

POTENTIAL HEALTH IMPACTS

HYDROGEN SULPHIDE (H₂S)

Hydrogen Sulphide (H₂S) is commonly found in conjunction with carbon dioxide, methane (natural gas) and other hydrocarbons in oil and gas fields. A mixture of such gases is called sour gas. Sour gas is hazardous because of the presence of H₂S.

H₂S is a colourless gas at normal atmospheric temperatures and pressures. It has an offensive rotten egg smell that is readily detected at very low concentrations. At higher concentrations, it can be lethal. If you suspect H₂S or SO₂ in the atmosphere, please contact the Alberta Energy Regulator (AER) first and then call Veren's 24 hour Emergency Number. Both numbers are found on the front of this pamphlet.

POTENTIAL HEALTH EFFECTS OF HYDROGEN SULPHIDE (H₂S)

CONCENTRATION EFFECTS

CONCENTRATION	EFFECTS
1 ppm	Noticeable odour. May temporarily experience mild discomfort including nausea, headache, and irritability. Asthma symptoms may worsen.
10-20 ppm	Obvious offensive odour. Eye irritation may occur and last several hours. Symptoms may include mild itchiness, dryness, increased blink reflex and slight watering. People may experience headaches, nausea and vomiting. Asthma, bronchitis or other chronic respiratory disease may worsen.
50 ppm	Strong, intense offensive odour. May irritate eyes and breathing passages. Eyes may be itchy, stinging, and red with increased blinking, tearing and tendency to rub eyes. Breathing passages could feel tingly or sting, with increased tendency to clear throat and cough. Pre-existing respiratory disease may worsen. No permanent injury to eyes or breathing passages is expected unless exposure is prolonged. Odour-sensitive individuals may experience headaches, nausea, vomiting and diarrhea.
100 ppm	Initial strong objectionable odour that lessens with prolonged exposure due to olfactory 'fatigue'. Eyes and breathing passages are often irritated within one hour of exposure. Eyes may be sore, stinging, burning, tearing, redness, swelling of eyelids, and possible blurred vision. Respiratory irritation may include sore throat, cough, soreness or stinging of breathing passages and wheezing. The symptoms of asthma, bronchitis or other forms of chronic respiratory disease will worsen, odour may cause headache, nausea, vomiting and diarrhea.
250 ppm	May be no odour present due to olfactory paralysis. Eyes and breathing passages will become irritated within minutes of exposure, and the irritation will worsen with longer exposure. The outer surface of the eyes and inner eyelid will be inflamed, red and sore. Eyes will begin watering and tearing immediately and vision may be blurred. Eyes may be permanently harmed with prolonged exposure. Respiratory irritation will include sore throat, cough, difficulty breathing, soreness of chest, and wheezing. Asthma symptoms will worsen. People may experience 'systemic' effects including headaches, nausea and vertigo depending on exposure.
500 ppm	No odour due to olfactory paralysis. Severe irritation and possible permanent injury to the eyes and breathing passages within 30 minutes. Chemical pneumonia may occur following prolonged exposure. Systemic effects involving the central nervous system may occur within one hour of exposure and include headache, anxiety, dizziness, loss of coordination and slurred speech. May lose consciousness, or collapse suddenly and die if exposure persists.
750 ppm	No odour due to olfactory paralysis. Central nervous system effects will be obvious and could include: anxiety, confusion, headache, slurred speech, dizziness, stumbling, loss of coordination, and other signs of motor dysfunction. May lose consciousness, collapse suddenly and possibly die with exposure longer than a few minutes. Lung and breathing passage damage will likely cause 'chemical pneumonia' among survivors.
1000 ppm	Immediate "knock down" and loss of consciousness. Death within moments to minutes. Immediate medical attention needed if victim is to survive.

Summarized from: Alberta Health Acute Exposure Health Effects of Hydrogen Sulphide and Sulphur Dioxide. For more details visit <http://www.h2safety.ca/AHSAcuteHealthEffects.pdf>.

