



# Emergency Management

## Manual

VERSION 2.4: November 2023

# About the Regulator

The BC Energy Regulator (Regulator) is the single-window regulatory agency with responsibilities for regulating oil and gas activities in British Columbia, including exploration, development, pipeline transportation and reclamation.



The Regulator's core roles include reviewing and assessing applications for industry activity, consulting with First Nations, ensuring industry complies with provincial legislation and cooperating with partner agencies. The public interest is protected by ensuring public safety, protecting the environment, conserving petroleum resources and ensuring equitable participation in production.

## Vision, Mission and Values

### Vision

A resilient energy future where B.C.'s energy resource activities are safe, environmentally leading and socially responsible.

### Mission

We regulate the life cycle of energy resource activities in B.C., from site planning to restoration, ensuring activities are undertaken in a manner that:



Protects public safety and the environment



Supports reconciliation with Indigenous peoples and the transition to low-carbon energy



Conserves energy resources



Fosters a sound economy and social well-being



### Values

**Respect** is our commitment to listen, accept and value diverse perspectives.

**Integrity** is our commitment to the principles of fairness, trust and accountability.

**Transparency** is our commitment to be open and provide clear information on decisions, operations and actions.

**Innovation** is our commitment to learn, adapt, act and grow.

**Responsiveness** is our commitment to listening and timely and meaningful action.

## Additional Guidance

As with all Regulator documents, this document does not take the place of applicable legislation. Readers are encouraged to become familiar with the acts and regulations and seek direction from Regulator staff for clarification.

The Regulator publishes both application and operations manuals and guides. The application manual provides guidance to applicants in preparing and applying for permits and the regulatory requirements in the planning and application stages. The operation manual details the reporting, compliance and regulatory obligations of the permit holder. Regulator manuals focus on requirements and processes associated with the Regulator's legislative authorities. Some activities may require additional requirements and approvals from other regulators or create obligations under other statutes. It is the applicant and permit holder's responsibility to know and uphold all legal obligations and responsibilities. For example, Federal Fisheries Act, Transportation Act, Highway Act, Workers Compensation Act and Wildlife Act.

Throughout the document there are references to guides, forms, tables and definitions to assist in creating and submitting all required information. Additional resources include:

- [Glossary and acronym listing](#) on the Regulator website.
- [Documentation and guidelines](#) on the Regulator website.
- [Frequently asked questions](#) on the Regulator website.
- [Advisories, bulletins, reports and directives](#) on the Regulator website.
- [Regulations and Acts](#) listed on the Regulator website.

In addition, this document may reference some application types and forms to be submitted outside of the Application Management System but made available on the Regulator's website. Application types and forms include:

- Heritage Conservation Act, Section 12
- Road use permits
- Water licences
- Master licence to cut
- Certificate of restoration
- Waste discharge permit
- Experimental scheme application
- Permit extension application

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## Manual Revisions

The Commission is committed to the continuous improvement of its documentation. Revisions to the documentation are highlighted in this section and are posted to the [Documentation Section](#) of the Commission's website. Stakeholders are invited to provide input or feedback on Commission documentation to [ServiceDesk@bc-er.ca](mailto:ServiceDesk@bc-er.ca) or submit feedback using the [feedback form](#).

Version Number	Posted Date	Effective Date	Chapter Section	Summary of Revision(s)
2.1	August 8, 2018	September 1, 2018	Various	<p>S. 1 Pg. 5, 6 – Added dam and geothermal references.</p> <p>S. 2.1 Pg. 7 - Added geothermal references.</p> <p>S. 2.2 Pg. 8, 9 – Revised to note application of EMR through permit conditions for geothermal, added references to regulation for dams and geothermal.</p> <p>S. 3.1, Pg. 11, S. 3.3, Pg. 12, 13 - Added geothermal reference.</p> <p>S. 4.2.1, Pg. 15 – Notes record keeping at program level.</p> <p>S. 4.2.2, Pg. 16 – Incorporates a review of security and post-incident evidence preservation processes to recommend training.</p> <p>S. 6.1.1, Pg. 21 Added dam and geothermal references.</p> <p>S. 7.3.1, P44-49 – Added guidance to dam incident classification.</p>
2.2	April 8, 2021	May 1, 2021	Various	<p>Various – Updated references to CSA Z246.2 to ensure correct citation. Added definition for CAS number.</p> <p>Ch. 1 – updated link to C &amp; N regulation</p> <p>Ch. 2 – Replaced “abandonment” references with Decommissioned.</p> <p>CH. 7.1 – provided example of tactical action requirements.</p> <p>Appendix F – Added e-Submissions references.</p>

