

Section 7

Emergencies



7. Emergencies

This chapter outlines what you should do and know in general emergency situations, what may occur and who may be involved in the event of an emergency. It is important to know what can specifically happen if there is a sour gas blowout, and how emergencies are classified according to the extent of the situation. Lastly, the section includes shelter-in-place instructions that may be given to you at the onset of a sour gas blowout.

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If you see, hear, or smell something unusual and suspect it is related to an emergency related to oil and gas operations, contact the **Energy and Environmental Emergency 24-hour Response Line at 1-800-222-6514**, and provide the operator with as much detail as possible about the emergency.

7.1 General emergency situations

If there is an emergency – a well *blowout*, a pipeline leak or an explosion, for example – you should immediately call the company’s 24-hour emergency number (if known), local emergency services (such as the fire department) and the Alberta Energy Regulator (AER). While the AER’s 24-hour Energy and Environmental Emergency Response Line is now centralized, the AER does have 24-hour response capacity at each of its regional centres. If you place a call to the Environmental Emergency Response Line, your call will be triaged to the appropriate field centre so that they can respond promptly.

If you are certain that the trouble is coming from an interprovincial or international pipeline, you can make a call to the toll-free NEB emergency number (Section A.12). If you are uncertain who is responsible, it is best to contact the Energy and Environmental Emergency 24-hour Response Line as they also respond to emergencies on NEB-regulated lines (listed above).

It is an offence under the Environmental Protection and Enhancement Act to release any harmful substance (even a small amount), and any person who should have a degree of control or influence, and knows of a release is required to report it.¹ If you notice any other unusual activity, such as water flowing from a *seismic hole*, structural damage, surface damage, concerns around abandoned wells or issues related to water wells, you should notify the company and the AER. Even if you are unsure if the incident is an emergency, call the Environmental Emergency Response Line as it also acts as a complaints line. Where required, the AER will send a staff person to inspect and take control of the situation, as outlined below. An inspector or an agent from AER can take any emergency measures they consider necessary to protect human life, health or the

¹ Alberta, Environmental Protection & Enhancement Act, RSA 2000, c E-12, s 110. Alberta government acts and regulations are available at Alberta Queen’s Printer, “Laws Online/Catalogue.” http://www.qp.alberta.ca/Laws_Online.cfm

environment,² and may issue an order, such as emergency environmental protection order.³

The company is required to handle an emergency situation, by, for example, establishing an on-site command post that may involve the AER, local municipality, Alberta Health Services, Alberta Emergency Management Agency, and other government agencies if needed.⁴ If the company does not act immediately to stop the escape of oil or gas from a well or to control a flow of water, the AER can take whatever action is necessary to deal with the situation and protect the public.⁵ The AER has far-reaching powers in such circumstances, including shutting down a well.⁶ For example, where oil has escaped, the AER can direct the company to contain and clean up the oil, give orders to company employees, or engage outside help and recover the costs from the company later.⁷

Not all operations in the province have a site-specific emergency response plan (ERP), but every company is required to have a corporate-level ERP to handle emergency events. Operations that are recognized as posing more of a hazard, such as *critical sour wells*, will have a site-specific ERP in place to notify those living and working in the designated *emergency planning zone* (EPZ). The company is responsible for implementing this plan. See Section 7.2, below, for the actions you should take in such a situation.

At the onset of an incident, if you are within the EPZ the company should be in contact with you to provide specific instructions, which may include evacuation or shelter-in-place instructions. They should also provide you with information on the type and status of the incident; where the incident is occurring; any public protection measures to follow; a description of how the company is responding to the situation; and additional contact information. As the incident is ongoing, the licensee should continue to be in contact with you, and will give you more information about the products involved and any long term affects they may have; what you should do if you begin

² Environmental Protection and Enhancement Act, s 115(1).

³ Environmental Protection and Enhancement Act, s 114(1).

⁴ Environmental Protection and Enhancement Act, s 115(3).

⁵ Alberta, Oil and Gas Conservation Act, RSA 2000, c O-6, s 41.

⁶ Oil and Gas Conservation Act, s 105.

