release off lease ENV: <ul style="list-style-type: none"> § Any quantity that could pose a risk to the public or environment |
| Produced Water (not a defined chemical class) | <ul style="list-style-type: none"> § Produced Water | <ul style="list-style-type: none"> § Any amount that may cause, is causing or has caused an adverse effect § >2 m³ on lease § Any release off lease § Any release from a pipeline | 200 L | ECON: <ul style="list-style-type: none"> § Any pipeline or flowline failure § Fluid release of >1.6 m³ on lease § Any release off lease ENV: <ul style="list-style-type: none"> § 2000 L on lease § Any quantity off lease |

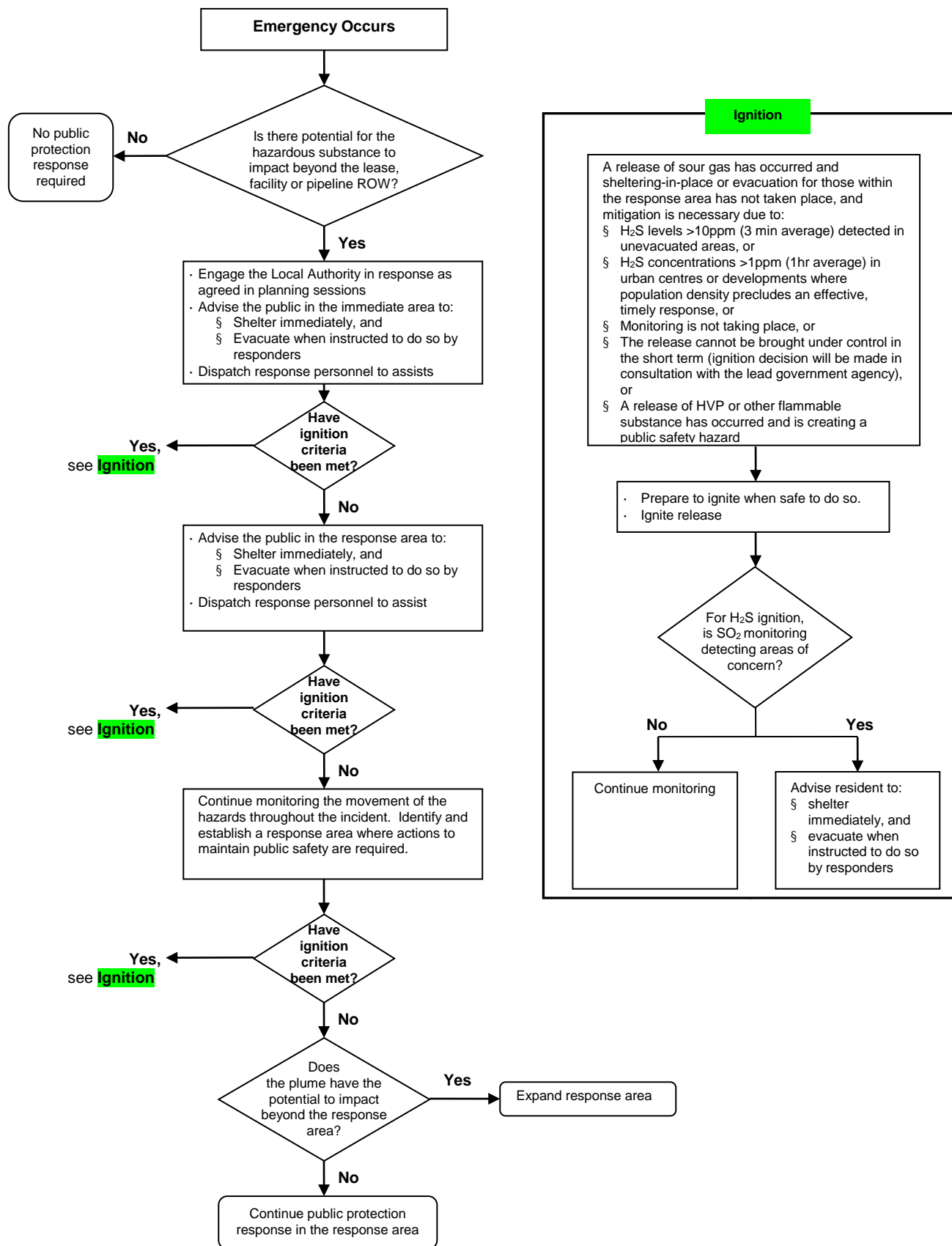
GAS RELEASES

The senior on-site person is the *On-Scene Commander*. If a release of gas occurs from a pipeline, well or plant, the following actions should be taken:

- § Account for all personnel on site at the time.
- § Determine the nature of the release:
 - What is the source of the release?
 - Is the release sweet or sour gas?
 - What is the volume of the release?
 - Have any on-site personnel been injured?
 - Are the on-site personnel at risk?
 - Is the public at risk?
 - Can the available personnel control the release or is assistance required?
 - Is it necessary to begin evacuation of residents?
- § If the emergency is a **Level 1, 2 or 3** emergency, activate the Emergency Response Plan. Immediately notify senior AltaGas management to establish an *Incident Commander* and report the release to the appropriate lead regulatory agency. The *On-Scene Commander* is authorized to contact the police and emergency services before an *Incident Commander* is established if circumstances require immediate action.
- § Begin corrective action to control the release. The flow of gas to the release area must be shut off. If necessary, the plant should be shut down and well owners contacted to shut in their wells.
- § If sour gas is present, all personnel in the area of the release must be equipped with H₂S monitors and SCBA.
- § Determine the extent of the PAZ. **Evacuation must begin when a Level 2 emergency is declared.** Evacuation should begin with residents nearest or downwind of the release site.

- § Contact a service company to conduct continuous air monitoring for **Level 1, Level 2 and Level 3** gas releases.
- § Secure the PAZ. For **Level 2 and 3** emergencies, begin establishing roadblocks to prevent public access to the area. Contact the police immediately if there is a gas release near a public road.
- § If the release is sour gas that may need to be ignited, refer to the following sections: *Ignition Criteria, Ignition Decision Flowchart and Ignition Procedure Flowchart*.
- § At a **Level 1** emergency, begin notifying any residents within the EPZ deemed “sensitive” (Emergency Evacuation Priority Level 1) in the event they wish to evacuate. AltaGas must provide transportation and temporary accommodation where needed. EVACUATION IS VOLUNTARY – AltaGas does not have the authority to order people to evacuate. The lead government agency or the police should be notified immediately if any residents are unwilling to evacuate a hazard area.
- § At a **Level 2** emergency, personnel at the CEOC, under the direction of the *Incident Commander*, will begin to make telephone contact with residents near the PAZ to alert them to the gas release and the potential need for evacuation or shelter (see *Shelter Procedure* and *Evacuation Procedure*). If circumstances do not justify immediate evacuation, residents should be asked to remain indoors and close doors and windows. It is the responsibility of the *Incident Commander* to ensure the residents are provided with updates as the emergency situation changes.
- § On the following page is a schematic of the public safety measures for a hazardous gas release in the form of a decision tree.

Public Safety Measures for Hazardous Gas Releases



AIR QUALITY MONITORING

Air quality monitoring is required to monitor and record the presence and concentrations of H₂S and SO₂ during a sour gas release and following an ignition of a release. The *On-Scene Commander* is responsible for ensuring effective air quality monitoring is performed.

Air quality monitoring is used to:

- § Track a gas plume
- § Determine if ignition criteria are met
- § Determine whether evacuation and/or sheltering criteria have been met (particularly beyond the EPZ)
- § Assist in determining when the emergency can be downgraded
- § Determine roadblock locations
- § Determine H₂S and SO₂ concentrations in areas being evacuated to ensure safety of personnel and evacuees

The type of air monitoring units and number of monitors required is determined by:

- § Access and egress points
- § Population density and proximity of urban development
- § Local conditions

Generally, a mobile air-monitoring vehicle is required for all **Level 2 and 3** emergencies and **Level 1** emergencies involving pipelines containing sour gas. See the table below for specific mobile air-monitoring requirements.

Downwind Mobile Air Quality Monitoring Requirements

| | Level 1 Emergency | Level 2 Emergency | Level 3 Emergency |
|--|---|--|--|
| Sour Well | If estimated time of arrival is greater than the estimated time for gas to surface, ¹ then dispatch to site. If estimated time of arrival is less than the estimated time for gas to surface, place on standby. | Deploy unit(s) from well site and commence mobile air monitoring. ² | Continue mobile air monitoring. |
| Special Sour Well | If the EPZ includes a portion of an urban centre, mobile air monitoring unit must be on lease during sour drilling, completion, servicing or testing of potential sour zones. Request additional air monitoring unit(s). <i>or</i> If there is no urban centre, a mobile air monitoring unit must be dispatched to the well site. | Deploy unit(s) from well site and commence mobile air monitoring. Request additional air monitoring unit(s), if required. | Continue mobile air monitoring. Request additional air monitoring unit(s), if required. |
| Production facilities containing sour gas | Deploy unit(s) to area of release and commence mobile air monitoring. | Continue mobile air monitoring. Request additional air monitoring unit(s), if required. | Continue mobile air monitoring. Request additional air monitoring unit(s), if required. |

¹ An estimated time for gas to surface should be based on the time to circulate bottoms-up.

² If a mobile air monitoring unit has not arrived on site by the time that gas has reached the surface, ignition criteria may have been met for a partially controlled or uncontrolled release.

Monitoring must occur downwind of the release with priority given to the nearest un-evacuated residence or location where people are present. Monitored H₂S and SO₂ information must be made available to the appropriate government agencies and the public during the emergency.

Notification of members of the public deemed “sensitive” (Emergency Evacuation Priority Level 1) must begin with a **Level 1** emergency so they may decide whether to voluntarily evacuate. Notification of all residents in the PAZ must begin when a **Level 2** emergency has been declared. The decision to begin notifying residents outside of the PAZ will be based on the results of air quality monitoring.

Criteria for Mandatory Public Safety Response

Air monitoring levels during an emergency for mandatory public safety response:

| H₂S Concentrations in Unevacuated Areas | Requirement |
|--|--|
| Above 10ppm (3 minute average)*, or Above 1ppm (1 hour average) in an urban centre | Carry out immediate shelter-in-place and/or evacuate all persons in the area. Assist if necessary. Ignition. |
| SO₂ Concentrations in Unevacuated Areas | Requirement |
| Above 5 ppm (15 minute average), or Above 1 ppm (3 hour average), or Above 0.3 ppm (24 hour average) | Carry out immediate shelter-in-place and/or evacuate all persons in the area. |

*If monitored levels in successive 3 minute intervals are declining and shelter-in-place is occurring, evacuation may not be necessary. AltaGas should consult with the lead government agency and use proper judgment in determining when evacuation should replace shelter-in-place as the recommended safety response.

IGNITION CRITERIA

Ignition of sweet gas, sour gas, condensate or natural gas liquids (NGLs) may be necessary if people or the environment are at risk due to an uncontrolled release. If ignition is necessary because there is insufficient time to evacuate the EPZ, the *On-Scene Commander* is authorized to ignite the gas release and his decision will be fully supported by AltaGas. Ignition must occur within 15 minutes if any of the ignition criteria are met. The ignition team must be certified in sour well ignition, and all other personnel at the site must be cleared to a safe distance.

Sweet Gas or Condensate Ignition Criteria

If time permits, the decision to ignite a sweet gas or condensate release will be made by the responsible AltaGas VP or Director in consultation with the *Incident Commander* and the *On-Scene Commander*. If condensate containing H₂S is spilled, the sour gas criteria apply. The regulatory authority with jurisdiction must be consulted prior to ignition. Ignition is mandatory if any of the following conditions exist:

- § An immediate threat to human life exists and there is insufficient time to evacuate the EPZ.
- § An immediate and serious threat to the environment exists.

Sour Gas Ignition Criteria

If time permits, the decision to ignite an uncontrolled or partially controlled sour gas release where public safety cannot be assured will be made by the responsible AltaGas VP or Director in consultation with the *Incident Commander* and the *On-Scene Commander*. The *On-Scene Commander* is authorized to make the ignition decision without consulting the *Incident Commander* if circumstances require immediate action. The regulatory agency with jurisdiction must be consulted prior to ignition; however, ignition is mandatory within 15 minutes if any of the following conditions exist:

- § It is known that H₂S is being released to the atmosphere but air monitoring is not taking place due to unforeseen circumstances (i.e. weather, unavailability of air monitoring equipment or equipment failure).
- § The average H₂S level exceeds 10 ppm over a 3-minute time period in an area that has not been evacuated. IF MONITORED LEVELS ARE DECLINING, THEN THE SITUATION NEEDS TO BE CONTINUOUSLY ASSESSED FOR IGNITION.
- § The average H₂S level exceeds 1 ppm over a 60-minute time period in urban density developments.

§ The EPZ has not been evacuated and the release cannot be brought under control in the short term.

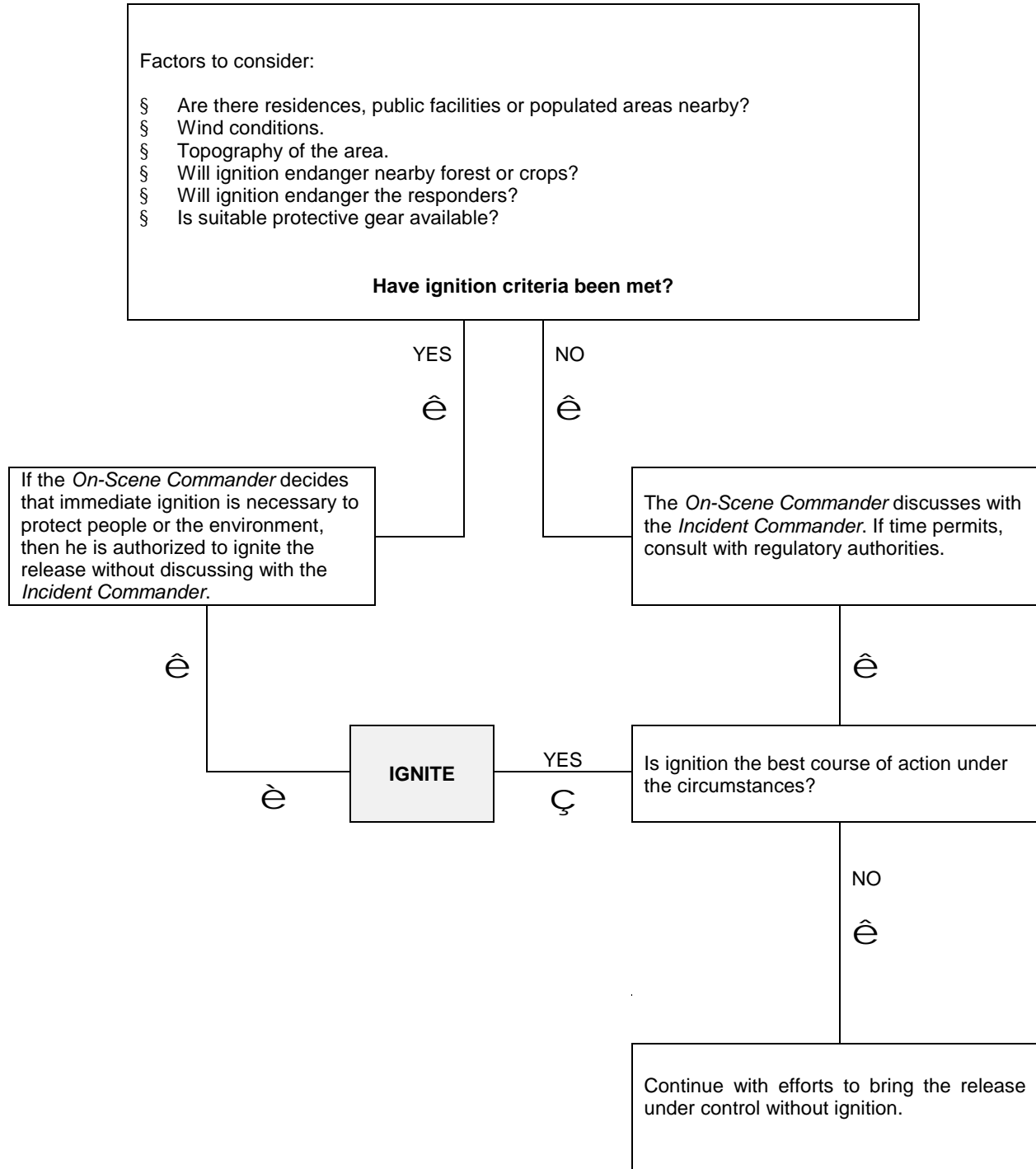
§ AltaGas has been directed to ignite the flow by the lead regulatory agency.

Ignition Equipment

The ignition team shall have the following equipment available before attempting to ignite a sour gas release:

- § Flare pistols and flares
- § Flame-retardant coveralls
- § Hearing protection
- § Hard hats with face shields and flame-retardant liners
- § Positive pressure self-contained breathing apparatus (SCBA) with 30 minute air supply
- § Safety harnesses (front D-Ring) or safety belts (rear D-Ring) with 30 metres of flame-retardant ropes
- § Gas detector (LEL and H₂S)
- § Communications (radios and/or cellular phones)

IGNITION DECISION FLOWCHART



IGNITION PROCEDURE FLOWCHART

If the decision is made to ignite a gas release, the *On-Scene Commander* will coordinate and supervise the ignition.



Prior to the ignition:

- § Install manned roadblocks to prevent access to the EPZ.
- § Evacuate all non-essential personnel.
- § Designate an ignition team of two qualified people.
- § Ensure the ignition team has the appropriate protective gear.
- § The *Incident Commander* will discuss the ignition procedure with the ignition team.
- § Select a position from which the ignition will be attempted.
- § Selection of the ignition position should ensure a safe escape route.
- § Monitor the ignition position for the presence of combustible gas.
- § If time permits erect a windsock and streamers.
- § Obtain a closure order from the Regulatory Authority or declare a state of emergency if release has spread beyond the EPZ.
- § Regulatory Authority issue NOTAM for closure of airspace, if necessary.



The ignition position must:

- § Allow for a safe escape route.
- § Be free of combustible gas.
- § Be upwind of the vapour plume.
- § Be a minimum of 300 metres from the outer edge of the vapour plume.



Attempt the ignition with a flare pistol. Aim for the ground at the outer edge of the vapour plume where the gas/air mixture is most likely to be in the combustible range.

YES



Ignition Successful?

NO



Advise the *Incident Commander* that the ignition has been successful. Continue to maintain roadblocks and monitor downwind for H₂S, SO₂ and combustible gas. Assist the fire crews.

Attempt ignition again – move closer if necessary, but no nearer to the vapour plume than 100 metres. Monitor for combustible gas at the new position before attempting ignition.

SHELTER PROCEDURE

If an emergency exists that threatens the general public it may be necessary to advise residents in the EPZ to shelter themselves in their homes. The decision to advise residents to shelter themselves will be made by the *On-Scene Commander* in consultation with the *Incident Commander*. If the situation requires immediate action the *On-Scene Commander* is authorized to begin notifying the general public without consulting the *Incident Commander*. Sheltering should be considered the primary protective measure in limited circumstances when:

- § There is not enough time or warning to safely evacuate the public who may be at risk;
- § The emergency is of short duration (several minutes to half an hour);
- § Residents are waiting for evacuation assistance;
- § During a sour gas release of limited duration (i.e. pipeline rupture);
- § The location of the release has not been identified; or
- § The public would be at higher risk if evacuated.

The *Public Safety Coordinator* is responsible for organizing the notification of residents in the EPZ. The *Public Safety Coordinator* will advise residents to:

- § Remain indoors and close all doors and windows;
- § Plug all air intakes into the building;
- § Extinguish all ignition sources (pilot lights on water heaters, stoves, etc.);
- § Not smoke, have any open flame or operate electrical appliances; and
- § Move to an interior room (away from windows) on the upper floor of the building and wait for further instructions.

EVACUATION PROCEDURE

Evacuation is the primary public protection measure for long term releases, assuming the public can be safely removed from the area either during or prior to a release of sour gas. If an emergency exists that threatens an AltaGas personnel or the general public, it may be necessary to evacuate the PAZ/EPZ. The decision to evacuate the PAZ will be made by the *On-Scene Commander* in consultation with the *Incident Commander*. Evacuation assembly areas shall be established upwind and at a safe distance from the EPZ. The *On-Scene Commander* will ensure that all AltaGas personnel are accounted for. The evacuation route taken will depend upon the location of the gas release and wind direction.

Evacuation begins in the IIZ and expands outward into the PAZ downwind of the release so that members of the public are not exposed to hazards.

At a **Level 1** emergency, AltaGas will notify all persons deemed “sensitive” (Emergency Evacuation Priority Level 1) via telephone to suggest they evacuate. Rovers may be sent to advise those persons who cannot be reached via telephone that evacuation is recommended. If the EPZ contains a particularly large number of residents, AltaGas may choose to begin notification of all residents at this time.

At a **Level 2** emergency, the company will notify all persons who may be in the affected area and the public in the surrounding area by:

- § Announcements on the local radio station informing of the incident.
- § Notification through telephone contact.
- § Acquiring helicopters to perform fly-overs to visually inspect for persons in the vicinity.
- § Dispatching rovers to locate persons and respond to sightings by the helicopter(s).

Evacuation of the general public may be necessary if an emergency occurs in close proximity to residences or public facilities. **Evacuation must begin when a Level 2 emergency is declared.** Persons deemed “sensitive” (Emergency Evacuation Priority Level 1) may be evacuated sooner. Evacuation should begin with residents nearest or downwind of the release site. The *Public Safety Coordinator* is responsible for organizing the notification and evacuation of residents and trappers in the EPZ.

Nearby communities will be notified if SO₂ levels reach 1 ppm over a 2 hour time frame or H₂S levels reach 10 ppm outside the EPZ boundaries. To ensure personnel and public safety outside the EPZ, actions will be performed by AltaGas staff with the following priority guidelines:

- § Anyone located directly downwind or adjacent to the site;
- § Anyone requiring assistance; and
- § Anyone who cannot be contacted by telephone.

Evacuation of residents and trappers is on a voluntary basis – **AltaGas personnel do not have authority to order residents to evacuate their homes.** If a resident or trapper chooses not to evacuate, the police should be notified. If the situation requires immediate action, the *On-Scene Commander* is authorized to begin notifying and evacuating the general public without consulting the *Incident Commander*. A sample evacuation notification statement is included in Section 6, FORMS.

In the event that a publicly used facility falls within the evacuation zone, the facility will be contacted by phone to begin the evacuation. AltaGas personnel will also be dispatched there to facilitate evacuation, as well as to transport/direct the occupants to safety.

The company shall provide suitable transportation and accommodations if evacuation is necessary. All residents and trappers within the affected area will be evacuated to nearby hotels or community centres.

In the unlikely event that sheltering and/or evacuation are required beyond the EPZ, AltaGas will work with the local authority to notify the affected residents. The notification mechanisms outlined in the local authority's emergency response framework may be used by the local authority to notify residents, based upon the monitored air quality and other information provided by AltaGas.

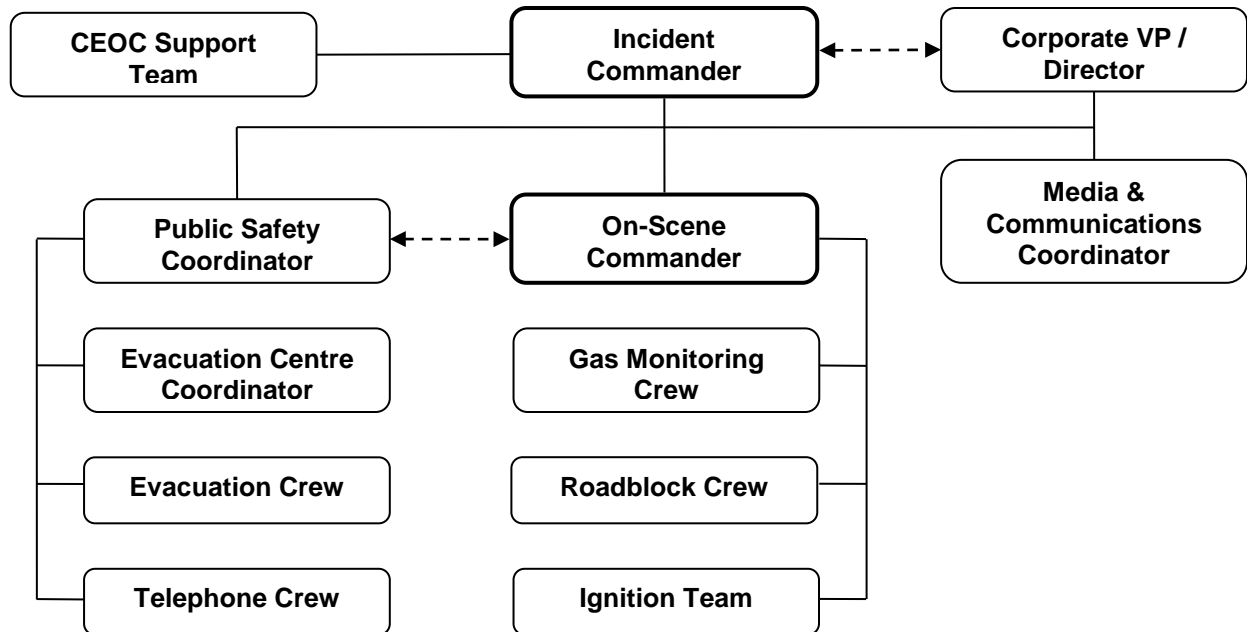
DOWNGRADING AN EMERGENCY

The emergency response may be downgraded once conditions have been stabilized; when there is no longer a threat to people, property or the environment. The decision to downgrade response activities must be based upon the specific circumstances of each emergency. The *Incident Commander* will consult the applicable government agencies to determine whether to downgrade or terminate an emergency. It is the responsibility of the *Incident Commander* to coordinate the post-emergency activities which may include:

- § Ensuring that all affected parties are notified that the emergency is over.
 - In consultation with the *On-Scene Commander*, the *Incident Commander* will (1) inform company of external resources that were needed to safely handle the emergency, (2) notify affected or evacuated area residents, (3) notify government agencies and (4) inform the *Media & Communications Coordinator* to issue a media statement.
- § Ensuring that residences in the EPZ are clear of gas before the residents return.
- § Providing transportation to residents who were evacuated.
- § If the emergency has resulted in serious injuries or fatalities it may be necessary to organize critical incident stress management assistance for the affected people.
- § Reimbursing costs incurred by residents due to the emergency.
- § Submitting incident reports to government agencies and AltaGas senior management.
- § Conducting a post-emergency debriefing to assess the effectiveness of the emergency response. Post-incident debriefings must be held within 30 days for all **Level 2 and 3** emergencies. A debriefing report must be submitted to the lead regulatory agency within 30 days following the debriefing. The debriefing report must address, at a minimum, the following:
 - The source, cause and other details of the incident.
 - Adequacy of the resources available during the incident.
 - Whether personnel were properly trained and responded effectively and timely according to pre-defined procedures.
 - Whether the equipment was effective and adequate.
 - The response and recovery efforts including public protection measures taken.
 - The incident site rehabilitation program and timing.
 - Recommendations for preventive or mitigative measures to ensure non-recurrence.
 - Any changes to ERP to improve future responses.
 - Any additional training required for personnel to improve response capability.
 - A monitoring report.

ALTAGAS PERSONNEL

Incident Command Structure



On-Scene Commander

The *On-Scene Commander (OSC)* is the senior person on-site during the emergency and coordinates all emergency activities at the site. The OSC reports directly to the *Incident Commander*.

The OSC's responsibilities include:

- § Ensuring the safety of employees, contractors and the general public.
- § Logging all actions and responses.
- § Assessing the incident scene (assume First Responder role or dispatch as appropriate).
- § Establishing the location of the On-Site Command Post (OSCP) where appropriate (i.e. facility office, operator's truck, trailer).

The OSC may be relieved at any time if a more senior person arrives at the scene of the emergency.

The OSC may also assume the role of *Public Safety Coordinator*.

Level 1 Emergency

- § Coordinate on-site response actions to immediately gain control of the emergency. Shut down/isolate gas or spill source, contain fluids and prevent entry into watercourse.
- § Ensure safety of all on-site personnel. Attend to medical requirements.
- § Immediately assess the level of emergency. **The OSC is authorized to evacuate the site and activate the ERP before contacting anyone if he/she believes the circumstances require immediate action.**
- § Contact a senior company representative to assume the *Incident Commander* role. If there is no time to attempt to locate an *Incident Commander*, call the AltaGas 24-hour emergency telephone number instead.
- § Coordinate response actions with the *Incident Commander* by telephone.
- § Obtain and/or request response personnel, equipment and other emergency services (i.e. RCMP, ambulance, fire department, etc.) as needed from the *Incident Commander*.
- § Notify mobile air monitoring unit and place on standby if necessary.
- § Begin evacuation procedures for those persons in the EPZ deemed "sensitive" (Emergency Evacuation Priority Level 1), dependent upon the nature of the emergency.
- § Direct control and/or containment procedures.

Level 2 or 3 Emergency

- § Complete all actions required at a **Level 1** emergency.
- § Notify personnel of the change to a **Level 2 or 3** emergency.
- § Consult with the *Incident Commander* on public safety actions (sheltering, evacuation, ignition, etc.).
- § Determine the need for and appoint *Gas Monitoring Crews* and *Roadblock Crews*.
- § Assemble and place on standby well control personnel and equipment, as necessary.
- § Liaise with government on-site representatives as they arrive.
- § Proceed with ignition of a gas release if ignition criteria has been achieved (see *Ignition Procedure* in Section 3). The decision to ignite a gas flow will be made by the *Incident Commander* in consultation with the appropriate government agencies, the responsible AltaGas VP or Director and other AltaGas officers. However, the OSC is authorized to ignite a gas flow if the situation requires immediate action to protect employees, contractors, the public or the environment.
- § Assess the impact of hydrocarbon or chemical spills and consult with the *Incident Commander*.
- § Designate an individual to establish a “staging area” at a location removed from the OSCP to receive and direct contract equipment and personnel, if necessary.
- § Assist with the deployment of a helicopter (equipped with a siren and loud-hailer) to assess the planning and response zones, if required, to:
 - survey the hazards/damages
 - identify the magnitude of any spill
 - identify residents/transients/recreational users in the EPZ
- § Request a Fire Hazard Closure Order from the *Incident Commander* if area isolation is required.
- § Maintain an Incident Log (Section 6 – FORMS) of the actions taken during the emergency.
- § Debrief all personnel once emergency is over.

Incident Commander

The *Incident Commander (IC)* is responsible for and manages the overall emergency response. The *IC* is the first person contacted by the *OSC* from the pre-determined list of potential *Incident Commanders*. They are the *IC* until relieved by a more senior AltaGas corporate representative on the list.

The *IC*, in consultation with the *OSC*, will assess the severity of the emergency and determine:

- what company and external resources are needed to safely handle the emergency
- whether it is necessary to begin notifying or evacuating area residents
- which government agencies should be notified
- whether the *Media & Communications Coordinator* should be activated

For all **Level 1, 2 and 3** emergencies the *IC* will, at the earliest opportunity, notify the responsible AltaGas VP or Director that an emergency exists. The responsible AltaGas VP or Director will decide if it is necessary to begin notifying other corporate officers that an emergency situation exists.

Level 1 Emergency

- § Acknowledge appointment by the *OSC* and provide response personnel and equipment as required.
- § Declare the Level of Emergency, in conjunction with the *OSC*.
- § Establish the location of the Corporate Emergency Operations Centre (CEOC).
- § Notify the appropriate regulatory agency and the local authorities should their assistance be required to contain the emergency or aid with evacuation of those individuals within the EPZ deemed “sensitive” (Emergency Evacuation Priority Level 1).
- § Log actions and responses.

Level 2 or 3 Emergency

- § Complete all actions required at a **Level 1** emergency.
- § Define the PAZ from data supplied from *Gas Monitoring Crews* and in conjunction with the AER.
- § Designate the *Public Safety Coordinator* and activate the *Media & Communications Coordinator*.
- § Proceed with the following public safety actions, in consultation with the *OSC*:

- **SHELTER** public inside the PAZ until H₂S/LEL levels indicate the area is safe.
- **EVACUATE** public inside the PAZ if H₂S/LEL levels indicate the area is not safe.
- **IGNITE** gas release source if the ignition criteria have been met. See *Ignition Procedure* in Section 3.

- § Ensure appropriate government agencies have been notified and liaise with them.
- § Obtain additional response personnel and equipment necessary to assist the OSC and all other responders.
- § Establish the location of the Regional Emergency Operations Centre (REOC), if required, and request appropriate personnel to assemble at the REOC to assist the OSC.
- § Assist the OSC with the procurement of a Fire Hazard Order, if requested.
- § Prepare initial statements for a press/media release at the local level. Refer media inquiries to the *Media & Communications Coordinator*. Issue any required statements carefully, and make no reference to deceased victims until the next-of-kin have been notified. Document any statements made to the media (see Section 6 - FORMS).
- § Notify the contractor's head office to apprise them of the situation regarding any contract personnel.
- § Consult with the government agencies that participated before downgrading or terminating emergency response activities.
- § Coordinate the post-emergency activities (see Section 3 – *Downgrading an Emergency*).

Public Safety Coordinator

The *Public Safety Coordinator (PSC)* coordinates all aspects of the Shelter/Evacuation process whenever public safety is in jeopardy. The *Incident Commander* appoints the *PSC*, and the *PSC* may also be the *On-Scene Commander*.

Level 1, 2 or 3 Emergency

- § Assist the *IC* and *OSC* with:
 - Organizing *Roadblock Crews* (includes requesting assistance from the RCMP);
 - Organizing *Telephone Crews (Telephoners)* to contact residents;
 - Organizing *Evacuation Crews*; and
 - Procuring additional staff, equipment or resources as required.
- § Establish a prioritized resident list, beginning with anyone located downwind and closest to the emergency site (including homes and businesses).
- § Organize the *Telephoner(s)* to contact area users with the applicable public safety message (no more than 7 residents per *Telephoner*).
- § Assemble and dispatch the *Evacuation Crews* to help residents requiring assistance with evacuation.
- § Direct *Evacuation Crews/Telephoners* to proceed with one of the following safety actions (in consultation with the *IC*):
 - **SHELTER** residents inside the PAZ until H₂S/LEL levels indicate the area is safe.
 - **EVACUATE** residents inside the PAZ if H₂S/LEL levels indicate the area is not safe.
- § Appoint an *Evacuation Centre Coordinator* to establish a Reception Centre.
- § Maintain a record of the public's status, and communicate that status to the *IC*.
- § Liaise with the officials from government agencies if they are called upon to assist with the public safety actions.
- § Establish an air-to-ground communication link if a helicopter is dispatched to assist with the public safety actions,

Evacuation Centre Coordinator

In consultation with the *Incident Commander*, the *Public Safety Coordinator (PSC)* appoints the *Evacuation Centre Coordinator*. The *Evacuation Centre Coordinator* assists the *PSC* with public safety actions from the Reception Centre.

Level 1, 2 or 3 Emergency

- § Obtain an evacuation centre kit and a copy of the ERP manual.
- § Coordinate travel requirements for evacuees with the *PSC*.
- § Proceed to designated Reception Centre to receive evacuees.
- § Set up Reception Centre (tables/chairs) as needed.
- § Record the arrival of all members of the public on the Reception Centre Check-in Sheet (see Section 6).
- § Report status of evacuees to the *PSC* and record status on the Reception Centre Check-in Sheet.
- § Provide shelter and food to evacuees.
- § Contact additional personnel to assist as required (utilize *PSC* if necessary).
- § Liaise with the *PSC* to ensure resident concerns are addressed and answered promptly.
- § Assist evacuees with compensation issues.
- § Assist with post-emergency actions.

Telephone Crew

The *Telephone Crew (Telephoners)*, under the direction of the *Public Safety Coordinator (PSC)*, conducts resident call down when public safety actions are required.

Level 1, 2 or 3 Emergency

- § Prioritize resident call down according to the *PSC's* directions.
- § Confirm with the *PSC* which message is to be delivered to area residences/businesses (shelter or evacuate).
- § Fill in appropriate information on message form.
- § Proceed to contact residences/businesses deemed “sensitive” (Emergency Evacuation Priority Level 1) and deliver selected message (for a Level 1 Emergency). **No more than 7 residents per Telephoner.**
- § Proceed to contact all remaining residences/businesses within the designated PAZ and deliver selected message (for a Level 2 or 3 Emergency).
- § Maintain an accurate log of all telephone conversations, times, etc. on the Resident Contact Log (see Section 6).
- § Establish communication with the *Evacuation Centre Coordinator*, relaying resident and/or business statuses as they change.
- § Notify the *PSC* of any problems, issues or requirements arising from the contact process (i.e. no contact made, need for assistance, only children at home, etc.).
- § Assist with the post-emergency notifications when the emergency is downgraded by the *Incident Commander*.

Evacuation Crew

The *Evacuation Crew* is made up of field personnel who assist the *Public Safety Coordinator (PSC)* with evacuation of the PAZ as required.

Level 1, 2 or 3 Emergency

- § Proceed, in designated evacuation vehicles, to residents/businesses deemed “sensitive” (Emergency Evacuation Priority Level 1) to assist with evacuation (for a Level 1 Emergency).
- § Proceed, in designated evacuation vehicles, to all remaining residents/businesses to assist, as necessary, with evacuation (for a Level 2 or 3 Emergency).
- § Ensure the following information is delivered to evacuees:
 - the type of emergency and related dangers
 - directions for proceeding out of the area safely
- § Provide assistance to individuals requesting help.
- § Record all evacuation data on the Resident Contact Log (Section 6).
- § Report evacuation status to the *PSC*.
- § Assist the *Roadblock Crews* with securing the PAZ and manning roadblocks after evacuation procedures have been completed.

No one will take unnecessary risks or perform any task for which they have not been trained and properly equipped. The *Evacuation Crew* will be staffed with operating personnel. Where necessary, outside personnel may be required to perform some of these duties.

Roadblock Crew

The *Roadblock Crew* is made up of field personnel who establish and maintain roadblocks to isolate the designated PAZ, under the supervision of the *On-Scene Commander (OSC)*. The *Roadblock Crew* will attempt to correct the conditions that are threatening the safety of workers, the general public or the environment.

Level 1, 2 or 3 Emergency

Prior to Dispatch:

- § Assemble at designated site for a briefing by the OSC (if possible).
- § Obtain roadblock kits and establish roadblocks at the designated locations.
- § Establish schedule of report-in times to the OSC.

To Isolate the PAZ:

- § Establish a safe route to get to the roadblock location(s) and an escape route, should conditions warrant.
- § Record the vehicle information for vehicles stopping at the roadblock(s) on the Roadblock Log (see Section 6).
- § Monitor H₂S/LEL levels and relay that information to the OSC.
- § Be prepared to move the position of the roadblock(s) as conditions change.
- § Maintain the roadblock(s) until relieved or informed by the OSC to stand down.
- § Complete a final report.

No one will take unnecessary risks or perform any task for which they have not been trained and properly equipped. The *Roadblock Crew* will be staffed with operating personnel. Where necessary, outside personnel may be required to perform some of these duties. The *Roadblock Crew* may receive assistance from the RCMP or transportation officials.

Gas Monitoring Crew

It is the responsibility of the *On-Scene Commander* to determine the need for and appoint a *Gas Monitoring Crew*.

Level 1, 2 or 3 Emergency

Locating the PAZ for a Gas Release:

- § Take a position downwind of the gas release at the nearest un-evacuated residence (c/w SCBA/gas detection and communication equipment).
- § Record H₂S/LEL readings on the Ambient Air Monitoring Log (see Section 6) and relay that information to the *On-Scene Commander* or *Incident Commander*.
- § Advance towards or retreat from the release according to the readings obtained. **Crews should always maintain their own safety.**
- § Expand or retract the PAZ based on air quality monitoring or other pertinent data.

Isolating the PAZ:

- § Under the instruction of the *On-Scene Commander*, dispatch *Roadblock Crews* (with applicable safety equipment) to selected locations outside the PAZ.

No one will take unnecessary risks or perform any task for which they have not been trained and properly equipped. The *Gas Monitoring Crew* will be staffed with operating personnel. Where necessary, outside personnel may be required to perform some of these duties.

Media & Communications Coordinator

AltaGas recognizes the need for effective and timely communication between the company and the general public if an emergency occurs. To facilitate the flow of information AltaGas has designated a corporate officer as its *Media & Communications Coordinator*.

The *Media & Communications Coordinator* is the AltaGas Corporate Communications Team designate. Only the *Media & Communications Coordinator*, or his designate, will make statements to the news media. No other employee, contract employee or employee of a contractor performing work for AltaGas shall provide any comments to the news media. If approached by the news media, provide them with the telephone number of the *Media & Communications Coordinator*.

The *Media & Communications Coordinator* will:

- § Lead strategic communications efforts in conjunction with the *Incident Commander*.
- § Direct the Communications Team to assist the *Incident Commander*, as required.
- § Create initial messaging framework and key messages.
- § Act as a liaison between the *Incident Commander* and external agencies, if required.
- § Develop and update communications strategies.
- § Co-ordinate and manage media issues.

Only the *Media & Communications Coordinator* will respond to requests for information from the news media and all information releases will be provided in cooperation with the lead government agency.

The Communications Team will assist the *Media & Communications Coordinator* and *Incident Commander* by performing the following tasks, as required:

- § Triage media inquiries.
- § Coordinate interviews with the approved spokesperson.
- § Ensure spokespeople and subject-matter experts are prepared for media interviews (messaging, background information, etc.).
- § Prepare news releases and other media collateral.
- § Post material on the Internet.
- § Log response actions (it is essential to keep accurate records and continuously track the order of responses).

- § Monitor media coverage and report developments, as well as all notification statuses, to the *Media & Communications Coordinator*.

Emergency Information Disseminated to the Public

The following information is to be provided, and updated regularly, by AltaGas to the public and others who have been asked to shelter-in-place or evacuate:

- type and status of the emergency
- location and proximity of the emergency to those who are sheltering-in-place or have been evacuated
- the public safety response to follow and the shelter/evacuation instructions
- any other emergency response actions to consider
- actions being taken to respond to the situation, including the anticipated time required
- contacts for additional information
- reception centre locations

The following information is to be provided to any interested members of the general public:

- type and status of the emergency
- location of the emergency
- areas affected by the emergency
- description of the products involved
- contacts for additional information
- actions being taken to respond to the situation, including the anticipated time required

Media Contact

If an employee, contract employee or employee of a contractor is approached by the media:

- § Respond with: “I can’t answer your questions, but I will find someone who can.”
- § Record their contact information (name, outlet, phone # and/or email)
- § Refer them to the designated media contact or Contact 3 on the AltaGas Crisis Communications Call Tree
- § Alert the Corporate Communications Team by using the Call Tree
- § Do:
- be courteous
 - assure them a company spokesperson will follow up

- pass along their contact information
- remain positive

§ Don't:

- say "no comment"
- go off the 'record'
- speculate or be hypothetical
- offer a personal opinion
- lose your patience

Emergency Response Plan Administrator

The AltaGas *Emergency Response Plan (ERP) Administrator* is required to review and update the ERP on an ongoing basis.