Version Number	Posted Date	Effective Date	Chapter Section	Summary of Revision(s)
2.3	November 5, 2021	November 5, 2021	Various	Changes to align with updated Emergency Management Regulation, September 1, 2021. CH. 4.2 - Updated exercise outcomes section. Ch. 7 – New interim and final reporting requirements for spills. Updated links to external references.
2.4	Nov. 27, 2023	Nov. 27, 2023	Various	Name change from BC Oil and Gas Commission to BC Energy Regulator. Replace BCOGC with BCER; OGAA with ERAA; new logos, references and associations Update EMBC references to reflect new Ministry of Emergency Management and Climate Readiness Update CSA references to reflect current edition Revised exercise section to include blending of security-initiated incidents

## CHAPTER 1: ABOUT THE MANUAL

The Emergency Management Regulation Manual is intended to provide a reference document for oil, gas, and geothermal permit holders and applicants. The manual provides an overview of the regulatory requirements for emergency management in British Columbia's oil and gas industry, recommendations based on industry best practices, references to applicable national standards, examples to assist with interpretation of requirements, and guidance to assist in the development and documentation of competencies related to emergency management.

The manual has been prepared to be as comprehensive as possible; however, it may not cover all situations. Where circumstances or scenarios arise, and are not covered by the manual, please contact one of the Regulator's Security and Emergency Management staff for assistance.

This manual guides the user through the requirements of the *Emergency Management Regulation* (EMR) and the emergency management aspects of the [Energy Resource Activities Act](#), as well as such national standards as may be referenced or included. Unless otherwise noted, all references to CSA standards should be interpreted as a reference to the most recent edition of CSA Z246.2: *Emergency Preparedness and Response for Petroleum and Natural Gas Industry Systems*.

All CSA documents referred to in this guidance are available at no cost from the [CSA website](#). Permit holders are responsible for ensuring they are referencing the most recent editions of any standard incorporated into regulation.

### Manual Scope

The manual is limited in scope to the authorities and requirements established within the [Energy Resource Activities Act](#) (ERAA), or specified enactments established thereunder. Carrying out oil, gas, geothermal and related activities may require additional approvals from other regulators or create obligations under other statutes. It is the permit holder's responsibility to know and uphold all their legal obligations.



## Additional Guidance

Additional BCER manuals and guidelines are available in the [Documentation Section](#) of the Commission's website. The glossary entries within ERAA and its regulations provide the primary source of legal definitions.

The Regulator has also developed a number of checklists, which may assist in the creation of emergency response plans, and as guides during exercises of the plan. These checklists are not intended to address every situation, and each plan must fully consider any unique aspects of the proponent's operation.

## Compliance and Enforcement

This document does not replace legislation or alter legislative requirements. All permit holders are ultimately responsible for ensuring they understand and meet all requirements described within the Energy Resource Activities Act, and their permits. Should a person not comply with the Energy Resource Activities Act, or any related Acts and regulations, the Regulator may take compliance and enforcement actions. For more information regarding the Regulator's Compliance and Enforcement processes, please refer to the [Compliance and Enforcement Manual](#).

## Glossary of Terms and Definitions

Most terms used in this guide are listed in the Energy Resource Activities Act, the Emergency Management Regulation, CSA Z246.2, the Geothermal Operations Regulation, or the Dam Safety Regulation. The following are common abbreviations and terms referenced in legislation, regulation or standards, which are used in this guide:

**API** – American Petroleum Institute

**CSA** - Canadian Standards Association

**CAS Number** – Numeric chemical identifier issued by the American Chemical Society

**EAZ** – Emergency Awareness Zone

**EMCR** – Ministry of Emergency Management & Climate Readiness (formerly EMBC)

**EMR** – Emergency Management Regulation

**ERP** – Emergency Response Plan

**EPZ** – Emergency Planning Zone (amalgamates / inclusive of multiple individual HPZ's)

**HPZ** - Hazard Planning Zone

**HRZ** – Hazard Response Zone, the area affected by an incident / emergency.

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**ICS<sup>1</sup>** – Incident Command System

**Inundation Zone** – Similar to EPZ, defines the area where risk from a dam failure is present.

**Local Authority** - has the same meaning as in the Emergency Program Act

**Multiphase fluid** - any combination of gas, oil, other hydrocarbon fluid, or water produced from or injected into, one or more wells, or recombined well fluids that possibly have been separated in passing through surface facilities.

**Mutual Aid** - is a reciprocal agreement between two or more permit holders to provide assistance between organizations to support a more effective response to an incident.