⁷ Oil and Gas Conservation Act, s 104 and 105.

experiencing *adverse effects*; and an ongoing update about the areas involved.⁸ If you are evacuated, the company will have a reception center, where they will register you as an evacuee, and offer assistance in arranging temporary accommodation.

The roles of the AER and other relevant bodies are described in Appendix A.

7.2 What to do in a sour gas emergency

Some substances found in *sour gas* are poisonous. *Hydrogen sulphide* (H₂S) for example, is highly toxic and can cause immediate death at concentrations as low as 750 parts per million (*ppm*).⁹ The “rotten egg” smell associated with H₂S can be detected when concentrations are as low as 0.001 to 0.13 ppm.¹⁰ Concentrations as low as 1–5 ppm may lead to nausea or headaches with prolonged exposure. Concentrations of 20–50 ppm may cause irritation of the nose, throat, and lung, digestive upset and a loss of appetite; as well, one’s sense of smell may become fatigued so odour can’t be relied on as a warning of exposure. Sense of smell temporarily disappears at concentrations of 100–200 ppm, and is accompanied by severe nose, throat and lung irritation. At 250–500 ppm, exposure can lead to pulmonary edema, a potentially fatal buildup of fluid in the lungs. Concentrations above 500 ppm could lead to respiratory paralysis, irregular heartbeat, collapse, and death.¹¹

If you live within an EPZ, the company is responsible with providing you with specific information during the consultation process. The public information package and its ERP will include information about the type of hazard, H₂S release rates (if applicable), relevant emergency contact information, and procedures in case of an emergency.¹² You should keep this information at hand for you, your family or staff in case of an

⁸ AER, Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry (2009), appendix 8. AER Directives are available at AER, “Directives.”
<http://www.aer.ca/rules-and-regulations/directives/>

⁹ Even at low levels, H₂S is acutely toxic to humans; see T. Guidotti, “Hydrogen Sulphide,” *Occupational Medicine* 46, no. 5, (1996). See also Appendix E Glossary.

¹⁰ Canadian Centre for Occupational Health and Safety, “Cheminfo: Hydrogen Sulphide”.
<http://www.ccohs.ca/products/databases/samples/cheminfo.html#TOC3A>

¹¹ The Technical Advisory Committee on Public Health and the Oil and Gas Industry is currently revising the *Environmental Public Health Field Manual for Oil and Gas Activities in Alberta* (2007), expected to be released in 2016.

¹² See AER, Directive 071, appendix 8.

emergency. See Section 4.6.1 for more details on what the licensee is responsible to plan for in the event of an emergency.

If you smell sour gas, first follow shelter-in-place instructions (see below), and then notify the company and AER through the Energy and Environmental Emergency line. Before you decide to leave the area, refer to the company representative, the municipality, or the AER for evacuation instructions. As per AER regulations, an evacuation suggestion and/or seek shelter notice will be given for any H₂S levels above 10 ppm.¹³ Depending on the circumstances, sheltering in place may be recommended over evacuation.¹⁴ For more information about critical sour wells, see the AER's *EnerFAQ: All about Critical Sour Wells*.¹⁵

Susceptible individuals should evacuate if they are concerned about their health and will probably not want to wait until they experience symptoms or are advised to evacuate an area. This includes pregnant women and those with cardiopulmonary conditions, as well as those with limited mobility. The company will advise people whom they know to be susceptible as part of the ERP (Section 4.6). In some cases, individuals may want to ask the company to install an H₂S monitor in their home.

It is recommended to move animals with pre-existing disease conditions if they show signs of distress at levels below 10 ppm H₂S when levels are predicted to continue for six hours or more. It may help to move livestock to higher elevations if they cannot be evacuated, as H₂S is slightly heavier than air and settles in lower areas. Make sure to check with the company to ensure that is possible for you to do this safely.

Wells are sometimes ignited to prevent the escape of H₂S. However, combustion of H₂S results in the formation of sulphur dioxide (SO₂). Because high levels of this gas are also harmful, it may still be necessary to evacuate the area. Currently, the emergency evacuation levels for SO₂ is a 5 ppm (measured average over 15 minutes), 1 ppm (3-hour average) and 0.3 ppm (24-hour average).¹⁶ An acute exposure above 20 ppm requires respiratory protection, and an exposure above 100 ppm poses immediate danger to life.¹⁷

¹³ AER, Directive 071, appendix 6.