GOVERNMENT OF ALBERTA

Alberta Energy Regulator (AER)

The AER is now the single regulator of energy development in Alberta—from application and exploration, to construction and development, to abandonment, reclamation, and remediation. The Alberta government drafted the Responsible Energy Development Act (REDA), which was passed in December 2012. Under this act, the regulator operates at arm's length from the Government of Alberta.

During a significant emergency response event involving a gas plant and/or the associated gathering system in Alberta, the AER will be an active participant. The AER will:

- § Determine the Level of Emergency with the AltaGas response team.
- § Provide an Alberta Government Agency Representative to the OSCP to maintain a communication link between AltaGas and the AER ECC.
- § Determine the extent of the immediate hazard and issue a FH (Fire Hazard) Closure Order to keep the public and media out of the planning and response zones if the situation warrants.
- § Notify Transport Canada, inform them of the situation and recommend the issue of a Notice to Airmen (NOTAM) if appropriate.
- § Monitor operations and mitigate notification and evacuation activities within the PAZ.
- § Notify other government agencies (i.e. AEMA, OHS, AEP & AHS) when necessary.

Energy & Environmental Emergency 24-Hour Response Line: 1-800-222-6514

Alberta Emergency Management Agency (AEMA)

The Alberta Emergency Management Agency (AEMA) leads the coordination, collaboration and co-operation of all organizations involved in the prevention, preparedness and response to disasters and emergencies, including government, industry, municipalities and first responders, through their Provincial Operations Centre (POC).

The AEMA is responsible to the government, to Albertans, to communities and to industry for the protection of people, property and the environment from the effects of emergency events.

At all times, local authorities in Alberta's municipalities are responsible for managing the first response to an emergency event. When an emergency event exceeds the capabilities of a municipal response or there is a significant threat to life and property, the Alberta Emergency Management Agency coordinates the Government of Alberta's support to the municipality by linking them with resources to help manage the event.

Alberta Environment & Parks

Alberta Environment and Parks (AEP) oversees air, land, water and sustainable development of natural resources for Alberta. AEP's responsibilities and powers are outlined in the *Environmental Protection and Enhancement Act* (EPEA) and its accompanying regulations. AEP can use administrative penalties or prosecution to enforce compliance with environmental legislation.

Generally, AEP has jurisdiction in cases of off-lease spills and releases. Off-site spills and releases must be reported to AEP. In a major emergency response involving sour gas, AEP will monitor H₂S levels and identify areas of risk. They will also monitor discharges into watercourses, determine areas at risk and ensure adequate equipment is available and appropriate data is collected.

Wildfires should be reported to AEP through their wildfire reporting number, and incidents with wildlife should also be reported to AEP.

Energy & Environmental Emergency 24-Hour Response Line: 1-800-222-6514

Wildfire Reporting: 310-FIRE (3473)

Wildlife Reporting: 1-877-944-0313

Alberta Transportation

The Alberta Transportation's Co-ordination and Information Centre (CIC) operates 24 hours a day, 7 days a week to provide information to the general public and industries on dangerous goods compliance. The CIC is also an emergency response centre for all transportation of dangerous goods (TDG) incidents.

The CIC will provided the following technical information:

- § Compliance information related to the Federal and Provincial dangerous goods legislation
- § Federal and international requirements for the shipment of dangerous goods by air, road, rail or marine modes of transportation
- § Interpretive information for the on-highway enforcement process as well as awareness material for inspectors, industry and the general public

Emergency Reporting:

- § The CIC will manage all TDG emergency calls and assess the severity of dangerous goods incidents.
- § The CIC will provide assistance to emergency response personnel attending the scene of an incident in which dangerous goods are involved, or may become a matter for concern.
- § In the event of an incident concerning the primary or secondary highways within the EPZ, AltaGas will inform the RCMP and Alberta Transportation of the emergency.
- § The RCMP and Alberta Transportation will assume responsibility with roadblocks on both primary and secondary highways, if required.

Co-ordination and Information Centre (CIC): 1-800-272-9600

Alberta Occupational Health & Safety (OHS)

Occupational Health & Safety enforces the Alberta *Occupational Health and Safety Act* and Regulations. OHS officers are empowered to enter and inspect worksites to enforce the *Act*, including order work stopped, call for corrective actions if a worksite is dangerous and investigate serious incidents and worksite fatalities.

The Alberta *Occupational Health & Safety Act* requires that serious incidents be reported to Occupational Health & Safety without delay. If a fatality, serious injury or any accident that has the potential to cause serious injury to a person occurs at a worksite, the supervisor must conduct an investigation and a written report must be readily available for inspection by an OHS officer.

You must call in an injury or incident as soon as possible to OHS if it:

- results in a death
- results in a worker staying in hospital for more than 2 days
- involves an unplanned or uncontrolled explosion, fire or flood that causes or may cause a serious injury
- involves the collapse or upset of a crane, derrick or hoist
- involves the collapse or failure of any component of a building or structure

OHS Contact Centre: 1-866-415-8690

County/Municipal District (local authorities)

- § May dispatch representative to the OSCP.
- § May implement the county/municipal emergency plan to protect the health, safety and welfare of residents using any or all of the resources available to the municipality.
- § May, upon request, assist in the opening and operation of a Reception Centre.
- § May, if necessary, declare a state of emergency.

Alberta Health Services (AHS)

Alberta Health Services (AHS) - Environmental Public Health (EPH) roles and responsibilities in public health emergency preparedness and response to the oil and gas industry are outlined below. The provision of services during an emergency is contingent upon AHS' assessment of legislative responsibilities, impact to services, and business continuity.

EPH will endeavor to:

- § Participate with AltaGas in the development of their ERPs as it relates to the Environmental Public Health Program's role and responsibility.
- § Provide the AHS Zone Single-Point-of-Contact (SPOC) emergency phone number to enable AltaGas to notify and alert the Zone of an emergency. From the initial notification or alert, AHS emergency response will fan out to and coordinate with other AHS programs and facilities as necessary. 911 EMS services remain independent of the Zone SPOC notification/alert process.
- § Participate with AltaGas in preparedness training and exercises associated with AltaGas' simulated activation of an ERP in which Environmental Public Health has a role and responsibilities.
- § Participate in public information sessions during AltaGas' ERP development process when appropriate and resources permit.
- § Provide guidance to AltaGas and local municipal authorities in identifying sites suitable for establishing and operating an evacuation centre and/or reception centre, including operational requirements.
- § In consultation with the Zone Medical Officer of Health (MOH), provide guidance to AltaGas on substances that may affect public health, including Alberta Health and Wellness acute exposure health effects for hydrogen sulphide and sulphur dioxide.
- § Conduct assessments, inspections and give regulatory direction, when appropriate, to ensure the requirements of provincial legislation and EPH program areas of responsibilities for public health protection and disease prevention are maintained.
- § Notify the Zone MOH of any incident affecting or potentially affecting other AHS programs or facilities. The Zone MOH will notify and coordinate emergency response in other program areas and facilities as necessary.
- § Establish EPH emergency management operations, when appropriate, to support regional response efforts and liaise with the Government ECC, Municipal ECC and/or AltaGas EOCs, if needed.
- § Assist the Zone MOH, local municipal authority, and Public Information/Communication

officers in the development, issuance, and rescinding of public health, public evacuation, and shelter-in-place advisories.

- § Provide guidance to AltaGas on matters relating to evacuation of the public and/or public facilities, and the re-occupancy of those evacuated areas or facilities.
- § Record and respond to health complaints or concerns from the public during and following an incident.
- § Participate in debriefings as necessary.

Alberta Boilers Safety Association (ABSA)

The Province of Alberta has delegated responsibility for the administration of all boiler and pressure vessel programs in Alberta to the Alberta Boilers Safety Association. Serious accidents involving pressure equipment must be reported to ABSA.

GOVERNMENT OF BRITISH COLUMBIA

British Columbia Oil & Gas Commission (OGC)

OGC's Roles and Responsibilities:

- § Oversees AltaGas' response to an incident
- § Notified by Emergency Management BC (EMBC) of incidents within the OGC's jurisdiction (on lease)
- § Establishes communication with AltaGas
- § Confirms incident level with AltaGas
- § Confirms downgrade of incident level
- § Issues road closure order upon request from AltaGas
- § Requests NOTAM order from NAV Canada upon request from the AltaGas
- § May send an OGC representative to the OSCP and/or Reception Centre
- § May establish a government EOC at the OGC office
- § Confirms ignition decision with AltaGas if time permits
- § Confirms media releases to be sent out by AltaGas

The OGC must be notified of all **Level 1, 2 and 3 Emergencies** immediately (within 1 hour). An OGC Permit Holder Post Incident Report Form must be submitted to the OGC within 60 days for all pipeline incidents (including Minor Incidents) and all Level 1, 2 and 3 emergencies.

In emergency situations, AltaGas must phone the EMBC incident reporting line to notify the OGC of needed emergency oil and gas road closures.

Minor Incidents:

Minor incidents (Alerts) in British Columbia must be reported to the OGC within 24 hours by electronic submission through the OGC Online Minor Incident Reporting System, operated through KERMIT.

- § If the minor incident involves a leak or a spill, the EMBC must also be called for the BC Ministry of Environment to be notified.
- § The incident must be reported by electronic submission. The OGC Minor Incident Notification Form and OGC Incident Classification Matrix can be found in Section 6 of this manual.

The OGC's Incident Classification Matrix is designed to assist in determining which incidents must be reported. However, some incidents, which do occur, may not meet the criteria outlined in the Incident Classification Matrix but still require notification to the OGC as a Minor notification. These include the following:

- § Spills or release of hazardous substances which are not provincially regulated, such as radioactive substances.
- § Major damage to oil and gas roads or road structures.
- § Drilling kicks when any one of the following occur:
 - pit gain of 3 m³ or greater
 - casing pressure 85% of MA
 - 50% out of hole when kicked
 - well taking fluid (LC)
 - associated spill
 - general situation deterioration, i.e. leaks, equipment failure, unable to circulate, etc.
- § Pipeline incidents, such as spills during construction phase, near misses from mobile or excavation equipment, exposed pipe caused by flooding, pipeline over pressure, failure (without release) of any pressure control or ESD device.
- § Security related issues which are relatively minor; such information may be required for tracking and monitoring purposes only.

Incident Reporting Line (EMBC): 1-800-663-3456

BC Environment

The Environmental Emergency Management Program, overseen by the Ministry of Environment, guides provincial response efforts in the event of an environmental emergency.

Roles During Emergency Response:

- § **Monitoring**
Ensuring response is adequate and meets provincial expectations. The monitoring role also includes establishing public safety and environmental protection priorities, and/or:
- § **Augmenting**
Providing provincial resources (equipment and expertise) to AltaGas and/or federal or local government, if requested, and/or:
- § **Taking Over**
Assuming full response management role in the event there is no Responsible Party (spiller/polluter) or if the response is inadequate.

Provincial response ensues when there is a threat to provincial resources, the local/industry response capability is exceeded, there is a strong public expectation, and/or when requested by another jurisdiction. Provincial response most often occurs when an incident takes place in BC that poses a threat to the province's people, infrastructure and/or environment. Each provincial emergency response is conducted in accordance with a provincial-level response plan, such as for water-related hazards, marine oil spills, inland oil spills and hazardous material incidents.

Spilled substances and amounts listed in the *Spill Reporting Regulation* of the BC *Environmental Management Act* must be reported using the EMBC incident reporting line.

Incidents with wildlife should also be reported to BC Environment through their Conservation Officer Service.

Incident Reporting Line (EMBC): 1-800-663-3456

Wildlife Reporting: 1-877-952-7277

Emergency Management BC (EMBC)

Emergency Management BC (EMBC) was formed to be the lead coordinating agency in the provincial government for all emergency management activities. EMBC provides executive coordination, strategic planning, and multi-agency facilitation and strives to develop effective working relationships in an increasingly complex emergency management environment.

EMBC works with local governments, First Nations, federal departments, industry, non-government organizations and volunteers to support the emergency management phases of mitigation/ prevention, preparedness, response and recovery. Additionally, EMBC engages provincial, national and international partners to enhance collective emergency preparedness.

Workers' Compensation Board of British Columbia (WorkSafe BC)

WorkSafe BC (the WCB) is dedicated to promoting workplace health and safety for the workers and employers in British Columbia. They consult with and educate employers and workers and monitor compliance with the *Occupational Health and Safety Regulation*. In the event of work-related injuries or diseases, WorkSafe BC works with the affected parties to provide return-to-work rehabilitation, compensation, health care benefits, and a range of other services.

Emergency and Accident Reporting

Monday – Friday 8:30 a.m. to 4:30 p.m.: **1-888-621-7233**

After Hours (Richmond): **1-866-922-4357**

BC Safety Authority

BC Safety Authority is an independent, self-funded organization mandated to oversee the safe installation and operation of technical systems and equipment, such as electrical equipment and systems, boilers, pressure vessels and refrigeration systems, and natural gas and propane appliances and systems, including hydrogen.

All incidents involving these systems or equipment must be reported to the BC Safety Authority, as per the *BC Safety Standards Act*. If an incident occurs in a plant and an injury or death has occurred as a result of the incident, the owner must isolate the equipment and prohibit any further use of the equipment until its use is approved by a provincial safety manager. The owner must conduct an investigation of the incident and submit a written report of the findings to a provincial safety manager within 30 days of the incident.

Regional Districts (local authorities)

AltaGas consults with local authorities on roles and responsibilities, as required, for each of its operating areas. These consultations included discussing coordination of responsibilities, and were agreed upon prior to the public involvement programs.

The **Peace River Regional District** has a formal Emergency Management Plan, which outlines the measures and sources of assistance that can be obtained to support emergency response efforts within their jurisdiction. Upon request from the Oil and Gas Commission (OGC), the Regional District may address emergency response capabilities, expectations and preparedness. If required, the Regional District may activate their emergency plan in order to achieve any of the following:

- § Dispatch representative(s) to the OGC's Emergency Operations Centre (EOC), if established
- § Provide support to ensure notification of endangered area residents
- § Provide support to coordinate and deliver emergency social services to evacuated residents
- § If necessary, declare a State of Local Emergency and issue an evacuation Alert, Order and Rescind
- § Assist in public information service (joint OGC, Industry, local government)
- § Provide building re-entry procedures

Regional Health Authority - Environmental Health Services

- § Provide information on toxic chemicals to the On-Scene Command Post and provide advice on potential health effects of the release
- § Monitor the health effects of the incident/emergency and ensure appropriate data is collected
- § Establish safe health levels of the release

GOVERNMENT OF SASKATCHEWAN

Saskatchewan Ministry of the Economy (ECON)

Saskatchewan Ministry of the Economy (ECON - *formerly Saskatchewan Energy & Resources - SER*) provides the following oil, gas and energy services:

- § Issues licenses for the drilling of, and production from, oil, gas and other wells in the province;
- § Reviews and issues approvals for projects requiring approval under *The Oil and Gas Conservation Act*;
- § Conducts regular sales of Crown oil and gas rights and administers all leases and dispositions of Crown oil and gas rights;
- § Ensures the orderly and safe development of oil and gas resources in the province through the monitoring of field activities in the oil and gas industry;
- § Issues construction and operating permits for pipelines under provincial jurisdiction;
- § Provides information and interpretations to industry with respect to oil and gas regulations; and
- § Issues natural gas permits for both the sale of Saskatchewan produced gas and the purchases of Saskatchewan gas users.

Fires, blowouts, sour gas releases, pipeline or flowline failures, on-lease spills of upstream petroleum products greater than 2.0 m³, and any off-lease spills of upstream petroleum products, including spills during transport, must be immediately reported to ECON's Petroleum and Natural Gas Division (PNG)'s Emergency & Incident Support line. The initial telephone notification must be followed by online notification using the Integrated Resource Information System (IRIS) within five (5) business days and a detailed incident report on IRIS within 90 days.

Contact damage to a pipeline or flowline that does not result in a break or leak, or an on-lease release of oil, condensate, emulsion or salt water less than 10.0 m³ are exempt from immediate telephone notification, but must be reported on IRIS within five business days.

Emergency & Incident Support: 1-844-764-3637

IRIS: www.saskatchewan.ca/IRIS

Saskatchewan Ministry of Environment

Saskatchewan Environment's mandate is to manage, enhance and protect Saskatchewan's natural and environmental resources (i.e. fish, wildlife, lands, forests, parks and protected areas, air, water and soil, etc.) for conservation, recreation, social and economic purposes and to ensure they are sustained for future generations.

Off-lease fires and spills of refined products and chemicals (including during transport) must be reported to Saskatchewan Environment's Spill Control Centre. Wildfires should be reported to Firewatch, and wildlife incidents should be reported to a provincial conservation officer.

Spill Control Centre: 1-800-667-7525

Firewatch: 1-800-667-9660

Wildlife Reporting: 1-800-667-7561

Saskatchewan Emergency Management & Fire Safety

The Government of Saskatchewan contributes to the safety of its residents and to the protection of property and the environment before, during and after an emergency or a disaster. The province also provides support and advice to local officials during an emergency event. Depending on the magnitude of an event, other levels of government may be requested to assist.

Provincial resources become involved at the point where local capacity is not sufficient to provide an adequate response and the jurisdiction has declared a Local State of Emergency. This response may include opening the Provincial Emergency Coordination Centre (ECC) to provide a central point to coordinate the operational response of provincial government ministries, agencies and crown corporations.

When emergencies begin to escalate beyond the capacity of a local jurisdiction or are in a number of jurisdictions, the Provincial ECC may be activated - depending on level of the incident(s). The ECC remains operational 24 hours-a-day during an emergency. Resources including Emergency Services Officers and Rapid Response Teams as well as equipment and supplies are assigned by the province to assist communities in their response efforts and are coordinated through the ECC.

The first point of contact in any emergency is always the local municipal government. They will make the decision to ask for provincial support if the event is beyond local capacity.

Local Authorities (Municipalities)

- § May dispatch a representative to the OSCP.
- § May implement the municipal emergency plan to protect the health, safety and welfare of residents using any or all of the resources available to the municipality.
- § May, upon request, assist in the opening and operation of a Reception Centre.
- § May, if necessary, declare a state of emergency.

In Saskatchewan, municipalities are obligated to establish emergency plans by *The Emergency Planning Act, 1989* which also gives council the responsibility for the direction and control of a municipal emergency response in order to take action to implement the plan and to protect the property, health, safety and welfare of the public. It requires municipalities to:

- appoint a municipal planning committee
- establish an Emergency Measures (Management) Organization (EMO)
- appoint an Emergency Coordinator; and
- prepare an emergency plan.

Only council or a member of council in the absence of a quorum can officially declare a State of Local Emergency in a municipality and exercise the special powers the legislation confers on council.

The Government of Saskatchewan can also declare an emergency through an Order-in-Council and direct municipal resources or direct one municipality to assist another during the emergency.

Regional Health Authority

The Health Authority's Medical Health Officer will:

- § Provide information on toxic chemicals to the OSCP and provide advice on potential health effects of a gas release.
- § Monitor the health effects of the incident/emergency and ensure appropriate data is collected.
- § Establish safe health levels of a release.

Saskatchewan Ministry of Labour Relations & Workplace Safety - OHS

Saskatchewan legislation requires an investigation for incidents that:

- § Caused a death or might have caused a death; or
- § Required hospitalization.

Dangerous occurrences must also be investigated and reported to Saskatchewan Occupational Health & Safety (refer to Sections 8, 9, 20 and 30 of the *Saskatchewan Occupational Health and Safety Regulations, 1996*).

WorkSafe Saskatchewan Incident Reporting: 1-800-567-7233

Saskatchewan Workers' Compensation Board (WCB)

The *Workers' Compensation Act* is administered by the Saskatchewan's Workers' Compensation Board. The Board collects assessment premiums from employers and makes appropriate payments to injured workers from a common fund. The Saskatchewan workers' compensation system is a no-fault system for workers against the result of work injuries.

Injury Reporting: 1-800-787-9288

Technical Safety Authority of Saskatchewan

The Technical Safety Authority of Saskatchewan (TSASK) is a not-for-profit company that administers Saskatchewan's safety program for boilers, pressure vessels, elevating devices and amusement rides. They administer and enforce the *Boiler and Pressure Vessel Act and Regulations*.

TSASK operates at arm's length from the government and are governed by their own Board of Directors. The provincial government continues to be responsible for establishing safety standards, policies, legislation and regulatory requirements related to public safety.

TSASK does not provide emergency assistance, but boiler and pressure vessel incidents must be reported to them.

GOVERNMENT OF THE NWT

Environment and Natural Resources

The Department of Environment and Natural Resources (ENR) administers *The Environmental Protection Act*. The Environmental Protection Service has a mandate similar to a provincial environmental agency. Programs include hazardous substances, waste management, air quality, and environmental impact assessment and are delivered in conjunction with community Renewable Resource Officers.

The Hazardous Substances Program is responsible for coordinating the department's response to spills of contaminants, ensuring continued operation of the NWT's 24-Hour Spill reporting telephone service, ensuring contaminated sites are cleaned up by the polluter, controlling the use of pesticide products through a system of permits, and participating in the review of land and water development proposals on federal and Commissioner's land which may affect the quality of the environment.

The Air Quality Program is responsible for monitoring the quality of the air and regulating activities that may emit contaminants to the atmosphere. The Air Quality Program also provides for northern participation in national and international air quality issues including global warming, depletion of the ozone layer, and the long-range transport of airborne pollutants.

Spill Reporting: 867-920-8130

Forest Fire Reporting: 1-877-698-3473

Wildlife Reporting: 867-678-0289

Workers' Safety & Compensation Commission (WSCC)

The Safety Act and the General Safety Regulations regulate workplace health and safety in the Northwest Territories. The Chief Safety Officer administers the legislation. The NWT safety officers are employees of the Workers' Safety & Compensation Commission. Serious injuries and accidents should be reported to the WSCC Serious Accident Reporting Line.

Serious Accident Reporting Line: 1-800-661-0792

Public Works and Services - Boilers and Pressure Vessels

The Government of the Northwest Territories has appointed inspectors to administer the *Boilers and Pressure Vessels Act*. Serious accidents involving pressure equipment must be reported to the Boiler/Gas Inspector at the Department of Public Works and Services.

NWT Municipal & Community Affairs (MACA)

The Department of Municipal and Community Affairs (MACA) safeguards the health and wellbeing of Northwest Territories residents by ensuring compliance with safety standards and coordinating emergency services. MACA strives to meet its goals by delivering frontline services to community governments through their headquarters in Yellowknife and five regional offices. The Department's functions are as follows:

- § Office of the Fire Marshal: MACA is responsible for delivering several programs relating to fire and life safety as identified in the *Fire Prevention Act*.
- § Emergency Management: MACA is responsible for NWT emergency preparedness and response activities.
- § Community governance support and advice.

Emergency Measures Office 24 Hour Emergency Line: 867-920-2303

Regional Health Authority

Public health matters are the responsibility of the Health Authority's Medical Officer of Health who will:

- § Provide advice on public health matters;
- § Arrange for dissemination of special instructions to the population on matters concerning public health;
- § Arrange for testing of water supplies and, when warranted, make recommendations for arranging alternate supplies;
- § Notify other agencies and senior levels of government about health related matters.

GOVERNMENT OF CANADA

National Energy Board (NEB)

The main responsibilities of the NEB are established in the *National Energy Board Act (NEB Act)* and include regulating:

- § The construction, operation, and abandonment of pipelines that cross international borders or provincial boundaries, as well as the associated pipeline tolls and tariffs;
- § The construction and operation of international power lines and designated inter-provincial power lines; and
- § Imports of natural gas and exports of crude oil, natural gas liquids, natural gas, refined petroleum products and electricity.

Additionally, the NEB has regulatory responsibilities for oil and gas exploration and production activities in Canada Lands not otherwise regulated under joint federal/provincial accords. These regulatory responsibilities are set out in the *Canada Oil and Gas Operations Act* and the *Canada Petroleum Resources Act*.

As lead regulatory agency, the NEB:

- § Monitors, observes and assesses the overall effectiveness of the company's emergency response in terms of:
 - emergency management
 - safety
 - security
 - environment
 - integrity of operations and facilities
 - energy supply
- § Investigates the incident, either in cooperation with the Transportation Safety Board of Canada, under the *Canada Labour Code*, or as per the *NEB Act* or *Canada Oil & Gas Operations Act* (whichever is applicable).
- § Inspects the pipeline or facility.
- § Examines the integrity of the pipeline or facility.
- § Requires appropriate repair methods be used.
- § Requires appropriate environmental remediation of contaminated areas be conducted.
- § Coordinates stakeholder and Aboriginal community feedback regarding environmental clean-up and remediation.

- § Confirms that AltaGas is following its ERP commitments, plans, procedures and NEB regulations, and identifies non-compliances.
- § Initiates enforcement actions as required.
- § Approves the restart of the pipeline.

All significant incidents involving NEB-regulated pipelines should be reported through the NEB/TSB single-window notification process – initial notification must be made to the TSB Reporting Hotline and then subsequently to the NEB's Online Event Reporting System (OERS). Significant incidents include the following:

- Death or serious injury (i.e. major bone fracture, amputation, loss of sight, internal hemorrhage, third degree burns, unconsciousness or loss of body function)
- A missing person
- A fire or explosion that causes a pipeline or facility to be inoperative
- An LVP hydrocarbon release in excess of 1.5 m³ that extends beyond the lease
- A pipeline rupture (an instantaneous release where the pressure of the pipeline segment cannot be maintained)
- A toxic plume as defined in CSA Z662

All other incidents involving areas under NEB jurisdiction must be reported within 24 hours to the OERS, including:

- All incidents under the *NEB Onshore Pipeline Regulations (OPR)*, *NEB Processing Plant Regulations (PPR)*, and *Canada Oil and Gas Drilling and Production Regulations (DPR)*
- Unauthorized activities under the *National Energy Board Pipeline Crossing Regulations Part II*
- Emergency burning or flaring under the *PPR*
- Hazard identification under the *PPR*
- Suspension of operations under the *PPR*
- Near-misses under the *DPR*
- Serious accidents or incidents under the *Canada Oil and Gas Geophysical Operations Regulations*
- Emergencies or accidents under the *Canada Oil and Gas Installation Regulations*
- Accidents, illnesses, and incidents under the *Canada Oil and Gas Diving Regulations*

If the OERS is unavailable, these incidents must be reported to the TSB Reporting Hotline.

For all other incidents, the NEB can be contacted at their 24/7 Incident Line.

TSB Reporting Hotline: 819-997-7887

OERS: <https://apps.neb-one.gc.ca/ERS/Home/Index/>

NEB Incident Line: 403-807-9473

Transportation Safety Board (TSB)

The Transportation Safety Board of Canada is an independent agency that investigates marine, pipeline, railway and aviation transportation occurrences. When notified of an occurrence, the TSB will assess the circumstances to determine if an investigation is warranted; this assessment may involve the deployment of an investigation team to the occurrence site.

The TSB requires the following incidents resulting directly from operation of a pipeline to be reported to them:

- § A person is killed or sustains a serious injury.
- § The safe operation of the pipeline is affected by:
 - damage sustained when another object came into contact with it; or
 - a fire or explosion or an ignition that is not associated with normal pipeline operations.
- § An event or an operational malfunction results in:
 - an unintended or uncontrolled release of gas;
 - an unintended or uncontrolled release of HVP hydrocarbons;
 - an unintended or uncontained release of LVP hydrocarbons in excess of 1.5 m³; or
 - an unintended or uncontrolled release of a commodity other than gas, HVP hydrocarbons or LVP hydrocarbons.
- § A release of a commodity from the line pipe body.
- § Pipeline operations beyond design limits or any operating restrictions imposed by the NEB.
- § When a pipeline restricts the safe operation of any mode of transportation.
- § An unauthorized third party activity within the EPZ poses a threat to the safe operation of the pipeline.
- § A geotechnical, hydraulic or environmental activity posing a threat to the safe operation of the pipeline.

- § The operation of a portion of the pipeline is interrupted as a result of a situation or condition that poses a threat to any person, property or the environment.
- § An unintended fire or explosion has occurred that poses a threat to any person, property or the environment.

The OERS must be used to report all pipeline incidents. Significant incidents (as defined above under the NEB), however, must be reported immediately by phone to the TSB Reporting Hotline, and then subsequently reported online through the OERS.

TSB Reporting Hotline: 819-997-7887

OERS: <https://apps.neb-one.gc.ca/ERS/Home/Index/>

Fax: 819-953-7876

Email: PipelineNotifications@tsb.gc.ca

Canada Labour Code

Oil and Gas Occupational Safety and Health Regulations

PART XVI - Hazardous Occurrence Report

[SOR/94-165, s. 62(F)]

16.4 (1) The employer shall report, by the most rapid means of communication available to the employer, the date, time, location and nature of any accident, occupational disease or other hazardous occurrence referred to in section 16.3 to the Minister and to the safety and health committee or the safety and health representative, if either exists, as soon as feasible but not later than 24 hours after becoming aware of the occurrence, if the occurrence resulted in one of the following circumstances:

- (a) the death of an employee;
- (b) a missing person;
- (c) a disabling injury to an employee;
- (d) the implementation of emergency rescue, revival or evacuation procedures;
- (e) a fire or explosion that threatened the safety or health of an employee;
- (f) the free fall of an elevating device that rendered the elevating device unsafe for use by an employee;
- (g) an accidental accumulation, spill or leak of a hazardous substance; or
- (h) the loss of or damage to support craft.

(2) A written report of the accident, occupational disease or other hazardous occurrence referred to in subsection (1) shall be submitted by the employer within 14 days after the occurrence to

(a) the Minister; and

(b) the safety and health committee or the safety and health representative, if either exists.

(3) The report referred to in subsection (2) shall be in the form set out in Schedule I to this Part and contain the information required by the form.

16.5 If an investigation referred to in subsection 16.3(2) reveals that the accident resulted in a circumstance referred to in subsection 16.4(1), the employer shall, within 14 days after the receipt of the report of the accident made by the police or other investigating authority, submit a copy of the report to the Minister.

RCMP

§ Will assume responsibility for traffic control, evacuation, and residence security if required

§ In the event of an incident concerning the primary or secondary highways within the EPZ, AltaGas will inform the RCMP, who will assume responsibility for roadblocks

§ The RCMP will clarify responsibilities in the event of fatalities

Indian Oil and Gas Canada (IOGC)

Indian Oil and Gas Canada (IOGC) is a regulatory agency within Indigenous and Northern Affairs Canada (INAC) responsible for managing and administering the exploration and development of crude oil and natural gas on First Nation reserve lands.

IOGC's specific responsibilities are to:

- § identify and evaluate oil and gas resource potential;
- § encourage companies to explore for, drill and produce these resources through leasing activity;
- § ensure equitable production, fair prices and proper collection of royalties; and
- § secure compliance with and administer the regulatory framework in a fair and equitable manner

IOGC is to be notified of all incidents that occur on First Nations reserve lands, but they will not act as a first responder during emergencies.

Incident Reporting: 403-292-5625

GOVERNMENT OF WASHINGTON

Utilities and Transportation Commission (UTC)

The UTC is responsible for developing and enforcing safety standards for natural gas and hazardous liquid pipelines located within the state. The Commission also inspects the portions of interstate natural gas and hazardous liquid pipelines located within Washington state; the standards and enforcement actions are the responsibility of the federal Pipeline and Hazardous Materials Safety Administration (PHMSA).

The following pipeline incidents must be reported to the UTC within 2 hours:

- (a) Results in a fatality or personal injury requiring hospitalization;
- (b) Results in damage to the property of the operator and others of a combined total exceeding fifty thousand dollars;
- (c) Results in the evacuation of a building, or high occupancy structures or areas
- (d) Results in the unintentional ignition of gas;
- (e) Results in the unscheduled interruption of service furnished by any operator to twenty-five or more distribution customers;
- (f) Results in a pipeline or system pressure exceeding the MAOP plus ten percent or the maximum pressure allowed by proximity considerations outlined in *WAC 480-93-020*;
- (g) Is significant, in the judgment of the operator, even though it does not meet the criteria of (a) through (e).

The following pipeline incidents must be reported to the UTC within 24 hours:

- (a) The uncontrolled release of gas for more than two hours;
- (b) The taking of a high pressure supply or transmission pipeline or a major distribution supply pipeline out of service;
- (c) A pipeline or system operating at low pressure dropping below the safe operating conditions of attached appliances and gas equipment; or
- (d) A pipeline or system pressure exceeding the MAOP.

UTC Pipeline Safety Incident Notification: 1-888-321-9144 or 1-888-321-9146

Department of Ecology

The Washington State Department of Ecology responds to incidents involving oil and hazardous materials that may harm Washington's environment, or public health and safety. Ecology is the designated State-On-Scene Coordinator for oil spills to water. Response teams are based in Bellingham, Bellevue, Olympia, Vancouver, Yakima and Spokane to provide year round, 24-hour a day response service.

According to Washington state law, all hazardous material and oil spills ***must be reported immediately by the spiller***. Spills into water must be reported to the National Response Center (NRC) and the Washington Military Emergency Management's Alert & Warning Center. All other spills must be reported to the local Ecology regional office.

Washington Military Emergency Management

The Washington Military's Emergency Management Division (EMD) notifies and alerts state agencies and local governments of impending emergencies and disasters. During state emergencies, EMD manages the State Emergency Operations Center located on Camp Murray, near Tacoma, and coordinates the response to ensure help is provided to those who need it quickly and effectively. The EOC is designated as the central location for information gathering, disaster analysis, and response coordination. Other state agencies with emergency roles may come to the EOC to help coordinate the state response. Federal government agencies, along with state and local volunteer organizations, also may provide representatives.

State Alert & Warning Center: 1-800-258-5990

Northwest Clean Air Agency (NWCAA)

The Northwest Clean Air Agency (NWCAA) is one of seven regional air quality control agencies located throughout Washington State. It was established in 1967 after passage of the Washington State Clean Air Act (RCW 70.94). The agency is responsible for enforcing federal, state and local air pollution regulations in Island, Skagit and Whatcom counties.

NWCAA regulates over 425 sources of air pollution ranging from large refineries to gas stations to home fireplaces and wood stoves. Operating permit and registration fees collected from industrial sources provides the agency's main source of funding.

Department of Health (DOH)

The Washington State Department of Health's Environmental Public Health Division supports the department's mission by working with local governments and other agencies in the areas of safe drinking water, food safety, shellfish protection, radiation safety, wastewater management, pesticide exposures, vector borne disease, general environmental health and safety issues and health risk assessments.

Department of Labor and Industries (L&I)

L&I is a diverse state agency dedicated to the safety, health and security of Washington's 3.2 million workers. They help employers meet safety and health standards and inspect workplaces when alerted to hazards. As administrators of the state's workers' compensation system, they provide medical and limited wage-replacement coverage to workers who suffer job-related injuries and illness. L&I's Division of Occupational Safety and Health (DOSH) administers the Washington Industrial Safety and Health Act (WISHA) law by developing and enforcing rules that protect workers from hazardous job conditions.

All fatalities and serious injuries requiring hospitalization must be reported to L&I within 8 hours.

Fatality and Serious Injury Reporting: 1-800-423-7233

GOVERNMENT OF THE UNITED STATES

Federal Energy Regulatory Commission (FERC)

The Federal Energy Regulatory Commission, or FERC, is an independent agency that regulates the **interstate** transmission of electricity, natural gas and oil. The *Energy Policy Act* of 2005 gave FERC additional responsibilities as outlined in FERC's Top Initiatives and updated Strategic Plan. As part of that responsibility, the FERC:

- § Regulates the transmission and sale of natural gas for resale in interstate commerce.
- § Approves the siting and abandonment of interstate natural gas pipelines and storage facilities.
- § Ensures the safe operation and reliability of proposed and operating LNG terminals.
- § Monitors and investigates energy markets.
- § Enforces FERC regulatory requirements through imposition of civil penalties and other means.
- § Oversees environmental matters related to natural gas and hydroelectricity projects and other matters.
- § Administers accounting and financial reporting regulations and conduct of regulated companies.

Department of Transportation (DOT)

Pipeline and Hazardous Materials Safety Administration (PHMSA)

The Department of Transportation's (DOT's) Pipeline and Hazardous Material Safety Administration (PHMSA), acting through the Office of Pipeline Safety, administers the Department's national regulatory program to assure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline.

Office of Pipeline Safety (OPS):

OPS develops regulations and other approaches to risk management to assure safety in design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Since 1986, the entire pipeline safety program has been funded by a user fee assessed on a per-mile basis on each pipeline operator OPS regulates. The OPS also:

- § Supports the operation of, and coordinates with, the United States Coast Guard on the National Response Center; also serves as a DOT liaison with the Department of

Homeland Security and the Federal Emergency Management Agency on matters involving pipeline safety.

- § Develops and maintains partnerships with other Federal, state, and local agencies, public interest groups, tribal governments, and the regulated industry and other underground utilities to address threats to pipeline integrity, service, and reliability and to share responsibility for the safety of communities.
- § Administers Pipeline Safety regulatory programs and establishes the regulatory agenda. Develops regulatory policy options and initiatives, and researches, analyzes, and documents social, economic, technological, environmental, safety, and security impacts upon existing/proposed regulatory, legislative, or program activities involving pipeline safety.
- § Oversees pipeline operator implementation of risk management and risk-based programs. Administers a national pipeline inspection and enforcement program.
- § Provides technical and resource assistance for state pipeline safety programs to ensure oversight of intrastate pipeline systems and educational programs at the local level.
- § Supports the development and conduct of pipeline safety training programs for Federal and state regulatory and compliance staff and the pipeline industry,

Hazardous materials transportation and pipeline accidents are to be reported directly to the National Response Center (NRC).

National Response Center (NRC): 1-800-424-8802

United States Coast Guard (USCG)

The U.S. Coast Guard is one of the five armed forces of the United States and the only military organization within the Department of Homeland Security. Since 1790 the Coast Guard has safeguarded the United States' maritime interests and environment around the world. The Coast Guard is an adaptable, responsive military force of maritime professionals whose broad legal authorities, capable assets, geographic diversity, and expansive partnerships provide a persistent presence along U.S. rivers, in the ports and littoral regions, and on the high seas. Coast Guard presence and impact is local, regional, national and international. These attributes make the Coast Guard a unique instrument of maritime safety, security and environmental stewardship.

Environmental Protection Agency (EPA)

The mission of EPA is to protect human health and the environment. When Congress writes an environmental law, the EPA implements it by writing regulations. Often, they set national standards that states and tribes enforce through their own regulations. The EPA also enforces their regulations, and helps companies understand the requirements. The EPA administers the following legislation:

- *Clean Air Act (CAA)*
- *Clean Water Act (CWA)*
- *Safe Drinking Water Act (SDWA)*
- *Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)*
- *Resource Conservation and Recovery Act (RCRA)*
- *Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)*
- *Toxic Substances Control Act (TSCA)*
- *Marine Protection, Research, and Sanctuaries Act (MPRSA)*
- *Pollution Prevention Act (PPA)*

U.S. Fish & Wildlife Service (FWS)

The United States Fish and Wildlife Service (FWS) provides support to National Response Framework activations. The Service performs the following emergency support functions:

- § Supplementary transport assets such as light fixed wing aircraft, vessels, boats and other watercraft, all-terrain vehicles and snow machines. FWS can provide support personnel, certified pilots and vessel operators.
- § FWS as a participant with the National Interagency Fire Center and National Interagency Radio Support System, maintains radio communications systems in support of firefighters, law enforcement officers, and incident response specialists. FWS may provide communications technical and support personnel to complement other Interior communications assets.
- § FWS can provide engineering support to assist in evaluating damage to water control systems, such as dams, levees, and water delivery facilities and structures.
- § FWS assumes responsibility for fighting wildfires burning on lands within its jurisdiction; assists the Forest Service and other federal and state agencies as requested.
- § FWS maintains a cadre of certified firefighting personnel within the National Wildlife Refuge System. FWS is a member of the National Multi-Agency Coordinating Group.

- § FWS assumes responsibility for managing or coordinating emergency responses on lands within its jurisdiction and assists other federal and state agencies on adjacent lands as requested. Many FWS National Wildlife Refuge System law enforcement and fire fighting personnel are certified in first aid, CPR, and other emergency response capabilities.
- § FWS may provide supporting material, property, facility, and transportation during emergencies as requested.
- § FWS personnel respond to spills of hazardous materials to provide scientific and technical advice relative to impacts on fish and wildlife and the environment. FWS maintains expertise in mitigating the effects of oil spills and hazardous materials.
- § FWS may provide trained personnel and resources from its Office of Law Enforcement and National Wildlife Refuge System in support of public safety and security within the legal authorities granted.

National Marine Fisheries Service (NMFS)

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is the federal agency, a division of the Department of Commerce, responsible for the stewardship of the United States' living marine resources and their habitat. NMFS is responsible for the management, conservation and protection of living marine resources within the United States' Exclusive Economic Zone (water three to 200 mile offshore). Under the *Marine Mammal Protection Act* and the *Endangered Species Act*, NMFS recovers protected marine species (i.e. whales, turtles) without unnecessarily impeding economic and recreational opportunities. With the help of the six regional offices and eight councils, NMFS is able to work with communities on fishery management issues. NMFS works to promote sustainable fisheries and to prevent lost economic potential associated with overfishing, declining species and degraded habitats. NMFS strives to balance competing public needs.

Occupational Safety and Health Administration (OSHA)

OSHA and its state partners have approximately 2100 inspectors, plus complaint discrimination investigators, engineers, physicians, educators, standards writers, and other technical and support personnel spread over more than 200 offices throughout the country. This staff establishes protective standards, enforces those standards, and reaches out to employers and employees through technical assistance and consultation programs.

The following *OSHA Regulations - Standards 29 CFR 1910 Occupational Health and Safety Standards*, in particular, may apply to AltaGas operations and emergency response:

1910.38 – Emergency action plans

1910.119 – Process safety management of highly hazardous chemicals

1910.120 – Hazardous waste operation and emergency response

Any accident that results in a fatality or which requires the hospitalization of five or more employees must be reported to OSHA within 48 hours.