**NFPA** - National Fire Protection Association

**Private Facilities** – are critical community facilities, which are not government owned or affiliated, and include items such as private medical clinics, churches, lodges, (etc.), which are designated as or may be used in the event of an emergency incident, to provide for the well-being of the residents.

**Rights Holder** - Has the same meaning as set out in the [Requirements for Consultation and Notification Regulation](#)

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<sup>1</sup> Note for awareness, the ICS acronym is also used for Industrial Control Systems by many industries. Within this document, only the incident management process will be referenced by the acronym.

## CHAPTER 2: INTRODUCTION AND OVERVIEW

### 2.1 Role of the Regulator

The BC Energy Regulator (the Regulator or BCER) regulates oil and gas exploration, development, production, pipelines, and all refining<sup>1</sup> process operations developed in B.C. since 2014 as well as emerging areas of alternate energy such as hydrogen. The Regulator also regulates geothermal activities, as defined by the *Geothermal Resources Act* (GRA). Its mandate includes a responsibility to ensure that operations are conducted in a socially and environmentally responsible manner.

The *Energy Resource Activities Act* and its regulations include provisions regarding the safe operation of oil and gas operations and the prevention of uncontrolled or inappropriate release of substances in the environment. These provisions are complimented by the activities of other agencies, legislation, and national safety standards to ensure adequate protection of people, property and the environment.

The Security and Emergency Management branch is responsible for ensuring permit holders are meeting their responsibilities to control incidents and accidents potentially affecting people and the environment, and to mitigate the consequences in the event of an accident. The Department oversees the administration of the *Emergency Management Regulation* (EMR). This includes:

- Evaluating permit holder emergency response capacities and capabilities;
- Ensuring emergency response capacities are appropriate to activities;
- Reviewing emergency management programs and plans;
- Supporting emergency and incident follow-up and investigations;
- Providing 24 hour Emergency Officer services;
- Administering incident and complaint response services; and
- Contributing to the assessment of each permit holder's safety record.

The Regulator uses a combination of reviews, evaluations, and field inspections to ensure permit holders maintain compliance with the requirements detailed in the *Emergency Management Regulation* and the *Energy Resource Activities Act*.

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<sup>1</sup> Burnaby and Prince George refineries excluded at this time, though pipelines to / from refineries are included.

The Security and Emergency Management branch assesses permit holder programs and plans, and evaluates exercises and worker briefings. This ensures permit holders have adequate training, resources, processes and procedures in place to meet their obligations. The branch also provides oversight of all incident and emergency response actions undertaken by, or on behalf of a permit holder.

## 2.2 The Emergency Management Regulation

The [Energy Resource Activities Act](#) (s. 38 (1) (b)) requires that a permit holder prepare and maintain an emergency response program and an emergency response plan (ERP) as prescribed in the *Emergency Management Regulation* (EMR) or defined through permit conditions for geothermal, dams, and other specified activities. The objective of the EMR is to protect people, property and the environment by establishing a framework for emergency preparedness, planning and response capabilities. The EMR (updated September 1, 2021), coupled with the included CSA standard, “CSA Z246.2 Emergency Preparedness and Response for Petroleum and Natural Gas Industry Systems”, provides the foundation for effective response to emergencies in the oil and gas sector.

The EMR encompasses and defines four main areas:

### Corporate programs:

Corporate emergency response programs incorporate the policies and procedures that companies use to create and manage records, training and planning processes.

### Emergency response planning:

The EMR outlines the activities and content that applicants and permit holders must adhere to when developing an emergency response plan.

### Emergency and Incident Response:

The EMR outlines the process that a permit holder follows in the event of an emergency, and sets the minimum requirements that an applicant or permit holder must adhere to in developing and implementing an emergency management program.

### Support for National Standards:

The Regulator has formally adopted the provisions contained within CSA Z246.2 as part of the *Emergency Management Regulation*. These standards may be updated from time to time, and permit holders are responsible for remaining aware of the provisions in the most current version.

In addition to this CSA standard, applicants, permit holders or operators may wish to refer to the following documents (as may be applicable) to support development of emergency response programs and plans, and to define the scope of appropriate staff training:

- Water Sustainability Act - [Dam Safety Regulation](#)
- Geothermal Resources Act - [Geothermal Operations Regulation](#)
- [Security Management Regulation](#) (also incorporates CSA Z246.1 into regulation)
- CSA Z 246.1, Security Management for Petroleum and Natural Gas Industry Systems
- CSA Z 662, Oil and Gas Pipeline Systems