¹⁴ AER, Directive 071, section 5.2.2.

¹⁵ AER, *EnerFAQs: All About Critical Sour Wells* (2015). EnerFAQs and Fact Sheets are available at AER, "EnerFAQs (Q&As)" <http://www.aer.ca/about-aer/enerfaqs>

¹⁶ AER, Directive 071, appendix 6.

¹⁷ *Environmental Public Health Field Manual for Oil and Gas Activities in Alberta*.

Once you have left an area, you should not return until the company or the AER says that the source of the emission has been addressed.

For critical wells, there are four general incident classifications that may be issued in an emergency.¹⁸ Background information on ERPs and the recovery of costs incurred due to evacuation in emergency situations is given in Section 4.6.1.

Alert — An incident that may be handled by the duty holder (such as an *operator*) through normal response procedures and may present low risk to the public. A release of unrefined hydrocarbons, associated byproducts or wastes has or may have potential to extend beyond the duty holder's property but imminent control of the hazard is probable. It is unlikely that the incident will escalate further.

Level 1 Emergency — An emergency where an uncontained release extending beyond the duty holder's property has impacted or could impact the public or sensitive terrain. Containment operations are proceeding and the duty holder will bring the hazard under control using internal and/or external resources.

Level 2 Emergency — An emergency where an uncontrolled release extending outside an energy resources facility has impacted the public or sensitive terrain. Control operations have been started and imminent and/or intermittent containment of the hazard is possible. The hazard can be brought under control utilizing the duty holder's internal and/or external resources.

Level 3 Emergency — An emergency where the safety of the public is in jeopardy from a major unconfined hazard. There are likely significant and ongoing environmental impacts. Immediate multi-agency and provincial government involvement is required.

7.3 Shelter-in-place

Depending on the circumstances of the incident, you may be asked to shelter in place instead of evacuating from any area, to minimize your exposure to the hazards. The Technical Advisory Committee on Public Health and the Oil and Gas Industry has released a guide for health authorities and other government agencies that play a role in emergency responses to incidents in the energy industry. This guide has a template for

¹⁸ AER, *Energy Resources Industry Emergency Support Plan* (2015).

<http://www.aema.alberta.ca/documents/ERIESP.pdf>; also AER, Directive 071, appendix 4.

shelter-in-place instructions for all *stakeholders* in the industry, which the company may issue in response to a well blowout.¹⁹

Shelter-in-place instructions rely on buildings that are habitable in typical Canadian winters, so that they are not drafty and minimize the air exchange between the outdoors and indoors. It is meant to create an indoor buffer to protect you from the hazardous substances outdoors.

An example of shelter-in-place instructions that you may receive from the company:

- Immediately gather everyone indoors and stay there
- Close and lock all windows and outside doors
 - If convenient, tape the gaps around the exterior door frames
- Extinguish indoor wood burning fires
 - If possible, close flue dampers
- Turn off appliances or equipment that either:
 - Blows out or uses indoor air, such as:
 - Bathroom and kitchen exhaust fans
 - Built-in vacuum systems
 - Clothes dryers
 - Gas fireplaces
 - Gas stoves
 - Sucks in outside air, such as:
 - Heat recovery ventilators (HRV)
 - HVAC systems (for apartments, commercial or public facilities)
- Turn down furnace thermostats to the minimum setting and turn off air conditioners
- Leave open all inside doors
- If you have only one telephone line, avoid using it (except for emergencies), so that you can be contacted by company emergency response personnel
- Call the company emergency numbers you have been provided:
 - If you are experiencing symptoms or smelling odours
 - If you have contacted fire, police or ambulance
- 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

¹⁹ The guide is currently being revised, so shelter-in-place instructions are subject to change. *Environmental Public Health Field Manual for Oil and Gas Activities in Alberta*, appendix 7-F.

- If you are unable to follow these instructions, please notify company emergency response personnel
- After the hazardous substance has passed through the area you will receive an “all-clear” message. You may also receive 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.

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