Incident Reporting: 1-800-321-6742

OIL SPILL SERVICES

Western Canada Spill Services Ltd. (WCSS)

WCSS is a legally registered corporation managed by a Board of Directors representing the major petroleum industry stakeholders in Western Canada.

WCSS is managed by the petroleum industry's training arm, Enform. A key service provided by WCSS is the establishment and maintenance of regional spill response groups known as Oil Spill Cooperatives. Each co-op is managed by a group of petroleum industry volunteers. The cooperatives maintain spill contingency plans and strategically placed OSCARs (*oil spill containment and recovery trailers*) that are available to all member companies in the co-op's area. The equipment is maintained by Equipment Custodians. Annual training exercises are conducted by each co-op to ensure that equipment and staff are prepared for emergencies. AltaGas maintains its annual membership in the WCSS and personnel participate in the annual exercises. The equipment and staff of the spill co-ops are available to AltaGas in the event of a spill of liquids from pipelines.

Saskatchewan Area Spill Co-ops - Environmental Response Unit

The Saskatchewan Environmental Response Unit is an oil and gas production industry affiliated organization in Saskatchewan whose mandate is to provide communication, training and contingency planning to minimize risks and environmental damage in the event of a major oil spill.

Their mission is to provide an environmental response unit to maintain the environment as best we can. They will provide clean up equipment to help member companies and non-member companies keep a clean environment, and have the equipment and emergency response unit ready to be accessed 24-7.

United States Marine Spill Response Corporation

The Marine Spill Response Corporation (MSRC) is a not-for-profit, U.S. Coast Guard Classified Oil Spill Removal Organization (OSRO). MSRC was formed in 1990 to offer oil spill response services and mitigate damage to the environment. These services are available to organizations, including those involved in the handling and transport of oil and other substances.

MUTUAL ASSISTANCE

Coordination of AltaGas ERPs with Well Owners' ERPs

In the event of an emergency:

§ AltaGas will proceed to investigate in accordance with its own Emergency Response Plan (ERP). Where it appears likely that the event involves or will affect another producer or producers, AltaGas will immediately contact them at the emergency telephone number(s) in its ERP.

§ AltaGas will shut down the affected pipeline when an interruption in flow is detected, if it is possible to do so. The owners of the well will be notified by telephone at their emergency number.

AltaGas will not assume responsibility for initiating corrective actions for emergencies occurring with foreign pipelines connected to their facilities. The level of assistance AltaGas is prepared to give another company in an emergency will depend upon the circumstances in each case. In no case will AltaGas personnel respond to an emergency if to do so would unreasonably jeopardize the safety of its employees, the public or anyone else living or working in the area.

SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Natural Gas

Chemical names: Aliphatic hydrocarbon mixture (Alkanes C₁ - C₄); primarily Methane (C₁)

Product uses:

Raw material. Compressed gas or liquefied gas. Aliphatic hydrocarbon mixture (Alkanes C₁ - C₄); primarily Methane (C₁)

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable Gases Cat. 1; H220

Gases Under Pressure, Compressed Gas or Liquefied Gas; H280

GHS Label elements:



Danger!

Extremely flammable gas.

Contains gas under pressure; may explode if heated.

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Response:

Leaking gas fire: do not extinguish, unless leak can be stopped safely.

Eliminate all ignition sources of safe to do so.

Storage:

Protect from sunlight. Store in a well ventilated place.

WHMIS:

Controlled product by WHMIS criteria.



- A – Compressed Gas
- B1 – Flammable Gas

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact with liquefied gas escaping from its cylinder may cause frostbite. The skin may become waxy white or yellow.

Eye contact: Contact with liquefied gas escaping from its cylinder may cause freezing of the eye. Permanent eye damage or blindness could result.

Ingestion: Not an applicable route of exposure.

Inhalation: Natural gas in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Symptoms of oxygen deficiency include increased breathing and pulse rate, slight loss of muscular coordination, emotional upsets, abnormal fatigue from exertion, disturbed respiration, nausea and vomiting, inability to move freely, collapse, possible loss of consciousness; extreme oxygen deficiency below 6% can induce convulsive movements, gasping, possible respiratory collapse and death. Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

High concentrations of Natural gas in air may cause central nervous system depression.

Propane in air (>1 000 ppm), can cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness and confusion. Higher concentrations (>100 000 ppm) may cause unconsciousness, narcosis and CNS depression.

1% butane in air, 10 minute exposure, can cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness and confusion. High concentrations (1.7% butane in air) may cause unconsciousness, narcosis and CNS depression.

Some components of Natural gas e.g. propane and butane are a weak cardiac sensitizers. Exposures by inhalation to high concentrations of these components may lead to cardiac sensitization; may cause the sudden onset of an irregular heartbeat. Sudden deaths have been reported in cases of substance abuse involving propane and butane. The asphyxiant effects of high concentrations of aliphatic gases in air may enhance cardiac sensitization.

Chronic Health Effects:

No human or animal information was located.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

May be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Natural gas is not expected to result in any ecological damage to water, land. Regulated as a VOC in air.

Section 3: Composition/Information on Ingredients

Hazardous Substances:

Natural gas is a naturally occurring gas mixture of aliphatic hydrocarbons, consisting mainly of methane. Natural gas is expected to have a typical composition reported in the table below. As a naturally occurring complex mixture, the composition will vary.

Other trace components may include pentanes, hexanes, nitrogen, carbon dioxide, oxygen, hydrogen sulfide and hydrogen.

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|-----------------------------|----------------|---------------|
| Natural Gas | 8006-14-2 | 100 |
| <u>Typical composition:</u> | | |
| Methane | 74-82-8 | 70 - 90 |
| Ethane | 74-84-0 | 1 - 20 |
| Propane | 74-98-6 | Not available |
| Butane | 106-97-8 | Not available |

SAFETY DATA SHEET

Section 4: First Aid Measures

Description of first aid measures:

Skin Contact: For liquefied / compressed gas: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove rest of the garment. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Eye Contact: For liquefied / compressed gas: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. Do NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Inhalation: This material is extremely flammable. Take proper precautions (e.g. remove any sources of ignition, wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility. Ensure that first aid providers are aware of the material involved and take precautions to protect themselves.

Ingestion: Not an applicable route of exposure.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Frostbite.

Eye Contact: Freezing of eye tissue.

Inhalation: Nausea, dizziness, drowsiness and confusion, unconsciousness.

Ingestion: Not applicable

Section 5: Fire Fighting Measures

Flammable properties:

Extremely flammable gas.

Readily forms explosive mixtures with air, which are easily ignited by heat, sparks or flame. Liquefied gas accumulates static charge. Liquefied Natural gas can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation. Natural gas in the flammable range can be easily ignited by an electrostatic discharge of sufficient energy (e.g. brush discharge). Minimum Ignition Energy= 0.21 mJ for 8.5% by volume (for methane).

Liquefied gas rapidly vaporizes under normal conditions. Ignition of a large volume of gas vapour mixed with air causes sudden expansion and turbulence resulting in an explosion known as vapour cloud explosion.

Natural gas can accumulate in confined spaces and low areas, resulting in an explosion or asphyxiation hazard.

Extinguishing media:

Leaking gas fire: Do not extinguish unless leak can be stopped safely.

Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

Unsuitable extinguishing media: Carbon dioxide, low expansion foams, and direct application of water on liquefied gas.

Under certain conditions, discharge of carbon dioxide produces electrostatic charges that could create a spark and ignite flammable gas.

Special hazards arising from the substance or mixture:

Natural gas can travel over long distances creating a flash back hazard.

Containers may rupture and explode if heated.

Material will readily ignite at normal temperatures.

The gas can accumulate in confined spaces, resulting in explosion and asphyxiation hazards.

Direct addition of water (or any other room temperature liquid) to the liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a "boiling liquid, expanding vapour explosion."

During a fire, toxic gases may be generated.

Cylinders exposed to heat and/or fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures, continued

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Stop flow of gas before attempting to extinguish fire. If flow cannot be stopped, let the fire burn while protecting the surrounding area. Cool exposed containers with water.

Fires 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.

If a tank or rail car is involved in a fire, isolate for 1600 m in all directions; also consider initial evacuation for 1600 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately.

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).

All equipment used when handling the product must be grounded.

Do not touch or walk through spilled material.

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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.

Do not direct water at spill or source of leak.

Prevent spreading of vapours through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Isolate the area until the gas has dispersed. Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area. Pay special attention to low-lying areas where the gas may have accumulated.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

This material is an extremely flammable gas. Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. During transfer operations, cylinders and vessels should be electrically grounded and bonded to prevent the build up of a static charge. Post NO SMOKING signs. It is very important to keep areas where this material is used clear of other materials which can burn. If flammable gas is released in a confined space, immediately evacuate the area.

Compressed or liquefied gas cylinders, piping and fittings must be protected from damage during handling, filling, transportation and storage.

Ensure that compressed or liquefied gas cylinders are secured, preferably upright, and cannot fall or roll.

Storage

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. No part of a cylinder should be subjected to temperature exceeding 52°C (125°F).

Keep quantity stored as small as possible. Store away from incompatible materials, such as oxygen and strong oxidizing agents.

Storage of compressed gas cylinders must be in accordance with the appropriate provincial or regional Fire Code.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>Alberta (8-hr. TWA)</u> | <u>Ontario TWA-EV</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|---|--|---------------------------------------|----------------------------------|---|
| Alkanes C ₁ - C ₄ (except Butane) | Asphyxia See Appendix F- Minimal Oxygen Content | 1000 ppm | 1000 ppm | 1000 ppm |
| Butane-all isomers | 1000 ppm | 1000 ppm | 800 ppm | 800 ppm |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Provide sufficient local exhaust and general (dilution) ventilation to maintain the gas concentration below one tenth of the lower explosive limit. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations and those handling liquefied gas, consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear a face shield when handling refrigerated liquefied gas.

Skin Protection: Wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear fire-resistant long-sleeved clothing and trousers worn outside boots or over top of shoes. Remove protective clothing immediately if it becomes wet with refrigerated liquefied gas. Wear appropriate foot protection when handling cylinders.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required.

If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Workplaces should have a frostbite wash readily available in the work area. Any clothing which becomes wet with liquid or saturated with gas should be removed immediately.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Gas, colourless |
| Odour: | Odourless when pure, may have mercaptan odourant added. |
| Odour threshold: | Not available |
| pH: | Not applicable |
| Melting point/freezing point: | -182°C (-296°F) for methane |
| Initial boiling point and boiling range: | -162°C (-259°F) for methane |
| Flash point: | Flammable gas |
| Auto-ignition temperature: | 537°C (999°F) for methane |
| Upper/lower flammability or explosive limits: | LEL: 5% for methane UEL: 15.4% for methane |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour cloud explosion. |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties, continued

| | |
|---|--|
| Sensitivity to static discharge: | Sensitive, Minimum Ignition Energy methane=0.21 mJ for 8.5% by volume. |
| Evaporation rate: | Liquefied methane evaporates rapidly at room temperature. |
| Vapour pressure: | Not available |
| Vapour density: | Not available |
| Relative density: | Not applicable |
| Solubility: | Insoluble in water |
| Partition coefficient (n-octanol/water): | Log P_{oct} = 1.09 for methane |
| Critical temperature: | -82°C (-116°F) for methane |
| Critical pressure: | 4640 kPa (45.9 atm) for methane |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Releases of gas are extremely flammable and/or explosive in the presence of an ignition source.

Possibility of Hazardous Reactions:

Forms an explosive mixture with air. Direct addition of water, or any other room temperature liquid, to the liquefied gas will cause flash vaporization resulting in an explosion.
Hot containers may explode.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with halogen compounds (e.g. chlorine gas), contact may cause an explosion.

Pure Methane gas is corrosive to acrylonitrile butadiene styrene (ABS) and high density polyethylene (HDPE). Slightly corrosive to polypropylene.

Hazardous Decomposition Products:

Not applicable

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|--|
| Methane | Not applicable | Not applicable | >800000 ppm (80%) (mice) asphyxiant duration not reported |

Chronic Toxicity Data:

No data available.

Sensitization:

Natural gas component propane, and some other closely related aliphatic hydrocarbons (isobutane and butane), are weak cardiac sensitizers in humans following inhalation exposures to high concentrations. Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death, particularly when under stress.

Neurological Effects:

At high concentrations, the components of Natural gas can cause depression of the central nervous system (CNS) based on animal and human information. Unconsciousness (narcosis) from inhalation of ethane has been observed due to CNS depression at approximately 130000 ppm (13%).

Unconsciousness (narcosis) from inhalation of butane has been observed due to CNS depression at approximately 17000 ppm (1.7%). Note that butane is extremely flammable, lower explosive limit: 1.8-1.9%.

Genetic Effects:

Not available

Reproductive Effects:

None reported.

Developmental Effects:

None reported.

Target Organ Effects:

Central nervous system.

Other Adverse Effects:

Natural Gas in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Natural gas concentration of greater than 14% (140 000 ppm) will displace oxygen (O₂) to 18% in air and cause oxygen deprivation.

Symptoms of oxygen deficiency are:

O₂=12-16% - breathing and pulse rate are increased, with slight loss of muscular coordination;

O₂=10-14% - emotional upsets, abnormal fatigue from exertion, disturbed respiration;

O₂=6-10% - nausea and vomiting, inability to move freely, collapse, possible loss of consciousness;

O₂=below 6% - convulsive movements, gasping, possible respiratory collapse and death.

Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Section 12: Ecological Information

Toxicity:

Natural gas is not expected to result in any ecological damage to water or land. VOC gases are reportable to the National Pollutant Release Inventory, Environment Canada. Methane is regulated as a greenhouse gas.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

SAFETY DATA SHEET

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

Transport symbol:



UN Number:

UN1971

UN proper shipping name:

METHANE, compressed or NATURAL GAS, compressed

Or

UN1972, LIQUEFIED NATURAL GAS or LNG (cryogenic liquid) or NATURAL GAS, refrigerated liquid

Transport hazard class(es):

2.1

Packing group:

Not applicable

Emergency response guide:

115

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: A - Compressed gas

B1 - Flammable and combustible material - Flammable gas.

New Substances Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: VOC gases are NPRI reportable substances.

Methane is regulated as a greenhouse gas.

SAFETY DATA SHEET

Section 16: Other Information

Issue date: October 25, 2013

Revision summary: Previous version: December 1, 2010
Revised Sections 2, 4, 5, 6, 7, 8, 16

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

Manufacturer disclaimer

AltaGas Ltd. and its affiliates make no representation or warranty (express or implied) of any kind, and without limiting the generality of the foregoing as to the completeness or accuracy of the information contained in this safety data sheet ("SDS"). This SDS is intended only as a guide to the appropriate handling of the product by properly trained personnel using suitable precautions. Individuals receiving this SDS must exercise their independent judgment in determining its appropriateness for a particular purpose. AltaGas Ltd. and its affiliates will not be liable for any damages or injuries which may result from the use of or reliance on this SDS. This SDS is only for the use of the customers (and their employees and agents) of AltaGas Ltd. and its affiliates, and any distribution of this SDS by such customers to third parties is prohibited without the written consent of AltaGas Ltd.

Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Butane
Chemical names: n-butane, Butyl hydride

Product uses:

Saturated aliphatic hydrocarbon; compressed gas or liquefied gas. Raw material for industrial uses.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable Gases Cat. 1; H220
Gases Under Pressure, Compressed Gas or Liquefied Gas; H280

GHS Label elements:



Danger!
Extremely flammable gas.
Contains gas under pressure; may explode if heated.

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Response:

Leaking gas fire: do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources of safe to do so.

Storage:

Protect from sunlight. Store in a well ventilated place.

WHMIS:

Controlled product by WHMIS criteria.



- A – Compressed Gas
- B1– Flammable Gas

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact with liquefied gas escaping from its cylinder may cause frostbite. The skin may become waxy white or yellow.

Eye contact: Contact with liquefied gas escaping from its cylinder may cause freezing of the eye. Permanent eye damage or blindness could result.

Ingestion: Not an applicable route of exposure.

Inhalation: 1% butane in air, 10 minute exposure, can cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness and confusion. High concentrations (1.7% butane in air) may cause unconsciousness, narcosis and CNS depression.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Butane in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

Butane is a weak cardiac sensitizer. Exposures by inhalation to high concentrations of butane may lead to cardiac sensitization; may cause the sudden onset of an irregular heartbeat. Sudden deaths have been reported in cases of substance abuse involving butane. The asphyxiant effects of butane may enhance cardiac sensitization.

Chronic Health Effects:

No human or animal information was located.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

May be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Butane is not expected to result in any ecological damage to water, land. Regulated as a VOC in air.

Section 3: Composition/Information on Ingredients

Hazardous Substances:

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|----------------------|----------------|--------------|
| Butane | 106-97-8 | 90-100 |

Section 4: First Aid Measures

Description of first aid measures:

Skin Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove rest of the garment. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Eye Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. Do NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Inhalation: This material is extremely flammable. Take proper precautions (e.g. remove any sources of ignition, wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility. Ensure that first aid providers are aware of the material involved and take precautions to protect themselves.

Ingestion: Not an applicable route of exposure.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Frostbite.

Eye Contact: Freezing of eye tissue.

Inhalation: Nausea, dizziness, drowsiness and confusion, unconsciousness.

Ingestion: Not applicable

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Extremely flammable gas.
Readily forms explosive mixtures with air, which are easily ignited by heat, sparks or flame. Liquefied gas accumulates static charge. Liquefied Butane can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation. Butane gas in the flammable range can be easily ignited by an electrostatic discharge of sufficient energy (e.g. brush discharge). Minimum Ignition Energy= 0.25 mJ for 4.7% by volume.
Liquefied gas rapidly vapourizes under normal conditions. Ignition of a large volume of gas vapour mixed with air causes sudden expansion and turbulence resulting in an explosion known as vapour cloud explosion.
Butane gas can accumulate in confined spaces and low areas, resulting in an explosion or toxicity hazard.

Extinguishing media:

Leaking gas fire: Do not extinguish unless leak can be stopped safely.
Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.
Unsuitable extinguishing media: Carbon dioxide, low expansion foams, and direct application of water on liquefied gas. Under certain conditions, discharge of carbon dioxide produces electrostatic charges that could create a spark and ignite flammable gas.

Special hazards arising from the substance or mixture:

Gas is heavier than air and can travel over long distances creating a flash back hazard.
Containers may rupture and explode if heated.
Material will readily ignite at normal temperatures.
The gas can accumulate in confined spaces, resulting in explosion and asphyxiation hazards.
Direct addition of water (or any other room temperature liquid) to the liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a "boiling liquid, expanding vapour explosion."
During a fire, toxic gases may be generated.
Cylinders exposed to heat and/or fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Stop flow of gas before attempting to extinguish fire. If flow cannot be stopped, let the fire burn while protecting the surrounding area. Cool exposed containers with water.
Fires 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.
If a tank or rail car is involved in a fire, isolate for 1600 m in all directions; also consider initial evacuation for 1600 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately.
Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
Do not direct water at spill or source of leak.
Prevent spreading of vapours through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed.

SAFETY DATA SHEET

Section 6: Accidental Release Measures, continued**Environmental precautions:**

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Isolate the area until the gas has dispersed. Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area. Pay special attention to low-lying areas where the gas may have accumulated.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage**Handling:**

This material is an extremely flammable gas. Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. During transfer operations, cylinders and vessels should be electrically grounded and bonded to prevent the build up of a static charge. Post NO SMOKING signs. It is very important to keep areas where this material is used clear of other materials which can burn. If flammable gas is released in a confined space, immediately evacuate the area.

Compressed or liquefied gas cylinders, piping and fittings must be protected from damage during handling, filling, transportation and storage.

Ensure that compressed or liquefied gas cylinders are secured, preferably upright, and cannot fall or roll.

Storage

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. No part of a cylinder should be subjected to temperature exceeding 52°C (125°F).

Keep quantity stored as small as possible. Store away from incompatible materials, such as oxygen and strong oxidizing agents.

Storage of compressed gas cylinders must be in accordance with the appropriate provincial or regional Fire Code.

Section 8: Exposure Controls / Personal Protection**Exposure guidelines:**

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>Alberta (8-hr. TWA)</u> | <u>Ontario TWAEV</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|--------------------------|---|---------------------------------------|-----------------------------|---|
| Butane-all isomers | 1000 ppm | 1000 ppm | 800 ppm | 800 ppm |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Provide sufficient local exhaust and general (dilution) ventilation to maintain the gas concentration below one tenth of the lower explosive limit. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations and those handling liquefied gas, consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear a face shield when handling refrigerated liquefied gas.

Skin Protection: Wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear fire-resistant long-sleeved clothing and trousers worn outside boots or over top of shoes. Remove protective clothing immediately if it becomes wet with refrigerated liquefied gas. Wear appropriate foot protection when handling cylinders.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Workplaces should have a frostbite wash readily available in the work area. Any clothing which becomes wet with liquid or saturated with gas should be removed immediately.

Section 9: Physical and Chemical Properties**Information on basic physical and chemical properties:**

| | |
|--|---|
| Appearance: | Gas, colourless. |
| Odour: | Odourless Higher concentrations have faint odour natural gas or petroleum. |
| Odour threshold: | 2591 ppm |
| pH: | Not applicable |
| Melting point/freezing point: | -138.4°C (-217.1°F) |
| Initial boiling point and boiling range: | -0.5°C (31.1°F) |
| Flash point: | - 74°C (- 101°F) (closed cup) |
| Auto-ignition temperature: | 287°C (550°F) |
| Upper/lower flammability or explosive limits: | LEL: 1.8 – 1.9% UEL: 8.4 – 8.5% |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour cloud explosion. |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Sensitive, Minimum Ignition Energy=0.25 mJ for 4.7% by volume. |
| Evaporation rate: | Liquefied butane evaporates rapidly at room temperature. |
| Vapour pressure: | 214.0 kPa (1614 mm Hg) at 21.1°C |
| Vapour density: | 2.00 (air = 1) (calculated) |
| Relative density: | Not applicable |
| Solubility: | Insoluble in water, 61 mg/L @ 25°C |
| Partition coefficient (n-octanol/water): | Log P _{oct} = 2.89 |
| Critical temperature: | 152°C (305.6°F) |
| Critical pressure: | 3797 kPa (37.47 atm) |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |

Section 10: Stability and Reactivity**Reactivity:**

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Releases of gas are extremely flammable and/or explosive in the presence of an ignition source.

Possibility of Hazardous Reactions:

Forms an explosive mixture with air. Direct addition of water, or any other room temperature liquid, to the liquefied gas will cause flash vaporization resulting in an explosion.
Hot containers may explode.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

SAFETY DATA SHEET

Section 10: Stability and Reactivity, continued

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with halogen compounds (e.g. chlorine gas), contact may cause an explosion.

Pure butane gas is corrosive to polypropylene, high density polyethylene (HDPE), polystyrene and polyurethane. Slightly corrosive to acrylonitrile butadiene styrene (ABS).

Hazardous Decomposition Products:

Not applicable

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|--|
| Butane | Not applicable | Not applicable | 658 mg/L (rat) 276000 ppm (27.6%) >140 000 ppm (14%) asphyxiant (duration not reported) |

Chronic Toxicity Data:

Studies were conducted on rats exposed to 1000 or 4500 ppm n-butane:n-pentane (50:50 wt.%) for 13 weeks (6 hr/d; 5 d/wk). Possible treatment-related, but not dose-related, effects included transient hunched posture and/or reduced activity and intermittent tremor.

Sensitization:

Butane and some other closely related aliphatic hydrocarbons (isobutane and propane) are weak cardiac sensitizers in humans following inhalation exposures to high concentrations. Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death, particularly when under stress.

Neurological Effects:

At high concentrations, it can cause depression of the central nervous system (CNS) based on animal and human information. Unconsciousness (narcosis) has been observed due to CNS depression at approximately 17000 ppm (1.7%). Note that n-butane is extremely flammable, lower explosive limit: 1.8-1.9%. No symptoms except drowsiness were experienced by human volunteers during a 10-minute exposure to 10000 ppm.

Genetic Effects:

Negative for mutagenic effects in short-term tests.

Reproductive Effects:

None reported.

Developmental Effects:

None reported.

Target Organ Effects:

Central nervous system.

Other Adverse Effects:

Butane in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Butane concentration of greater than 14% (140 000 ppm) will displace oxygen (O₂) to 18% in air and cause oxygen deprivation.

Symptoms of oxygen deficiency are:

O₂=12-16% - breathing and pulse rate are increased, with slight loss of muscular coordination;

O₂=10-14% - emotional upsets, abnormal fatigue from exertion, disturbed respiration;

O₂=6-10% - nausea and vomiting, inability to move freely, collapse, possible loss of consciousness;

O₂=below 6% - convulsive movements, gasping, possible respiratory collapse and death.

Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

SAFETY DATA SHEET

Section 11: Toxicological Information, continued

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Section 12: Ecological Information

Toxicity:

Butane is not expected to result in any ecological damage to water or land.
VOC gases are reportable to the National Pollutant Release Inventory, Environment Canada.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

Transport symbol:



UN Number: UN1011
UN proper shipping name: BUTANE
Transport hazard class(es): 2.1
Packing group: Not applicable
Emergency response guide: 115

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: A - Compressed gas
B1 - Flammable and combustible material - Flammable gas.

New Substances Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: VOC gases are NPRI reportable substances.

SAFETY DATA SHEET

Section 16: Other Information

Issue date: October 24, 2013

Revision summary: Previous version: December 1, 2010
Revised Sections 2, 4, 5, 6, 7, 8, 16

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Propane
Chemical names: n-propane, Propyl hydride

Product uses:

Saturated aliphatic hydrocarbon; compressed gas or liquefied gas. Raw material for industrial uses. Colourless gas, odourless. High concentrations may have a faint odour; fuel grades contain a foul-smelling odourant, mercaptan.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable Gases Cat. 1; H220
Gases Under Pressure, Compressed Gas or Liquefied Gas; H280

GHS Label elements:



Danger!
Extremely flammable gas.
Contains gas under pressure; may explode if heated.

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Response:

Leaking gas fire: do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources of safe to do so.

Storage:

Protect from sunlight. Store in a well ventilated place.

WHMIS:

Controlled product by WHMIS criteria.



- A – Compressed Gas
- B1– Flammable Gas

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact with liquefied gas escaping from its cylinder may cause frostbite. The skin may become waxy white or yellow.

Eye contact: Contact with liquefied gas escaping from its cylinder may cause freezing of the eye. Permanent eye damage or blindness could result.

Ingestion: Not an applicable route of exposure.

Inhalation: Propane in air (>1 000 ppm), can cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness and confusion. Higher concentrations (>100 000 ppm) may cause unconsciousness, narcosis and CNS depression.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Propane in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

Propane is a weak cardiac sensitizer. Exposures by inhalation to high concentrations of propane may lead to cardiac sensitization; may cause the sudden onset of an irregular heartbeat. Sudden deaths have been reported in cases of substance abuse involving propane. The asphyxiant effects of propane may enhance cardiac sensitization.

Chronic Health Effects:

No human or animal information was located.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

May be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Propane is not expected to result in any ecological damage to water, land. Regulated as a VOC in air.

Section 3: Composition/Information on Ingredients**Hazardous Substances:**

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|----------------------|----------------|--------------|
| Propane | 74-98-6 | 90-100 |

Section 4: First Aid Measures**Description of first aid measures:**

Skin Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove rest of the garment. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Eye Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. Do NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Inhalation: This material is extremely flammable. Take proper precautions (e.g. remove any sources of ignition, wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility. Ensure that first aid providers are aware of the material involved and take precautions to protect themselves.

Ingestion: Not an applicable route of exposure.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Frostbite.

Eye Contact: Freezing of eye tissue.

Inhalation: Nausea, dizziness, drowsiness and confusion, unconsciousness.

Ingestion: Not applicable

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Extremely flammable gas.
Readily forms explosive mixtures with air, which are easily ignited by heat, sparks or flame. Liquefied gas accumulates static charge. Liquefied Propane can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation. Propane gas in the flammable range can be easily ignited by an electrostatic discharge of sufficient energy (e.g. brush discharge). Minimum Ignition Energy= 0.25 mJ for 5.2% by volume.
Liquefied gas rapidly vapourizes under normal conditions. Ignition of a large volume of gas vapour mixed with air causes sudden expansion and turbulence resulting in an explosion known as vapour cloud explosion.
Propane gas can accumulate in confined spaces and low areas, resulting in an explosion or toxicity hazard.

Extinguishing media:

Leaking gas fire: Do not extinguish unless leak can be stopped safely.
Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.
Unsuitable extinguishing media: Carbon dioxide, low expansion foams, and direct application of water on liquefied gas. Under certain conditions, discharge of carbon dioxide produces electrostatic charges that could create a spark and ignite flammable gas.

Special hazards arising from the substance or mixture:

Gas is heavier than air and can travel over long distances creating a flash back hazard.
Containers may rupture and explode if heated.
Material will readily ignite at normal temperatures.
The gas can accumulate in confined spaces, resulting in explosion and asphyxiation hazards.
Direct addition of water (or any other room temperature liquid) to the liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a "boiling liquid, expanding vapour explosion."
During a fire, toxic gases may be generated.
Cylinders exposed to heat and/or fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Stop flow of gas before attempting to extinguish fire. If flow cannot be stopped, let the fire burn while protecting the surrounding area. Cool exposed containers with water.
Fires 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.
If a tank or rail car is involved in a fire, isolate for 1600 m in all directions; also consider initial evacuation for 1600 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately.
Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
Do not direct water at spill or source of leak.
Prevent spreading of vapours through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed.

SAFETY DATA SHEET

Section 6: Accidental Release Measures, continued

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Isolate the area until the gas has dispersed. Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area. Pay special attention to low-lying areas where the gas may have accumulated.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

This material is an extremely flammable gas. Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. During transfer operations, cylinders and vessels should be electrically grounded and bonded to prevent the build up of a static charge. Post NO SMOKING signs. It is very important to keep areas where this material is used clear of other materials which can burn. If flammable gas is released in a confined space, immediately evacuate the area.

Compressed or liquefied gas cylinders, piping and fittings must be protected from damage during handling, filling, transportation and storage.

Ensure that compressed or liquefied gas cylinders are secured, preferably upright, and cannot fall or roll.

Storage

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. No part of a cylinder should be subjected to temperature exceeding 52°C (125°F).

Keep quantity stored as small as possible. Store away from incompatible materials, such as oxygen and strong oxidizing agents.

Storage of compressed gas cylinders must be in accordance with the appropriate provincial or regional Fire Code.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>ACGIH TLV</u> <u>(8-hr. TWA)</u> | <u>Alberta</u> <u>(8-hr. TWA)</u> | <u>Ontario TWAEV</u> | <u>U.S. OSHA PEL</u> <u>(8-hr. TWA)</u> |
|--|--|--------------------------------------|----------------------|--|
| Propane and Alkanes C ₁ - C ₄ | Asphyxia See Appendix F- Minimal Oxygen Content | 1000 ppm | 1000 ppm | 1000 ppm |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Provide sufficient local exhaust and general (dilution) ventilation to maintain the gas concentration below one tenth of the lower explosive limit. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations and those handling liquefied gas, consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear a face shield when handling refrigerated liquefied gas.

Skin Protection: Wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear fire-resistant long-sleeved clothing and trousers worn outside boots or over top of shoes. Remove protective clothing immediately if it becomes wet with refrigerated liquefied gas. Wear appropriate foot protection when handling cylinders.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Workplaces should have a frostbite wash readily available in the work area. Any clothing which becomes wet with liquid or saturated with gas should be removed immediately.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Gas, colourless |
| Odour: | Odourless when pure, may have mercaptan odourant added. |
| Odour threshold: | Not available |
| pH: | Not applicable |
| Melting point/freezing point: | -187°C (-306°F) |
| Initial boiling point and boiling range: | -42°C (-44°F) |
| Flash point: | Extremely flammable gas |
| Auto-ignition temperature: | 450°C (842°F) |
| Upper/lower flammability or explosive limits: | LEL: 2.1% UEL: 9.5% |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour cloud explosion. |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Sensitive, Minimum Ignition Energy=0.25 mJ for 5.2% by volume. |
| Evaporation rate: | Liquefied propane evaporates rapidly at room temperature. |
| Vapour pressure: | 855 kPa (8.42 atm) at 21.1°C |
| Vapour density: | 1.55 (air = 1) |
| Relative density: | Not applicable |
| Solubility: | Insoluble in water, 0.01% @ 25°C |
| Partition coefficient (n-octanol/water): | Log P _{oct} = 2.36 |
| Critical temperature: | 96.8°C (206.3°F) |
| Critical pressure: | 4245 kPa (41.9 atm) |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Releases of gas are extremely flammable and/or explosive in the presence of an ignition source.

Possibility of Hazardous Reactions:

Forms an explosive mixture with air. Direct addition of water, or any other room temperature liquid, to the liquefied gas will cause flash vaporization resulting in an explosion.

Hot containers may explode.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.

Avoid unintended contact with incompatible materials.

SAFETY DATA SHEET

Section 10: Stability and Reactivity, continued

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with halogen compounds (e.g. chlorine gas), contact may cause an explosion.

Pure Propane gas is corrosive to high density polyethylene (HDPE), polystyrene and polyurethane. Slightly corrosive to acrylonitrile butadiene styrene (ABS).

Hazardous Decomposition Products:

Not applicable

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|--|
| Propane | Not applicable | Not applicable | >800000 ppm (80%) (rat) 15-minute exposure |

Chronic Toxicity Data:

Studies were conducted on monkeys exposed to 750 ppm propane (50-65% propane in aerosol spray) for 90 days. No toxic effects were observed.

Sensitization:

Propane and some other closely related aliphatic hydrocarbons (isobutane and butane) are weak cardiac sensitizers in humans following inhalation exposures to high concentrations. Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death, particularly when under stress.

Neurological Effects:

At high concentrations, it can cause depression of the central nervous system (CNS) based on animal and human information. Unconsciousness (narcosis) has been observed due to CNS depression at approximately 47000 ppm (4.7%). Note that propane is extremely flammable, lower explosive limit: 2.1%. Human volunteers exposed to 10000 ppm (10%) for 2 minutes experienced slight dizziness (vertigo); exposure to 10000 ppm (1%) for 10 minutes produced no symptoms.

Genetic Effects:

Not mutagenic in a modified Ames Test with propane (99.9% pure) at concentrations of 5 – 50%. Not mutagenic to 5 strains of bacteria, with and without metabolic activation.

Reproductive Effects:

None reported.

Developmental Effects:

None reported.

Target Organ Effects:

Central nervous system.

Other Adverse Effects:

Propane in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Propane concentration of greater than 14% (140 000 ppm) will displace oxygen (O₂) to 18% in air and cause oxygen deprivation.

Symptoms of oxygen deficiency are:

O₂=12-16% - breathing and pulse rate are increased, with slight loss of muscular coordination;

O₂=10-14% - emotional upsets, abnormal fatigue from exertion, disturbed respiration;

O₂=6-10% - nausea and vomiting, inability to move freely, collapse, possible loss of consciousness;

O₂=below 6% - convulsive movements, gasping, possible respiratory collapse and death.

Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

SAFETY DATA SHEET

Section 11: Toxicological Information, continued

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Section 12: Ecological Information

Toxicity:

Propane is not expected to result in any ecological damage to water or land.
VOC gases are reportable to the National Pollutant Release Inventory, Environment Canada.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

Transport symbol:



UN Number:

UN1978

UN proper shipping name:

PROPANE

Transport hazard class(es):

2.1

Packing group:

Not applicable

Emergency response guide:

115

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: A - Compressed gas

B1 - Flammable and combustible material - Flammable gas.

New Substances Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: VOC gases are NPRI reportable substances.

SAFETY DATA SHEET

Section 16: Other Information

Issue date: October 24, 2013

Revision summary: Previous version: December 1, 2010
Revised Sections 2, 4, 5, 6, 7, 8, 16

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

Manufacturer disclaimer

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Molten sulphur
SDS record # 004
Chemical names: Liquefied sulphur ; Elemental sulphur

Product uses:

Raw material; industrial uses.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable solid Cat. 2; H228
Acute toxicity Cat. 2 (inhalation); H330

GHS Label elements:



Danger!
Flammable solid.
Fatal if inhaled.

Prevention

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/Bond container and receiving equipment.
Use explosion-proof electrical/ventilating/ lighting/... /equipment.
Wear protective gloves/eye protection/face protection
Do not breathe dust/fume/gas/mist/ vapors/spray.
Use only outdoors or in a well-ventilated area.
In case of inadequate ventilation wear respiratory protection.

Response

In case of fire: Use Water spray, fog or regular foam to extinguish
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Immediately call a poison center/doctor.

Storage

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS:

Controlled product by WHMIS criteria.



- B4 – Flammable solid
- D1A – Immediate and Serious Toxic Effects

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Hot, yellow molten liquid, rapidly transforms to a solid when cooled. Direct contact with molten sulphur may cause severe thermal burns.

Eye contact: Direct contact with molten sulphur may cause severe burns and permanent corneal damage, which may result in blindness. Mist, vapours and dusts may cause irritation, conjunctivitis, and possible corneal damage. Hydrogen sulphide in concentrations of 10 - 50 ppm irritates the eyes.

Inhalation: Dusts, mists and vapours are irritating to the nose, throat and respiratory tract, and may cause chronic bronchitis with long-term exposure.

Danger! Hydrogen sulphide gas may be released if this material is overheated especially in the presence of water.

Hydrogen sulphide (H₂S) gas can be fatal if inhaled. High concentrations of H₂S cause breathing failure, coma and death without necessarily any warning odour being sensed.

Airborne concentrations 1-5 ppm have a moderately offensive odour, may cause nausea and/or headaches with prolonged exposure. Airborne concentrations of 20-50 ppm cause irritation to the nose, throat and lung, digestive upset and loss of appetite and the sense of smell starts to become "fatigued"; presence or absence of odour cannot be relied upon as a warning of exposure. Airborne concentrations of 100 -200 ppm cause severe nose, throat and lung irritation; the ability to smell odour completely disappears.

Airborne concentrations of 250-500 ppm cause pulmonary edema, a potentially fatal build-up of fluid in the lungs, in the absence of central nervous system effects (headache, nausea, dizziness) especially if exposure is prolonged. Airborne concentrations of 500 ppm cause severe lung irritation, excitement, headache, dizziness, staggering, sudden collapse ("knockdown"), unconsciousness and death within 4-8 hours, loss of memory for period of exposure. Exposures above 500 ppm rapidly cause unconsciousness and death.

Ingestion: Not an applicable route of exposure. Ingestion or direct contact with molten sulphur will cause severe thermal burns.

Chronic Health Effects:

Permanent or persistent nervous system effects following an acute overexposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Long-term occupational exposure to H₂S has generally been associated with nervous system, respiratory system and eye effects.

Medical Conditions Aggravated by Exposure:

Breathing of dust, vapours or sprays (mists) may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

Interactions With Other Chemicals:

H₂S is a strong reducing agent and is highly reactive. (Section 10)

Potential Environmental Effects:

Sulphur can cause adverse effects to aquatic and terrestrial environments. H₂S is regulated as an environmental pollutant.

Section 3: Composition/Information on Ingredients

Hazardous Substances:

| Chemical Name | CAS No. | Wt.% |
|--------------------------------------|-----------|----------|
| Sulphur | 7704-34-9 | 99 – 100 |
| Hydrogen sulphide (H ₂ S) | 7783-06-4 | 0.1-1.0 |

SAFETY DATA SHEET

Section 4: First Aid Measures

Description of first aid measures:

Rescuers, attempting to save an unconscious co-worker, have entered a hazardous and/or confined area without respiratory protection or safety lines. They, in turn, have been overcome by H₂S. Victims who have been exposed to 500 ppm or higher may pose a threat to responders due to H₂S released from their clothing, skin and exhaled air. Risk of thermal burns.

Skin Contact: Quickly remove victim from source of contamination. Avoid direct contact. Wear chemical resistant protective clothing if necessary. Rinse exposed skin with plenty of water. Under running water, remove contaminated clothing, shoes and leather goods. Obtain medical advice immediately.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto face. Obtain medical attention immediately.

Inhalation: This material is flammable and toxic. Rescuers must take proper precautions (e.g. remove any sources of ignition, wear appropriate respiratory protection) before attempting rescue. Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, rinse mouth and repeat administration of water. Obtain medical advice immediately.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Burns.

Eye Contact: Irritation and/or burns.

Inhalation: Sudden loss of consciousness, pulmonary edema, respiratory irritation, nausea, drowsiness and confusion. H₂S is fatal if inhaled. H₂S concentrations below 100 ppm, odour of rotten eggs; above 100 ppm, sense of smell can be impaired. Detection through odour is not a reliable indication of exposure.

Ingestion: Burns.

Section 5: Fire Fighting Measures

Flammable properties:

Flammable solid. Both molten and solid forms of sulphur are flammable.

Extinguishing media:

Water fog, saturated stream, carbon dioxide. Small fires may be extinguished with sand.

Avoid straight streams of water, which can scatter molten sulphur and dust.

Special hazards arising from the substance or mixture:

May be ignited by friction, heat, sparks or flames.

The decomposition and combustion products of sulphur (e.g., sulphur dioxide gas) are toxic and corrosive.

May re-ignite after fire is extinguished.

The vapour space over molten sulphur in enclosed tanks, tank cars, or other confined spaces may contain concentrations of Hydrogen sulphide gas (H₂S), which can be fatal if inhaled and which can form an explosive mixture with air.

Dust explosion possible if in powder or granular form, mixed with air.

Sulphur burns with a pale blue flame that may be difficult to see in daylight.

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location; consider initial downwind evacuation for at least 100 m. Approach fire from upwind to avoid hazardous gas and toxic decomposition products.

If a tank or rail car is involved in a fire, isolate for 800 m in all directions; also consider initial evacuation for 800 m in all directions.

Move containers from fire area if you can do it without risk.

Cool containers with flooding quantities of water until well after fire is out.

For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

Always stay away from tanks engulfed in fire.

SAFETY DATA SHEET

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately.
Wear appropriate respiratory protection and vapour protective clothing.
Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.
If molten sulphur is accidentally released into a confined or enclosed space, monitor for hydrogen sulphide build-up in the vapour space above the spill.