- CSA Z1600 Emergency and Continuity Management Program
- ISO/CSA 31000 Risk Management, Principles & Guidelines
- API Standard 2350 – *Overfill Prevention for Storage Tanks in Petroleum Facilities*
- API Recommended Practice - *Fire Protection in Refineries*
- API 1164 - Pipeline Control Systems Cybersecurity
- UL 2900 – Software Cybersecurity for Network-Connectable Products
- [Fundamentals of Cyber Security for Canada's CI Community](#) (Public safety Canada)
- NFPA 600, Standard on Industrial Fire Brigades<sup>2</sup>
- NFPA 1081, Standard for Industrial Fire Brigade Member Professional Qualifications
- NFPA 59A Standard for the Production, Storage, and Handling of Liquefied Natural Gas
- [Federal Emergency Management Framework for Canada](#);
- The [Emergency Response Guidebook](#) (CANUTEC)

## 2.3 Activities Subject To The EMR

The EMR applies to applicants and permit holders carrying out oil and gas or geothermal activities as defined in the [Energy Resource Activities Act](#), [Geothermal Operations Regulation](#), or by specific permit conditions.

Section 1 (Scope) of CSA Z246.2 provides additional guidance for oil and gas permit holders.

Section 18 of the EMR allows the Regulator to exempt an applicant or permit holder from complying with one or more provisions of the regulation, in cases where compliance with the provision (s) is not reasonably practicable or the exemption is in the public interest.

The exemption request can be made anytime as long as the request is provided in a manner that will allow the Regulator sufficient time to render a decision prior to the start of the activity for which an exemption is requested. A complete description of why the exemption is necessary, and the scope of applicability (duration, location(s), etc.), should be provided as part of the submission.

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<sup>2</sup> In the oil and gas sector, NFPA 600 and NFPA 1081 standards are most commonly applied in facilities that have or process significant on-site volumes of liquid hazardous products. Both are referenced in API guidance.

## 2.4 Exemptions and Special Permit Conditions

All requests for an exemption must be made in writing and be signed by the permit holder's representative. Any exemption issued by an official will be in writing.

Exemption requests should include:

- The specific regulatory provision(s) requiring an exemption;
- Rationale for exemption (explanation of why an exemption is required);
- Proposed plan which demonstrates equivalency or outlines mitigation strategies to reduce impacts (if required)
- The term of the exemption, if it is meant to address a particular time-bound condition.

Should a change to regulation or the incorporated standard affect the terms of an exemption, the permit holder will be advised that their exemption may be reviewed, altered or terminated.

In the event an exemption is granted, the exempted provision in the EMR may be replaced with permit conditions. The oil and gas activity cannot proceed until the permit holder has received a written response from the Regulator, and a copy of the exemption (and conditions, if applicable) must be included in any related emergency management plan so long as the exemption remains in place.

When a facility is no longer in use, it may be excluded from consideration within an emergency response plan, provided that:

- A Hazard-Risk-Vulnerability Assessment (HRVA) has been completed.
- The permit holder confirms that there are no risk items remaining on the site such as, but not limited to: processing chemicals; unpurged propane or NGL bullets; any link to an active pipeline, or to any well that has not been decommissioned; any tanks, c-rings, or other containers (including pipelines) that may contain hydrocarbons, produced water, H<sub>2</sub>S, or any other product introduced or extracted for which an MSDS sheet would be required, or any water storage for industrial use which includes an engineered containment system.
- The permit holder has complied with all other regulations and permit requirements applicable with respect to a suspension and decommissioning of operations.
- A well may only be excluded when decommissioned, and all decommissioning documentation must be on record with the Regulator. A suspended well must continue to be included in a valid ERP.
- A pipeline may be excluded when decommissioned in accordance with regulation, or if suspended, when purged of any hazardous product, and blind flanges have been fitted between the pipeline and any source of fluid or pressure.
- Should a permit holder wish to reactivate a well, pipeline or facility, a new ERP (or update to an existing plan) including any required hazard mapping, response resources, etc. must be provided to the BCER and other key recipients, prior to the commencement of any oil or gas operations. Note that there may be additional

permitting /engineering requirements.

Depending on the nature of an activity, special permit conditions may have been given to the permit holder, and these must be reflected in the applicable emergency management plan. Examples of special conditions include:

- Use of the AERH2S (ERCB H2S) modeling tool for acid gas disposal wells and associated pipelines, including safety factors as determined by the Regulator.
- Revised requirements and conditions for resident information gathering and maintenance for assets within urban areas.

## CHAPTER 3: EMERGENCY MANAGEMENT IN BC

Emergency management is a continuous and integrated process involving the efforts of individuals, business, local, provincial, and federal governments to identify threats, determine vulnerabilities and ensure required resources are available and able to respond effectively to incidents.