POTENTIAL HEALTH IMPACTS

SULPHUR DIOXIDE (SO₂)

Sulphur Dioxide (SO₂) is a by-product from the combustion of Hydrogen Sulphide (H₂S) and would only be present if the source of H₂S was ignited. In its normal state, SO₂ is heavier than air; however, during the combustion process, the hot gas is driven upwards in the thermal column resulting in rapid dispersion and low ppm values.

POTENTIAL HEALTH EFFECTS OF SULPHUR DIOXIDE (SO₂)

CONCENTRATION EFFECTS

CONCENTRATION	EFFECTS
0.1 ppm	Irritation in sensitive asthmatics that ceases when exposure ceases.
0.3 - 1 ppm	Possibly detected by taste or smell.
1 - 2 ppm	Lung function changes in healthy non-asthmatics. Symptoms in asthmatics would likely increase in severity.
3 ppm	Easily detected odour.
6 - 12 ppm	May cause nasal and throat irritation. Upper respiratory irritation, some nosebleeds.
20 ppm	Definitely irritating to the eyes; chronic respiratory symptoms develop; respiratory protection is necessary.
50 - 100 ppm	Maximum tolerable exposures for 30-60 minutes.
Over 100 ppm	Immediate danger to life.

Summarized from: Alberta Health Acute Exposure Health Effects of Hydrogen Sulphide and Sulphur Dioxide. For more details visit www.h2safety.ca/AHSAcuteHealthEffects.pdf.

NOTES

24 HOUR EMERGENCY NUMBER
1-888-799-0043



veren

KAYBOB Emergency Response Plan

COMPANY OVERVIEW

Veren Inc. (Veren) is a conventional oil and gas producer; however, we are anything but conventional. We are dynamic, disciplined, and driven by results. We have high-quality light and medium oil and natural gas assets across western Canada and the United States.

Veren recognizes the importance of establishing and maintaining positive relationships with our community neighbours. It is Veren's intention to meet or exceed all regulatory requirements related to the ongoing operation of our wells, pipelines, and associated facilities.

For more information, please visit:

www.vrn.com

KEY GOVERNMENT CONTACTS

AER - Emergency Response Line	24 Hr: 800-222-6514
M.D. of Greenview No. 16	Cell: 780-552-4513
Yellowhead County	24 Hr: 780-723-3221
Woodlands County	Bus: 780-778-8400

POSSIBLE RECEPTION CENTRES

Fox Creek Community Hall	Admin: 780-622-3896
200A - 1 Street, Fox Creek, AB	Cell: 780-622-7970
Fox Creek Comfort Inn & Suites	Bus: 780-622-3311
317 - 1 Avenue, Fox Creek, AB	



ALBERTA
Utility Safety Partners
(Click Before You Dig)
Call Toll Free: 1-800-242-3447
<https://utilitysafety.ca/>

Please review and familiarize yourself with the information in this pamphlet.

OVERVIEW

As part of the public safety process, Veren has created this information pamphlet, a site specific Emergency Response Plan (ERP), and is contacting you to ensure that you are aware of their operations in the area. The person contacting you is also gathering confidential information and will be reviewing this pamphlet and answering any questions you may have to ensure that you understand your role in the emergency response process. Veren is the owner of pipelines, facilities, wells and gathering systems in your area.

	Maximum
Cumulative Release Volumes	3491 m ³
Release Rates	0.0241 m ³ /s
Gathering System H ₂ S	5.12 %
Emergency Planning Zones	2680 m

WHY ARE YOU BEING CONTACTED?

Although the probability of an incident is low, Veren is taking advance preparations to ensure your safety. Veren would like to ensure:

- 1 You are aware of the Emergency Response Plan and understand how it functions.
- 2 You are aware of the Reception Centre(s) and their locations.
- 3 You are advised of methods of communication to be used in case of an emergency.

Veren obtains the **confidential*** information it may need to contact each household in the immediate area.

WHAT TO DO DURING AN H₂S RELEASE?