Methods and material for containment and cleaning up:

Small spills: With clean shovel place material into clean, dry container and cover loosely; move containers from spill area
Large spills: When spilled in a molten form, contain if possible by forming barriers and let it solidify.
Shovel solid sulphur into containers with covers (avoid dusting) for recovery or disposal. If removal is not possible, let it solidify and apply a cover material, preferably inert and basic (limestone), to the spilled area until recovery procedures begin. This will reduce the possible release of sulphuric acid in the water.
Collect product and contaminated soil and water for recovery or disposal.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Workers must be trained regarding the hazards and safety procedures for molten sulphur and hydrogen sulphide gas.
Eliminate all ignition sources (e.g., sparks, open flames). Keep away from heat and welding operations. Post NO SMOKING signs.
Wear Personal Protection Equipment. Do not breathe dusts or mists. Do not ingest. Do not get in eyes, on skin or on clothing.
Liquid sulphur should not be put into any tank, rail car or truck that contains trace quantities of hydrocarbons, or more than a trace of moisture. When unloading tank cars or trucks, wear suitable protective equipment and stand to one side, upwind of the path of the escaping gas. Care should be taken against possible dangerous concentrations of hydrogen sulphide in the vicinity of the tank.
Avoid excessive dust generation, sparks or open flames. Avoid breathing fumes of molten sulphur. The hydrogen sulphide level in the vapour space in a storage vessel should be checked periodically for explosivity. Material can accumulate static charges that may cause a spark. Static charge build-up could become an ignition source. Use proper grounding and bonding procedures.

Storage

Liquid sulphur tanks should be ventilated to prevent accumulation of toxic and explosive quantities of hydrogen sulphide. Separate from chlorates, nitrates and other oxidizers.
Molten sulphur should be maintained at temperatures between 127°C - 149°C (260°F - 300°F).

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Canada-Provincial TWA</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|-------------------|---|----------------------------------|---|
| Sulphur | Alberta <ul style="list-style-type: none"> 8-hr TWA: 10 mg/m³ | Not listed | Not listed |
| Hydrogen sulphide | Alberta <ul style="list-style-type: none"> 8-hr TWA: 10 ppm 15-minute Ceiling: 15 ppm British Columbia <ul style="list-style-type: none"> 1 ppm; 5 ppm STEL Saskatchewan <ul style="list-style-type: none"> 8-hour TWA: 10 ppm 15 minute average contamination limit: 15 ppm | 1ppm STEL: 5 ppm | 10 ppm STEL: 15 ppm Ceiling: 20 ppm |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear a face shield or safety goggles or other appropriate full-face protection (e.g. full-face respirator).

Skin Protection: Wear thermal protective gloves, clothing and boots when handling molten liquids.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

NIOSH Respirator Recommendations for H₂S:

Up to 100 ppm:

(APF = 25) An approved powered, air-purifying respirator with cartridge(s) providing protection against H₂S.

(APF = 50) An approved air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against H₂S.

(APF = 10) An approved supplied-air respirator.

(APF = 50) An approved self-contained breathing apparatus with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) An approved self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

(APF = 10,000) An approved supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape:

(APF = 50) An approved air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against H₂S.

An approved, appropriate escape-type, self-contained breathing apparatus.

Other: Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before re-wearing. Inform laundry personnel of contaminant's hazards. Do not smoke, eat or drink in work areas. Wash hands thoroughly after work and before eating, drinking or smoking.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|---|---|
| Appearance: | Liquid |
| Odour: | Sulphur or rotten-egg odour. |
| Odour threshold: | H ₂ S: 0.001-0.13 ppm - odour threshold (highly variable). At concentrations below 100 ppm, odour of rotten eggs. Above 100 ppm, sense of smell can be impaired and no odour is detected. |
| pH: | Not available |
| Melting point/freezing point: | 121°C |
| Initial boiling point and boiling range: | 444°C |
| Flash point: | 207°C (405°F) |
| Auto-ignition temperature: | 232 – 266°C (450 – 511°F) |
| Upper/lower flammability/explosive limits: | LEL: 3.3% for H ₂ S UEL: 46% for H ₂ S |
| Explosive properties: | Not available |
| Oxidizing properties: | H ₂ S is a strong reducing agent. |
| Sensitivity to mechanical impact: | Not available |
| Sensitivity to static discharge: | Sensitive |
| Evaporation rate: | Not available |
| Vapour pressure: | 0.11 mm Hg @ 25°C) |
| Vapour density: | 8.9 (air = 1) |
| Relative density: | 2.1 |
| Solubility: | Insoluble in water |
| Partition coefficient (n-octanol/water): | Not available |
| Critical temperature: | Not available |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | 6.5 cP at 150°C |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. H₂S is a strong reducing agent and is highly reactive.

Possibility of Hazardous Reactions:

Hydrocarbons in contact with molten sulphur generate hydrogen sulphide and carbon disulfide, which may accumulate in explosive concentrations.

Conditions to Avoid:

Avoid contact with water, sparks, flames and incompatible substances such as alkalis or oxidizing agents such as chlorine and fluorine.

Incompatible Materials:

May react explosively with ammonia; ammonium nitrate; chlorine dioxide; bromates, chlorates, and iodates of barium, calcium, magnesium, potassium, sodium or zinc; chlorate in presence of copper; chromic anhydride; silver bromate; lead dioxide; mercuric nitrate; all inorganic perchlorates; phosphorus trioxide; sodium nitrate and zinc.

Hazardous Decomposition Products:

Hydrogen sulphide. Produces oxides of sulphur on combustion.

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|--------------------------------------|---|---|--|
| Sulphur | > 8437 (rat) | Not available | Not available |
| Hydrogen sulphide (H ₂ S) | Not available | Not available | 335 ppm (mouse) |

Chronic Toxicity Data:

Repeated or prolonged contact with skin may cause dermatitis. Inhalation of Sulphur dust may have effects on the respiratory tract, resulting in chronic bronchitis.

Permanent or persistent nervous system effects following an acute overexposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Inhalation exposure to 30 ppm H₂S or above has produced signs of irritation of the nasal passages, including sensory neuron loss in male rats, in rats and mice for 10-13 weeks. Increased bronchial responsiveness was observed in individual rats exposed to 1-100 ppm for 5 weeks. Subtle evidence of mild brain dysfunction was observed in male rats exposed to 125 ppm for 11 weeks.

Sensitization:

No sensitization in human patch test with sulphur.

Neurological Effects:

None reported for Sulphur. H₂S is acutely toxic to the central nervous system. Permanent or persistent nervous system effects following an acute exposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Genetic Effects:

Sulphur was not mutagenic in *in-vitro* Ames test.

Reproductive Effects:

None reported for Sulphur. No significant reproductive effects were observed in one study with rats exposed to H₂S by inhalation up to 80 ppm.

Developmental Effects:

None reported for Sulphur. No significant developmental effects were observed in rat studies with inhalation exposures to H₂S of up to 100 ppm.

Target Organ Effects:

Skin – thermal burns
Exposure to H₂S: Central nervous system.

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists), OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Section 12: Ecological Information

Toxicity:

Sulphur can cause adverse effects to aquatic and terrestrial environments. H₂S is regulated as a hazardous pollutant.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable waste disposal and environmental regulations.
Empty containers retain product residue, adhere to warnings after container has been emptied.

SAFETY DATA SHEET

Section 14: Transport Information

Transport symbol:



UN Number: UN2448
UN proper shipping name: SULPHUR, MOLTEN
Transport hazard class(es): 4.1
Packing group: III
Emergency response guide: 133
IATA: Forbidden from air transport

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.**OSHA:** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.**WHMIS Classification:**

B4 – Flammable solid

D1A – Immediate and Serious Toxic Effects

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).**National Pollutant Release Inventory:** Total sulphur and H₂S gas are NPRI reportable substances.Hydrogen sulphide (H₂S) is regulated as an environmentally hazardous pollutant.

Section 16: Other Information

Issue date: December 16, 2013**Revision summary:** Previous version: January 3, 2011
Revised Sections 2, 4, 8, 11, 16**References and sources for data:**

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

Manufacturer disclaimer

AltaGas Ltd. and its affiliates make no representation or warranty (express or implied) of any kind, and without limiting the generality of the foregoing as to the completeness or accuracy of the information contained in this safety data sheet ("SDS"). This SDS is intended only as a guide to the appropriate handling of the product by properly trained personnel using suitable precautions. Individuals receiving this SDS must exercise their independent judgment in determining its appropriateness for a particular purpose. AltaGas Ltd. and its affiliates will not be liable for any damages or injuries which may result from the use of or reliance on this SDS. This SDS is only for the use of the customers (and their employees and agents) of AltaGas Ltd. and its affiliates, and any distribution of this SDS by such customers to third parties is prohibited without the written consent of AltaGas Ltd.

Prepared by: LEHDER Environmental Services Limited (519) 336-4101www.lehder.com

While LEHDER Environmental Services Limited believes that the data set forth herein is accurate, as of the date hereof, LEHDER makes no warranty with respect thereto and expressly disclaims all liability for reliance thereon. Such data is offered solely for your consideration, investigation and verification.

SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Sour Natural Gas

Chemical names: Aliphatic hydrocarbon mixture (Alkanes C₁ - C₄); primarily Methane (C₁) with Hydrogen sulphide (H₂S).

Product uses:

Raw material; fuel for industrial uses. Compressed gas.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable Gases Cat. 1; H220

Gases Under Pressure, Compressed Gas; H280

Acute toxicity, inhalation Cat. 2; H330

Eye irritation Cat. 2B; H320

GHS Label elements:



Danger

Extremely flammable gas.

Contains gas under pressure; may explode if heated.

Fatal if inhaled.

Causes eye irritation.

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

Do not breathe gas/vapours.

Use only outdoors or in a well-ventilated area.

Wear respiratory protection.

Response

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Immediately call a POISON CENTER or doctor. Specific treatment is urgent; trained personnel should administer emergency oxygen or, if victim is not breathing, begin CPR immediately.

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Eliminate all ignition sources if safe to do so.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage:

Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

WHMIS:

Controlled product by WHMIS criteria.



- A – Compressed Gas
- B1 – Flammable Gas
- D1A – Immediate and Serious Toxic Effects
- D2B – Material Causing other Toxic Effects – eye irritation

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact with liquefied gas escaping from its cylinder may cause frostbite. The skin may become waxy white or yellow.

Eye contact: Contact with liquefied gas escaping from its cylinder may cause freezing of the eye. Permanent eye damage or blindness could result. Inflammation and irritation of the eyes has been reported at very low airborne concentrations of H₂S, as low as 10 ppm.

Inhalation: Danger! Contains Hydrogen sulphide (H₂S) gas which can be fatal if inhaled. High concentrations of H₂S cause breathing failure, coma and death without necessarily any warning odour being sensed. Airborne concentrations 1-5 ppm have a moderately offensive odour, may cause nausea and/or headaches with prolonged exposure. Airborne concentrations of 20-50 ppm cause irritation to the nose, throat and lung, digestive upset and loss of appetite and the sense of smell starts to become "fatigued"; presence or absence of odour cannot be relied upon as a warning of exposure. Airborne concentrations of 100 -200 ppm cause severe nose, throat and lung irritation; the ability to smell odour completely disappears. Airborne concentrations of 250-500 ppm cause pulmonary edema, a potentially fatal build-up of fluid in the lungs, in the absence of central nervous system effects (headache, nausea, dizziness) especially if exposure is prolonged. Airborne concentrations of 500 ppm cause severe lung irritation, excitement, headache, dizziness, staggering, sudden collapse ("knockdown"), unconsciousness and death within 4-8 hours, loss of memory for period of exposure. Exposures above 500 ppm rapidly cause unconsciousness and death.

Ingestion: Not an applicable route of exposure.

Chronic Health Effects:

Permanent or persistent nervous system effects following an acute overexposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Long-term occupational exposure to H₂S has generally been associated with nervous system, respiratory system and eye effects.

Medical Conditions Aggravated by Exposure: None known

Interactions With Other Chemicals:

H₂S is a strong reducing agent and is highly reactive. Natural gas may be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

H₂S is regulated as an environmental pollutant. Methane is regulated as a greenhouse gas in air.

SAFETY DATA SHEET

Section 3: Composition/Information on Ingredients

Hazardous Substances:

Natural gas is a naturally occurring gas mixture of aliphatic hydrocarbons, consisting mainly of methane. Natural gas is expected to have a typical composition reported in the table below. As a naturally occurring mixture, the composition will vary.

Other trace components may include pentanes, hexanes, nitrogen, carbon dioxide, oxygen, hydrogen sulfide and hydrogen.

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt.%</u> |
|--------------------------------------|----------------|---------------|
| Natural Gas | 8006-14-2 | 100 |
| Hydrogen sulphide (H ₂ S) | 7783-06-4 | 0.1-1.0 |
| Methane | 74-82-8 | 70 - 90 |
| Ethane | 74-84-0 | 1 - 20 |
| Propane | 74-98-6 | Not available |
| Butane | 106-97-8 | Not available |

Section 4: First Aid Measures

Description of first aid measures:

Rescuers, attempting to save an unconscious co-worker, have entered a hazardous and/or confined area without respiratory protection or safety lines. They, in turn, have been overcome by H₂S. Victims who have been exposed to 500 ppm or higher may pose a threat to responders due to H₂S released from their clothing, skin and exhaled air.

Skin Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove rest of the garment. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Eye Contact: GAS: If irritation occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. Remove contact lenses if present and easy to do. Immediately obtain medical attention. Any eye contact will also involve significant inhalation exposure. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Inhalation: This material is extremely flammable and toxic. Rescuers must take proper precautions (e.g. remove any sources of ignition, wear appropriate respiratory protection) before attempting rescue. Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility.

Ingestion: Not an applicable route of exposure.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Frostbite.

Eye Contact: Irritation, soreness, light sensitivity, blurred vision, pain with a spasm of the eyelids.

Inhalation: Respiratory irritation, sudden loss of consciousness, pulmonary edema, nausea, dizziness, drowsiness and confusion, unconsciousness.

Ingestion: Not applicable.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Extremely flammable gas. Readily forms explosive mixtures with air, which are easily ignited by heat, sparks or flame. Liquefied gas accumulates static charge. Liquefied Natural Gas can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation. Natural gas in the flammable range can be easily ignited by an electrostatic discharge of sufficient energy (e.g. brush discharge). Minimum Ignition Energy= 0.21 mJ for 8.5% by volume (for methane). Liquefied gas rapidly vapourizes under normal conditions. Ignition of a large volume of gas vapour mixed with air causes sudden expansion and turbulence resulting in an explosion known as vapour cloud explosion. Natural gas can accumulate in confined spaces and low areas, resulting in an explosion or asphyxiation hazard.

Extinguishing media:

Leaking gas fire: Do not extinguish unless leak can be stopped safely. Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates. Unsuitable extinguishing media: Carbon dioxide, low expansion foams, and direct application of water on liquefied gas. Under certain conditions, discharge of carbon dioxide produces electrostatic charges that could create a spark and ignite flammable gas.

Special hazards arising from the substance or mixture:

Natural gas can travel over long distances creating a flash back hazard. Containers may rupture and explode if heated. Material will readily ignite at normal temperatures. The gas can accumulate in confined spaces, resulting in explosion, toxicity and asphyxiation hazards. Products of combustion may include toxic gases, including carbon monoxide and/or sulfur oxides. Sour Natural Gas is an extremely toxic, flammable gas. The combustion products of hydrogen sulfide (e.g., sulfur dioxide) are skin contact and inhalation hazards.

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Stop flow of gas before attempting to extinguish fire. If flow cannot be stopped, let the fire burn while protecting the surrounding area. Cool exposed containers with water. Fires 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. If a tank or rail car is involved in a fire, isolate for 1600 m in all directions; also consider initial evacuation for 1600 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately. Wear respiratory protection to protect against exposure to toxic hydrogen sulfide gas. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. 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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak. Prevent spreading of vapours through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Isolate the area until the gas has dispersed. Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

SAFETY DATA SHEET

Section 7: Handling and Storage

Handling:

This material is an extremely flammable and toxic gas. Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Workers must be trained regarding the hazards and safety procedures for sour natural gas.

Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. During transfer operations, cylinders and vessels should be electrically grounded and bonded to prevent the build up of a static charge. Post NO SMOKING signs. It is very important to keep areas where this material is used clear of other materials which can burn. If Natural gas is released in a confined space, immediately evacuate the area.

Compressed or liquefied gas cylinders, piping and fittings must be protected from damage during handling, filling, transportation and storage.

Ensure that compressed or liquefied gas cylinders are secured, preferably upright, and cannot fall or roll.

Storage

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. Keep quantity stored as small as possible. Store away from incompatible materials, such as oxygen and strong oxidizing agents. Storage of compressed gas cylinders must be in accordance with the appropriate provincial or regional Fire Code.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>Alberta (8-hr. TWA)</u> | <u>Ontario TWA-EV</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|---|--|---------------------------------------|----------------------------------|---|
| Hydrogen sulphide | 1ppm STEL: 5 ppm | 10 ppm Ceiling: 15 ppm | 10 ppm Ceiling: 15 ppm | 10 ppm STEL: 15 ppm Ceiling: 20 ppm |
| Alkanes C ₁ - C ₄ (except Butane) | Asphyxia See Appendix F- Minimal Oxygen Content | 1000 ppm | 1000 ppm | 1000 ppm |
| Butane-all isomers | 1000 ppm | 1000 ppm | 800 ppm | 800 ppm |

Other Exposure guidelines:

- Hydrogen sulphide NIOSH REL: 10 ppm 10-minute. IDLH: 100 ppm

Exposure controls:

Engineering Controls: Hydrogen sulphide (H₂S) levels must be monitored where there is a risk of H₂S exposure in the workplace. Ventilate the workplace; methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Provide sufficient local exhaust and general (dilution) ventilation to maintain the Natural gas concentration below one tenth of the lower explosive limit. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations and those handling liquefied gas, consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear full-face respiratory protection when handling liquid Sour Natural gas. Workers who may be exposed to hydrogen sulphide gas should not wear contact lenses; soft contact lenses may absorb chemical irritants and hold them against the eye.

Skin Protection: Wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear fire-resistant long-sleeved clothing and trousers worn outside boots or over top of shoes. Remove protective clothing immediately if it becomes wet with liquefied Natural gas.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required.

If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

NIOSH Respirator Recommendations for H₂S:

Up to 100 ppm: (APF = 25) An approved powered, air-purifying respirator with cartridge(s) providing protection against H₂S.

(APF = 50) An approved air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against H₂S.

(APF = 10) An approved supplied-air respirator.

(APF = 50) An approved self-contained breathing apparatus with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) An approved self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

(APF = 10,000) An approved supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape: (APF = 50) An approved air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against H₂S. An approved, appropriate escape-type, self-contained breathing apparatus.

Other: Workplaces should have a frostbite wash readily available in the work area.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Gas, colourless |
| Odour: | Sulphur or rotten-egg odour. |
| Odour threshold: | 0.001-0.13 ppm - odour threshold (highly variable). At concentrations below 100 ppm, odour of rotten eggs. Above 100 ppm, sense of smell can be impaired and no odour is detected. |
| pH: | Not applicable |
| Melting point/freezing point: | -182°C (-296°F) for methane |
| Initial boiling point and boiling range: | -162°C (-259°F) for methane |
| Flash point: | Flammable gas |
| Auto-ignition temperature: | 537°C (999°F) for methane |
| Upper/lower flammability or explosive limits: | LEL: 5% for methane UEL: 15.4% for methane |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour cloud explosion. |
| Oxidizing properties: | H ₂ S is a strong reducing agent. |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Sensitive, Minimum Ignition Energy methane=0.21 mJ for 8.5% by volume. |
| Evaporation rate: | Liquefied methane evaporates rapidly at room temperature. |
| Vapour pressure: | Not available |
| Vapour density: | Not available |
| Relative density: | Not applicable |
| Solubility: | Insoluble in water |
| Partition coefficient (n-octanol/water): | Log P _{oct} = 1.09 for methane |
| Critical temperature: | -82°C (-116°F) for methane |
| Critical pressure: | 4640 kPa (45.9 atm) for methane |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |

SAFETY DATA SHEET

Section 10: Stability and Reactivity

Reactivity:

Not classified for reactivity hazards.

Chemical Stability:

Normally stable. Releases of gas are extremely flammable and/or explosive.
H₂S is a strong reducing agent and is highly reactive.

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with halogen compounds (e.g. chlorine gas), contact may cause an explosion.

Hazardous Decomposition Products:

Not applicable

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|--------------------------------------|---|---|---|
| Methane | Not applicable | Not applicable | >800000 ppm (80%) (mice) asphyxiant duration not reported |
| Hydrogen sulphide (H ₂ S) | Not available | Not available | 335 ppm (mouse) |

Chronic Toxicity Data:

Permanent or persistent nervous system effects following an acute overexposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Inhalation exposure to 30 ppm H₂S or above has produced signs of irritation of the nasal passages, including sensory neuron loss in male rats, in rats and mice for 10-13 weeks. Increased bronchial responsiveness was observed in individual rats exposed to 1-100 ppm for 5 weeks. Subtle evidence of mild brain dysfunction was observed in male rats exposed to 125 ppm for 11 weeks.

Sensitization:

Propane and some other closely related aliphatic hydrocarbons (isobutane and butane) are weak cardiac sensitizers in humans following inhalation exposures to high concentrations. Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death, particularly when under stress.

Neurological Effects:

H₂S is acutely toxic to the central nervous system. Permanent or persistent nervous system effects following an acute exposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Genetic Effects:

H₂S was not mutagenic in rats and in bacteria.

Reproductive Effects:

No significant reproductive effects were observed in one study with rats exposed to H₂S by inhalation to up to 80 ppm.

SAFETY DATA SHEET

Section 11: Toxicological Information, continued

Developmental Effects:

No significant developmental effects were observed in rat studies with inhalation exposures to H₂S of up to 100 ppm.

Target Organ Effects:

Central nervous system.

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Other Adverse Effects:

Natural Gas in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Natural gas concentration of greater than 14% (140 000 ppm) will displace oxygen (O₂) to 18% in air and cause oxygen deprivation.

Symptoms of oxygen deficiency are:

O₂=12-16% - breathing and pulse rate are increased, with slight loss of muscular coordination;

O₂=10-14% - emotional upsets, abnormal fatigue from exertion, disturbed respiration;

O₂=6-10% - nausea and vomiting, inability to move freely, collapse, possible loss of consciousness;

O₂=below 6% - convulsive movements, gasping, possible respiratory collapse and death.

Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

Section 12: Ecological Information

Toxicity:

H₂S is regulated as a hazardous pollutant. VOC gases are reportable to the National Pollutant Release Inventory, Environment Canada. Methane is regulated as a greenhouse gas.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable waste disposal and environmental regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

Transport symbol:



UN Number:

UN1953

UN proper shipping name:

COMPRESSED GAS, TOXIC, FLAMMABLE N.O.S. (Sour Natural Gas)

Transport hazard class(es):

2.3 (2.1)

Packing group:

Not applicable

Emergency response guide:

119

SAFETY DATA SHEET

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200, 2012).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

A - Compressed gas

B1 - Flammable and combustible material - Flammable gas

D1A – Immediate and serious toxic effects – H₂S toxic if inhaled.

D2B – Material causing other toxic effects – eye irritation.

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: VOC gases are NPRI reportable substances.

Hydrogen sulphide (H₂S) is regulated as an environmentally hazardous pollutant. Methane is regulated as a greenhouse gas.

Section 16: Other Information

Issue date: October 28, 2013

Revision summary: Previous version: December 1, 2010
Revised Sections 2, 4, 5, 6, 7, 8, 16

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine

Cheminfo – Canadian Centre for Occupational Health and Safety

RTECS – Registry of Toxic Effects of Chemical Substances

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Natural Gas Condensate

SDS record # 006

Chemical names:

- Natural gas condensates (petroleum);
- Low boiling point naphtha – unspecified.

Product uses:

Industrial by-product

Supplier of the Safety Data Sheet:

AltaGas Ltd.

1700, 355 4th Avenue SW

Calgary, AB

T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable liquid Cat. 2; H225

Skin Irritation Cat. 2; H315

Aspiration Hazard Cat. 1; H304

Toxic to Reproduction Cat. 2; H361

Mutagenicity Cat. 1B; H340

Carcinogenicity Cat. 1B; H350

Specific Target Organ Toxicity (Single Exposure), Cat. 3; H336

GHS Label elements:



Danger!

Highly flammable liquid and vapour.

Causes skin irritation.

Suspected of damaging the unborn child.

May be fatal if swallowed and enters airways.

May cause genetic defects.

May cause cancer.

May cause drowsiness or dizziness.

Prevention:

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical, ventilating, lighting, and other equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Wear protective gloves/protective clothing/eye protection/face protection.

Avoid breathing vapours, gas, and spray.

Wash exposed skin thoroughly after handling.

Use only outdoors or in a well-ventilated area.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Response

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower . If skin irritation occurs: Get medical advice/attention.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

Do NOT induce vomiting.

IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.

Storage

Store in a well-ventilated place. Keep cool. Keep container tightly closed.

Disposal

Dispose of contents/container in accordance with local, regional, national and international regulations.

WHMIS:

Controlled product by WHMIS criteria.



- B2 – Flammable Liquid
- D2A – Materials Causing Other Toxic Effects – carcinogenicity and embryotoxicity.
- D2B – Material Causing other Toxic Effects – skin and eye irritation.

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact causes drying of the skin and may cause a skin rash (dermatitis).

Benzene may be absorbed through the skin and may cause harm to blood or blood producing system.

Eye contact: Airborne vapours may be irritating to the eyes. Direct contact with the liquid may be irritating to the eyes.

Inhalation: Vapour concentrations above the recommended exposure guidelines are irritating to the eyes and respiratory tract and can cause headache, drowsiness and dizziness. Exposures to high levels of solvent vapours may cause narcosis; symptoms of narcosis include disorientation, euphoria, giddiness, confusion progressing to unconsciousness, paralysis, convulsion and death from respiratory or cardiovascular arrest.

Product may contain Hydrogen sulphide (H₂S) gas which can be fatal if inhaled. High concentrations of H₂S cause breathing failure, coma and death without necessarily any warning odour being sensed. Airborne concentrations 1-5 ppm have a moderately offensive odour, may cause nausea and/or headaches with prolonged exposure.

Ingestion: Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

Chronic Health Effects:

Contains benzene. Human health studies (epidemiological) indicate that prolonged and/or repeated exposures to benzene by inhalation, skin contact or ingestion may cause damage to the blood producing system (particularly the bone marrow) and serious blood disorders including leukemia.

Prolonged exposures to solvent vapours by inhalation, above the exposure guidelines may cause nerve damage, with symptoms including weakness and numbness in hands and feet.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

Natural gas may be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Benzene is regulated as environmental pollutant.

SAFETY DATA SHEET

Section 3: Composition/Information on Ingredients

Hazardous Substances:

A complex combination of hydrocarbons separated as a liquid from natural gas in a surface separator by retrograde condensation. It consists mainly of hydrocarbons having carbon numbers predominantly in the range of C₂ to C₂₀. It is a liquid at atmospheric temperature and pressure.

Other expected components may include benzene, toluene, xylenes, ethylbenzene and hydrogen sulphide. The composition and hazardous properties will vary depending on the source.

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|--------------------------------------|----------------|--------------|
| Natural Gas Condensate | 64741-47-5 | 100 |
| Benzene | 71-43-2 | 0 - 5 |
| Toluene | 108-88-3 | 0 - 5 |
| Xylenes | 1330-20-7 | 0 - 5 |
| Ethylbenzene | 100-41-4 | 0 - 5 |
| Hydrogen sulphide (H ₂ S) | 7783-06-4 | 0 – 0.1 |

Section 4: First Aid Measures

Description of first aid measures:

Rescuers, attempting to save an unconscious co-worker, have entered a hazardous and/or confined area without respiratory protection or safety lines. They, in turn, have been overcome by H₂S. Victims who have been exposed to 500 ppm or higher may pose a threat to responders due to H₂S released from their clothing, skin and exhaled air.

Skin Contact: Quickly remove victim from source of contamination. Avoid direct contact. Wear chemical resistant protective clothing if necessary. Quickly and gently, blot or brush away excess chemical. Wash gently and thoroughly with water and non-abrasive soap for 5 minutes or until chemical is removed. Under running water, remove contaminated clothing, shoes and leather goods. Obtain medical advice immediately.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto face. Obtain medical attention immediately.

Inhalation: This material is flammable and toxic. Rescuers must take proper precautions (e.g. remove any sources of ignition, wear appropriate respiratory protection) before attempting rescue. Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Obtain medical advice immediately.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Skin irritation and dryness. Absorption through the skin may cause long-term chronic effects (see inhalation).

Eye Contact: Irritation.

Inhalation: May cause drowsiness or dizziness. Prolonged exposures to solvent vapours may cause weakness and numbness in hands and feet. Contains benzene; exposures to benzene by inhalation, skin contact or ingestion may cause damage to the blood producing system and serious blood disorders including leukemia.

Ingestion: May be fatal if swallowed and enters airways.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Highly flammable liquid and vapour. Flashpoint will vary for this complex mixture. Forms vapour mixtures with air, which can be ignited by heat, sparks or flame. Spills of liquid can form flammable vapours, which will travel over long distances and will create a flash back hazard. The vapours can accumulate in confined spaces and low areas, resulting in an explosion or toxicity hazard.

Extinguishing media:

Fire-fighting foam, dry chemical powder, carbon dioxide or water fog. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates. Unsuitable extinguishing media: Water may be ineffective to extinguish, 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 personnel attempting to stop a leak. Water spray may be used to flush spills away from areas of potential ignition.

Special hazards arising from the substance or mixture:

Will be easily ignited by heat, sparks or flames.
Vapors may form explosive mixtures with air.
Vapors may travel to source of ignition and flash back.
Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
Vapor explosion hazard indoors, outdoors or in sewers.
Runoff to sewer may create fire or explosion hazard.
Containers may explode when heated.
Many liquids are lighter than water.
Fire may produce irritating, corrosive and/or toxic gases including oxides of carbon, sulphur and nitrogen.
Health effects (lung damage) may be delayed after exposure to exposure to combustion products.
Runoff from fire control or dilution water may cause pollution.
Products of combustion may include toxic gases, including carbon monoxide.

Advice for firefighters:

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. 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.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill contact Fire/ Emergency Services immediately.
Wear appropriate respiratory protection and vapour protective clothing.
As an immediate public safety precautionary measure; Isolate spill or leak area for at least 100 meters in all directions. Consider initial evacuation for 1600 meters in all directions.
ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
Wear eye, skin and respiratory personal protective equipment.
Personnel cleaning up spills must be properly trained.
Isolate the area and restrict access. Ventilate the area.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.
A vapor suppressing foam may be used to reduce vapors.

Methods and material for containment and cleaning up:

Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area.
Contain spills to water by booming. Contain spills to land by diking.
Absorb spills using a suitable absorbent such as commercial absorbent product, dry earth, sand or other non-combustible material.

SAFETY DATA SHEET

Section 7: Handling and Storage

Handling:

Follow the proper procedures for handling flammable liquids.

Keep away from heat, sparks and flames. Use with adequate ventilation. Avoid breathing vapours. Avoid generating oil mists or aerosols. Wash all exposed skin thoroughly with detergent and water after handling, before eating, drinking, smoking or using the toilet. Remove contaminated clothing and wash before reuse. Discard saturated leather goods. Wear personal protective equipment appropriate to the workplace where this material is handled.

Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. Post NO SMOKING signs.

During transfer operations containers and vessels should be electrically grounded and bonded to prevent the build-up of a static charge. Keep containers closed when not in use.

If gas or vapour is released in a confined space, immediately evacuate the area.

Empty containers may contain hazardous residues. Never perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all liquid and vapours have been cleared.

Storage

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. Keep containers tightly closed. Avoid all possible sources of ignition (spark or flame).

Empty containers may contain hazardous residues. Keep closed.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Canada-Provincial TWA</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|-------------------|--|---|---|
| Benzene | Alberta: <ul style="list-style-type: none"> 0.5 ppm; Skin STEL: 2.5 ppm Designated substance; requires code of practice A1 Confirmed human carcinogen British Columbia: <ul style="list-style-type: none"> 0.5 ppm; Skin STEL: 2.5 ppm A1 Confirmed human carcinogen Saskatchewan: <ul style="list-style-type: none"> Designated substance | 0.5 ppm STEL: 2.5 ppm Skin; A1 Confirmed human carcinogen BEI | 1 ppm STEL: 5 ppm OSHA Carcinogen |
| Toluene | Alberta: <ul style="list-style-type: none"> 50 ppm British Columbia: <ul style="list-style-type: none"> 20 ppm; R Saskatchewan: <ul style="list-style-type: none"> 50 ppm; Skin 15 minute average contamination limit: 60 ppm | 20 ppm A4; BEI | 100 ppm STEL: 150 ppm |
| Xylene | Alberta: <ul style="list-style-type: none"> 100 ppm 150 ppm STEL British Columbia: <ul style="list-style-type: none"> 100 ppm 150 ppm STEL Saskatchewan: <ul style="list-style-type: none"> 100 ppm 150 minute average contamination limit: 60 ppm | 100 ppm STEL: 150 ppm A4; BEI | 100 ppm STEL: 150 ppm |
| Ethylbenzene | Alberta: <ul style="list-style-type: none"> 100 ppm 125 ppm STEL British Columbia: <ul style="list-style-type: none"> 20 ppm Saskatchewan: <ul style="list-style-type: none"> 100 ppm; T20 125 minute average contamination limit: 60 ppm | 20 ppm A3; BEI | 100 ppm STEL: 125ppm |

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear a face shield or full-face respiratory protection for open handling of liquid.

Skin Protection: Wear chemical protective gloves for all conditions of handling. Wear chemical protective boots and clothing for open handling of liquid and when there is the risk of contact with the skin. Recommended glove materials are nitrile or neoprene.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

NIOSH Respirator Recommendations for Benzene:

(APF = 10,000) An approved self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) An approved supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) An approved air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister or an appropriate, approved escape-type, self-contained breathing apparatus

Other: Do not smoke in work areas. Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before rewearing. Inform laundry personnel of contaminant's hazards. Do not smoke, eat or drink in work areas. Wash hands thoroughly after work and before eating, drinking or smoking.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Liquid, Varies from colourless to golden yellow. |
| Odour: | Mild hydrocarbon. Pungent rotten-egg odour indicates presence of H ₂ S. |
| Odour threshold: | 0.001-0.13 ppm - odour threshold for H ₂ S. At concentrations below 100 ppm, odour of rotten eggs. Above 100 ppm, sense of smell can be impaired and no odour is detected. |
| pH: | Not applicable |
| Relative Density (water = 1): | 0.626 – 0.707 at 25°C |
| Melting point/freezing point: | -54°C |
| Initial boiling point and boiling range: | 36.1 – 125°C |
| Flash point: | Varies; approximately -13°C (CC) |
| Auto-ignition temperature: | 257°C |
| Upper/lower flammability or explosive limits: | LEL: 1.4 for methane UEL: 7.4% for methane |
| Explosive properties: | Forms explosive vapour mixtures with air. |
| Oxidizing properties: | Not available |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Sensitive. |
| Evaporation rate: | Not available |
| Vapour pressure: | 53.4 to 133 mm Hg @ 25°C |
| Vapour density: | 2.49 – 3.94 |
| Relative density: | Not applicable |
| Solubility: | Insoluble in water |
| Partition coefficient (n-octanol/water): | Not available |
| Critical temperature: | Not available |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable.

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with strong acids.

Hazardous Decomposition Products:

Hydrocarbon vapour.

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|------------------------|---|---|--|
| Natural Gas Condensate | 14 000 (rat) | >2 000 (rabbit) | >5.2 mg/L (rat) |

Chronic Toxicity Data:

Contains benzene; human experience and animal studies show that long-term benzene exposure causes harmful effects to the blood and blood-forming organs, as well as the immune system.

Sensitization:

No experimental data demonstrating occupational respiratory or skin sensitization.

Neurological Effects:

Over-exposure to petroleum vapours by inhalation may cause drowsiness and dizziness. Peripheral neurotoxicity has been reported in connection with over exposure to hexacarbon solvents (e.g. n-hexane). Prolonged exposures above the exposure guidelines may cause nerve damage, with symptoms including weakness and numbness in hands and feet.

Genetic Effects:

Benzene has demonstrated mutagenic effects in animal studies and in exposed workers.

Reproductive Effects:

Limited evidence that exposures to benzene may cause adverse reproductive effects.

Developmental Effects:

Toxicity to fetuses has been demonstrated for some components (xylenes, toluene).

Target Organ Effects:

Eyes, skin, respiratory system, blood, central nervous system, bone marrow, peripheral nervous system.

Carcinogenicity:

Contains a carcinogen according to IARC, NTP, ACGIH and OSHA. Contains benzene; a regulated human carcinogen. Benzene is recognized as having the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure.

Section 12: Ecological Information

Toxicity:

Aquatic Chronic Cat. 2; H411: Toxic to aquatic life with long lasting effects.

Hydrocarbons will float on the surface of water.

Algae: 72 Hr EC₅₀ *Pseudokirchneriella subcapitata*: 56 mg/L.

Fish: 96 Hr LC₅₀ *Alburnus alburnus*: 119 mg/L [static]; 96 Hr LC₅₀ *Cyprinodon variegatus*: 82 mg/L [static].

Water flea: 24 Hr EC₅₀ *Daphnia magna*: 170 mg/L.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not available

Mobility in soil:

Not available

Section 13: Disposal Considerations

Waste treatment methods:

Recover or dispose of waste material in accordance with applicable waste disposal and environmental regulations.

Empty containers retain product residue, adhere to warnings after container has been emptied.

SAFETY DATA SHEET

Section 14: Transport Information

Transport symbol:



UN Number: UN1268
UN proper shipping name: PETROLEUM PRODUCTS, N.O.S. (natural gas condensate)
Transport hazard class(es): 3
Packing group: II
Emergency response guide: 128

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory or are exempt.**OSHA:** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.**WHMIS Classification:**

B2 - Flammable and combustible material - Flammable liquid

D2A – Other toxic effects – Carcinogenicity, Embryotoxicity

D2B – Material causing other toxic effects – skin and eye irritation.

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL) or are exempt.**National Pollutant Release Inventory:** Benzene, Toluene, Xylenes, Ethylbenzene and VOC gases are NPRI reportable substances.

Contains substances regulated as environmentally hazardous pollutants.

Section 16: Other Information

Issue date: December 16, 2013**Revision summary:** Previous version: February 3, 2011
Revised Sections 2, 3, 4, 7, 8, 13, 16**References and sources for data:**

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine

Cheminfo – Canadian Centre for Occupational Health and Safety

RTECS – Registry of Toxic Effects of Chemical Substances

Manufacturer disclaimer

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Natural Gas Liquids

Chemical names: NGL; Aliphatic hydrocarbon mixture (Alkanes C₂ – C₈).

Product uses:

A complex combination of hydrocarbons separated and/or condensed from natural gas during transportation and collected at the wellhead and/or from the production, gathering, transmission, and distribution pipelines in deeps, scrubbers, etc. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C₂ through C₈.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Emergency Overview:

Danger! Extremely flammable gas, compressed gas or refrigerated liquefied gas.
Colourless refrigerated liquid. May have mild gasoline-like or sweet odour depending on the impurities present.

WHMIS:

Controlled product by WHMIS criteria.



- A – Compressed Gas
- B1– Flammable Gas, or B2 - Flammable Liquid

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact with liquefied gas escaping from its cylinder may cause frostbite. The skin may become waxy white or yellow.

Eye contact: Contact with liquefied gas escaping from its cylinder may cause freezing of the eye. Permanent eye damage or blindness could result.

Ingestion: Not an applicable route of exposure. Aspiration hazard, may be fatal if swallowed and enters airways.

Inhalation: High concentrations of alkane gases in air may cause central nervous system depression. High concentrations (>100000 ppm; 12 – 16% as methane in air) may cause unconsciousness and suffocation due to lack of oxygen. Symptoms of oxygen deficiency include increased breathing and pulse rate, slight loss of muscular coordination, emotional upsets, abnormal fatigue from exertion, disturbed respiration, nausea and vomiting, inability to move freely, collapse, possible loss of consciousness; extreme oxygen deficiency below 6% can induce convulsive movements, gasping, possible respiratory collapse and death. Since exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment.

Very high concentrations (300000 ppm; 30% as methane) can cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness and confusion.

Propane and butane are weak cardiac sensitizers. Exposures by inhalation to high concentrations may lead to cardiac sensitization; may cause the sudden onset of an irregular heartbeat. See Section 11.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Chronic Health Effects:

No human or animal information was located.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

May be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Natural gas liquid is not expected to result in any ecological damage to water or land. Methane is regulated as a greenhouse gas in air.

Section 3: Composition/Information on Ingredients

Hazardous Substances:

The chemical composition of Natural Gas Liquids will vary depending on the source. Natural Gas Liquids is a complex mixture, consistent with the definition in the Canadian Controlled Products Regulations, Section 2.

| Chemical Name | CAS No. | Wt. % |
|--|------------|---------------|
| Natural Gas Liquids | 68919-39-1 | 99 – 100 |
| Some common hazardous components of Natural Gas Liquids are listed below. The product may also contain other naturally occurring hydrocarbons. | | |
| Methane | 74-82-8 | Not available |
| Ethane | 74-84-0 | Not available |
| Propane | 74-98-6 | Not available |
| Butane | 106-97-8 | Not available |

Section 4: First Aid Measures

Description of first aid measures:

Skin Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove rest of the garment. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Eye Contact: GAS: No health effects expected. LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. Do NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Inhalation: This material is extremely flammable. Take proper precautions (e.g. remove any sources of ignition, wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility.

Ingestion: Not an applicable route of exposure.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Frostbite.

Eye Contact: Freezing of eye tissue.

Inhalation: Nausea, dizziness, drowsiness and confusion, unconsciousness.

Ingestion: Aspiration hazard.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Extremely flammable gas, compressed gas or refrigerated liquefied gas.
Readily forms explosive mixtures with air, which are easily ignited by heat, sparks or flame. Liquefied gas accumulates static charge. Liquefied gas rapidly vapourizes under normal conditions and produces 600 volumes vapour for every one volume of liquid. Ignition of a large volume of gas vapour mixed with air causes sudden expansion and turbulence resulting in an explosion known as vapour cloud explosion. Large spills of liquefied natural gas form rapidly dense flammable vapours, which will travel over long distances and will create a flash back hazard. The gas can accumulate in confined spaces and low areas, resulting in an explosion or toxicity hazard.

Extinguishing media:

Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.
Unsuitable extinguishing media: Carbon dioxide, low expansion foams, and direct application of water on liquefied gas. Under certain conditions, discharge of carbon dioxide produces electrostatic charges that could create a spark and ignite flammable gas.