- 1) If you suspect there may be an H₂S release from a pipeline (for example if you detect a strong rotten egg odour, detect the sound of a leak, or observe a gas release), take shelter in your residence. Close all doors and windows and turn down the furnace and thermostat immediately. In the summer, turn off all air conditioning.
- 2) If you are outside, travel away and upwind from the suspected source.
- 3) Do not use any forms of ignition (lighters, fire places, wood stoves, etc.).
- 4) Contact the **Alberta Energy Regulator (AER)** at **1-800-222-6514** and/ or **Veren** at **1-888-799-0043** and report the H₂S odour. Immediate action will be taken to determine the source of the odour.
- 5) Monitor the radio or television for explanation and instruction. You may also receive a call from Veren, the local authority, or the AER providing further instruction or explanation.
- 6) If you are considering leaving the area, contact the Veren representative, the municipality, or the AER for evacuation instructions. For major incidents, a special number may be provided, which should be called.
- 7) If environmental monitoring indicates that the H₂S release may impact members of the public, an evacuation will be carried out under the direction of authorized emergency personnel. Individuals previously identified with special needs will be given top priority.
- 8) If you are directed to evacuate, follow the instructions that will safely move you away from the H₂S source and out of harm's way. You will also be provided with instructions to check in and register at a Reception Centre that is located in a secure and safe place.
- 9) All other individuals should consider leaving the area and should seek medical advice if health symptoms develop.

* INFORMATION GATHERED IS PROVIDED TO THE GOVERNMENT REGULATORS (AER) AND SELECTED RESPONDERS WITHIN THE COMPANY (VEREN). ALL COPIES ARE DESTROYED AFTER OPERATIONS HAVE CEASED.

KNOW THE WARNING SIGNS

You might see:

- Dead or dying vegetation on or near a pipeline in an otherwise green area.
- Water bubbling or blowing into the air at a pond, creek or river.
- Dirt being blown or appearing to be thrown into the air.
- Frost build up on the ground.
- Fire coming from the ground or appearing to burn above the ground.

You might hear:

- A roaring, blowing, hissing or loud whistling sound.

You might smell:

- An unusual sulphur or rotten egg odour. Sour gas smells like rotten eggs. In some instances, exposure to sour gas can diminish a person's sense of smell, so it's important to know that smell cannot always be trusted to warn of sour gas.

LEVELS OF EMERGENCY

ALERT	ON-SITE ONLY - Immediate control of the hazard with progressive resolution of the solution. There is no risk to the public or environment as the incident is contained to the site.
LEVEL 1	LOW IMPACT - Public, personnel, and environment are not at serious risk and on-site personnel can control the incident. The incident is usually confined to the company.
LEVEL 2	MODERATE IMPACT - Public, personnel, or the environment are at definite risk and external assistance is required to control the situation. Media coverage is possible and the incident has an effect outside the company boundaries. External and provincial agencies must be notified.
LEVEL 3	HIGH IMPACT - Control of the situation has been lost and presents or has caused a hazard to public, personnel, or the environment on or off company property. Immediate multi-agency and provincial government involvement is required.

EARLY NOTIFICATION

At any level of Emergency, Veren responders will contact downwind residents and residents with special needs considerations. Special needs considerations include residents who may require transportation, residents who do not have a telephone on-site and / or residents that have health or respiratory problems.

If you require voluntary evacuation assistance or if there is no answer to our telephone calls, we will dispatch personnel to your residence or business to verify your location and inform you of the situation.

EMERGENCY PROCEDURES

At any level of Emergency, roadblocks would be set up around the Emergency Planning Zone (EPZ) to keep traffic out of the hazard area. Residents in the immediate area would be contacted, given an update of the situation and instructed on which precautions to take.

In the event the Emergency Planning Zone had to be evacuated, a Reception Centre would likely be set up at one of the locations identified on the front of this pamphlet.

In some cases, there may be concern that evacuation would expose people to greater hazard than if they remain in their homes. Buildings provide a supply of clean indoor air to dilute H₂S contaminated air that infiltrates from outdoors, reducing the concentrations to which the occupants are exposed; therefore, Sheltering-In-Place may be considered as an alternative to evacuations for short durations.