Special hazards arising from the substance or mixture:

Large spills of liquefied gases behave like dense flammable vapours and travel over long distances creating a flash back hazard. Containers may rupture and explode if heated. Vapour and air mixtures are explosive. Material will readily ignite at normal temperatures. The gas can accumulate in confined spaces, resulting in explosion and asphyxiation hazards. Direct addition of water (or any other room temperature liquid) to the liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a "boiling liquid, expanding vapour explosion." During a fire, toxic gases may be generated. Cylinders exposed to heat and/or fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Stop flow of gas before attempting to extinguish fire. If flow cannot be stopped, let the fire burn while protecting the surrounding area. Cool exposed containers with water.
Fires 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.
If a tank or rail car is involved in a fire, isolate for 1600 m in all directions; also consider initial evacuation for 1600 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately.
Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
If possible, turn leading containers so that gas escapes rather than liquid.
Use water spray to reduce vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
Do not direct water at spill or source of leak.
Prevent spreading of vapours 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.

SAFETY DATA SHEET

Section 6: Accidental Release Measures, continued

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Isolate the area until the gas has dispersed. Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

This material is an extremely flammable gas, or refrigerated liquefied gas. Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. During transfer operations, cylinders and vessels should be electrically grounded and bonded to prevent the build up of a static charge. Post NO SMOKING signs. It is very important to keep areas where this material is used clear of other materials which can burn. If flammable gas is released in a confined space, immediately evacuate the area.

Compressed or liquefied gas cylinders, piping and fittings must be protected from damage during handling, filling, transportation and storage.

Ensure that compressed or liquefied gas cylinders are secured, preferably upright, and cannot fall or roll.

Storage

Storage temperature should not exceed 52°C (125°F).

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. Keep quantity stored as small as possible. Store away from incompatible materials, such as oxygen and strong oxidizing agents.

Storage of compressed gas cylinders must be in accordance with the appropriate provincial or regional Fire Code.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Ontario TWAEV</u> | <u>ACGIH®</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|---|----------------------|--|--------------------------------------|
| Butane | 800 ppm | 1000 ppm STEL | 800 ppm |
| Aliphatic hydrocarbon gases Alkanes C ₁ - C ₄ | 1000 ppm | Minimal oxygen content required (Appendix F 2014 TLVs® and BEIs®) | Not established |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Provide sufficient local exhaust and general (dilution) ventilation to maintain the gas concentration below one tenth of the lower explosive limit. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations and those handling liquefied gas, consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear a face shield when handling refrigerated liquefied gas.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Skin Protection: Wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear fire-resistant long-sleeved clothing and trousers worn outside boots or over top of shoes. Remove protective clothing immediately if it becomes wet with refrigerated liquefied gas.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Workplaces should have a frostbite wash readily available in the work area. Any clothing which becomes wet with liquid or saturated with gas should be removed immediately.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Liquid, colourless. |
| Odour: | Odourless, or faint odour of gasoline. |
| Odour threshold: | Not available |
| pH: | Not applicable |
| Melting point/freezing point: | -180°C (-292°F) approximate |
| Initial boiling point and boiling range: | Not available |
| Flash point: | -15°C (5°F) approximate |
| Auto-ignition temperature: | 450°C (842°F) for propane |
| Upper/lower flammability or explosive limits: | LEL: 1.5% UEL: 12.5% approximate |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour cloud explosion. |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Sensitive; can readily form explosive mixtures with air, which are easily ignited by a static charge. Liquefied methane can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation. |
| Evaporation rate: | >1 |
| Vapour pressure: | Not available |
| Vapour density: | Not available |
| Relative density: | Not applicable |
| Solubility: | Insoluble in water |
| Partition coefficient (n-octanol/water): | >1 |
| Critical temperature: | Not available |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |
| Percent volatile: | 100% |

SAFETY DATA SHEET

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Releases of gas are extremely flammable and/or explosive in the presence of an ignition source.

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.

Avoid unintended contact with incompatible materials.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with halogen compounds (e.g. chlorine gas), contact may cause an explosion.

Hazardous Decomposition Products:

Not applicable

Section 11: Toxicological Information

Acute Toxicity Data: Acute toxicity data for Natural Gas Liquids is not available. The following data is for the component substances.

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|---|
| Methane | Not applicable | Not applicable | >800000 ppm (80%) (mice), asphyxiant duration not reported |

Chronic Toxicity Data:

No data available.

Sensitization:

Propane and some other closely related aliphatic hydrocarbons (isobutane and butane) are weak cardiac sensitizers in humans following inhalation exposures to high concentrations. Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death, particularly when under stress.

Neurological Effects:

At high concentrations, it can cause depression of the central nervous system (CNS) based on animal and human information.

Methane in air can cause central nervous system depression at very high concentrations (30% or 300 000 ppm).

Unconsciousness (narcosis) from inhalation of ethane has been observed due to CNS depression at approximately 130000 ppm (13%).

Propane in air can cause depression of the central nervous system (CNS) with symptoms such as headache, nausea, dizziness, drowsiness and confusion, based on animal information. It is expected to cause unconsciousness (narcosis) due to CNS depression at approximately 47000 ppm (4.7%).

Genetic Effects:

Not available

Reproductive Effects:

None reported.

Developmental Effects:

None reported.

Target Organ Effects:

Central nervous system.

SAFETY DATA SHEET

Section 11: Toxicological Information, continued

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Other Adverse Effects:

Alkane gases in high concentrations in the air displace oxygen and can cause symptoms of asphyxiation. Methane concentration of greater than 14% (140 000 ppm) will displace oxygen to 18% in air and cause oxygen deprivation.

Section 12: Ecological Information

Toxicity:

Natural Gas Liquid is not expected to result in any ecological damage to water or land. VOC gases are reportable to the National Pollutant Release Inventory, Environment Canada. Methane is regulated as a greenhouse gas.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

Transport symbol:



UN Number:

UN1075

UN proper shipping name:

LIQUEFIED PETROLEUM GASES

Transport hazard class(es):

2.1

Packing group:

Not applicable

Emergency response guide:

115

SAFETY DATA SHEET

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

A - Compressed gas

B1 - Flammable and combustible material - Flammable gas or B2 – Flammable liquid.

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: VOC gases are NPRI reportable substances.

Methane is regulated as a greenhouse gas.

Section 16: Other Information

Issue date: March 12, 2015

Revision summary: Previous version: March 1, 2012
Revised Section 8

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Produced Water

Product uses:

Produced water is a product extracted from processing of Natural Gas. It is primarily water with varying amounts and types of dissolved inorganic salts and may contain trace amounts of hydrogen sulphide at not more than 1%.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Emergency Overview:

Product may contain hydrogen sulphide gas, H₂S. If present, H₂S is an extremely flammable gas which forms explosive mixtures with air over a wide concentration range. H₂S may accumulate in confined spaces, especially in low-lying, poorly ventilated areas, producing a fire, toxicity and explosion hazard. Take appropriate precautions to prevent or minimize exposure to this product. Follow procedures for handling materials of unknown hazards.

Appearance, Colour and Odour: Discoloured water, if hydrogen sulphide is present it may smell of rotten egg.

WHMIS:

Canada: This is not a controlled product under WHMIS.

While this product is not controlled under WHMIS, this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other handlers of this product.

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact. Possible inhalation if H₂S is present.

Skin contact: Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

Eye contact: Liquid may cause eye irritation.

Inflammation and irritation of the eyes has been reported at low airborne concentrations of H₂S with symptoms of scratchiness, irritation, tearing, burning, sensitivity to light, rainbow-like halos around lights, blurred vision and ulceration.

Inhalation: Product may contain Hydrogen sulphide (H₂S) gas which can be fatal if inhaled. H₂S gas may be released from closed containers and from heated Produced water. H₂S may cause irritation to the respiratory tract. High concentrations of H₂S cause breathing failure, coma and death without necessarily any warning odour being sensed. Airborne H₂S concentrations 1-5 ppm have a moderately offensive odour, may cause nausea and/or headaches with prolonged exposure. Airborne concentrations of 100 -200 ppm cause severe nose, throat and lung irritation; the ability to smell odour completely disappears. Over-exposure to H₂S can cause pulmonary edema, a potentially fatal build-up of fluid in the lungs in the absence of central nervous system effects (headache, nausea, dizziness) especially if exposure is prolonged. Over-exposure to H₂S causes excitement, headache, dizziness, staggering and sudden collapse ("knockdown"). Exposures above 500 ppm rapidly cause unconsciousness and death.

Always exercise caution when working around closed bulk containers of this material.

Ingestion: May be harmful if swallowed.

Swallowing may cause irritation of the digestive tract, nausea, vomiting and diarrhea, and central nervous system effects. The oral toxicity of this product has not been evaluated. Its toxicity depends on the type and amounts of dissolved salts.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Chronic Health Effects:

No human or animal data is available.

Prolonged or repeated skin contact may cause dermatitis.

May contain Hydrogen sulphide (H₂S). Long-term occupational exposure to H₂S has generally been associated with nervous system, respiratory system and eye effects.

Medical Conditions Aggravated by Exposure:

Exposure by skin contact may aggravate pre-existing skin disorders. Inhalation of spray mists may aggravate chronic respiratory conditions such as asthma and bronchitis.

Interactions With Other Chemicals:

If present, H₂S is a strong reducing agent (see Section 10).

Potential Environmental Effects:

Not available

Section 3: Composition/Information on Ingredients

The chemical composition of Produced Water will vary depending on the source.

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|----------------------|--------------------------|--------------|
| Water | 7732-18-5 | 90 - 99 |
| Inorganic Salts | Not applicable - Mixture | 1 - 5 |

Hazardous Ingredients:

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|-------------------------------------|----------------|--------------------------|
| Hydrogen sulphide, H ₂ S | 7783-06-4 | 0 – 0.1 or 0.1 – 1.0* |

Section 4: First Aid Measures

Description of first aid measures:

May contain unknown amounts of H₂S. Do not attempt the rescue of an H₂S poisoning victim without the use of an appropriate respirator.

Skin Contact: Wash gently and thoroughly with lukewarm, gently flowing water and non-abrasive soap for 5 minutes. If irritation persists, repeat flushing. Obtain medical advice. Completely decontaminate clothing, shoes and leather goods before re-use, or discard.

Eye Contact: Remove source of contamination or move victim to fresh air. Immediately flush the contaminated eye with lukewarm, gently flowing water for 5 minutes while holding the eyelids open. If irritation occurs obtain medical advice.

Inhalation: Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. Obtain medical advice. Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Obtain medical attention immediately.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Obtain medical attention immediately.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Aqueous mixture, not flammable or combustible.

H₂S (hydrogen sulphide), if present, may accumulate in the headspace of containers. H₂S is a highly flammable and toxic gas.

Extinguishing media:

Use extinguishing media suitable for the surrounding fire.

Special hazards arising from the substance or mixture:

H₂S gas (hydrogen sulphide), if present, may accumulate in the headspace of containers.

Advice for firefighters:

Evacuate area and fight fire from safe distance. Wear self-contained breathing apparatus (SCBA), eye protection and protective clothing. As with any fire, toxic gases, vapors and fumes can be generated.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Do not touch or walk through spilled material.

Stop leak if you can do it without risk.

Wear eye, skin and respiratory personal protective equipment.

Personnel cleaning up spills must be properly trained.

Isolate the area and restrict access. Ventilate the area.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

For large spills, dike ahead of liquid spill for later disposal.

Methods and material for containment and cleaning up:

Contain spills to land by diking. Absorb spills using a suitable absorbent such as commercial absorbent product, dry earth, sand or other non-combustible material. Use clean non-sparking tools to collect absorbed material. Put material in suitable, covered, labeled containers.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

Avoid contact with eyes and skin. Avoid breathing vapours. Wear personal protective equipment appropriate to the workplace where this material is handled.

Use with adequate ventilation. Wash thoroughly after handling.

Care must be taken when opening containers as extremely flammable and harmful H₂S may have accumulated in the container headspace. Only open in a well ventilated area free from heat, flame and ignition sources. Use appropriate bonding and grounding protocols and non-sparking equipment when opening and closing containers, handling or transferring. Take precautionary measures against static discharges, e.g. when opening drums use non-sparking tools.

Storage

Follow good hygiene and handling procedures to prevent any unnecessary contact. Keep away from heat, sparks and flames. Keep containers tightly closed. Store in a cool, well ventilated place away from incompatible materials.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Canada-Provincial TWA</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|--|--|----------------------------------|---|
| Hydrogen sulphide | Alberta <ul style="list-style-type: none"> • 10 ppm • 15-minute Ceiling: 15 ppm British Columbia <ul style="list-style-type: none"> • Ceiling: 10 ppm Saskatchewan <ul style="list-style-type: none"> • 8-hour TWA: 10 ppm • 15 ppm 15 minute average contamination limit | 1ppm STEL: 5 ppm | 10 ppm STEL: 15 ppm Ceiling: 20 ppm |
| Other Exposure guidelines: <ul style="list-style-type: none"> • NIOSH REL for H₂S: 10 ppm 10-minute. IDLH: 100 ppm | | | |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

Monitor the workplace air for the presence of hazardous vapours of H₂S and to determine the effectiveness of ventilation and the necessity for personal respirators.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear chemical safety goggles or other appropriate eye protection.

Skin Protection: Wear chemical protective gloves, impermeable to water, for all conditions of handling. Wear chemical protective boots and clothing for open handling of liquid and when there is the risk of contact with the skin. Contact safety supplier for specifications.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Do not smoke in work areas. Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before rewearing. Inform laundry personnel of contaminant's hazards. Do not smoke, eat or drink in work areas. Wash hands thoroughly after work and before eating, drinking, smoking or using the toilet.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Liquid. Discoloured water. |
| Odour: | If H ₂ S is present, may have rotten egg odour. |
| Odour threshold: | H ₂ S, if present, has a threshold of 0.001-0.13 ppm. |
| pH: | Not applicable |
| Relative Density (water = 1): | Not available |
| Melting point/freezing point: | Not available |
| Initial boiling point and boiling range: | Not available |
| Flash point: | Not available |
| Auto-ignition temperature: | Not available |
| Upper/lower flammability or explosive limits: | Not available |
| Explosive properties: | Not available |
| Oxidizing properties: | Not available |
| Sensitivity to mechanical impact: | Not available |
| Sensitivity to static discharge: | H ₂ S, if present, may be ignited by static discharge. |
| Evaporation rate: | Not available |
| Vapour pressure: | Not available |
| Vapour density: | Not available |
| Solubility: | Not available |
| Partition coefficient (n-octanol/water): | Not available |
| Critical temperature: | Not available |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | Not available |

Section 10: Stability and Reactivity

Reactivity:

Not dangerously reactive.

Chemical Stability:

Normally stable. H₂S, if present, is a strong reducing agent and is highly reactive.

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur.

Conditions to Avoid:

Avoid prolonged exposure to extreme heat.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates).

Hazardous Decomposition Products:

May evolve toxic hydrogen sulphide (H₂S) gas or other sulfur containing gases.

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data:

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(ppm, 4 hrs.)</u> |
|-------------------|---|---|---|
| Hydrogen sulphide | Not available | Not available | 335 (mouse) |

Chronic Toxicity Data:

Product may evolve quantities of H₂S gas. Permanent or persistent nervous system effects following an acute overexposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Sensitization:

Not available

Neurological Effects:

H₂S, if present, is acutely toxic to the central nervous system. Permanent or persistent nervous system effects following an acute exposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

Genetic Effects:

Not available

Reproductive Effects:

Not available

Developmental Effects:

Not available

Target Organ Effects:

Eyes, respiratory system, central nervous system.

Carcinogenicity:

Not available

Section 12: Ecological Information

Toxicity:

Not available. Prevent release of this product to natural waterways.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not available

Mobility in soil:

Liquid, dispersible in water and soil.

Section 13: Disposal Considerations

Waste treatment methods:

Recycle, recover or dispose of waste material in accordance with applicable waste disposal and environmental regulations.
Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

UN proper shipping name:

Not regulated as a dangerous good for transport.

SAFETY DATA SHEET

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substances listed on the TSCA inventory or are exempt.

OSHA: This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

Not controlled

Hydrogen sulphide is present at less than 1% concentration cut-off (*Controlled Products Regulations* – Section 48).

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: If present, Hydrogen sulphide is a NPRI reportable substance.

Section 16: Other Information

Issue date: March 12, 2015

Revision summary: Previous version: March 1, 2012

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101

www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Crude Oil

Chemical names: Crude Petroleum

Product uses:

A complex combination of hydrocarbons. It consists predominantly of aliphatic, alicyclic and aromatic hydrocarbons. It may also contain small amounts of nitrogen, oxygen and sulfur compounds. This category encompasses light, medium, and heavy petroleum, as well as the oils extracted from tar sands.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

2.1 Classification of the substance or mixture:

Classification according to GHS

Flammable Liquid Cat. 2; H225

Acute toxicity Cat. 2; H330

Aspiration Toxicity Cat. 1; H304

Specific Target Organ Toxicity Single Exposure Cat. 3; H336

Germ Cell Mutagenicity Cat. 1B; H340

Carcinogenicity Cat. 1B; H350

2.2 Label elements:

Label according to GHS



Danger.

H225: Highly flammable liquid and vapour.

H330: Fatal if inhaled

H304: May be fatal if swallowed and enters airways.

H336: May cause drowsiness or dizziness.

H340: May cause genetic defects

H350: May cause cancer.

Prevention

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat, sparks, open flames and hot surfaces. – No smoking.

P233: Keep container tightly closed.

P240: Ground/bond container and receiving equipment.

P241: Use explosion-proof electrical, ventilating, lighting, and other equipment.

P242: Use only non-sparking tools.

P243: Take precautionary measures against static discharge.

P260: Do not breathe fume/gas/mist/vapours.

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P284: In case of inadequate ventilation wear respiratory protection.

Response

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTRE/doctor. P331: Do NOT induce vomiting.

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

SAFETY DATA SHEET

Section 2: Hazard Identification, continued

2.2 Label elements: (continued)

P304 +P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P310: Immediately call a POISON CENTER or doctor.
P308 +P313: IF exposed or concerned: Get medical advice/attention.
P370 +P378: In case of fire: Use water spray or appropriate foam to extinguish.

Storage

P403 +P233: Store in a well-ventilated place. Keep container tightly closed.
P235: Keep cool.
P405: Store locked up.

Disposal

P501: Dispose of contents/containers in accordance with local/regional/national/ international regulations.

2.3 Other hazards:

May release Hydrogen sulphide an extremely flammable and very toxic gas; may accumulate in the head space of closed containers or in confined spaces.
Material can accumulate static charges which may ignite vapours.
High pressure injection of crude oil under the skin can cause serious injury.
Hot crude oil will cause thermal burns to the skin.
Repeated contact causes skin dryness and cracking.

2.4 Other hazard classifications:

USA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada: This is a controlled product under WHMIS. Classification according to Controlled Products Regulations:

B2: Flammable Liquid
D1A – Immediate and Serious Toxic Effects
D2A/D2B: Material Causing Other Toxic Effects

Section 3: Composition/Information on Ingredients

The chemical composition of crude oils can vary greatly from different producing regions and even from within a particular geological formation. Crude oil is a complex mixture, consistent with the definition in the Canadian Hazardous Products Regulations. Crude oil contains highly flammable gases such as methane, ethane, propane, butane and other short-chain hydrocarbons that present an immediate flammability risk.

Crude oil contains hydrocarbons in the carbon number range from C1 to C60+. It also contains organometallic complexes, notably of sulfur and vanadium, and dissolved gases such as hydrogen sulfide. Crude oils range from thin, light colored oils consisting mainly of gasoline quality stock to heavy, thick tar-like materials. Crude oil has the following general composition:

Carbon 84%
Hydrogen 14%
Sulfur 1-3%
Nitrogen 1%
Oxygen 1%
Minerals and salts 0.1%

Hazardous Ingredients:

| Chemical Name | CAS No. | Wt. % |
|--|-----------|---------------|
| Crude oil, petroleum | 8002-05-9 | 100 |
| Common hazardous components of Crude Oil are listed below; concentrations vary depending on the source of the crude. | | |
| Benzene | 71-43-2 | Not available |
| Toluene | 108-88-3 | Not available |
| Xylene | 1330-20-7 | Not available |
| Ethylbenzene | 100-41-4 | Not available |
| Polynuclear aromatic hydrocarbons | 100-01-6 | Not available |
| Hydrogen sulphide | 7783-06-4 | Not available |

SAFETY DATA SHEET

Section 4: First Aid Measures

4.1 Description of first aid measures:

Precautions: First aid providers should avoid direct contact with this chemical. Wear chemical protective gloves, if necessary. Take precautions to ensure your own safety before attempting rescue, (e.g. wear protective equipment).

Do not attempt the rescue of an H₂S poisoning victim without the use of an appropriate respirator.

Inhalation: This material is flammable and toxic. Rescuers must take proper precautions (e.g. remove any sources of ignition, wear appropriate respiratory protection) before attempting rescue.

Remove person to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell or if exposed or concerned call a POISON CENTRE or doctor.

If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately obtain medical attention and transport victim to an emergency care facility.

Eye Contact: Rinse cautiously with water for several minutes or until the chemical is removed while holding the eyelid(s) open. Remove contact lenses if present and easy to do. Continue rinsing. If eye irritation persists get medical attention.

Skin Contact: As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Rinse skin with water or shower. Wash with plenty of soap and water. For hot crude, immediately flush affected area with large amounts of cold water and get medical attention immediately. Completely decontaminate clothing, shoes and leather goods before reuse or discard. If skin irritation or rash occurs: Get medical attention.

If crude oil is injected under the skin or into the body, get immediate medical attention.

Ingestion: If swallowed, call a POISON CENTER or doctor/physician. Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Quickly transport victim to an emergency care facility.

4.2 Most important symptoms and effects, both acute and delayed:

Inhalation: May be harmful or toxic by inhalation. High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches, drowsiness and dizziness. May cause cancer by inhalation of vapors containing benzene.

Hydrogen sulphide (H₂S) gas may be released from closed containers or if heated. Hydrogen sulfide may cause irritation to the eyes and respiratory tract. High concentrations of H₂S cause breathing failure, coma and death without necessarily any warning odour being sensed.

Eye Contact: Liquid, fumes and vapours cause eye irritation, symptoms include pain, tearing and blurred vision. Hot crude oil will cause thermal burns.

Skin Contact: Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis). Benzene may be absorbed through damaged skin and may cause blood or blood producing system disorder and/or damage. Hot crude oil will cause thermal burns to the skin. High pressure injection under the skin may cause serious damage.

Ingestion: Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects such as bronchopneumonia or pulmonary oedema.

Swallowing may cause irritation of the digestive tract, nausea, vomiting and diarrhea, and central nervous system effects.

4.3 Indication of any immediate medical attention and special treatment needed:

If H₂S is inhaled, immediately call a POISON CENTER or doctor.

High pressure injection under the skin or into the body requires immediate medical treatment.

4.4 Medical Conditions Aggravated by Exposure:

Individuals with liver disease may be more susceptible to toxic effects from exposure to crude oil containing benzene.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

5.1 Extinguishing media:

Small Fires

Dry chemical, CO₂, water spray or appropriate foam. Crude oil products have a low flash point; use of water spray when fighting fire may be inefficient, alcohol-resistant foam may be more effective.

Large Fires

Water spray, fog or appropriate foam.

Use water spray or fog; do not use straight streams.

Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

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.

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.

Foam suppliers should be consulted for recommendations regarding types of foams and application rates. Cover liquid spills with foam.

Some Crude oils have a low flash point; use of water spray when fighting fire may be ineffective to extinguish. Do not use a direct stream of water as it may spread the fire.

Move containers from fire area if you can do it without risk.

5.2 Special hazards arising from the substance or mixture:

Will be ignited by heat, sparks or flames.

Vapors may form explosive mixtures with air.

Vapors may travel to source of ignition and flash back.

Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).

Vapor explosion hazard indoors, outdoors or in sewers.

Runoff to sewer may create fire or explosion hazard.

Containers may explode when heated.

Many liquids are lighter than water.

Fire may produce irritating, corrosive and/or toxic gases including oxides of carbon, sulphur and nitrogen. Health effects (lung damage) may be delayed after exposure to combustion products.

Runoff from fire control or dilution water may cause pollution.

May accumulate static charge by flow or agitation. Vapours in the flammable range may be ignited by a static discharge.

5.3 Advice for firefighters:

Wear positive pressure self-contained breathing apparatus (SCBA).

Structural firefighters' protective clothing will only provide limited protection

If tank, rail car or tank truck is involved in a fire, isolate for 800 meters in all directions; also, consider initial evacuation for 800 meters in all directions.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

All equipment used when handling the product must be grounded.

Do not touch or walk through spilled material.

Stop leak if you can do it without risk.

Wear eye, skin and respiratory personal protective equipment.

Personnel cleaning up spills must be properly trained.

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.

Keep unauthorized personnel away.

Stay upwind.

Keep out of low areas.

Ventilate closed spaces before entering.

Short-chain hydrocarbon vapors will be emitted from the crude at the time of a spill, presenting an immediate flammability risk. Flashpoint of the spilled liquid rises following the flashing of the highly flammable vapors.

SAFETY DATA SHEET

Section 6: Accidental Release Measures

6.2 Environmental precautions:

Prevent entry into waterways, sewers, basements or confined areas.

A vapor suppressing foam may be used to reduce vapors.

Large Spills:

Dike far ahead of liquid spill for later disposal.

Water spray may reduce vapor; but may not prevent ignition in closed spaces.

In the event of a release to the environment, notify relevant authorities in accordance with applicable local and national regulations.

6.3 Methods and material for containment and cleaning up:

Absorb or cover with dry earth, sand or other commercial absorbent material.

Use clean non-sparking tools to collect absorbed material.

Carefully scoop or shovel contaminated absorbent material and transfer into suitable, covered, labeled containers for reclamation or disposal. Do not touch spilled material. Contaminated absorbent material may pose the same hazards as the spilled product. Dispose of waste and contaminated absorbent according to the directions in Section 13 of this SDS.

6.4 Reference to other sections:

See Section 1 for emergency telephone numbers in case of spill or fire.

See Section 8 for information on selection of personal protective equipment.

See Section 13 for information on disposal of spilled product and contaminated absorbents.

Section 7: Handling and Storage

7.1 Precautions for safe handling:

Follow the procedures for handling flammable liquids.

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat, sparks, open flames, and hot surfaces. – No smoking. ELIMINATE all ignition sources.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical, ventilating, lighting, and other equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe fume/gas/mist/vapours.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

In case of inadequate ventilation, or if H₂S is present, wear respiratory protection.

7.2 Conditions for safe storage, including any incompatibilities:

Follow applicable fire codes for storage of flammable liquids, e.g. NFPA 30 "Flammable and Combustible Liquid Code". Store in a well-ventilated area. Keep containers tightly closed and properly labeled. Ground/bond container and receiving equipment. Use explosion-proof electrical, ventilating, lighting and other equipment.

Follow guidelines for cleaning of storage tanks such as API Recommended Practice 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API Recommended Practice 2015 "Cleaning Petroleum Storage Tanks."

Crude oils may release very toxic and extremely flammable hydrogen sulfide gas (H₂S). In a tank, barge or other closed container, the vapor space above this material may accumulate H₂S. Check atmosphere for oxygen content, H₂S, and flammability prior to entry.

Empty containers contain explosive vapours and other hazardous substances. Do not cut, weld, braze, solder, drill, grind, pressurize crude oil containers or expose them to heat, flame, sparks, or other sources of ignition. Refer to occupational health and safety regulations or ANSI Z49.1, and other references for guidance pertaining to cleaning, repairing, cutting or welding.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Canada-Provincial TWA</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|--|--|---|---|
| Hydrogen sulphide | Alberta <ul style="list-style-type: none"> 10 ppm 15-minute Ceiling: 15 ppm British Columbia <ul style="list-style-type: none"> Ceiling: 10 ppm Saskatchewan <ul style="list-style-type: none"> 8-hour TWA: 10 ppm 15 minute average contamination limit: 15 ppm | 1ppm STEL: 5 ppm | 10 ppm STEL: 15 ppm Ceiling: 20 ppm |
| Benzene | Alberta <ul style="list-style-type: none"> 0.5 ppm STEL: 2.5 ppm Designated substance; requires code of practice A1 Confirmed human carcinogen Substance readily absorbed through intact skin British Columbia <ul style="list-style-type: none"> 0.5 ppm STEL: 2.5 ppm Skin notation A1 Confirmed human carcinogen Saskatchewan <ul style="list-style-type: none"> Designated substance | 0.5 ppm STEL: 2.5 ppm Skin; BEI A1 Confirmed human carcinogen | 1 ppm STEL: 5 ppm OSHA Carcinogen |
| Toluene | Alberta: <ul style="list-style-type: none"> 50 ppm British Columbia: <ul style="list-style-type: none"> 20 ppm; R Saskatchewan: <ul style="list-style-type: none"> 50 ppm; Skin 60 ppm -15 minute average contamination limit | 20 ppm BEI | 100 ppm STEL: 150 ppm |
| Xylene | Alberta: <ul style="list-style-type: none"> 100 ppm 150 ppm STEL British Columbia: <ul style="list-style-type: none"> 100 ppm 150 ppm STEL Saskatchewan: <ul style="list-style-type: none"> 100 ppm 60 ppm -150 minute average contamination limit | 100 ppm STEL: 150 ppm BEI | 100 ppm STEL: 150 ppm |
| Ethylbenzene | Alberta: <ul style="list-style-type: none"> 100 ppm 125 ppm STEL British Columbia: <ul style="list-style-type: none"> 100 ppm 125 ppm STEL Saskatchewan: <ul style="list-style-type: none"> 100 ppm; T20 60 ppm -125 minute average contamination limit | 20 ppm BEI | 100 ppm STEL: 125ppm |
| Other Exposure guidelines: <ul style="list-style-type: none"> NIOSH REL for H₂S: 10 ppm 10-minute. IDLH: 100 ppm | | | |

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Exposure controls:

Engineering Controls: Provide ventilation sufficient to keep exposure to airborne substances below the exposure limits and below any explosive limits. Methods include a closed handling system with leak and fire detection equipment, and suitable automatic fire suppression system. For open handling methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

Monitor the workplace air to determine the effectiveness of ventilation and the necessity for personal respirators.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear chemical safety goggles or or full-face respirator when needed to prevent exposure to liquid, vapour or fume.

Skin Protection: Wear chemical protective gloves for all conditions of handling. Wear chemical protective boots and clothing for open handling of liquid and when there is the risk of contact with the skin. Recommended glove materials are nitrile or neoprene. Evaluate resistance under conditions of use and maintain protective clothing carefully. Consult safety supplier for glove, boot and clothing specifications.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets the regulatory requirement, such as Canadian Standards Association (CSA) Standard Z94.4, must be followed whenever workplace conditions warrant a respirator's use.

Other: Do not smoke in work areas. Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before rewearing. Inform laundry personnel of contaminant's hazards. Do not smoke, eat or drink in work areas. Wash hands thoroughly after work and before eating, drinking, smoking or using the toilet.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Liquid. Appearance can vary from clear, light to dark viscous liquid. |
| Odour: | Hydrocarbon odour. May have sulphur or rotten egg (H ₂ S) odour. |
| Odour threshold: | Not available |
| pH: | Not applicable |
| Relative Density (water = 1): | 0.7-0.95 |
| Melting point/freezing point: | -60 to -20°C |
| Initial boiling point and boiling range: | Not available |
| Flash point: | Varies; approximately -20 to 93°C |
| Auto-ignition temperature: | Not available |
| Upper/lower flammability or explosive limits: | Not available |
| Explosive properties: | Vapour mixtures with air may be explosive. |
| Oxidizing properties: | Not available |
| Sensitivity to mechanical impact: | Not available |
| Sensitivity to static discharge: | Vapours in the flammable range may be ignited by a static discharge. |
| Evaporation rate: | Not available |
| Vapour pressure: | Not available |
| Vapour density: | Not available |
| Solubility: | Low solubility in water. Some components are soluble in water. |
| Partition coefficient (n-octanol/water): | Not available |
| Critical temperature: | Not available |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | Not available |

SAFETY DATA SHEET

Section 10: Stability and Reactivity

10.1 Reactivity:

Not classified for reactivity hazards.

10.2 Chemical Stability:

Normally stable. H₂S, if present, is a strong reducing agent and is highly reactive.

10.3 Possibility of Hazardous Reactions:

None known.

10.4 Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

10.5 Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion.

10.6 Hazardous Decomposition Products:

Hydrocarbon vapours, carbon monoxide, carbon dioxide, aldehydes and ketones, Phosgene gas, sulphur oxides, nitrogen oxides and phosphorus oxides may form as products of decomposition or combustion.

Section 11: Toxicological Information

11.1 Information on toxicological effects:

Likely routes of exposure

Inhalation; skin contact; skin absorption; eye contact.

Acute Toxicity

Inhalation: Breathing vapours may cause drowsiness and dizziness.

Danger! Product may contain Hydrogen sulphide (H₂S) gas which can be fatal if inhaled. H₂S gas may be released from closed containers and from heated crude oil. H₂S may cause irritation to the eyes and respiratory tract. High concentrations of H₂S cause breathing failure, coma and death without necessarily any warning odour being sensed. Airborne H₂S concentrations 1-5 ppm have a moderately offensive odour, may cause nausea and/or headaches with prolonged exposure. Airborne concentrations of 100 -200 ppm cause severe nose, throat and lung irritation; the ability to smell odour completely disappears. Over-exposure to H₂S can cause pulmonary edema, a potentially fatal build-up of fluid in the lungs in the absence of central nervous system effects (headache, nausea, dizziness) especially if exposure is prolonged. Over-exposure to H₂S causes excitement, headache, dizziness, staggering and sudden collapse ("knockdown"). Exposures above 500 ppm rapidly cause unconsciousness and death.

Ingestion: Aspiration hazard, small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects such as bronchopneumonia or pulmonary edema.

Swallowing may cause irritation of the digestive tract, nausea, vomiting and diarrhea, and central nervous system effects.

Skin: Some harmful components, such as benzene, may be absorbed through the skin.

Acute Toxicity Data

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(ppm, 4 hrs.)</u> |
|-----------------------------------|---|---|---|
| Crude oil, petroleum | >4 300 (rat) | >2 000 (rabbit) | Not available |
| Benzene | 930 (rat) | >9400 (rabbit) | 13700 |
| Toluene | 2600 (rat) | 12225 (rabbit) | 8800 (rat) |
| Xylene | 5251 (mouse) | 12180 (rabbit) | 6350 (rat) |
| Ethylbenzene | 3500 (rat) | Not available | 4000 (rat) |
| Polynuclear aromatic hydrocarbons | 750 (rat) | >500 (guinea pig) | Not available |
| Hydrogen sulphide | Not available | Not available | 335 (mouse) |

SAFETY DATA SHEET

Section 11: Toxicological Information, continued

Skin corrosion / irritation

May cause skin irritation or a rash. Repeated contact may cause skin dryness or cracking. Hot crude oil will cause serious thermal burns to the skin.

Serious eye damage / irritation

Data are not available. Contact with vapours, liquid and mist may cause irritation with redness, swelling, pain and watering of the eyes.

STOT (Specific Target Organ Toxicity) – Single Exposure

Exposure to some hydrocarbon vapors, including toluene, may cause narcotic effects including drowsiness and dizziness. Narcotic effects may occur when exposed to low boiling point petroleum gases, gasoline and naphtha.

H₂S, if present, is acutely toxic to the central nervous system. Permanent or persistent nervous system effects following an acute exposure to H₂S have included fatigue, anxiety, irritability, intellectual decline, reduced attention span, impaired learning and memory, altered sense of smell, and motor deficits.

STOT (Specific Target Organ Toxicity) – Repeated Exposure

Contains benzene. Human health studies indicate that prolonged and/or repeated overexposures to benzene may cause damage to the blood producing system (particularly the bone marrow) and serious blood disorders including leukemia. The 90 day LOAEL for hematological effects from exposure to benzene is reported as 8050 mg/m³, which does not meet the classification criteria of the GHS for STOT RE effects (IPIECA 2010).

Aspiration hazard

May cause lung damage if aspirated based on physical and chemical properties. Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects such as bronchopneumonia or pulmonary oedema.

Sensitization - respiratory and/or skin

Not known to cause respiratory or dermal sensitization.

Carcinogenicity

Contains benzene. Human health studies indicate that prolonged and/or repeated overexposures to benzene may cause damage to the blood producing system (particularly the bone marrow) and serious blood disorders including leukemia. Benzene is listed by the International Agency For Research on Cancer (IARC), ACGIH® and National Toxicology Program (NTP), as carcinogenic in humans.

Contains Ethylbenzene. The International Agency for Research on Cancer has evaluated ethylbenzene and classified it as a possible human carcinogen (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed human.

Contains polynuclear aromatic hydrocarbons (PAHs). Animal tests have shown that prolonged and/or repeated exposure to certain PAHs can cause cancer of the skin, the lung and other organs. Several 3-7 fused-ring PAHs are classified as Group 1 or 2 carcinogens by IARC. Petroleum products containing PAH's present a carcinogenic hazard to skin.

Reproductive toxicity

Development of offspring: Contains Toluene. High exposures to toluene in some animal studies have been reported to cause health effects on the developing embryo/fetus. Fetotoxicity (reduced fetal weight), behavioral effects (effects on learning and memory) and hearing loss (in males) have been observed in the offspring of rats exposed by inhalation to 1200 or 1800 ppm toluene. These effects were observed in the absence of maternal toxicity.

IPIECA has evaluated Weight of evidence for developmental toxicity and recommends that petroleum products containing 3% or more of toluene be classified for developmental toxicity. These crude products contain less than 2% toluene and are not classified for developmental effects.

Sexual function and fertility: Conclusions cannot be drawn from the information available.

Effects on or via lactation: Conclusions cannot be drawn from the information available.

Germ cell mutagenicity

Data are not available. Data for Benzene: In vitro tests using human lymphocytes and animal cells exposed to benzene has resulted in chromosomal aberrations.

Interactive effects

Crude oils contain varying concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) which are known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. Symptoms are similar to severe sunburn which reverse following removal of exposures. Continued exposure to sunlight may cause skin discoloration, skin eruptions and possible skin cancers.

SAFETY DATA SHEET

Section 12: Ecological Information

12.1 Toxicity:

Ecotoxicology data specific to these crude oil products are not available. In general, Crude oil should be considered harmful to aquatic organisms and may cause long-term adverse effects in the aquatic, marine and terrestrial environments.

A wide variation in the response of organisms to oil exposures has been noted. The larvae of fish and crustaceans appear to be most susceptible to the water-soluble fraction of crude oil. Birds and other animals are susceptible to the physical fouling effects of oil.

12.2 Persistence and degradability:

Crude oils are considered not readily biodegradable.

Crude oil hydrocarbons are biodegraded at different rates. n-Alkanes are readily degraded in sea water, since many micro-organisms can utilize them. Branched-chain or iso-alkanes are less readily biodegraded but they do ultimately biodegrade. The degradation of cycloalkanes has not been extensively studied, but the ring structure is resistant to biodegradation.

Aromatic hydrocarbons are also resistant to biodegradation, but a few micro-organisms are able to utilize them. High molecular weight compounds, the tars and asphaltenes, degrade very slowly.

12.3 Bioaccumulative potential:

Not available

12.4 Mobility in soil:

Crude oils contain substances that may be mobile in soil and contaminate groundwater.

Section 13: Disposal Considerations

13.1 Waste treatment methods:

Do NOT discard into any sewers, on the ground or into any body of water.

Store material for disposal as indicated in Section 7 Handling and Storage.

Empty containers may retain highly flammable and hazardous product residue, adhere to warnings after container has been emptied. Do not cut, weld, grind, drill or otherwise expose containers to sources of ignition such as heat, flame and spark as it may cause explosion.

Refer to regulatory guidance for risk management relating to drum and tank cleaning and disposal.

Dispose of waste in accordance with relevant national, regional and local environmental control provisions.

Section 14: Transport Information

14.1 UN Number:

UN1267

14.2 Shipping name:

PETROLEUM CRUDE OIL

14.3 Transport hazard class(es):

Class 3

14.4 Packing group:

Not determined

Packing group is dependent on boiling point of the material.

14.5 Environmental hazards:

Harmful to aquatic life with long lasting effects.

14.6 Special precautions for user:

Emergency response guide 128

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Not available

SAFETY DATA SHEET

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

B2 - Flammable liquid

D1A – Immediate and serious toxic effects

D2A – Material causing other toxic effects – Carcinogenicity, Embryotoxicity

D2B – Material causing other toxic effects – skin and eye irritation.

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: Benzene, Toluene, Xylenes, Ethylbenzene and hydrogen sulphide are NPRI reportable component substances.

Section 16: Other Information

Issue date: March 11, 2015

Revision summary: Previous version: March 1, 2012
Updated SDS template. Revised in all sections

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine

Cheminfo – Canadian Centre for Occupational Health and Safety

RTECS – Registry of Toxic Effects of Chemical Substances

Agency for Toxic Substances and Disease Registry ATSDR-Toxicological Profile for Polycyclic Aromatic Hydrocarbons.

IPIECA-Guidance on the application of Globally Harmonized System (GHS) criteria to petroleum substances. June 2010

American Petroleum Institute API-Safety Data Sheets: Petroleum Industry Practices

Additional information:

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Methanol
SDS record # 010
Alternate names: Methyl alcohol, Methyl hydrate, Methyl hydroxide, Wood alcohol

Product uses:

Raw material; industrial uses.
Intermediate SDS prepared for AltaGas Ltd. for Methanol used in various operations.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Classification of the substance according to GHS:

Flammable liquid - Category 2; H225
Acute toxicity (Oral, Dermal, Inhalation) - Category 3; H301+H311+H331
Serious eye damage/eye irritation - Category 2B; H320
Toxic to reproduction - Category 2; H361
Specific target organ toxicity (single exposure) - Category 1; H370

GHS Label elements:



Highly flammable liquid and vapour.
Toxic if swallowed, in contact with skin and if inhaled.
Causes damage to organs (eyes, nervous system) if inhaled, following skin contact and/or if swallowed.
Suspected of damaging the unborn child if inhaled, following skin contact and/or if swallowed.
Causes eye irritation.

Prevention:

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical, ventilating, lighting, and other equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe fume, gas, mist, spray, vapours.
Wash hands and skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.

Response

IF SWALLOWED: Immediately call a POISON CENTRE/doctor.
Rinse mouth.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Call a POISON CENTRE/doctor if you feel unwell.
Take off immediately all contaminated clothing and wash it before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTRE/doctor.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

Storage

Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal

Dispose of contents/container in accordance with local, regional, national and international regulations.

WHMIS:

Controlled product by WHMIS criteria.



- B2 – Flammable Liquid
- D1B – Immediate and Serious Toxic Effects
- D2A & D2B – Other Toxic Effects

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Toxic in contact with skin; can be absorbed through the skin and harmful effects have been reported by this route of exposure. In most cases, inhalation exposure would have also occurred at the same time. Symptoms of toxicity are expected to be the same as those described for Inhalation.

Eye contact: Methanol is a mild to moderate eye irritant.

Inhalation: Toxic by inhalation. Methanol can form high vapour concentrations at room temperature. Inhalation is the most common route of occupational exposure. Methanol causes mild central nervous system (CNS) depression with symptoms such as nausea, headache, vomiting, dizziness, loss of coordination and an appearance of drunkenness. A time period with no obvious symptoms follows (typically 8-24 hours, but may last several hours to 2 days). This latent period is then followed by development of metabolic acidosis and severe visual effects. Symptoms such as headache, dizziness, nausea and vomiting, followed in more severe cases by abdominal and muscular pain and difficult periodic breathing have been observed. Coma and death, usually due to respiratory failure, may occur if medical treatment is not received. Visual effects may include reduced reactivity and/or increased sensitivity to light, blurred, double and/or snowy vision, and blindness. Inhalation can cause adverse effects to vision, including increased sensitivity to light, blurred vision, optic nerve damage and permanent blindness.

Ingestion: Toxic if swallowed. Symptoms of toxicity are the same as those described for Inhalation. Methanol can be aspirated (breathed) into the lungs during ingestion or vomiting. Aspiration of methanol could cause a potentially fatal accumulation of fluid in the lungs (pulmonary edema).

Chronic Health Effects:

Long-term, high-level exposure may cause central nervous system (CNS) effects and visual disorders.

May cause harm to the unborn child; Methanol has caused fetotoxic or teratogenic effects, in the absence of maternal toxicity in animal studies.

Repeated contact may cause skin dryness and cracking.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

Increased risk of explosion when in contact with strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Methanol can cause adverse effects to aquatic and terrestrial environments. Regulated as a hazardous pollutant in air.

SAFETY DATA SHEET

Section 3: Composition/Information on Ingredients

Hazardous Substances:

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt. %</u> |
|----------------------|----------------|--------------|
| Methanol | 67-56-1 | 60 – 100 |

Section 4: First Aid Measures

Description of first aid measures:

Rescuers must take proper precautions (e.g. remove any sources of ignition, avoid direct contact with the victim and wear appropriate skin and respiratory protection) before attempting rescue.

Rapid medical treatment is needed following exposure to methanol by ingestion and inhalation.

Skin Contact: As quickly as possible, flush with lukewarm, gently flowing water for at least 20 minutes or until the chemical is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Obtain medical advice immediately. Completely decontaminate clothing before re-use or discard. Discard contaminated shoes and leather goods.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately.

Inhalation: This material is toxic and flammable. Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Immediately transport victim to an emergency care facility.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Nausea, dizziness, drowsiness, visual disturbances, unconsciousness. Skin dryness and cracking.

Eye Contact: If in eyes: may cause serious eye damage. May irritate or burn the eyes. Permanent damage including blindness may result.

Inhalation: If inhaled and/or swallowed and/or on skin: symptoms may include headache, nausea, dizziness, drowsiness and confusion. A severe exposure can cause unconsciousness. Delayed effects include metabolic acidosis, severe visual effects including blindness, abdominal pain and difficult breathing. Permanent blindness, coma and death may result if medical treatment is not received.

Ingestion: Nausea, dizziness, drowsiness, visual disturbances, unconsciousness.

Section 5: Fire Fighting Measures

Flammable properties:

Flammable liquid and vapour [Flashpoint = 11°C (52°F)].

Extinguishing media:

Alcohol-resistant foam, carbon dioxide, dry chemical powder or water spray. Water may be ineffective because it will not cool methanol below its flash point. Use water spray or fog; do not use straight streams.

Special hazards arising from the substance or mixture:

Can readily form explosive mixtures with air, at or above 11°C over a wide concentration range, and may be ignited by a source of ignition of sufficient energy.

Burns with a clear, almost invisible light blue flame.

During a fire, irritating and toxic gases, such as formaldehyde may be generated.

Can accumulate in confined spaces, resulting in a toxicity and flammability hazard.

Runoff to sewer may create fire or explosion hazard.

Vapours may travel to source of ignition and flash back.

Vapor explosion and poison hazard indoors, outdoors or in sewers.

Containers may explode when heated.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures, continued

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Cool exposed containers with water.

Fires 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.

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.

If a tank or rail car is involved in a fire, isolate for 800 m in all directions; also consider initial evacuation for 800 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Isolate the spill or leak area and prevent entry of unauthorized personnel. Ventilate closed spaces before entering. Wear personal protective equipment, including respiratory protection (e.g. chemical protection suit and SCBA, see Section 8)..

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).

All equipment used when handling the product must be grounded.

Do not touch or walk through spilled material.

Stop leak if you can do it without risk.

Prevent spreading of vapours through sewers, ventilation systems and confined areas.

A vapour suppressing foam may be used to reduce vapours.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

SMALL SPILLS: Collect leaking liquid in sealable containers. Soak up spilled liquid with absorbent, non-combustible material which does not react with spilled chemical. Put material in suitable, covered, labeled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product.

LARGE SPILLS: Contact fire and emergency services for advice. Dike far ahead of liquid spill for later disposal. Water spray may reduce vapour but may not prevent ignition in closed spaces.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

Highly flammable liquid and vapour. Do not heat methanol container. Eliminate all ignition sources (e.g. sparks, open flames, hot surfaces). Prevent release of vapour and mist into workplace air. Never perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all liquid and vapours have been cleared. Post "NO SMOKING" signs. Keep aisles and exits free of obstruction. It is very important to keep areas where this material is used clear of other materials which can burn. Do not use with incompatible materials such as strong oxidizing agents, mineral and organic acids and metals. Make sure containers are labeled clearly. Avoid damaging containers. Regularly check containers for evidence of corrosion or leakage. During transfer operations containers and vessels should be electrically grounded and bonded to prevent the build-up of a static charge. Never return contaminated material to its original container. Keep containers closed when not in use. Empty containers may contain hazardous residues. Keep suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping.

Storage

Store this material in a cool, dry, well-ventilated area away from oxidizing materials and corrosive atmospheres, in a fireproof area. Keep amount in storage to a minimum. Keep storage area separate from work areas. Do not store below ground level, or in confined spaces. Ground floor storage facilities are usually recommended. Store away from work process and production areas, elevators, loading docks, building and room exits or main aisles leading to exits. Have appropriate fire extinguishers and spill clean-up equipment in or near storage area. Ground all containers and storage vessels. Store away from heat and ignition sources and out of direct sunlight.

SAFETY DATA SHEET

Section 7: Handling and Storage, continued

Inspect all incoming containers to make sure they are properly labeled and not damaged. Always store in original containers. Keep containers tightly closed when not in use. Avoid bulk storage indoors.

Keep empty containers in separate storage area. Protect from damage. Empty containers may contain hazardous residues. Keep closed.

Storage facilities should be made of fire resistant materials. Use a grounded, non-sparking ventilation system, approved explosion-proof equipment and intrinsically safe electrical systems.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Canada-Provincial TWA</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|-------------------|--|--|--------------------------------------|
| Methanol | Alberta <ul style="list-style-type: none"> • 200 ppm TWA; 250 ppm STEL British Columbia <ul style="list-style-type: none"> • 200 pp TWA; 250 ppm STEL Saskatchewan <ul style="list-style-type: none"> • 200 ppm TWA; 250 ppm STEL | 200 ppm ; 250 ppm STEL Skin; BEI | 200 ppm |

Exposure controls:

Engineering Controls: Engineering methods include mechanical (local exhaust) ventilation, process or personnel enclosure and control of process conditions. Stringent measures such as enclosure should be considered because of the high potential hazard associated with this substance. For large-scale operations, consider the installation of leak and fire detection equipment along with a suitable, automatic fire suppression system. Use a non-sparking, grounded, ventilation system separate from other exhaust ventilation systems.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear safety goggles, a face shield or other appropriate full-face protection (e.g. full-face respirator).

Skin Protection: Skin absorption hazard; wear chemical protective gloves, clothing and boots. Remove protective clothing immediately if it becomes wet with methanol.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Up to 2000 ppm: SAR (supplied-air respirator)

Up to 5000 ppm: SAR operated in a continuous-flow mode.

Up to 6000 ppm: SAR with a tight-fitting facepiece operated in a continuous- flow mode; or Full-facepiece SCBA (self-contained breathing apparatus) or Full-facepiece SAR.

Other: Workplaces should have a safety shower and eye-wash fountain readily available in the immediate work area. Keep contaminated clothing in closed containers; launder before rewearing or discard; inform laundry personnel of hazards. No eating, drinking or smoking in the work area.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Liquid, colourless |
| Odour: | Mild, characteristic alcohol odour, when pure. Crude methanol may have a repulsive, pungent odour. |
| Odour threshold: | Varies. Approx. 160 ppm |
| pH: | Not available |
| Melting point/freezing point: | -97.8 °C (-144 °F) |
| Initial boiling point and boiling range: | 64.7 °C (148.5 °F) |
| Flash point: | 11°C (52°F) (closed cup) |
| Auto-ignition temperature: | Reported values vary; 385 °C (725°F); 464-470 °C (867-878°F) |
| Upper/lower flammability or explosive limits: | LEL: 5.5% UEL: 36% |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour explosion. |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not available |
| Sensitivity to static discharge: | Sensitive, Minimum Ignition Energy = 0.14 millijoules at 14.7% by volume. |
| Evaporation rate: | 4.1 (n-Butyl Acetate = 1) |
| Vapour pressure: | 12.8 kPa (96 mm Hg) at 20°C |
| Vapour density: | 1.1 (air = 1) |
| Relative density: | 0.791 at 20°C |
| Solubility: | Soluble in water; soluble in ethanol, other alcohols and organic solvents. |
| Partition coefficient (n-octanol/water): | Log P _{oct} = -0.82 (estimated) |
| Critical temperature: | -0.82 |
| Critical pressure: | -0.82 |
| Decomposition temperature: | Not available |
| Viscosity: | 0.75 mm ² /s (0.75 centistokes) at 20°C |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Decomposes on heating to produce carbon monoxide and formaldehyde.

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

Incompatible Materials:

Incompatible with strong oxidizing agents, hydrogen peroxide, mineral acids, organic acids, acid anhydrides, acid chlorides, metals, carbon tetrachloride, alkali metals, acetyl bromide, dichloromethane, perchloric acid, metal perchlorates, potassium tert-butoxide, alkylaluminum solutions, beryllium hydride, cyanuric chloride, isocyanates, tetraphosphorus hexaoxide and diethyl zinc.

Methanol attacks some plastics and elastomers. Methanol is corrosive to some types of iron, steel, brass and aluminum.

Hazardous Decomposition Products:

Carbon monoxide, formaldehyde.

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data: Evidence from accidental human exposures indicates that Methanol is more toxic to humans than to most experimental animal species.

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|--|
| Methanol | 5 628 (rat) | 15 800 (rabbit) | 64 000 ppm (rat) |

Chronic Toxicity Data:

Case reports and human population studies have suggested that long-term, high-level exposure may cause central nervous system (CNS) effects and vision disorders.

Sensitization:

Not sensitizing in animal tests.

Neurological Effects:

Methanol causes mild central nervous system (CNS) depression with symptoms such as nausea, headache, vomiting, dizziness, loss of coordination and an appearance of drunkenness. Depending on the severity of poisoning, symptoms may be reversible or may cause permanent blindness, vision disturbances and/or nervous system effects.

Genetic Effects:

Not available

Reproductive Effects:

Not available

Developmental Effects:

Methanol has produced fetotoxicity in rats and teratogenicity in mice exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

Target Organ Effects:

Eyes, central nervous system.

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists), OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Toxicologically Synergistic Products:

In animals, high concentrations of methanol can increase the toxicity of other chemicals, particularly liver toxins like carbon tetrachloride.

Section 12: Ecological Information

Toxicity:

Methanol may be harmful to aquatic and terrestrial organisms. Regulated as a hazardous pollutant in air.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not available

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

SAFETY DATA SHEET

Section 14: Transport Information

Transport symbol:



UN Number: UN1230
UN proper shipping name: METHANOL
Transport hazard class(es): 3 (6.1)
Packing group: II
Emergency response guide: 131

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.**OSHA:** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.**WHMIS Classification:**

- B2 – Flammable Liquid
- D1B – Immediate and Serious Toxic Effects – toxic by inhalation, in contact with skin and if swallowed.
- D2A – Other Toxic Effects - fetotoxic and teratogenic effects observed in animals
- D2B – Other Toxic Effects – eye irritation

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).**National Pollutant Release Inventory:** Methanol is an NPRI reportable substance.

Section 16: Other Information

Issue date: December 16, 2013**Revision summary:** Previous version: January 4, 2011
Revised Sections 2, 5, 6, 7, 8, 11.**References and sources for data:**

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

Manufacturer disclaimer

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Naturally Occurring Radioactive Materials

SDS record # 011

Alternate names: NORM; Technically Enhanced Naturally Occurring Radioactive Materials (TENORM)

Product uses:

Oil and gas production and processing operations sometimes cause naturally occurring radioactive materials (NORM) to accumulate at elevated concentrations in by-product waste streams. The primary radionuclides of concern are isotopes of radium that originate from the decay of uranium and thorium naturally present in the subsurface formations from which oil and gas are produced. Process equipment (e.g., lines, filters, pumps and reaction units) may accumulate radioactive decay products and emit gamma radiation during operation. Equipment emitting gamma radiation may be presumed to be internally contaminated with alpha-emitting decay products that may be a hazard if inhaled or ingested. Consult applicable NORM regulations for worker protection guidelines and handling requirements before initiating maintenance operations that require opening contaminated equipment. In Canada, The NORM Working Group, of the Federal Provincial Territorial Radiation Protection Committee has assembled Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM).

Supplier of the Safety Data Sheet:

AltaGas Ltd.

1700, 355 4th Avenue SW

Calgary, AB

T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Emergency Overview:

The principle hazard from NORM is from ionizing radiation particularly the potential inhalation of airborne radioactive particles. Radioactive particles in air or radon gas attached to dust particles may be inhaled and deposited in the trachea, bronchial tree or lungs.

Radon is a radioactive gas produced by the decay of radium isotopes in both the uranium and thorium radioactive decay series. As it is a gas, radon can be carried away from its origin by air or water flows, and released into workplace air. Radon gas can accumulate in buildings.

Over-exposures to NORM may induce cancer, cause genetic damage, tissue damage and/or developmental effects in the unborn child.

NORM has no odour, colour or taste associated with its radioactivity and will have no immediate signs or symptoms of exposure.

The processing of raw materials by many resource-based industries may increase the concentration of radioactive substances in those materials, to levels at which special precautions are needed for handling, storing, transporting, and disposal of material, by-products, end-products or process equipment.

WHMIS:

Not regulated under WHMIS.

Refer to the Canadian Guidelines for the management of NORM and The Federal Provincial Territorial Radiation Protection Committee (FPTRPC).

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation. Ingestion

Skin contact: No symptoms of immediate adverse effects are expected. Skin contact to dusts containing NORM may cause long-term tissue damage.

Eye contact: No symptoms of immediate adverse are expected. Contact to dusts containing NORM may cause long-term tissue damage.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Inhalation: An individual may receive an "internal" exposure to a radioactive substance, by inhaling radioactive gas or particles suspended in the air. The material may remain in the body for some time after the intake. No symptoms of acute poisoning are expected.

Overexposure by inhalation to inhaled dusts containing radioactive uranium, thorium and radium may cause lung cancer.

Ingestion: An individual may receive an "internal" exposure to a radioactive substance by ingesting radioactive dust. No symptoms of acute poisoning are expected.

Chronic Health Effects:

Over-exposures to NORMs may induce cancer, cause genetic damage, tissue damage and/or developmental effects in the unborn child. Radiation to terminal airways may lead to emphysema and pulmonary fibrosis.

Medical Conditions Aggravated by Exposure: Not available

Interactions With Other Chemicals:

Not available

Potential Environmental Effects:

Not available

Section 3: Composition/Information on Ingredients

Hazardous Substances:

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Approximate Concentration</u> |
|--|-----------------|---|
| Long-lived radioactive elements of interest include uranium, thorium and potassium, and any of their radioactive decay products, such as radium and radon. | No Specific CAS | Radium 226 and Thorium 232 may range from less than 1 to 1800 picocuries per gram, or higher in infrequent instances. Radon is a radioactive gas produced by the decay of radium isotopes in both the uranium and thorium radioactive decay series. |

Although the concentration of NORM in most natural substances is low, higher concentrations may arise as the result of human activities. For example, calcium scale precipitated from oil recovery brine may contain radium at greater concentrations than the water source itself.

Section 4: First Aid Measures

Description of first aid measures:

Rescuers, should take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment).

Skin Contact: Wash the affected area thoroughly with soap and water.

Eye Contact: Remove source of contamination or move victim to fresh air. If irritation occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. Obtain medical advice.

Inhalation: Remove source of contamination or move victim to fresh air.

Ingestion: Not an applicable route of exposure.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures

Flammable properties:

Not flammable

Extinguishing media:

Use appropriate media for the surrounding material.

Special hazards arising from the substance or mixture:

NORM is not flammable and does not support combustion.

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location.

Move containers from fire area if you can do it without risk.

Wear full protective gear including self-contained breathing apparatus.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Restrict access to area until completion of cleanup.

Wear appropriate respiratory protection and protective clothing.

Do not touch or walk through spilled material.

Stop leak if you can do it without risk.

Environmental precautions:

If NORM material is released, steps should be taken to contain or prevent discharges to the environment and to control or stop release of NORM material into the air as dust.

Methods and material for containment and cleaning up:

Clean up should be continued until residual radioactivity levels return to background levels.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Workers must be trained regarding the hazards and safety procedures for NORM.

Areas where NORM is present or stored should be surveyed as often as necessary to ensure exposure limits are not exceeded. Assess the work site periodically to measure changes in conditions and to facilitate worker dose calculations.

Follow good hygiene and handling procedures to prevent any unnecessary contact with NORM.

Estimates should be made of the effective dose to workers and the public resulting from the following exposure pathways:

External gamma exposure.

Ingestion of NORM-containing materials.

Inhalation of NORM-containing dust.

Inhalation of radon gas and its radioactive decay products.

Storage

Store in isolated areas to which access can be controlled or limited. These areas should be clearly posted and identifiable.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

The following dose limits were obtained from the Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM), referred to as "the Guidelines".

ICRP suggests that for the control of public exposure an appropriate value for the dose constraint is 0.3 mSv in a year. In keeping with this suggestion the Canadian NORM Guidelines have adopted 0.3 mSv/a as its first investigation level.

Investigation Threshold: An incremental dose of 0.3 mSv/a, the dose constraint value set in section 2.4.3, is adopted as the NORM Investigation Threshold. Where doses to workers or members of the public may exceed this value, a site-specific assessment should be carried out.

NORM Management Threshold: An assessed incremental dose to the public or workers of greater than 0.3 mSv/a, the dose constraint value set in section 2.4.3 and the Investigation Threshold, is adopted as the NORM Management Threshold.

Dose Management Threshold: An assessed incremental dose of 1 mSv/a to a worker is adopted as the Dose Management Threshold.

It is the recommendation of the Federal Provincial Territorial Radiation Protection Committee that the annual incremental effective dose to persons exposed to NORM as the result of a work practice be limited to the values given in the following table.

These dose limits are the foundation for all other radiation protection program recommendations contained in the *Guidelines*; are harmonized with the radiation dose limits recommended by the Canadian Nuclear Safety Commission for Nuclear Fuel Cycle; and incorporate the recommendations of ICRP Publication 60.

The sievert (Sv) is the unit of Effective Dose of radiation, and accounts for the total effect of different types of radiation on different parts of the body. Most occupational doses are in the millisievert range, or mSv. Regulations express the dose on a yearly basis, as millisieverts per annum or mSv/a. The life-time dose that will be received from an internal exposure is the "committed dose," also expressed in sieverts.

| Table Radiation Dose Limits | | |
|--|---|--|
| Affected Group | Annual Effective Dose Limit (mSv) ^(a) | Five Year Cumulative Dose Limit (mSv) |
| Occupationally Exposed Workers ^(b) | 20 ^(c) | 100 |
| Incidentally Exposed Workers and Members of the Public | 1 | 5 |

Notes:

- These limits are exclusive of natural background and medical exposures. Refer to Appendix D of the Guidelines for guidance on dose limit calculations.
- For the balance of a known pregnancy, the effective dose to an occupationally exposed worker must be limited to 4 mSv as stipulated in the "Radiation Protection Regulations", Canadian Nuclear Safety Act.
This limit may differ from corresponding dose limits specified in current provincial legislation applicable for exposure to sources of x-rays.
- For occupationally exposed workers, a maximum dose of 50 mSv in one year is allowed, provided that the total effective dose of 100 mSv over a five-year period is maintained. This translates into an average limit of 20 mSv/a.

Occupationally Exposed Workers are employees who are exposed to NORM sources of radiation as a result of their regular duties. They are classified as NORM Workers working in an occupational exposure environment, and their average annual effective dose should not exceed 20 mSv (see Table 2.1 note c, for exception).

Incidentally Exposed Workers are employees whose regular duties do not include exposure to NORM sources of radiation. They are considered as members of the public who work in an occupational exposure environment and, as such, the annual effective dose limit for these workers is 1 mSv.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure controls:

Engineering Controls: Use engineering controls at the source of airborne radioactive material. Controls include capture ventilation at the source to prevent escape into the air, and room ventilation rate increase.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled. Protective equipment (coveralls, gloves and a respirator with HEPA filters, or supplied-air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion or inhalation of any NORM contaminated residue.

Eye/Face Protection: Wear a face shield or safety goggles or other appropriate full-face protection (e.g. full-face respirator).

Skin Protection: Wear appropriate working clothes with long-sleeves and long-pants.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits/dose limits are exceeded then respiratory protection is required.

If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Estimate doses to members of the public, and workers by conducting a radiation survey of the workplace/ worksite. The survey should be conducted by a person knowledgeable in radiation protection and should include evaluations of both gamma dose-rates and airborne radioactivity as required.

Other: Use good personal hygiene practices. If skin contact should occur, material should be washed away with a mild soap and water. Wash hands and other exposed areas thoroughly before eating, drinking, smoking or using toilet facilities. Do not smoke, drink or eat in areas where this product is stored or handled.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|---|-------------------|
| Appearance: | Solid dust or gas |
| Odour: | Odourless |
| Odour threshold: | Not applicable |
| pH: | Not applicable |
| Melting point/freezing point: | Not applicable |
| Initial boiling point and boiling range: | Not applicable |
| Flash point: | Not applicable |
| Auto-ignition temperature: | Not applicable |
| Upper/lower flammability/explosive limits: | Not applicable |
| Explosive properties: | Not applicable |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Not applicable |
| Evaporation rate: | Not available |
| Vapour pressure: | Not available |
| Vapour density: | Not available |
| Relative density: | Not available |
| Solubility: | Not applicable |
| Partition coefficient (n-octanol/water): | Not applicable |
| Critical temperature: | Not applicable |
| Critical pressure: | Not applicable |
| Decomposition temperature: | Not available |
| Viscosity: | Not applicable |

SAFETY DATA SHEET

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Normal radioactive decay will occur.

Possibility of Hazardous Reactions:

Radioactive decay products.

Conditions to Avoid:

Not available

Incompatible Materials:

Not available

Hazardous Decomposition Products:

Radon gas

Section 11: Toxicological Information

Acute Toxicity Data: Acute toxicity data are not available for these materials.

Chronic Toxicity Data:

Over-exposures to NORM may induce cancer, cause genetic damage, tissue damage and/or developmental effects in the unborn child.

Sensitization:

Not available

Neurological Effects:

Not applicable

Genetic Effects:

Over-exposures to NORM may induce genetic damage.

Reproductive Effects:

Not available

Developmental Effects:

Over-exposures to NORM suspected of damaging the unborn child.

Target Organ Effects:

Lungs

Carcinogenicity:

Overexposure by inhalation to inhaled dusts containing radioactive uranium, thorium and radium may cause lung cancer.

Section 12: Ecological Information

Toxicity:

Concentrated NORMs can cause adverse effects to aquatic and terrestrial environments.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable waste disposal and environmental regulations.
Empty containers retain product residue, adhere to warnings after container has been emptied.

SAFETY DATA SHEET

Section 14: Transport Information

Transport symbol:

The transport of radioactive material, including NORM, with radioactivity below 70 Bq/g is not subject to federal transportation regulations. All NORM consignments must initially be analyzed for radioactive content to determine whether the material meets Unconditional Derived Release Limits, and if it does not, whether federal transport regulations apply.

NORM with activity above 70 Bq/g falls under federal jurisdiction and is therefore subject to the requirements of federal regulations, including the CNSC's Packaging and Transport Regulations (12) and the Transport of Dangerous Goods Regulations (13) for all dangerous goods shipments. The CNSC Packaging and Transport Regulations have been harmonized with the IAEA's Safety Series 6, Regulations for the Safe Transport of Radioactive Materials,

Refer to the Transportation of Dangerous Goods Regulations, the CNSC Packaging and Transportation Regulations and the IAEA Regulations for the Safe Transport of Radioactive Material for additional information on requirements for the transport of NORM.

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

Exempt from classification under WHMIS.

New Substance Notification Regulations: Naturally occurring substances.

Section 16: Other Information

Issue date: December 16, 2013

Revision summary: Previous version: January 3, 2011
Revised Sections: 16

References and sources for data:

Canadian Nuclear Safety Commission (CNSC)

The *Guidelines* are based on the most recent international standards recommended by the International Commission on Radiological Protection (ICRP) and CNSC regulations.

<http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/norm-mrn/index-eng.php>

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101

www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Ethane
Chemical names: Ethyl hydride

Product uses:

Saturated aliphatic hydrocarbon; compressed gas or refrigerated liquid. Petrochemicals (source of ethylene, halogenated ethanes), Refrigerant, Fuel.

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Emergency Overview:



Danger!
Extremely flammable gas.
Contains refrigerated liquefied gas; may cause cryogenic burns or injury
Contains gas under pressure; may explode if heated.

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Wear cold insulating gloves, face shield/eye protection.

Response:

Leaking gas fire: do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources of safe to do so.
Thaw frosted body parts with lukewarm water. Do not rub affected area.
Get immediate medical attention.

Storage:

Protect from sunlight. Store in a well ventilated place.

WHMIS:

Controlled product by WHMIS criteria.



- A – Compressed Gas
- B1 – Flammable Gas

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Contact with liquefied gas escaping from its cylinder may cause frostbite. The skin may become waxy white or yellow.

Eye contact: Contact with liquefied gas escaping from its cylinder may cause freezing of the eye. Permanent eye damage or blindness could result.

Ingestion: Not an applicable route of exposure.

Inhalation: Ethane in air is not expected to cause health effects below the lower explosive limit of 3% (30 000 ppm).

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Inhalation: Ethane in air can cause central nervous system depression at concentrations of 13% or 130 000 ppm. Symptoms of central nervous system depression are headache, nausea, vomiting dizziness and possibly loss of consciousness,

Ethane in high concentrations in the air displaces oxygen and can cause symptoms of oxygen deprivation (asphyxiation). Ethane concentration of greater than 14% (140 000 ppm) will displace oxygen (O₂) to 18% in air and cause oxygen deprivation.

Symptoms of oxygen deficiency are:

O₂=12-16% - breathing and pulse rate are increased, with slight loss of muscular coordination;

O₂=10-14% - emotional upsets, abnormal fatigue from exertion, disturbed respiration;

O₂=6-10% - nausea and vomiting, inability to move freely, collapse, possible loss of consciousness;

O₂=below 6% - convulsive movements, gasping, possible respiratory collapse and death.

Exercise increases the body's need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment. Survivors of oxygen deprivation may show damage to some or all organs including the central nervous system and the brain. These effects may or may not be reversible with time, depending on the degree and duration of the low oxygen and the amount of tissue injury.

Some closely related aliphatic hydrocarbons (propane, butane and isobutane) may be weak cardiac sensitizers in humans following inhalation exposures to high concentrations (greater than 5% for isobutane and greater than 10% for propane). Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death. Sudden deaths have been reported in cases of substance abuse involving butane and propane. The asphyxiant effects of ethane may enhance cardiac sensitization.

Chronic Health Effects:

No human or animal information was located.

Medical Conditions Aggravated by Exposure:

None known

Interactions With Other Chemicals:

May be explosive in contact with oxygen, halogen gases and strong oxidizing agents. (Section 10)

Potential Environmental Effects:

Ethane is not expected to result in any ecological damage to water or land. Methane is regulated as a greenhouse gas in air.

Section 3: Composition/Information on Ingredients

Hazardous Substances:

The chemical composition of Ethane will vary depending on the source.

| Chemical Name | CAS No. | Wt. % |
|----------------|----------|-------------------|
| Ethane | 74-84-0 | 90-100 |
| Carbon Dioxide | 124-38-9 | 1 – 5 or 5 – 10* |
| Methane | 74-82-8 | 0 – 1 or 1 – 2.5* |
| Propane | 74-98-6 | 0 - 0.5* |

Note: * These substances are impurities in the ethane product; the precise concentrations of the impurities will vary.

SAFETY DATA SHEET

Section 4: First Aid Measures

Description of first aid measures:

Skin Contact: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove rest of the garment. DO NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Eye Contact: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. Do NOT allow victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility.

Inhalation: This material is extremely flammable. Take proper precautions (e.g. remove any sources of ignition, wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel. If breathing has stopped, begin artificial respiration or, if the heart has stopped, give CPR immediately. Immediately transport victim to an emergency care facility.

Ingestion: Not an applicable route of exposure.

Most important symptoms and effects, both acute and delayed:

Skin Contact: Frostbite.

Eye Contact: Freezing of eye tissue.

Inhalation: Nausea, dizziness, drowsiness and confusion, unconsciousness.

Ingestion: Not applicable

Section 5: Fire Fighting Measures

Flammable properties:

Extremely flammable gas, compressed gas or refrigerated liquefied gas.

Readily forms explosive mixtures with air, which are easily ignited by heat, sparks or flame. Liquefied gas accumulates static charge. Liquefied ethane can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation.

Liquefied gas rapidly vapourizes under normal conditions. Ignition of a large volume of gas vapour mixed with air causes sudden expansion and turbulence resulting in an explosion known as vapour cloud explosion. The gas can accumulate in confined spaces and low areas, resulting in an explosion or toxicity hazard.

Extinguishing media:

Leaking gas fire: Do not extinguish unless leak can be stopped safely.

Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

Unsuitable extinguishing media: Carbon dioxide, low expansion foams, and direct application of water on liquefied gas. Under certain conditions, discharge of carbon dioxide produces electrostatic charges that could create a spark and ignite flammable gas.

Special hazards arising from the substance or mixture:

Gas is heavier than air and travel over long distances creating a flash back hazard. Containers may rupture and explode if heated. Vapour and air mixtures are explosive. Material will readily ignite at normal temperatures. The gas can accumulate in confined spaces, resulting in explosion and asphyxiation hazards. Direct addition of water (or any other room temperature liquid) to the liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a "boiling liquid, expanding vapour explosion." During a fire, toxic gases may be generated.

Cylinders exposed to heat and/or fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.

SAFETY DATA SHEET

Section 5: Fire Fighting Measures, continued

Advice for firefighters:

Evacuate the area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid hazardous gas and toxic decomposition products. Stop flow of gas before attempting to extinguish fire. If flow cannot be stopped, let the fire burn while protecting the surrounding area. Cool exposed containers with water.

Fires 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.
If a tank or rail car is involved in a fire, isolate for 1600 m in all directions; also consider initial evacuation for 1600 m in all directions.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

For a large spill or gas release, contact Fire/ Emergency Services immediately.
Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
If possible, turn leading containers so that gas escapes rather than liquid.
Use water spray to reduce vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
Do not direct water at spill or source of leak.
Prevent spreading of vapours 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.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Isolate the area until the gas has dispersed. Monitor workplace air for levels of oxygen and flammable gas before anyone is allowed into area. Pay special attention to low-lying areas where the gas may have accumulated.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

This material is an extremely flammable gas. Before handling, it is very important that engineering controls are operating and that protective equipment requirements are being followed. Eliminate all ignition sources (e.g., sparks, open flames, hot surfaces). Keep away from heat and welding operations. During transfer operations, cylinders and vessels should be electrically grounded and bonded to prevent the build up of a static charge. Post NO SMOKING signs. It is very important to keep areas where this material is used clear of other materials which can burn. If flammable gas is released in a confined space, immediately evacuate the area.
Compressed or liquefied gas cylinders, piping and fittings must be protected from damage during handling, filling, transportation and storage.
Ensure that compressed or liquefied gas cylinders are secured, preferably upright, and cannot fall or roll.

SAFETY DATA SHEET

Section 7: Handling and Storage, continued

Storage

Storage temperature should not exceed 52°C (125°F).

Store in a cool, dry, well-ventilated area out of direct sunlight and away from all ignition and heat sources. Keep quantity stored as small as possible. Store away from incompatible materials, such as oxygen and strong oxidizing agents.

Storage of compressed gas cylinders must be in accordance with the appropriate provincial or regional Fire Code.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Ontario TWAEV</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|---|----------------------|----------------------------------|--------------------------------------|
| Aliphatic hydrocarbon gases Alkanes C ₁ - C ₄ | 1000 ppm | 1000 ppm | 1000 ppm |
| Carbon Dioxide | Refer to ACGIH TLV | 5000 30 000 STEL Asphyxia | 5 000 (9 000 mg/m ³) |

Exposure controls:

Engineering Controls: Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification. Provide sufficient local exhaust and general (dilution) ventilation to maintain the gas concentration below one tenth of the lower explosive limit. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Administrative controls and personal protective equipment may also be required.

For large-scale operations and those handling liquefied gas, consider a closed handling system and the installation of leak and fire detection equipment and a suitable automatic fire suppression system.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection. Wear a face shield when handling refrigerated liquefied gas.

Skin Protection: Wear thermal protective clothing when handling refrigerated/cryogenic liquids. Wear fire-resistant long-sleeved clothing and trousers worn outside boots or over top of shoes. Remove protective clothing immediately if it becomes wet with refrigerated liquefied gas. Wear appropriate foot protection when handling cylinders.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Workplaces should have a frostbite wash readily available in the work area. Any clothing which becomes wet with liquid or saturated with gas should be removed immediately.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|---|
| Appearance: | Gas, colourless. |
| Odour: | Odourless, or faint odour of gasoline or sweet odour depending on impurities. |
| Odour threshold: | Not available |
| pH: | Not applicable |
| Melting point/freezing point: | -183°C (-297.4°F) |
| Initial boiling point and boiling range: | -88.1°C (-126.6°F) |
| Flash point: | -135°C (211°F) |
| Auto-ignition temperature: | 472°C (882°F) for propane |
| Upper/lower flammability or explosive limits: | LEL: 2.9% UEL: 13% |
| Explosive properties: | Readily forms explosive vapour mixtures with air. Risk of vapour cloud explosion. |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Sensitive; can readily form explosive mixtures with air, which are easily ignited by a static charge. Liquefied methane can accumulate electrostatic charge by flow, friction in pipes, splashing or agitation. |
| Evaporation rate: | 3.85 (n-butyl acetate = 1) |
| Vapour pressure: | 544 psi at 21°C |
| Vapour density: | 1.04 |
| Relative density: | 0.45 at 0°C |
| Solubility: | Insoluble in cold water |
| Partition coefficient (n-octanol/water): | Log P(oct) = 1.81 |
| Critical temperature: | 32.4°C (90.3°F) |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | Not available |
| Percent volatile: | 100% |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable. Releases of gas are extremely flammable and/or explosive in the presence of an ignition source.

Possibility of Hazardous Reactions:

Forms an explosive mixture with air. Direct addition of water, or any other room temperature liquid, to the liquefied gas will cause flash vaporization resulting in an explosion.
Hot containers may explode.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion. Incompatible with halogen compounds (e.g. chlorine gas), contact may cause an explosion.

Pure ethane gas is corrosive to acrylonitrile butadiene styrene (ABS), high density polyethylene (HDPE), polyvinyl chloride (PVC), polypropylene, polyamides, and polyurethane. Ethane gas is not corrosive to fluorinated plastics, ultra high molecular weight polyethylene, and polyacetals.

Hazardous Decomposition Products:

Not applicable

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data: Acute toxicity data for Ethane are not available. The following data is for the component substances.

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|--|
| Ethane | Not applicable | Not applicable | >140 000 ppm (14%) asphyxiant duration not reported |

Chronic Toxicity Data:

No data available.

Sensitization:

Propane and some other closely related aliphatic hydrocarbons (isobutane and butane) are weak cardiac sensitizers in humans following inhalation exposures to high concentrations. Cardiac sensitizers may cause the sudden onset of an irregular heartbeat (arrhythmia) and, in some cases, sudden death, particularly when under stress.

Neurological Effects:

At high concentrations, it can cause depression of the central nervous system (CNS) based on animal and human information.
Unconsciousness (narcosis) from inhalation of ethane has been observed due to CNS depression at approximately 130000 ppm (13%).
Propane in air can cause depression of the central nervous system (CNS) with symptoms such as headache, nausea, dizziness, drowsiness and confusion, based on animal information. It is expected to cause unconsciousness (narcosis) due to CNS depression at approximately 47000 ppm (4.7%).

Genetic Effects:

Not available

Reproductive Effects:

None reported.

Developmental Effects:

None reported.

Target Organ Effects:

Central nervous system.

Other Adverse Effects:

Ethane in high concentrations in the air displaces oxygen and can cause symptoms asphyxiation. Ethane concentration of greater than 14% (140 000 ppm) will displace oxygen to 18% in air and cause oxygen deprivation.

Carcinogenicity:

This product does not contain any component at a concentration of greater than 0.1% that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Other Adverse Effects:

Ethane in high concentrations in the air displaces oxygen and can cause symptoms asphyxiation. Ethane concentration of greater than 14% (140 000 ppm) will displace oxygen to 18% in air and cause oxygen deprivation.

SAFETY DATA SHEET

Section 12: Ecological Information

Toxicity:

Ethane gas is not expected to result in any ecological damage to water or land. VOC gases are reportable to the National Pollutant Release Inventory, Environment Canada. Methane is regulated as a greenhouse gas.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not applicable

Mobility in soil:

Not applicable

Section 13: Disposal Considerations

Waste treatment methods:

Dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied.

Section 14: Transport Information

Transport symbol:



UN Number:

UN1035

UN proper shipping name:

ETHANE

Transport hazard class(es):

2.1

Packing group:

Not applicable

Emergency response guide:

115

Transport symbol:



UN Number:

UN1961

UN proper shipping name:

ETHANE, REFRIGERATED LIQUID

Transport hazard class(es):

2.1

Packing group:

Not applicable

Emergency response guide:

115

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substance listed on the TSCA inventory.

OSHA: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: A - Compressed gas

B1 - Flammable and combustible material - Flammable gas.

New Substance Notification Regulations: Substances listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: VOC gases are NPRI reportable substances.

Methane is regulated as a greenhouse gas.

SAFETY DATA SHEET

Section 16: Other Information

Issue date: December 18, 2012

Revision summary: Previous version: April 19, 2010
Updated SDS template
Revised Sections 1, 2, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101
www.lehder.com

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SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier:

Used Motor Oil

Alternate Names:

Used Lubricating Oil
Used Engine Oil
Used Crank Case Oil
Used Machinery Oil

Chemical names:

Petroleum Hydrocarbon

Product uses:

An oil from industrial and non-industrial sources, which has been acquired for lubricating or other purposes and has become unsuitable for its original purpose due to the presence of impurities or the loss of original properties. The used oil is collected for re-refining (recycling).

Supplier of the Safety Data Sheet:

AltaGas Ltd.
1700, 355 4th Avenue SW
Calgary, AB
T2P 0J1

Emergency telephone number:

1-866-826-3830

Section 2: Hazards Identification

Emergency Overview:

Used motor oil may contain contaminants which have adverse health and environmental effects. This product is expected to be combustible when heated. During a fire, irritating and/or toxic substances, such as sulfur, nitrogen and phosphorus oxides, reactive hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) may be generated depending on fire conditions and the presence of additives or impurities. Used oils may contain carcinogenic polycyclic aromatic hydrocarbons.

WHMIS:

* WHMIS: Hazardous waste that is "intended for disposal" or is "sold for recycling or recovery" falls within the definition of hazardous waste and is thereby exempt from the WHMIS requirements of the Hazardous Products Act. While this product is not controlled under WHMIS, this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential Health Effects

Acute Health Effects:

Relevant Route(s) of Exposure: Skin contact, Eye contact, Inhalation.

Skin contact: Prolonged or repeated contact may cause mild irritation, including redness, burning, temporary drying/cracking, and possibly dermatitis. Contact with hot material may cause thermal burns. It is possible for the oil to become injected under the skin when contained in a high pressure system; if this occurs, there can be considerable damage to the underlying tissues.

Eye contact: Contact may cause irritation, including burning, redness, and tearing. Contact with hot material may cause thermal burns.

Ingestion: Ingestion is not an expected route of occupational exposure. May cause irritation of the digestive tract, including cramping, diarrhea, nausea and vomiting. Aspiration into the lungs, by initial ingestion or vomiting, may cause pulmonary injury.

Inhalation: Not expected to cause adverse effects when the liquid is handled at normal temperatures (up to 38°C, 100°F). Exposure to oil mists or fumes from hot oil may be irritating to the respiratory tract, including nose and throat, and may cause difficulty breathing.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

Chronic Health Effects:

Prolonged or repeated contact with skin may cause cracking, drying and chronic dermatitis. Prolonged and/or repeated contact with used motor oil has caused skin cancer in experimental animals; the relationship of these results to humans has not been fully established.
Exposure to high levels of mist concentration may lead to chronic pulmonary conditions such as chronic bronchitis, pneumonia, and emphysema.

Medical Conditions Aggravated by Exposure:

Exposure to vapours and mists may aggravate existing respiratory disorders.

Interactions With Other Chemicals:

Incompatible with strong oxidizing agents.

Potential Environmental Effects:

Used motor oil is dangerous for the environment and may cause long-term adverse effects in the aquatic environment. This material presents environmental risks common to oil spills.

Section 3: Composition/Information on Ingredients

Hazardous Substances:

This material is a complex mixture of paraffinic, naphthenic & aromatic petroleum hydrocarbons that may contain one or more of the following: carbon deposits, sludge, aromatic & non-aromatic solvents, water (as a water-in-oil emulsion), glycols, wear metals & metallic salts, silicon-based antifoaming compounds, and miscellaneous lube-oil additive materials.