IGNITION

In conjunction with Shelter-In-Place and Evacuation strategies, the release may be ignited at the source in order to reduce your exposure to the hazard. The combustion of Hydrogen Sulphide (H₂S) results in the produced Sulphur Dioxide (SO₂) being carried high into the atmosphere allowing additional time for the public to safely evacuate.

VEREN 24 HOUR EMERGENCY NUMBER
1-888-799-0043

PUBLIC PROTECTION MEASURES

SHELTER-IN-PLACE PROCEDURE

If you are advised to stay sheltered, do not leave your house or attempt to start any vehicles until a Veren representative advises you that it is safe to do so.

The following steps should be taken if "Shelter-In-Place" procedures have been implemented:

- Immediately gather everyone indoors and stay there.
- Tightly close windows and outside doors. If convenient, tape the gaps around the exterior door frames.
- Extinguish indoor wood burning fires and close flue dampers if possible.
- Turn off appliances or equipment that either:
 - Blow out or use indoor air, such as:
 - Bathroom and kitchen exhaust fans
 - Built in vacuum systems
 - Clothes dryers
 - Gas fire places and stoves.
 - Sucks in outdoor air, such as:
 - Heating ventilation and air conditioning (HVAC) systems
 - Fans for heat recovery ventilators or energy recovery ventilators.
- Turn down furnace thermostats to the minimum setting, turn off air conditioners.
- Leave open all inside doors.
- Wait in an interior room upstairs for further instruction.
- Avoid using the telephone, except for emergencies, so that you can be contacted by Veren emergency response personnel.
- Call Veren if you are experiencing symptoms, smelling odours, or have contacted government agencies (so that Veren can coordinate our response).
- Stay tuned to local radio and television for possible information updates.
- Even if you see people outside, do not leave until told to do so.
- If you are unable to follow these instructions, please notify Veren emergency response personnel.

After the hazardous substance has passed through the area, you will receive an "all-clear" message from Veren emergency response personnel. You may also receive, if required, instructions to:

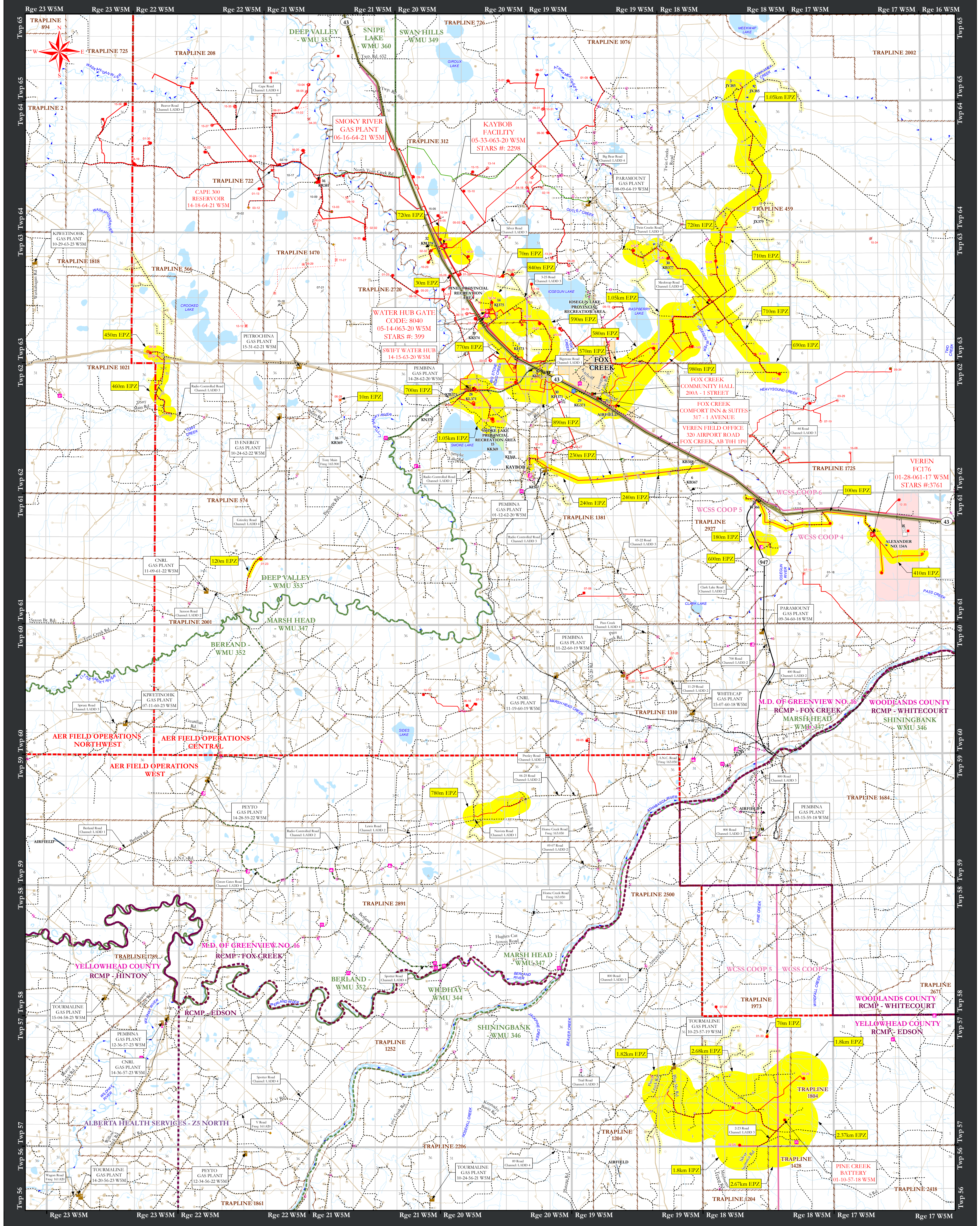
- Ventilate your building by opening all windows and doors, turning on fans, and turning up thermostats. During this time the air outside may be fresher and you may choose to leave your building while ventilating.
- Once the building is completely ventilated, return all equipment to normal settings and operation.

PROCEDURE FOR EVACUATION

If it is necessary to evacuate, you will be contacted by telephone immediately. If there is no answer to our calls, we will proceed to your residence to inform you of the situation. The steps below should be followed if "Evacuation" procedures have been implemented:

- Gather all residents and bring any medicines required.
- Lock all windows and doors.
- Turn down thermostat and shut off any air exchange fans to outside.
- Drive safely on the route provided and proceed directly to the Reception Centre and check in with the representative.
- Wait for further instruction.

WHILE THE CHANCE OF AN UNCONTROLLED RELEASE OF GAS IS REMOTE, THE EMERGENCY RESPONSE PLAN FOR THIS AREA IS IN PLACE TO ENSURE YOUR SAFETY.