The expected composition of used oils is summarized in the table below:

| <u>Chemical Name</u> | <u>CAS No.</u> | <u>Wt.%</u> |
|--|----------------|---------------|
| Lubricating Oil | 70514-12-4 | 60 - 100 |
| Water | 7732-18-5 | Not available |
| Solids | Not applicable | Not available |
| Hydrocarbon solvents: May include gasoline, diesel fuel, jet fuel, mineral spirits and others. | Not applicable | Not available |
| Metals: May include lead, iron, zinc, copper, chromium, arsenic, nickel and others. | Not applicable | Not available |
| Polynuclear aromatic hydrocarbons: May include naphthalene, fluoranthrene, phenanthrene, pyrene and others. | Not applicable | Not available |
| Chlorinated solvents | Not applicable | Not available |

Section 4: First Aid Measures

Description of first aid measures:

Skin Contact: Avoid direct contact. Wear chemical protective clothing, if necessary. Remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm, gently flowing water and non-abrasive soap for 5 minutes. If irritation persists, repeat flushing. Obtain medical advice. Completely decontaminate clothing, shoes and leather goods before re-use, or discard.

Eye Contact: Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye with lukewarm, gently flowing water for 15 minutes while holding the eyelids open. Obtain medical advice.

Inhalation: If symptoms are experienced remove source of contamination or move victim to fresh air. Obtain medical advice.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Obtain medical attention immediately.

SAFETY DATA SHEET

Section 4: First Aid Measures, continued

Most important symptoms and effects, both acute and delayed:

Skin Contact: Mild irritation. Thermal burns.

Eye Contact: Mild irritation. Thermal burns.

Inhalation: Fumes may cause irritation.

Ingestion: Nausea, vomiting.

Section 5: Fire Fighting Measures

Flammable properties:

Product will burn when heated.

Extinguishing media:

Dry chemical powder and high-expansion foam. Foam suppliers should be consulted for recommendations regarding types of foams and application rates. Cover liquid spills with foam. Use water spray to cool fire-exposed containers.

Some oils have a low flash point; use of water spray when fighting fire may be ineffective to extinguish. Do not use a direct stream of water as it may spread the fire.

Special hazards arising from the substance or mixture:

Decomposition or combustion may generate irritating and very toxic fumes. Products of combustion may include carbon monoxide, carbon dioxide, phosgene, aldehydes, ketones, and oxides of metals, sulphur, nitrogen and phosphorus.

Advice for firefighters:

As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Wear eye, skin and respiratory personal protective equipment as indicated in Section 8. Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Ventilate the area.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Stop leak if it can be done without risk. Use water spray to reduce vapours. Isolate area until harmful vapour has dispersed. Contain spill with clay, earth, sand, or absorbent material which does not react with spilled material. Do not use combustible material such as sawdust.

Do not touch spilled material. For small spills, soak up spill with absorbent material which does not react with spilled chemical. Large spills may be picked up using vacuum pumps, shovels, buckets, or other means. Put material in suitable, covered, labelled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product. Notify government occupational and environmental authorities.

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.

Section 7: Handling and Storage

Handling:

Keep away from heat, sparks and flames. Use with adequate ventilation. Avoid generating oil mists or aerosols. Wash all exposed skin thoroughly with detergent and water after handling, before eating, drinking, smoking or using the toilet. Remove contaminated clothing and wash before reuse. Discard saturated leather goods. Avoid contact with eyes and skin. Avoid breathing fumes and vapours.

Storage

Keep away from heat, sparks and flames. Keep containers closed. Store in a cool, well ventilated place away from incompatible materials. May be stored in steel tanks or drums.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection

Exposure guidelines:

Consult regional/local authorities for acceptable exposure limits.

| <u>Ingredient</u> | <u>Ontario TWAEV</u> | <u>ACGIH TLV (8-hr. TWA)</u> | <u>U.S. OSHA PEL (8-hr. TWA)</u> |
|-------------------|-------------------------|----------------------------------|--------------------------------------|
| Used Motor Oil | Not established | Not established | Not established |
| Oil Mist, Mineral | 5 10 STEV | 5 (Inhalable) | 5 |
| Diesel Fuel | 100 | 100 | Not established |
| Gasoline | 300 ppm 500 ppm STEV | 300 ppm 500 ppm STEL | Not established |

Exposure controls:

Engineering Controls: Provide ventilation sufficient to keep exposure to fumes, mists and vapours below the exposure limits listed above. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions. Administrative controls and personal protective equipment may also be required. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear chemical safety goggles.

Skin Protection: Wear chemical protective gloves, coveralls, boots, and/or other resistant protective clothing. Gloves should be made from Viton™, Nitrile, latex, neoprene.

Respiratory Protection: In workplaces where engineering controls and work practices are not effective in controlling exposure to this material, or where occupational exposure limits are exceeded then respiratory protection is required. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Have a safety shower and eyewash fountain readily available in the work area.

Do not smoke in work areas. Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before rewearing. Inform laundry personnel of contaminant's hazards. Do not eat or drink in work areas. Wash hands thoroughly before eating, drinking, smoking or using the toilet.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

| | |
|--|--|
| Appearance: | Liquid. Dark brown to black viscous oil. |
| Odour: | Pronounced hydrocarbon odour. |
| Odour threshold: | Not available |
| pH: | Not applicable |
| Melting point/freezing point: | Not available |
| Initial boiling point and boiling range: | Not available |
| Flash point: | Not available |
| Auto-ignition temperature: | Not available |
| Upper/lower flammability or explosive limits: | Not available |
| Explosive properties: | Not available |
| Oxidizing properties: | Not applicable |
| Sensitivity to mechanical impact: | Not applicable |
| Sensitivity to static discharge: | Not available |
| Evaporation rate: | <1 (n-Butyl Acetate = 1) |
| Vapour pressure: | <0.1 |
| Vapour density: | >1 |
| Relative density: | 0.8-1.0 @15°C (approximate) |
| Solubility: | Low water solubility |
| Partition coefficient (n-octanol/water): | Not available |
| Critical temperature: | Not available |
| Critical pressure: | Not available |
| Decomposition temperature: | Not available |
| Viscosity: | Not available |
| Percent volatile: | Not available |

Section 10: Stability and Reactivity

Reactivity:

Not classified as dangerously reactive.

Chemical Stability:

Normally stable.

Possibility of Hazardous Reactions:

Not available.

Conditions to Avoid:

Avoid heat, flame, static discharge, sparks and other ignition sources.
Avoid unintended contact with incompatible materials.
Avoid formation of oil mist.

Incompatible Materials:

Avoid contact with oxygen and strong oxidizing agents (e.g. chlorine, fluorine, peroxides, nitrates and perchlorates) which can increase risk of fire and explosion

Hazardous Decomposition Products:

Carbon monoxide, carbon dioxide, aldehydes and ketones, Phosgene gas, oxides of sulphur, nitrogen and phosphorus may form as products of decomposition or combustion.

SAFETY DATA SHEET

Section 11: Toxicological Information

Acute Toxicity Data: Acute toxicity data for Used Motor Oil are not available.

| <u>Chemical</u> | <u>LD₅₀ Oral</u> <u>(mg/kg)</u> | <u>LD₅₀ Dermal</u> <u>(mg/kg)</u> | <u>LC₅₀ Inhalation</u> <u>(4 hrs.)</u> |
|-----------------|---|---|--|
| Motor oil | Not available | Not available | Not available |

Chronic Toxicity Data:

No data available.

Sensitization:

No data available.

Neurological Effects:

Limited information from a report of health effects in mechanics and other auto workers suggests that headaches may be associated with occupational exposure to used motor oil. In addition, cattle that ingested used motor oil showed marked neurotoxicity, including blindness, muscle twitching, hyperirritability, depression, and convulsions which were attributed to lead toxicity. Muscle tremors and weakness were observed in another study; these effects may be associated with toxicity from metal contaminants.

Genetic Effects:

This product may contain contaminants which are known to cause Mutagenicity in bacterial tests.

Reproductive Effects:

This product may contain contaminants which are known to cause reproductive effects in animal studies.

Developmental Effects:

This product may contain contaminants which are known to cause developmental effects in animal studies.

Target Organ Effects:

Skin, eyes, lungs, digestive tract, central nervous system.

Other Adverse Effects:

Aspiration into the lungs, by initial ingestion or vomiting, may cause pulmonary injury.

Carcinogenicity:

Used lubricant oils have been associated with skin cancer. Long-term inhalation of high concentrations of oil mists may also be associated with lung cancer, but only with exposure conditions where skin cancer has also occurred.

This product may contain contaminants such as metals, polynuclear aromatic hydrocarbons and chlorinated solvents which are classified as known or possible human carcinogens by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists), OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

Section 12: Ecological Information

Toxicity:

Used motor oil is dangerous for the environment and may cause long-term adverse effects in the aquatic environment. This material presents environmental risks similar to oil spills.

Persistence and degradability:

Hydrocarbons from oil can move to the air or settle through water to bottom sediments, where they may persist for years.

Bioaccumulative potential:

Not available

Mobility in soil:

Used motor oils spilled on soil move downward by gravity through the soil and possibly to groundwater. Some metals and other harmful contaminant substances in used motor oil, will move through the soil easily and may contaminate surface water and groundwater.

SAFETY DATA SHEET

Section 13: Disposal Considerations

Waste treatment methods:

Recycle or dispose of material in accordance with applicable regulations. Empty containers retain product residue, adhere to warnings after container has been emptied. Do NOT discard into any sewers, on the ground or into any body of water. Do NOT burn. Store material for disposal as indicated in Section 7 Handling and Storage.

Section 14: Transport Information

Canadian Transportation of Dangerous Goods (TDG): Not evaluated for transportation regulations.

May be regulated when shipped as a waste.

Marine Pollutants: Not evaluated

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: Not controlled

By virtue of paragraph 12(e) of the Hazardous Products Act (HPA), hazardous waste is exempt from the WHMIS supplier labelling and MSDS requirements of the HPA. Controlled Products Regulations, 2(2) defines hazardous waste as "...a controlled product that is intended for disposal or is sold for recycling or recovery."

New Substance Notification Regulations: "Lubricating oils, refined used" is listed on Canada's Domestic Substances List (DSL).

National Pollutant Release Inventory: Not evaluated for NPRI reportable substances. Some contaminants may be listed.

Section 16: Other Information

Issue date: December 19, 2012

Revision summary: Previous version: January 7, 2010
Updated SDS template
Revised Sections 1, 2, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16

References and sources for data:

HSDB – Hazardous Substances Data Bank ; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances

Manufacturer disclaimer

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Prepared by: LEHDER Environmental Services Limited (519) 336-4101

www.lehder.com

While LEHDER Environmental Services Limited believes that the data set forth herein is accurate, as of the date hereof, LEHDER makes no warranty with respect thereto and expressly disclaims all liability for reliance thereon. Such data is offered solely for your consideration, investigation and verification.

INITIAL NOTIFICATION REPORT

Caller Information

Date: _____ Time: _____ a.m/p.m.
 Caller's Name: _____ Caller's Phone Number: _____

Location of Incident

Location of Incident: _____
 Section _____ Township _____ Range _____ West _____ Meridian _____

Type of incident

Sweet Gas Release ☐ Liquid Spill ☐ Explosion/Fire ☐
 Sour Gas Release ☐ Vehicle Accident ☐ Chemical Spill ☐
 Other (describe) ☐ _____

Victim Information

Has anyone been injured ? Yes ☐ No ☐ Fatalities ? Yes ☐ No ☐
 To which hospital were the victims taken ? _____
 Has anyone been evacuated ? Yes ☐ No ☐
 If yes, how many people have been evacuated ? _____
 Where have they been evacuated to ? _____

Weather Conditions

Clear ☐ Cloudy ☐ Fog ☐ Rain ☐ Snow ☐ Windy ☐ Temperature: _____ °C
 Strong Wind ☐ Light Wind ☐ Gusts ☐ Steady Wind ☐ Estimated Wind Speed: _____ km/hr
 Wind Direction: _____

Who Has Been Notified ?

| | |
|---|---|
| AltaGas 24-Hour Emergency Telephone # <input type="checkbox"/> | Occupational Health/Safety (_____) <input type="checkbox"/> |
| Alberta Energy Regulator <input type="checkbox"/> | Local Police <input type="checkbox"/> |
| Alberta Environment <input type="checkbox"/> | Fire Department <input type="checkbox"/> |
| British Columbia Oil & Gas Commission <input type="checkbox"/> | Ambulance <input type="checkbox"/> |
| British Columbia Ministry of Environment <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| Saskatchewan ECON <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| National Energy Board (Canada) <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| Environment Canada <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| Canadian Transportation Safety Board <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| US National Response Center <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| Washington UTC <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| Health Authority (_____) <input type="checkbox"/> | Other _____ <input type="checkbox"/> |
| Workers' Compensation (_____) <input type="checkbox"/> | Other _____ <input type="checkbox"/> |

KEY RESPONDER ROLE LOG

Incident Name _____ Date _____

| Role | Name | Contact No. |
|--|------|-------------|
| Corporate Emergency Operations Center (CEOC) - Calgary | | |
| Incident Commander (IC) | | |
| Initial IC: | | |
| Final IC: | | |
| Media/Communications Coordinator: | | |
| Public Safety Coordinator (PSC)*: | | |
| Additional CEOC Support Staff** (list Observers/Trainees on reverse): | | |
| | | |
| | | |
| | | |
| | | |
| On-Site Command Post (OSCP) | | |
| First Responder (1): | | |
| First Responder (2): | | |
| On-Scene Commander (OSC) | | |
| Initial OSC: | | |
| Final OSC: | | |
| Roadblock Crew | | |
| Location 1: | | |
| Location 2: | | |
| Location 3: | | |
| Location 4: | | |
| Gas Monitoring Crew | | |
| Location 1: | | |
| Location 2: | | |
| Evacuation Crew | | |
| Area 1: | | |
| Area 2: | | |
| Evacuation Center Coordinator | | |
| Location 1: | | |
| Location 2: | | |
| Operations Supervisor/Foreman: | | |
| Remedial Measures Advisor (LPGERC): | | |
| [] REOC [] MECC [] ECC (List location, attendees & phone numbers for activated Centres on reverse) | | |

*May be the On-Scene Commander and may be located at the OSCP

**Additional CEOC Roles may include:

| | | | |
|--------------|----------------------------|--------------------------------|------------------|
| -Engineering | - Internal Resource (Name) | - Telephoner/Contactor | - Legal Scribe |
| -Event Log | - Logistics/IT Support | - Executive Management (Title) | - Communications |

INCIDENT LOG

[illegible]

AMBIENT AIR MONITORING LOG

Date: _____

[illegible]

THREAT REPORT

| | | | | | | | | | | |
|---|---------|--------------------------|--------------|--------------------------|--------|--------------------------|--------|--------------------------|--------|--------------------------|
| Date: | | | Time: | | | Site: | | | | |
| Threat received by: | | | | | | | | | | |
| 1. <i>What did the caller say when making the threat (use the exact words if possible)?</i> | | | | | | | | | | |
| 2. <i>Did you notice anything else that might help the police identify the caller?</i> | | | | | | | | | | |
| 3. <i>Describe any background noises heard over the telephone.</i> | | | | | | | | | | |
| Other information: | | | | | | | | | | |
| 4. Sex: | Male | <input type="checkbox"/> | Female | <input type="checkbox"/> | | | | | | |
| 5. Voice: | Loud | <input type="checkbox"/> | Soft | <input type="checkbox"/> | Accent | <input type="checkbox"/> | Other | | | |
| 6. Manner: | Nervous | <input type="checkbox"/> | Calm | <input type="checkbox"/> | Angry | <input type="checkbox"/> | Vulgar | <input type="checkbox"/> | Joking | <input type="checkbox"/> |
| 7. <i>Did you recognize the caller's voice?</i> | | | | | | | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| 8. <i>Did the caller seem to be familiar with the site and company?</i> | | | | | | | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| Questions to ask the caller if a bomb threat is received: | | | | | | | | | | |
| 2. <i>What time will the bomb explode?</i> | | | | | | | | | | |
| 3. <i>Where is the bomb?</i> | | | | | | | | | | |
| 4. <i>What does the bomb look like?</i> | | | | | | | | | | |
| 5. <i>Why did you place the bomb?</i> | | | | | | | | | | |
| 6. <i>Where are you calling from?</i> | | | | | | | | | | |
| 7. <i>What is your name?</i> | | | | | | | | | | |

PRELIMINARY MEDIA ANNOUNCEMENT

Date: _____ Time: _____ ☐ a.m. ☐ p.m.

My Name Is: _____

My Job Title Is: _____

This is the information I can give you at this time:

At approximately _____ ☐ a.m. ☐ p.m. on _____ (date) there was a
_____ (fire, explosion, spill, release of gas, etc.) involving the _____
pipeline ☐ gas plant ☐ compressor station ☐ approximately _____ kilometers ☐ east ☐ west ☐
north ☐ south of _____. This facility is operated by AltaGas of Calgary.

At this time _____ people are being treated for injuries. The AltaGas Media & Communications Coordinator through the police can only release the names and condition of the injured.

The facility ☐ has been shut down ☐ has not been shut down.

Emergency response procedures have been activated and our first priority is to protect the public and the environment.

The cause of the _____ (fire, explosion, spill, release of gas, etc.) is not yet known and no estimate of damage is available.

Any further inquiries should be directed to the AltaGas *Media & Communications Coordinator* at _____. Media releases will be issued whenever new information becomes available.

ROADBLOCK LOG

| Date | Time | Name of Driver | License Plate # | Province | Time Entered PAZ | Time Left PAZ | Resident of EPZ? |
|------|------|----------------|-----------------|----------|------------------|---------------|--|
| | | | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| | | | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| | | | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |
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| | | | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| | | | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> |

RESIDENT CONTACT LOG

| Name | Date | Time | Successfully Contacted? | Reason For Contact | Contacted By |
|------|------|------|--|--------------------|--------------|
| | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
| | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
| | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
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| | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |

EVACUATION NOTIFICATION

(Note: Evacuation is voluntary for Level 1 emergencies, required for Level 2 and 3.)

Hello Mr./Mrs./Ms. _____

This is _____ of AltaGas calling to inform you that we have encountered problems at our gas plant ☐ pipeline ☐ compressor station ☐ and/or associated gathering system approximately _____ kilometres from _____. You are in no immediate danger, but as a safety precaution we are asking everyone to evacuate the area until we are able to correct the problem.

Do you have any children now in school?

Yes

☐

No

☐

Do you require transportation or other assistance?

Yes

☐

No

☐

If yes, then.....

Please remain indoors and AltaGas will send someone to pick you up and transport you to a safe area.

How many people will require transportation? _____

AltaGas is establishing a reception centre at _____. You will be provided with meals and accommodations while the emergency lasts.

If no, then.....

AltaGas is establishing a reception centre at _____. Please check in at the reception centre and you will be provided with meals and accommodations if necessary.

If you are evacuating the area on your own, please avoid _____ as this is the hazard area. We recommend you leave the area by the following route:

If you are not going to the designated reception centre, do you have a telephone number where we can reach you to let you know when the emergency is over? _____

Thank you very much for your cooperation and we do apologize for the inconvenience.

SHELTER NOTIFICATION

Hello Mr./Mrs./Ms. _____

This is _____ of AltaGas calling to inform you that we are encountering problems at our gas plant ☐ pipeline ☐ compressor station ☐ and/or associated gathering system approximately _____ kilometres from _____.

You are in no immediate danger, but as a safety precaution we are asking everyone to remain indoors until we are able to correct the problem.

How many people are at your residence? _____

Do you have any children now in school?

Yes

☐

No

☐

Is there anyone outside that you cannot contact easily?

Yes

☐

No

☐

Is there another telephone number where we can contact you? _____

For your safety, we recommend the following precautions.....

- § Gather everyone in the residence and close the doors and windows.
- § Shut down the furnace and exhaust fans (not possible in extremely cold weather).
- § Plug any air intakes into your home.
- § Extinguish all ignition sources (pilot lights on water heater, stove, etc.)
- § Do not smoke or operate electrical appliances.
- § Move to the upper floors of your home and stay away from windows.

Do not leave your home or start a motor vehicle. A Company representative or the police will contact you when the emergency is over. If you wish to contact us our telephone number is

_____ .

Thank you very much for your cooperation and we do apologize for the inconvenience.

RECEPTION CENTRE CHECK-IN SHEET

| Name | Date | Arrival Time | Evacuation Centre | Number of People | Is Return Transportation Required? | Any Special Needs? | Date Resident Able To Return Home |
|------|------|--------------|-------------------|------------------|--|--------------------|-----------------------------------|
| | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
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| | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
| | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |

EVACUATION EXPENSES COMPENSATION REQUEST

| Resident's name: | | | | | Resident's Telephone Number: | |
|------------------------|----------------|-------|-----------|--------------|------------------------------|------------------------|
| Date(s) Of Evacuation: | | | | | Resident's Address: | |
| EXPENSES | | | | | | |
| Hotel/Motel | Transportation | Meals | Telephone | Other | TOTAL | Description of Expense |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| \$ | \$ | \$ | \$ | \$ | \$ | |
| | | | | TOTAL | | |

Note: Please attach receipts for expenses.

OGC MINOR INCIDENT NOTIFICATION FORM



FORM A: MINOR INCIDENT NOTIFICATION FORM

Physical Address: 6534 Airport Road,
Fort St. John, B.C. V1J 4M6
Mailing Address: Bag 2, Fort St. John, B.C.
V1J 2B0
Phone: (250) 794-5200
emp@bcogc.ca

This form is to be used for incidents which do not meet OGC Level 1, 2, or 3 Classification

Minor incidents must be reported to the Commission within **24** hours through the Commission's [Online Minor Incident Reporting System](#), operated through KERMIT.

| MISCELLANEOUS INFORMATION | | | A |
|--|--|--------------------------------------|---|
| Risk Score: | (attach risk matrix) | DGIR #: | |
| Incident Date (YYYY-MM-DD): | Incident Time (24 hour clock): <input type="checkbox"/> PST <input type="checkbox"/> MST | | |
| INFORMATION OF PERSON REPORTING INCIDENT | | | B |
| Permit holder Name: | Reported by (name): | | |
| Phone Number: | Alternate Number: | | |
| E-mail: | Fax Number: | | |
| INCIDENT DETAILS | | | C |
| | | | |
| SITE TYPE | | | D |
| <i>Select only one type.</i> | | | |
| <input type="checkbox"/> Well (Active) | <input type="checkbox"/> Well (Abandoned/Suspended) | <input type="checkbox"/> Remote Sump | |
| <input type="checkbox"/> Battery/Plant/Facility | <input type="checkbox"/> Tank Farm/Storage | <input type="checkbox"/> Pipeline | |
| <input type="checkbox"/> Riser (pipeline) | <input type="checkbox"/> Well (Drilling & Completions): | Rig Name: | |
| <input type="checkbox"/> Road or Road Structure: Name: | | Location on road: | |
| <input type="checkbox"/> Other (specify): | | | |

| | | | | |
|--|-----------|---|---|--|
| OTHER LOCATION | | | | |
| <i>Any asset that does not apply to above such as a road, remote sump, borrow pit, etc. (A UTM location must be filled out in the Location Section.)</i> | | | | |
| Location Type: | | Location Description : | | |
| LOCATION | | | | |
| Location of asset: | | NTS _____ - _____ - _____ / _____ - _____ - _____ or | | |
| | | DLS _____, SEC _____, TWP _____, RGE _____ W6M | | |
| UTM (NAD 83: | | _____ m easting | | _____ m northing |
| GPS: | Latitude: | Longitude: | | |
| AREA INFORMATION | | | | I |
| Land Type: <input type="checkbox"/> Private Land <input type="checkbox"/> Crown Land | | Field Name: | | |
| Access: <input type="checkbox"/> ATV <input type="checkbox"/> Helicopter <input type="checkbox"/> Four-wheel-drive <input type="checkbox"/> Two-wheel-drive <input type="checkbox"/> Unknown | | | | |
| Name of road the asset is located on: | | | | |
| Km where the incident occurred: | | | | |
| Distance to nearest residence/public facility: | | | Nearest City/Town/Pubic Camp: | |
| CAUSE | | | | J |
| <i>Check all that apply.</i> | | | | |
| <input type="checkbox"/> Third Party | | <input type="checkbox"/> Manufacturing Defect | | <input type="checkbox"/> Corrosion (internal, external) |
| <input type="checkbox"/> Employee (negligence, procedural, behavioural) | | <input type="checkbox"/> Natural (weather, flood, fire) | | <input type="checkbox"/> Failure (materials, mechanical, equipment, system) |
| <input type="checkbox"/> Geological | | <input type="checkbox"/> Over Pressuring Equipment | | |
| <input type="checkbox"/> Unknown at this time Explain: | | | | |
| <input type="checkbox"/> Other Factors (specify): | | | | |
| CAUSE/REMEDIAL ACTIONS | | | | K |
| Describe the cause and remedial actions in more detail: | | | | |
| WEATHER | | | | L |
| Weather Conditions: | | <input type="checkbox"/> clear | <input type="checkbox"/> cloudy | <input type="checkbox"/> other (specify): |
| Wind Direction: From: | | <input type="checkbox"/> N | <input type="checkbox"/> NE <input type="checkbox"/> NW | <input type="checkbox"/> E <input type="checkbox"/> SE <input type="checkbox"/> S <input type="checkbox"/> SW <input type="checkbox"/> W |
| Wind Strength: | | <input type="checkbox"/> calm | <input type="checkbox"/> moderate | <input type="checkbox"/> strong <input type="checkbox"/> gusty |
| Temperature: | | °C | | |
| Comments: | | | | |

| | | | |
|---|--|---|----------|
| PUBLIC INJURIES / MEDICAL EMERGENCIES | | | M |
| <input type="checkbox"/> First Aid | <input type="checkbox"/> Hospitalization | <input type="checkbox"/> Fatality | |
| Other (specify): | | | |
| NOTIFICATION | | | N |
| <i>What government agencies has the permit holder notified:</i> | | | |
| <input type="checkbox"/> EMBC | <input type="checkbox"/> Ministry of Environment | <input type="checkbox"/> Ministry of Transportation | |
| <input type="checkbox"/> Public Works | <input type="checkbox"/> WorkSafe BC | <input type="checkbox"/> Local Health Authority | |
| <input type="checkbox"/> Regional/Municipal Authority | <input type="checkbox"/> RCMP | <input type="checkbox"/> Ministry of Forest | |
| <input type="checkbox"/> National Energy Board | <input type="checkbox"/> Other (specify): | | |
| INFORMATION FOR SPILLS ONLY | | | O |
| Is spill off lease? <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |
| Spill Material Type: <input type="checkbox"/> Acid <input type="checkbox"/> Emulsion (oil, gas, water) <input type="checkbox"/> Fresh Water <input type="checkbox"/> Liquid Hydrogen (crude, oil, diesel, fuel) <input type="checkbox"/> Methanol <input type="checkbox"/> Non-Toxic Gases (Nitrogen, Carbon Dioxide, Inert Gases) <input type="checkbox"/> Non Toxic Liquids <input type="checkbox"/> Salt Water <input type="checkbox"/> Sour Natural Gas <input type="checkbox"/> Sour Liquid < 1% only H2S) <input type="checkbox"/> Sweet Natural Gas <input type="checkbox"/> Toxic Gas <input type="checkbox"/> Toxic Liquid (>1% different toxins) <input type="checkbox"/> Other (specify): | | | |
| Amount Spilled: | | bbl or m ³ or litre (circle one) | |
| Does Material contain any H2S? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A | | | |
| If Yes, how much? | | ppm | |
| Has spill been cleaned up? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | | | |
| Date of Clean Up/Proposed Clean Up: | | (mmm dd, yyyy) | |
| Estimated Cost of clean-up: \$ | | | |
| PERMIT HOLDER POST INCIDENT REPORT | | | P |
| PLEASE NOTE: "All incidents involving a pipeline must submit a Form D: Permit Holder Post Incident Report Form within 60 days by email to EMP@bcogc.ca . A Permit Holder Post Incident Report Form may be required to be submitted for other minor incidents upon request by a Commission employee." The form can be found on the Commission's website. | | | |
| Permit Holder Post Incident Report Required: <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |



INCIDENT CLASSIFICATION MATRIX

Instructions: Start at the top and continue down until you check off any one box in both consequence and probability to determine the incident classification. *This matrix is required as an attachment upon submission of an incident through the [Online Minor Incident Reporting System](#).*

TABLE 1. CONSEQUENCE RANKING

| RANK | CONSEQUENCE (any one of the following) |
|------|---|
| 4 | <input type="checkbox"/> Major on site equipment or infrastructure loss <input type="checkbox"/> Major act of violence, sabotage, or terrorism which impacts permit holder assets <input type="checkbox"/> Reportable liquid spill beyond site, uncontained and affecting environment <input type="checkbox"/> Gas release beyond site affecting public safety |
| 3 | <input type="checkbox"/> Threats of violence, sabotage, or terrorism <input type="checkbox"/> Reportable liquid spill or gas release beyond site, potentially affecting public safety, environment, or property <input type="checkbox"/> HAZMAT worker exposure exceeding allowable <input type="checkbox"/> Major on site equipment failure |
| 2 | <input type="checkbox"/> Major on site equipment damage <input type="checkbox"/> A security breach that has potential to impact people, property or the environment <input type="checkbox"/> Reportable liquid spill or gas release potentially or beyond site, not affecting public safety, environment, or property |
| 1 | <input type="checkbox"/> Moderate on site equipment damage <input type="checkbox"/> A security breach that impacts oil and gas assets <input type="checkbox"/> Reportable liquid spill or gas release on location <input type="checkbox"/> **Occurrence of magnitude 4.0 or greater induced earthquake within 3 km of oil and gas operations or any earthquake which is felt on surface within a 3 km radius of oil and gas operations |
| 0 | <input type="checkbox"/> No consequential impacts |

**** For this consequence criteria, a probability score of 2 or higher must be used.**

TABLE 2. PROBABILITY RANKING

| RANK | PROBABILITY (any one of the following) |
|------|---|
| 4 | <input type="checkbox"/> Uncontrolled, with control unlikely in near term |
| 3 | <input type="checkbox"/> Escalation possible; under or imminent control |
| 2 | <input type="checkbox"/> Escalation unlikely; controlled or likely imminent control |
| 1 | <input type="checkbox"/> Escalation highly unlikely; controlled or imminent control |
| 0 | <input type="checkbox"/> Will not escalate; no hazard; no monitoring required |

TABLE 3. INCIDENT RISK SCORE AND CLASSIFICATION

CONSEQUENCE _____ + PROBABILITY _____ = RISK SCORE _____ (this must be completed)

| RISK SCORE | ASSESSMENT RESULT |
|----------------|---|
| Minor (1-2) | Notification Only; permit holder must notify the Commission online within 24 hours using the Form A: Minor Incident Notification Form . In addition to Form A, spills must also be reported to EMBC. |
| Moderate (3-4) | Level-1 Emergency; immediate notification (call EMBC) |
| Major (5-6) | Level-2 Emergency; immediate notification (call EMBC) |
| Serious (7-8) | Level-3 Emergency; immediate notification (call EMBC) |

RESIDENTS

If an emergency occurs that poses a threat to the residents in the vicinity of an AltaGas facility it may be necessary to notify residents and evacuate them to safety. The *Public Safety Coordinator* is responsible for organizing the notification and evacuation of residents. Evacuation of residents is on a voluntary basis – **AltaGas personnel do not have authority to order residents to evacuate their homes**. If a resident chooses not to evacuate the police should be notified.

The *Public Safety Coordinator* will organize *Telephone Crews* and *Evacuation Crews* if an evacuation is necessary. The *Telephone Crews* will use the evacuation and shelter forms included in Section 6, when contacting residents to arrange evacuation or sheltering. A record of all resident contacts must be made in the Resident Contact Log in Section 6. Refer to the site-specific ERP for evacuation of residents near facilities that have a site-specific ERP. Evacuees who have incurred expenses due to the evacuation should request compensation using the Evacuation Expenses Compensation Report in Section 6.

At a **Level 2** emergency, the company will notify all persons who may be in the affected area and the public in the surrounding area by:

- § Announcements on the local radio station informing of the incident.
- § Notification through telephone contact.
- § Acquiring helicopters to perform fly-overs to visually inspect for persons in the vicinity.
- § Dispatching rovers to locate persons and respond to sightings by the helicopter(s).

It is the responsibility of the *Media & Communications Coordinator* to ensure that the following information is available to the public during an emergency:

- type and status of incident,
- proximity of the incident to people in the area,
- the area impacted by the incident,
- the effects of the incident on the people in the area,
- actions that should be taken by the public if they experience adverse effects,
- information on the substances involved and their short and long-term effects,
- public protection measures, including evacuation and shelter procedures,
- actions being taken to address the incident and the time they will take, and
- contact information for additional information and updates.

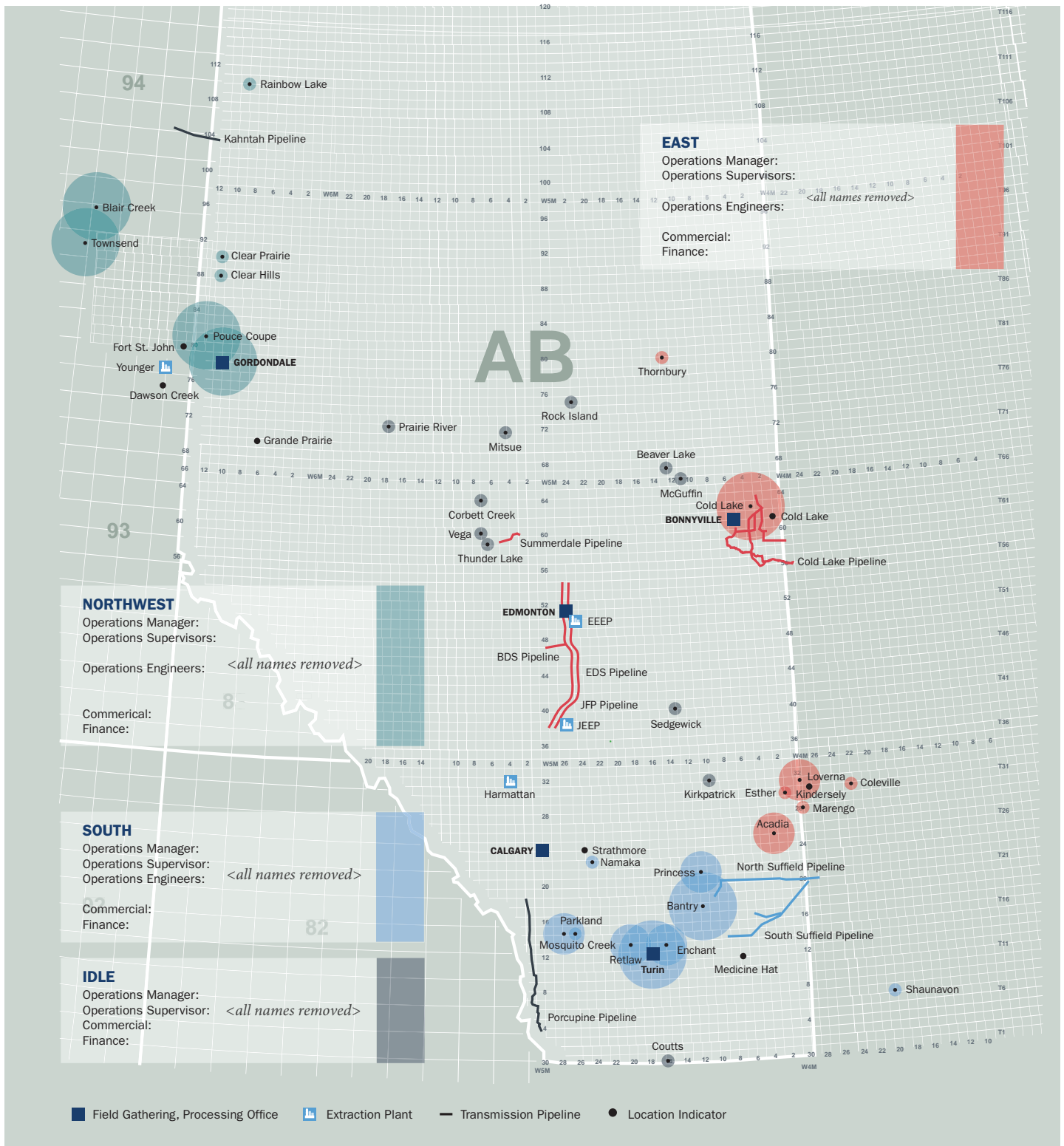
RECEPTION CENTRE

If any type of **Level 2 or 3 Emergency** threatens area residents, they will be relocated to a nearby hotel or community centre. It is the responsibility of the *Public Safety Coordinator* to appoint an *Evacuation Centre Coordinator*, who will establish a reception centre at a safe location outside of the EPZ if it becomes necessary to begin evacuating residents. Evacuees should be registered using the Reception Centre Check-In Sheet in Section 6. Any concerns the evacuees may have should be addressed at this time. Once evacuees have registered at the reception centre and have indicated where they may be contacted, they are free to go as they please. If necessary, the *Evacuation Centre Coordinator* will arrange food and shelter for the evacuees.