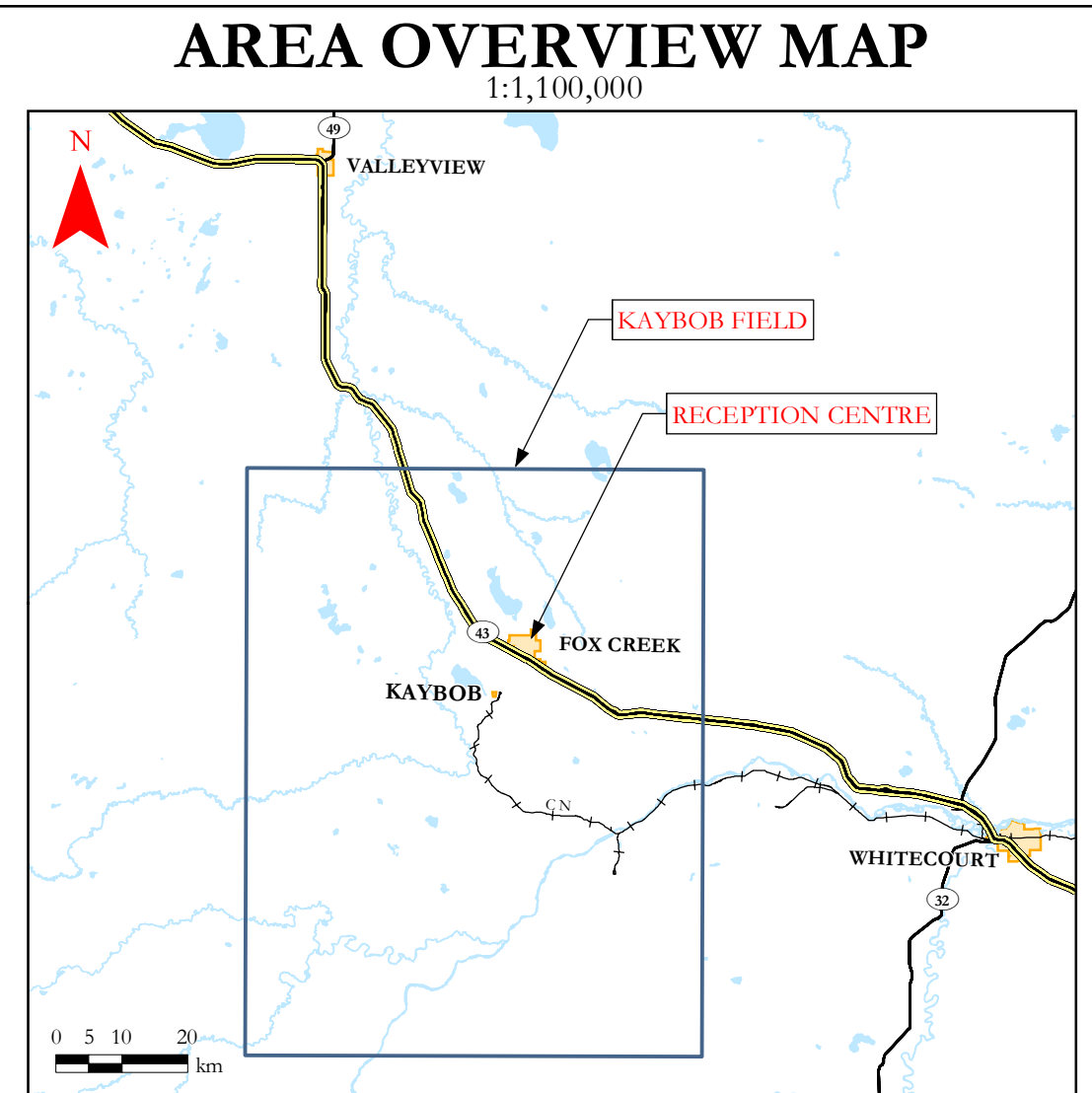
KAYBOB ALBERTA ERP

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Draft Date: July 13, 2023 GLG Scale: 1:130,000 Map: 12477
Revision Date: July 25, 2024 FSC UTM ZONE 11 NAD83

0 2 4 8 12 16 km

H2Safety
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Gas Well	Other Roads	Farm Use Area	River Flow Direction
Suspended Gas Well	Main Hwy	Golf Course	Hydrology
Oil Well	Divided Hwy	Gravel Pit	Waterbody
Suspended Oil Well	Railway	Helicopter Pad	Urban Area
Injection Well	Airfield	Locked Gate	First Nations
Suspended Well	Abandoned	Power Station	Protected Area
Third Party Well	Air Monitor	Recreation Area	AER Field Centre
Facility	Bridge	Rig Camp	Health Authority
Gas Plant	Bridge Out	Rifle Range	Local Authority
Third Party Facility	Communication Tower	Road Blocked	RCMP
Third Party Gas Plant	Community Well	Staging Area	Trapper Boundary
Gas Pipeline	Dead End	Washout	Wildlife Management Unit
Discontinued Gas Pipeline	Reception Centre	Waste	WCSS COOP
Oil Pipeline		STARS	Egress EPZ
Water Pipeline			EPZ
Third Party Pipeline			