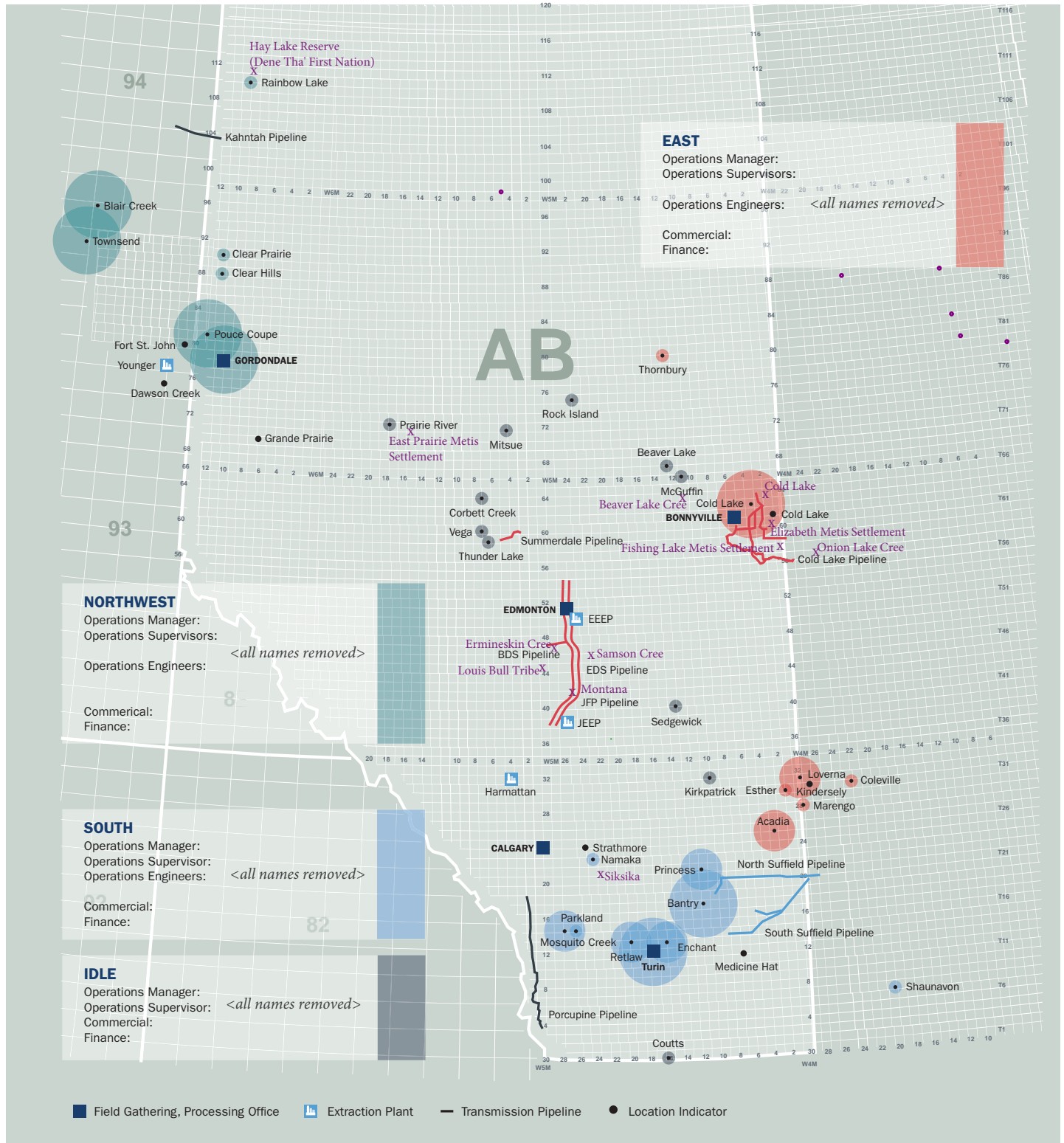
GAS DIVISION

Field Gathering, Processing, Transmission and Storage Areas

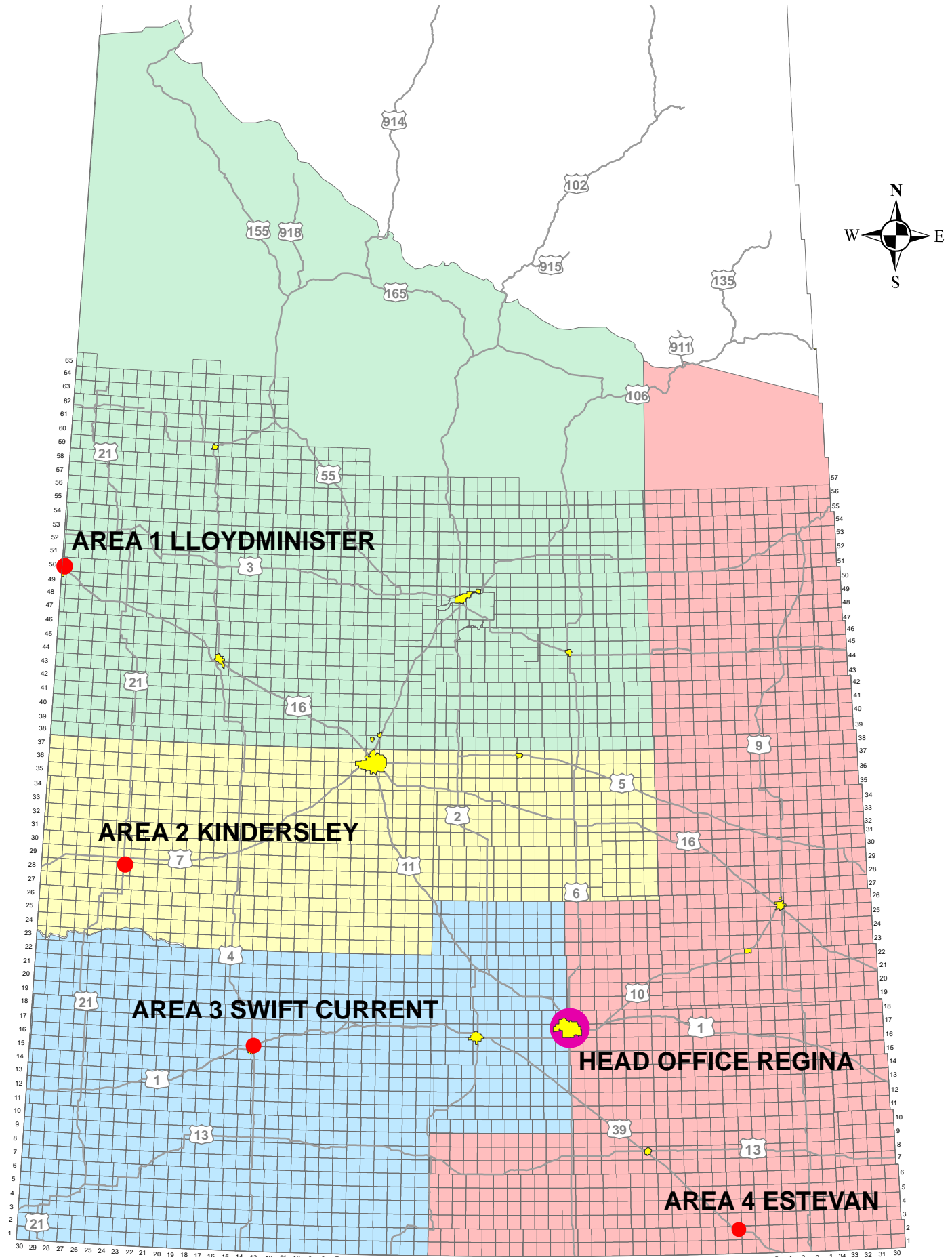
AltaGas



Aboriginal Areas Impacted by AltaGas Operations



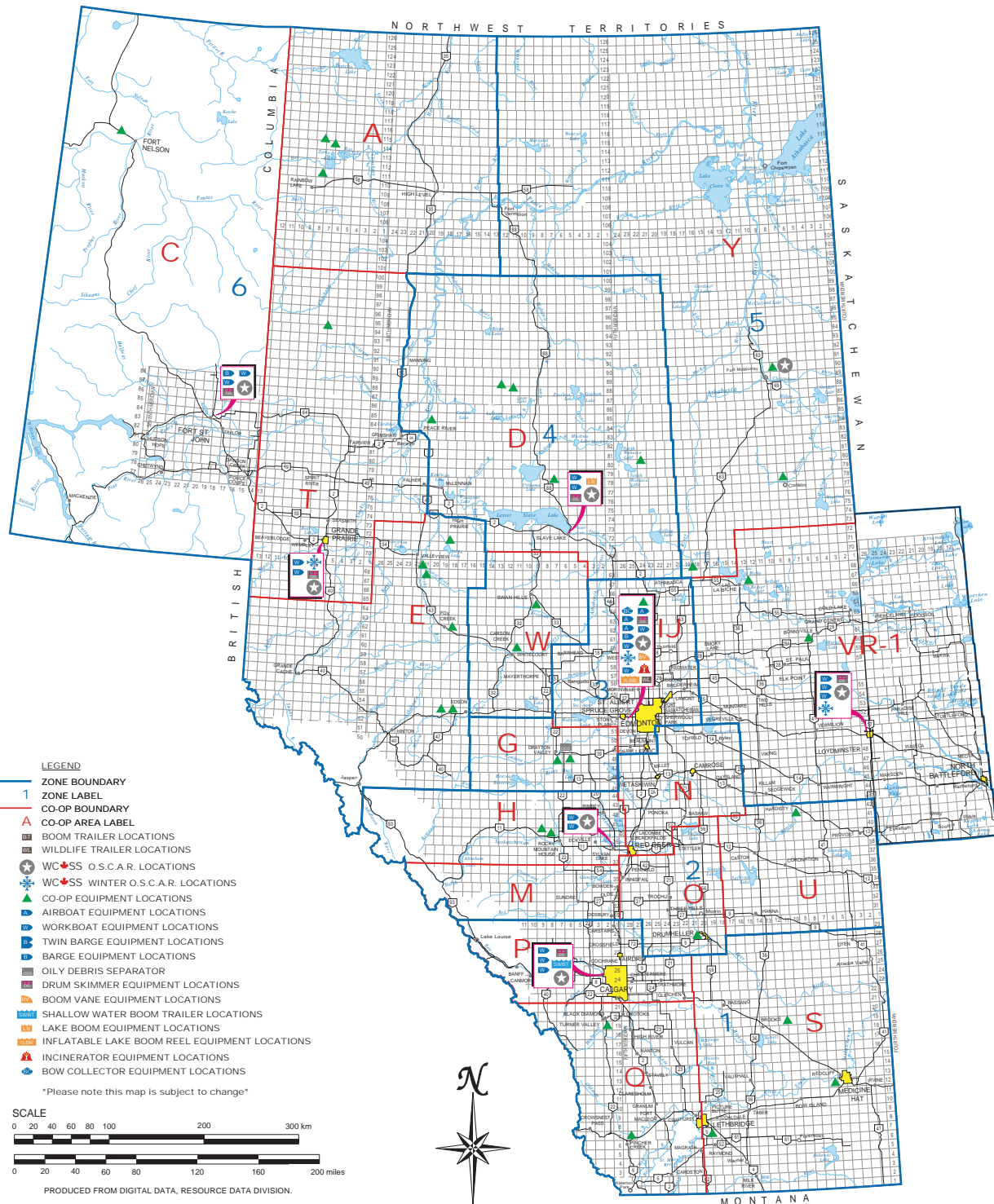
SASKATCHEWAN PNG OFFICE ADMINISTRATIVE BOUNDARIES



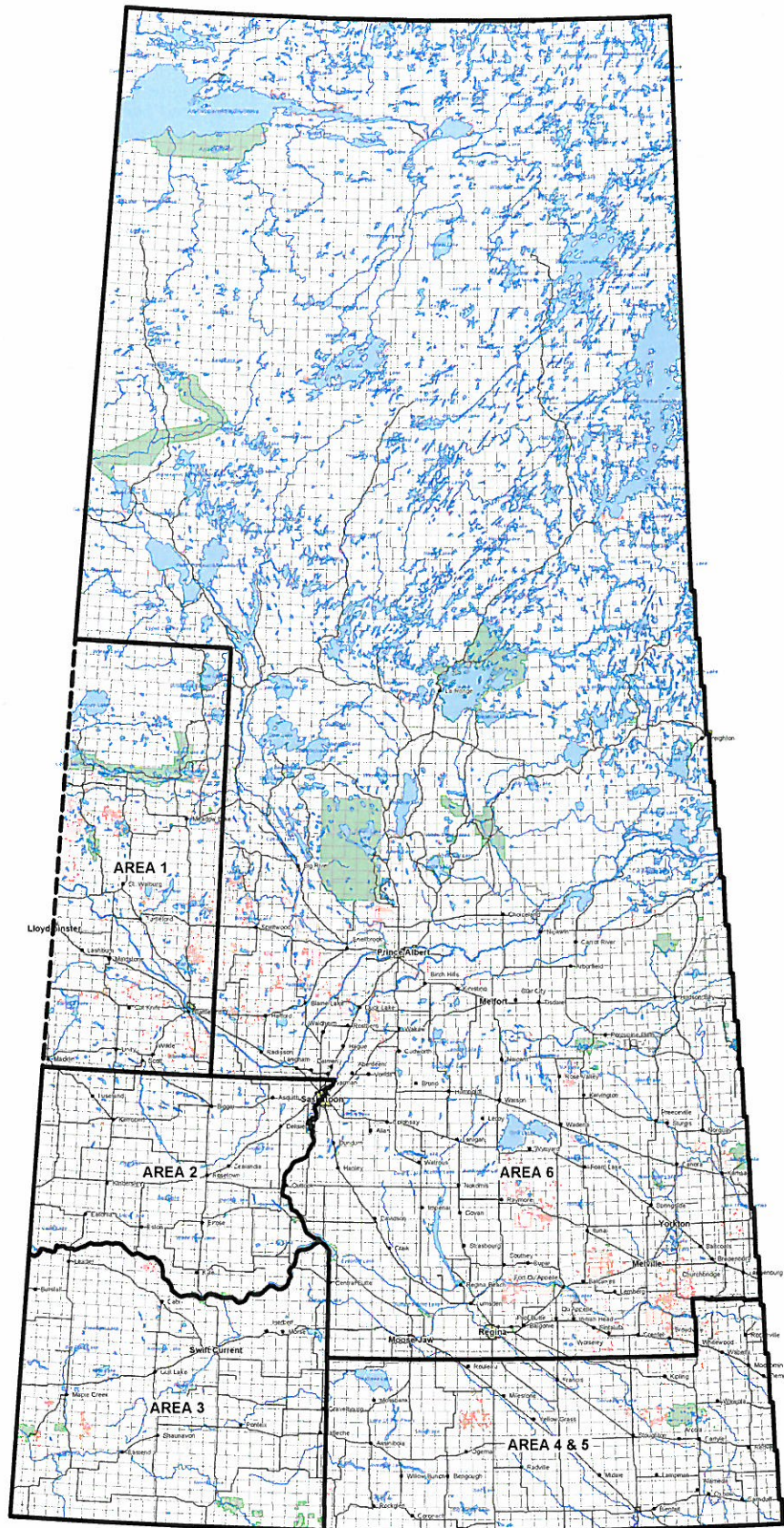
WCSS OIL SPILL

COOPERATIVE BOUNDARIES 2013

SHOWING EQUIPMENT LOCATIONS



ABACUS DATAGRAPHS LTD.
300 4814 ROSS STREET
RED DEER, ALBERTA, CANADA T4N 1X4
TEL: (403) 346-7555
FAX: (403) 346-7550
E-MAIL: abadata@abacusdatagraphs.com



Emergency Response Units

Saskatchewan Area Spill Co-op Boundaries

| | | | | | | | | |
|------|-------------|--------------------|----------|----------|----------|----------|-------|-----------|
| City | PR Jan 2013 | T. E. Saskatchewan | Province | S. Wente | Reviewer | S. Wente | Drawn | G. Eveson |
|------|-------------|--------------------|----------|----------|----------|----------|-------|-----------|

Disclaimer: The information contained herein may be compared from numerous third party sources that are subject to periodic change without prior notification. While every effort has been made to ensure the accuracy of the information presented at the time of preparation, Sask. Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in this third party material.

Figure 1

INITIAL RESPONSE

Key Responders – Log all actions as appropriate

- Step 1** The **First Responder** assesses the incident scene to determine the immediate impact. Ensure personal protection by:
- Utilizing “buddy” system and/or following “Work Alone” protocol
 - Approaching with extreme caution from upwind direction
 - Having all necessary PPE (Gas detection, SCBA, FRC etc.)
- § For incoming calls, record information on the Initial Notification Report or Threat Report
- The **First Responder** becomes the **On-Scene Commander** until or unless relieved by a more senior Company representative.
- Step 2** The **On-Scene Commander** assesses the emergency to determine the immediate and potential actions required. First response actions may include:
- § Establishing the Initial Isolation Zone (IIZ) and ensuring the safety of all personnel within
 - § Securing the incident scene
 - § Contacting and sheltering/evacuating residents if immediate danger exists
 - § Determining the initial Level of Emergency
 - § Establishing a field On-Site Command Post (OSCP) at or near the emergency site
- Step 3** The **On-Scene Commander** immediately contacts an **Incident Commander** (see list of potential *Incident Commanders* on the next page).
The **Incident Commander** assumes overall command of the incident.
- Step 4** The **Incident Commander** and **On-Scene Commander** affirm the Level of Emergency and develop and implement an action plan for responding to the emergency.
- § Review the Emergency Planning Zone (EPZ), if applicable, and establish the Protective Action Zone (PAZ) – Downwind Danger Area
 - § Begin public safety response actions, as appropriate, which may include:
 - Establishing perimeter roadblocks
 - Notifying sensitive residents (those classified at Emergency Evacuation Priority Level 1)
 - Evacuating/Sheltering residents
 - Igniting gas release
 - § Delineate the PAZ on an on-going basis through air monitoring
 - § Identify and contact all internal and external personnel (including Emergency Services) needed to respond to the emergency
- Step 5** The **Incident Commander** is responsible for establishing the Corporate Emergency Operations Centre (CEOC) and assembling the appropriate corporate support staff including senior management.
The **Incident Commander** is also responsible for notifying regulatory agencies, including:
- § Regional Health Authority / Local Hospital
 - § Oil & Gas Regulator
 - § Environmental Regulator
 - § Occupational Health & Safety Authority
 - § Provincial/State Emergency Management Agency
- Should the incident warrant, the **Incident Commander** is also responsible for establishing a Regional Emergency Operations Centre (REOC) – usually at the nearest urban centre.
- Step 6** The **Incident Commander**, in consultation with the **On-Scene Commander** and appropriate regulatory agencies, determines when the emergency response is to be terminated and notifies company, regulatory and emergency services personnel.

**For a comprehensive list of potential emergency response actions refer to the
Emergency Response Checklist
at the end of this section.**

ALTAGAS CORPORATE PERSONNEL

| Name | Position | Telephone Business | Telephone Residence | Telephone Cellular |
|--|--------------------------------------|--------------------|---------------------|--------------------|
| Potential Incident Commanders – Field Gathering & Processing (FG&P) | | | | |
| <name removed> | Ops Manager, Central & NE | <# removed> | n/a | <# removed> |
| <name removed> | Director Ops – FG&P & Trans. | <# removed> | n/a | <# removed> |
| <name removed> | Operations Manager, NW | <# removed> | n/a | <# removed> |
| <name removed> | Div VP Operations - Gas | <# removed> | n/a | <# removed> |
| <name removed> | Operations Manager, South | <# removed> | <# removed> | <# removed> |
| Potential Incident Commanders – Extraction | | | | |
| <name removed> | Director Operations - Extraction | <# removed> | n/a | <# removed> |
| <name removed> | Div VP Operations - Gas | <# removed> | n/a | <# removed> |
| Potential Incident Commanders – Power Canada | | | | |
| <name removed> | Director Business Development | <# removed> | <# removed> | <# removed> |
| | | Calgary office: | Vancouver office: | |
| <name removed> | Div VP Eng & Construction | <# removed> | <# removed> | <# removed> |
| <name removed> | President & COO | <# removed> | <# removed> | <# removed> |
| Potential Incident Commanders – Major Projects | | | | |
| | | Calgary office: | Vancouver office: | |
| <name removed> | President & COO | <# removed> | <# removed> | <# removed> |
| Potential Incident Commanders – Ferndale | | | | |
| <name removed> | Div VP Operations - Gas | <# removed> | <# removed> | <# removed> |
| | | Calgary office: | Vancouver office: | |
| <name removed> | Div VP Eng & Construction | <# removed> | <# removed> | <# removed> |
| <name removed> | President & COO | <# removed> | <# removed> | <# removed> |
| AltaGas Media / Communications Personnel | | | | |
| <name removed> | VP, Stakeholder Relations | <# removed> | n/a | <# removed> |
| <name removed> | Senior Advisor, External Comm. | <# removed> | n/a | <# removed> |
| <name removed> | Senior Advisor, External Comm. | <# removed> | n/a | <# removed> |
| Other AltaGas Personnel | | | | |
| <name removed> | Process Safety Manager, EHS | <# removed> | n/a | <# removed> |
| <name removed> | VP EHS, Security & Sust., Compliance | <# removed> | n/a | <# removed> |
| <name removed> | Executive Vice President | <# removed> | n/a | <# removed> |
| <name removed> | Stakeholder | <# removed> | n/a | n/a |
| 24 Hour Emergency (Canada): 1-866-826-3830 | | | | |
| 24 Hour Emergency (Washington): 1-360-384-1701 | | | | |

| AltaGas EMERGENCY RESPONSE CHECKLIST | | | | EMERGENCY RESPONSE SIDE 2 | | | |
|--|--|---|--|--|--|--------------------|--|
| PUBLIC SAFETY COORDINATOR (PSC) | | SHELTER/EVACUATION PROCEDURES | | PUBLIC SAFETY COORDINATOR EVACUATION & ROADBLOCK CREWS TELEPHONE CREWS EVACUATION CENTRE COORDINATOR | | | |
| Coordinates all aspects of the Shelter/Evacuation process using available resources to protect Public Safety | | Alternatives for the protection of public safety should be considered on a site-specific basis, taking into account all pertinent factors | | LEVEL 1 EMERGENCY: | | | |
| <div><div><div><div><div><div></div><div>Assist Incident Commander and On-Scene Commander with organizing Roadblock Crews, Telephone Crews And Evacuation Crews.</div></div><div><div></div><div>Establish a prioritized resident list beginning with residences/businesses located downwind close to the emergency site.</div></div><div><div></div><div>Organize Telephone Crew to contact area users with the applicable public safety message (no more than 7 residents per Telephoner).</div></div><div><div></div><div>Assemble and dispatch Evacuation Crew(s) to assist residents/businesses requiring assistance with evacuation.</div></div><div><div></div><div>In consultation with the Incident Commander, direct Evacuation Crews/Telephoners to proceed with one of the following safety actions:</div></div><div><div></div><div>- "SHELTER" residents/businesses inside/outside the EPZ/PAZ until H₂S/LEL levels indicate the area is safe.</div></div><div><div></div><div>- "EVACUATION" of residents/businesses inside/outside the EPZ/PAZ if H₂S/LEL levels indicate area is not safe.</div></div><div><div></div><div>Appoint & direct Evacuation Centre Coordinator to establish the Reception Centre.</div></div><div><div></div><div>Maintain record of the public's status, both inside and outside the EPZ and communicate status to the On-Scene or Incident Commander.</div></div><div><div></div><div>Liaise with the government officials if called upon to assist with public safety actions.</div></div><div><div></div><div>If helicopter is dispatched to assist with public safety actions, establish air-to-ground communication link.</div></div></div></div></div></div> | | <div><div><div><div><div><div></div><div>SHELTER-IN-PLACE:</div></div><div><div></div><div>Criteria for implementation:</div></div><div><div></div><div>▪ Not enough time to safely evacuate residents/businesses from the area.</div></div><div><div></div><div>▪ The product release will be of short duration (i.e. several minutes to half an hour).</div></div><div><div></div><div>▪ Release of limited duration or the location of release has not been identified.</div></div><div><div></div><div>▪ Waiting for evacuation assistance.</div></div><div><div></div><div>▪ Residences/businesses would be at higher risk if they were asked to evacuate.</div></div></div><div><div></div><div>Implementation by Public Safety Coordinator:</div></div><div><div></div><div>Determine from maps which residents must be sheltered based on initial data from on-site responders.</div></div><div><div></div><div>Assign personnel to contact residents by phone with emphasis on those downwind from the incident.</div></div><div><div></div><div>Maintain record of all residents asked to take shelter using the Resident Contact Log in Section 6.</div></div></div><div><div><div><div><div><div></div><div>EVACUATION:</div></div><div><div></div><div>Criteria for Implementation:</div></div><div><div></div><div>▪ H₂S concentrations below 10 ppm (1 hour average):</div></div><div><div></div><div>- "Sensitive" individuals should consider leaving the area.</div></div><div><div></div><div>- All other individuals should consider leaving the area if health symptoms develop.</div></div><div><div></div><div>▪ If H₂S concentrations exceed 10 ppm (3 minute average), evacuation should be implemented immediately.</div></div><div><div></div><div>▪ If H₂S concentrations exceed 1 ppm (1 hour average) in an urban centre, evacuation should be implemented immediately.</div></div></div><div><div></div><div>Implementation by Public Safety Coordinator:</div></div><div><div></div><div>Determine appropriate Reception Centre and direct Evacuation Centre Coordinator there.</div></div><div><div></div><div>Determine from maps which residents must be evacuated.</div></div><div><div></div><div>Assign personnel to contact residents by phone or proceed to residence if required (i.e. assistance required or no answer).</div></div><div><div></div><div>Maintain a record of all evacuated persons.</div></div></div></div></div></div></div> | | <div><div><div><div><div><div></div><div>Assist with evacuation of the Emergency Planning & Response Zones</div></div><div><div></div><div>Assemble at designated site for briefing by Public Safety Coordinator (if possible).</div></div><div><div></div><div>Proceed, in designated evacuation vehicles, to residents/businesses to initiate evacuation procedures.</div></div><div><div></div><div>Ensure the following information is delivered:</div></div><div><div></div><div>- The type of emergency and related dangers.</div></div><div><div></div><div>- Directions for proceeding out of the area safely.</div></div><div><div></div><div>- Provide assistance to individuals requesting help.</div></div><div><div></div><div>If residence is unoccupied, record in Resident Contact Log (Section 6).</div></div><div><div></div><div>Report evacuation status to Public Safety Coordinator.</div></div><div><div></div><div>Record all evacuation data on Resident Contact Log (Section 6).</div></div><div><div></div><div>After evacuation procedures are completed, assist roadblock crews with securing the EPZ and manning roadblocks.</div></div></div></div></div></div> | | LEVEL 2 EMERGENCY: | |
| EVACUATION CENTRE COORDINATOR | | DOWNGRADING AN EMERGENCY | | LEVEL 3 EMERGENCY: | | | |
| Assist Public Safety Coordinator with notifications, record keeping and securing equipment/services for evacuation | | The Level of Emergency may be downgraded through joint decision of the IC and the appropriate Government Agencies | | LEVEL 2 EMERGENCY: | | | |
| <div><div><div><div><div><div></div><div>Pick up evacuation centre kit (if applicable) and ERP Manual.</div></div><div><div></div><div>Proceed to designated Reception Centre to receive evacuees.</div></div><div><div></div><div>Contact additional personnel to assist as required.</div></div><div><div></div><div>Set up Reception Centre (tables/chairs) as needed.</div></div><div><div></div><div>Record the arrival of all members of the public on the Evacuation Centre Check-in Sheet (Section 6).</div></div><div><div></div><div>Liaise with Public Safety Coordinator to ensure resident concerns are addressed and answered promptly.</div></div><div><div></div><div>Report status of evacuees to Public Safety Coordinator and record status on the Evacuation Centre Check-in Sheet (Section 6).</div></div><div><div></div><div>Assist residents with compensation issues.</div></div><div><div></div><div>Assist with post-emergency actions.</div></div></div></div></div></div> | | <div><div><div><div><div><div></div><div>Activities can be downgraded once when there is no longer a threat to people, property or the environment.</div></div><div><div></div><div>Incident Commander (in consultation with the OSC) will notify all affected parties that the emergency is over, including:</div></div><div><div></div><div>▪ Company and external resources used to handle the emergency</div></div><div><div></div><div>▪ Affected/evacuated area residents</div></div><div><div></div><div>▪ Government agencies</div></div><div><div></div><div>▪ Media & Communications Coordinator (who must then issue a media statement)</div></div></div><div><div></div><div>OSC to ensure affected residences are clear of gas before allowing residents to return</div></div><div><div></div><div>OSC to provide transportation to evacuated residents</div></div><div><div></div><div>OSC to ensure evacuated personnel return and roadblocks are discontinued.</div></div><div><div></div><div>OSC to complete initial AltaGas Incident Investigation Report Form.</div></div><div><div></div><div>OSC/IC are to make arrangements for repair, clean-up, refurbishing of equipment, etc.</div></div><div><div></div><div>IC to initiate critical stress management action as appropriate.</div></div><div><div></div><div>IC to conduct a post-incident debriefing within 30 days and submit report to the appropriate government agency.</div></div><div><div></div><div>IC to ensure reimbursement of all costs incurred by residents due to the emergency.</div></div></div></div></div> | | <div><div><div><div><div><div></div><div>Assist Public Safety Coordinator with prioritizing and conducting Resident call down</div></div><div><div></div><div>Assist the Public Safety Coordinator with prioritizing resident call down.</div></div><div><div></div><div>Confirm with Public Safety Coordinator which message is to be delivered to area residences/businesses ("Shelter" or "Evacuation").</div></div><div><div></div><div>Fill in appropriate information in message form.</div></div><div><div></div><div>Proceed to contact residences/businesses and deliver selected message.</div></div><div><div></div><div>Maintain an accurate log of all telephone conversations, times, etc. on Resident Contact Log (Section 6).</div></div><div><div></div><div>Establish communications with Evacuation Centre Coordinator, relaying resident and/or business status as it changes.</div></div><div><div></div><div>Notify the Public Safety Coordinator of any problems, issues or requirements arising from the contact process (i.e. no contact made, need for assistance, only children at home, etc.).</div></div><div><div></div><div>Assist with post-emergency notifications when the emergency is called down by the Incident Commander.</div></div></div></div></div></div> | | LEVEL 3 EMERGENCY: | |
| ROADBLOCK CREWS | | LEVELS OF EMERGENCY SHELTER / EVACUATION & DOWNGRADING PROCEDURES | | LEVEL 1 EMERGENCY: | | | |
| Establish and maintain hazardous area roadblocks | | Prior To Dispatch: | | LEVEL 2 EMERGENCY: | | | |
| <div><div><div><div><div><div></div><div>Assemble at designated site for briefing by On-Scene Commander (if possible).</div></div><div><div></div><div>Obtain roadblock kits and applicable safety equipment.</div></div><div><div></div><div>Establish schedule of report-in times to On-Scene Commander.</div></div></div><div><div></div><div>To Isolate the Emergency Planning Zone (EPZ):</div></div><div><div></div><div>Establish a safe route to get to your location and an escape route should conditions warrant.</div></div><div><div></div><div>Record vehicle information for vehicles stopping at roadblock on Roadblock Log (Section 6).</div></div><div><div></div><div>Monitor H₂S/LEL levels and relay information to On-Scene Commander. Be prepared to move position of roadblock(s) as conditions change.</div></div><div><div></div><div>Maintain roadblock until relieved or informed by On-Scene Commander to stand down.</div></div><div><div></div><div>Finalize report.</div></div></div></div></div> | | <div><div><div><div><div><div></div><div>A Level 2 Emergency which has escalated in scope and is an immediate or major hazard to the public or environment.</div></div><div><div></div><div>Significant media interest.</div></div><div><div></div><div>Situation is uncontrolled and will require external assistance to bring under control.</div></div></div><div><div></div><div>Examples:</div></div><div><div></div><div>▪ Uncontrolled release from any source resulting in prolonged concentrations of H₂S/SO₂/LEL which exceed evacuation criteria.</div></div><div><div></div><div>▪ Ignition procedures implemented.</div></div><div><div></div><div>▪ Uncontrolled release from any source which may result in an environmental disaster (spill enters a water course).</div></div><div><div></div><div>▪ Ongoing breach or security or bomb threat.</div></div><div><div></div><div>Actions - Level 2, Plus:</div></div><div><div></div><div>▪ Escalated response actions utilizing appropriate external resources.</div></div><div><div></div><div>▪ Enhanced CEOC Team membership.</div></div></div></div></div> | | LEVEL 1 EMERGENCY: | | | |

AltaGas Pipeline Partnership

Kahntah Pipeline

License No. 76033

Emergency Response Plan Supplement

August 2016

AltaGas Pipeline Partnership
1700, 355 - 4th Avenue SW
Calgary, Alberta T2P 0J1
Telephone: 403-691-7575
Fax: 403-691-7576

Introduction

This Emergency Response Plan (ERP) Supplement only covers the National Energy Board regulated AltaGas Kahntah Pipeline. This ERP Supplement is to be used in conjunction with the emergency response procedures found in the AltaGas Corporate ERP.

Location and Description of the Kahntah Pipeline

The Kahntah Pipeline is a pipeline that runs from d-53-D, 94-I-02 (Peace River Regional District, British Columbia) to TransCanada's Meter Station at 13-6-104-12 W6M (County of Northern Lights, Alberta). The Kahntah pipeline is located approximately 193 kilometres north of Fort St. John. AltaGas Pipeline Partnership (AltaGas) owns the pipeline.

Operations

The Kahntah Pipeline was deactivated in 2011 in accordance with the technical requirements of CSA Z662. The pipeline was pigged, purged with nitrogen, and isolated.

Kahntah Pipeline:

| From Location | To Location | License No. | Subst. | Pressure (psi) | Pipeline Length (km) | Inner Diameter (mm) | Status |
|---------------|----------------|-------------|----------|----------------|----------------------|---------------------|-------------|
| 94-I-02-D53-D | 13-06-104-12W6 | 76033 | Nitrogen | 20 | 54.8 | 323.9 | Deactivated |

Regulatory Jurisdiction

Because the pipeline crosses the British Columbia / Alberta provincial border, it is under the jurisdiction of the National Energy Board (NEB). All significant incidents involving NEB-regulated pipelines should be reported through the NEB/TSB single-window notification process – initial notification must be made to the TSB Reporting Hotline (**819-997-7887**) and then subsequently to the NEB's Online Event Reporting System (OERS).

Emergency Equipment

AltaGas operators / field personnel keep the following emergency equipment in their vehicles (trucks), so that they have access to it on a 24 hour basis.

Gas Detection

§ Personal monitor (Multi Gas)

First Aid Kits

§ Portable Vehicle #1 Kit

§ Optional larger kit

Fire Extinguishers

§ Portable 30 lb dry chemical

Communications

§ Cellular telephone

§ Optional 2-way Radios when cell phones not viable

Roadblock Kits

§ Road barricade with flashing light

§ Stop/Slow paddle

§ Hi-Visibility vest

§ Flashlight

§ Map of the area and checklist/control Log

Other

§ Towing hitches (c/w clevis's) and recovery ropes or straps

§ Booster cables

§ Reflective flares

§ Snow shovel / tire chains

Emergency Contacts

| Name | Position | Telephone Business | Telephone Residence | Telephone Cellular |
|---|------------------------------|--------------------|---------------------|--------------------|
| Potential AltaGas Incident Commanders for the Kahntah Pipeline | | | | |
| <name removed> | Div. VP Operations - Gas | <# removed> | n/a | <# removed> |
| <name removed> | Director Ops – FG&P & Trans. | <# removed> | n/a | <# removed> |
| <name removed> | Ops Manager, Central & NE | <# removed> | n/a | <# removed> |
| 24 Hour Emergency 1-866-826-3830 | | | | |

Resident Information

The Kahntah Pipeline has been deactivated; however, an emergency awareness zone of 100 metres has been set around the pipeline. The emergency awareness zone is a guide for the initial response; in an emergency, the hazard area may be larger or smaller than the awareness zone.

There are no residents within the Kahntah Pipeline emergency awareness zone, but there are trappers using traplines that are partially within the zone. The trappers are listed in the following tables and can be located by trapline number on the map.

Alberta Trapping Area:

<trapper information removed>

British Columbia Trapping Area:

<trapper information removed>

Distribution List

| Name | Title | Location | # of Copies | Corporate ERP Manual # |
|--|------------------------|----------|-------------|------------------------|
| AltaGas | | | | |
| Corporate Emergency Operations Centre (CEOC) | | Calgary | 1 | 1 |
| Operations | 16 th Floor | Calgary | 1 | 2 |
| EOH&S | 17 th Floor | Calgary | 1 | 3 |
| External | | | | |
| Emerg. Manag. Compliance | National Energy Board | Calgary | 1 | 12 |

AltaGas Ltd
RESIDENCE SKETCH
(PIPELINE E.R.P.)
FOR THE
KAHNTAH AREA
WITHIN
**94-I-01, 94-I-02 &
PEACE RIVER DISTRICT (BC)**
AND
TWP. 104 RGE. 12 W.6M.
M.D. OF NORTHERN LIGHTS No. 22 (AB)

ALBERTA TRAPPING AREA:

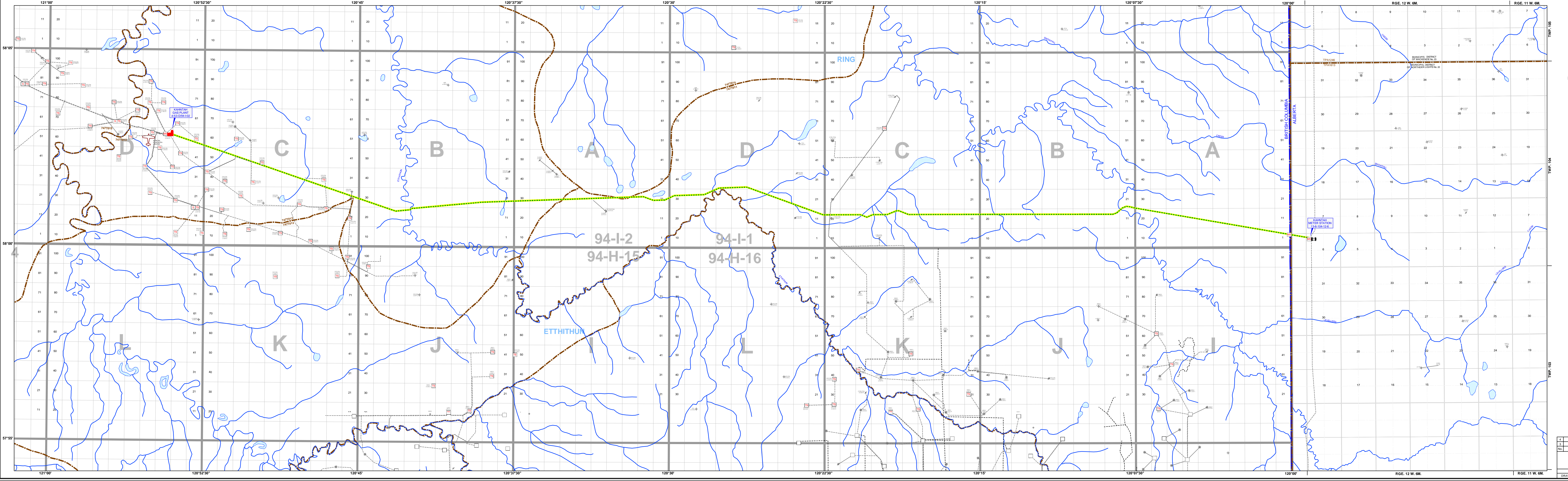
| | |
|----------|----------|
| TPA 1246 | TPA 1613 |
|----------|----------|

BRITISH COLUMBIA TRAPPING AREA:

| | |
|---------|---------|
| 747T006 | 747T009 |
| 747T010 | 747T011 |
| 747T012 | 747T013 |
| 747T014 | 747T015 |

- LEGEND:**
- PAVED HIGHWAYS
 - GRAVEL HIGHWAYS
 - ACCESS ROAD/RAIL
 - M.D. OR COUNTY B.D.
 - TRAPPING AREA BOUNDARY
 - RIVERS / CREEKS
 - OCCUPIED RESIDENCES
 - UNOCCUPIED RESIDENCES
 - CABINS
 - ROAD BLOCKS
 - EMERGENCY PLANNING ZONE
 - EMERGENCY AWARENESS ZONE
 - BATTERY
 - METER STATION
 - TEST SITE
 - PIG TRAP
 - ALTAGAS PIPELINES (NEB-regulated)
 - FOREIGN PIPELINES (EGIS)
 - SERVICE WELLS
 - OIL WELLS
 - GAS WELLS
 - GAS INJECTION WELLS
 - SUSPENDED GAS WELLS
 - ABANDONED GAS WELLS
 - SUSPENDED OIL WELLS
 - ABANDONED OIL WELLS
 - SURFACE HOLE LOCATION
 - LOCATION
 - SUSPENDED
 - ABANDONED
 - ABANDONED SERVICE WELLS

| | | | | |
|--------------------------------------|--------------------------|------------|----|------|
| 4 | UPDATE LEGEND | 2012-03-27 | TD | BN |
| 3 | EDIT TRAPPER INFORMATION | 2010-11-25 | TD | BP |
| No | REVISIONS | DATE | BY | CKD. |
| SCALE 1:80 000 | | | | |
| DRAWN:MLM | | | | |
| Checked by: BP | | | | |
| JOB No.: 053180 | | | | |
| T:\ERP\BC-EXP\05050-31800-318001.dwg | | | | |



AltaGas

John Lake Pipelines

Emergency Response Plan Supplement

August 2016

AltaGas
1700, 355 - 4th Avenue SW
Calgary, Alberta T2P 0J1
Telephone: 403-691-7575
Fax: 403-691-7576

Introduction

This Emergency Response Plan (ERP) Supplement only covers the National Energy Board regulated pipelines within the AltaGas John Lake operating area, which is part of the AltaGas East - Cold Lake district. This ERP Supplement is to be used in conjunction with the emergency response procedures found in the AltaGas Corporate ERP.

Location and Description of the John Lake Pipelines

The John Lake Pipelines cross the Alberta/Saskatchewan border near John Lake (Alberta). The northern John Lake Pipeline starts in the Municipal District of Bonnyville, AB and crosses into the Rural Municipality of Loon Lake, SK. The southern John Lake Pipeline starts in the County of Vermilion River, AB and crosses into the Rural Municipality of Loon Lake, SK. AltaGas owns and operates the pipelines.

Operations

| From Location | To Location | License No. | Substance | Op. Pressure | Pipeline Length (km) | Inner Diameter (mm) | Status |
|----------------|----------------|-------------|-----------|--------------|----------------------|---------------------|-----------|
| 06-04-57-27 W3 | 07-01-57-01 W4 | AO-2-XG-3-1 | NG | 5100 | 3.7 | 111.1 | Inactive |
| 12-04-56-27 W3 | 10-01-56-01 W4 | AO-2-XG-3-1 | NG | 5100 | 3.0 | 111.1 | Abandoned |

Regulatory Jurisdiction

Because the pipelines cross the Alberta/Saskatchewan provincial border, they are under the jurisdiction of the National Energy Board (NEB). All significant incidents involving NEB-regulated pipelines should be reported through the NEB/TSB single-window notification process – initial notification must be made to the TSB Reporting Hotline (**819-997-7887**) and then subsequently to the NEB's Online Event Reporting System (OERS).

Emergency Equipment

AltaGas operators / field personnel keep the following emergency equipment in their vehicles (trucks), so that they have access to it on a 24 hour basis.

Gas Detection

§ Personal monitor (Multi Gas)

First Aid Kits

§ Portable Vehicle #1 Kit

§ Optional larger kit

Fire Extinguishers

§ Portable 30 lb dry chemical

Communications

§ Cellular telephone

§ Optional 2-way Radios when cell phones not viable

Roadblock Kits

§ Road barricade with flashing light

§ Stop/Slow paddle

§ Hi-Visibility vest

§ Flashlight

§ Map of the area and checklist/control Log

Other

§ Towing hitches (c/w clevis's) and recovery ropes or straps

§ Booster cables

§ Reflective flares

§ Snow shovel / tire chains

Emergency Contacts

| Name | Position | Telephone Business | Telephone Residence | Telephone Cellular |
|---|------------------------------|--------------------|---------------------|--------------------|
| John Lake Personnel (Responders and Potential On-Scene Commanders) | | | | |
| <name removed> | Operations Supervisor | <# removed> | <# removed> | <# removed> |
| <name removed> | Operator | <# removed> | <# removed> | <# removed> |
| <name removed> | Operator | <# removed> | <# removed> | <# removed> |
| Potential AltaGas Incident Commanders for the John Lake Pipelines | | | | |
| <name removed> | Ops Manager, Central & NE | <# removed> | n/a | <# removed> |
| <name removed> | Director Ops – FG&P & Trans. | <# removed> | n/a | <# removed> |
| <name removed> | Div VP Operations - Gas | <# removed> | n/a | <# removed> |
| 24 Hour Emergency 1-866-826-3830 | | | | |

Distribution List

| Name | Title | Location | Copies | 2016 Corporate ERP Manual # |
|--|------------------------|----------------|--------|--------------------------------------|
| AltaGas | | | | |
| Corporate Emergency Operations Centre (CEOC) | | Calgary | 1 | 1 |
| Operations | 16 th Floor | Calgary | 1 | 2 |
| EOH&S | 17 th Floor | Calgary | 1 | 3 |
| <name removed> | Operations Supervisor | Bonnyville | 1 | 21 |
| John Lake North Plant | | 11-35-56-01-W4 | 1 | 41 |
| External | | | | |
| Emerg. Manag. Compliance | National Energy Board | Calgary | 1 | 12 |

Legend

| | |
|----------------------------------|------------------------------------|
| AltaGas - Sour | Foreign Pipelines |
| AltaGas - Sweet | Foreign Processing Plant |
| AltaGas - Abandoned | Foreign Battery |
| AltaGas - Discontinued | Foreign Satellite |
| AltaGas - Proposed | Foreign Compressor |
| Tie-in Pipeline | Foreign Meter Station |
| Indicates NEB Regulated Pipeline | Well Location |
| AltaGas Processing Plant | Gas |
| AltaGas Satellite | Abandoned Gas |
| AltaGas Compressor | Suspended Gas |
| AltaGas Meter Station | Injection |
| Well Location | Abandoned Injection |
| Gas | Abandoned |
| Abandoned Gas | Oil |
| Suspended Gas | Abandoned Oil |
| Injection | Suspended Oil |
| Abandoned Injection | Main Access Route |
| Abandoned | Road Block |
| Oil | Dead End |
| Abandoned Oil | Residence - Access Point |
| Suspended Oil | Residence - Unoccupied |
| ESD & Riser Site | Residence - Occupied |
| Riser & Isolation Site | Community Hall |
| Buried Valve | Hospital |
| Paved Road | School |
| Gravel Road/Trail | Church |
| Winter Road | Other Public Facility |
| Railway | Picnic |
| Airport | Public Camp |
| City/Town | Private Camp |
| First Nations | Emergency Planning Zone (EPZ) |
| Park/Natural Area | Gathering Pipeline EPZ Border |
| Crown Land | Acid Gas Pipeline EPZ Border |
| Provincial/County Boundary | Acid Gas Injection Well EPZ Border |

Facility Information

| | |
|-------------------------------|------------------|
| JOHN LAKE COMPRESSOR | 11-35-056-01 W4M |
| USD Location: | N/A |
| GPS Location: | N/A |
| State Facility Code: | <# removed> |
| Main Phone: | <# removed> |
| Second Phone Line: | <# removed> |
| Satellite Phone: | N/A |
| Fax Number: | N/A |
| Transmitting Radio Frequency: | ----- |
| Receiving Radio Frequency: | ----- |
| Counter To: | N/A |

Key Responders:
See List of Potential On-Scene Commanders and Incident Commanders in EPR Supplement

John Lake Compressor Notes:
Closest Hamlet: Marwayne approx. distance 28 km
Closest Village: -----
Closest Town: -----
Closest City: Lloydminster approx distance 43 km
RCMP Detachments: Elk Point