In British Columbia, emergency management uses the incident command system (ICS), a structured response framework that supports an all hazards approach. Industry and community emergency management organizations using ICS have developed the ability to respond collaboratively to a broad range of incidents. Depending on the nature and scope of the emergency, additional levels of government or supporting agencies may be involved.

EMCR (formerly EMBC) works directly with local governments and other agencies such as the Regulator, organizations, and volunteers in a coordinated effort to prepare for, respond to, and recover from disasters. For more information about EMBC, please refer to the [Emergency Management in BC: Reference Manual](#).

### 3.1 Permit Holders and the Incident Command System

ICS is an operational framework for emergency response. The system facilitates communication, response activities, and cooperation, within and between organizations, and allows incidents to be managed in a cohesive manner.

All permit holders are required to use the Incident Command System (ICS) for any incidents requiring a complex or multi-agency response. The ICS structure should also be reflected in a permit holder's response plans, exercises and training.

Under ss. 5 of the EMR, and section 11.2 of CSA Z246.2, all plans must include an emergency management system that identifies the specific roles and responsibilities of personnel required to effectively respond to any emergency.

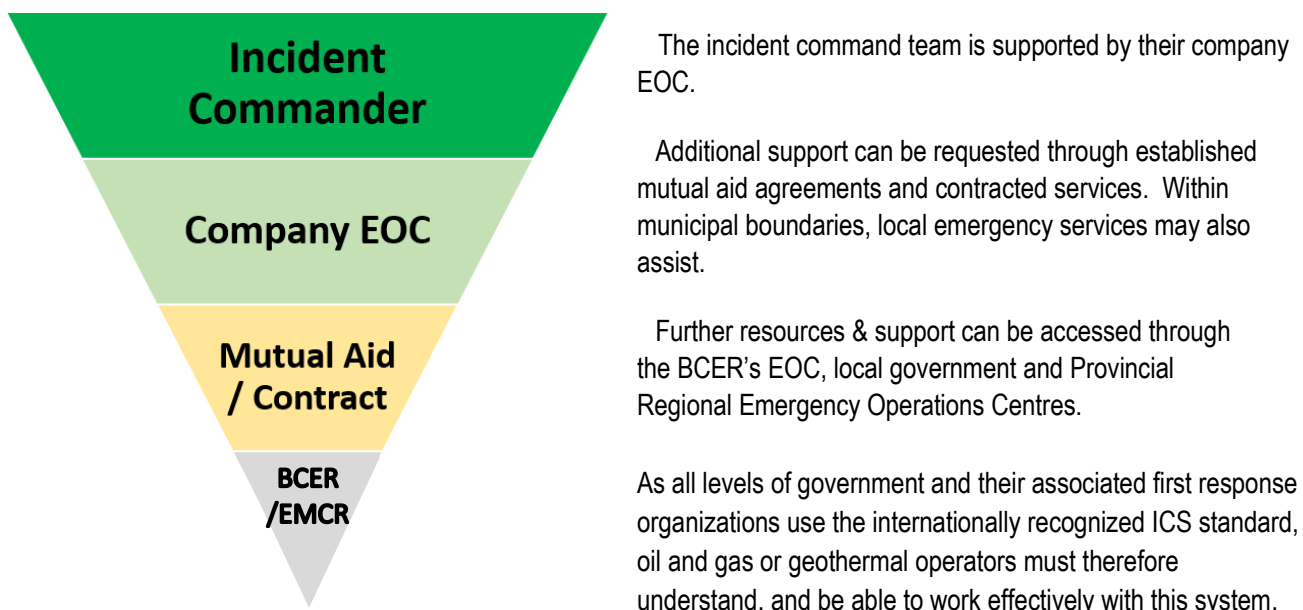
The plan must:

- Describe the powers and duties of emergency response roles; and,
- Assign emergency response staff to the roles. Key personnel and responders and their alternates should be identified.

The plan should also include organizational charts showing the command structure, key positions, and reporting relationships within the ICS sections. This could include (as applicable):

- Emergency Operations Centre (typically based at company head office)
- Field incident command;
- Public safety coordination, including evacuation and sheltering;
- Security (roadblocks, rovers, etc.);
- Air quality monitoring;
- On-site safety and ignition;
- Communications with responders and media/public communication.

Through ICS, the focus is supporting the *incident commander* – the local leader of incident response actions.



Incidents classified as minor do not typically require the use of a formal ICS processes, though all responders should be aware of their potential roles should a minor incident escalate into an emergency.

Companies should also have links to specialized resources defined in their plans and based on the identified risks. This can include mutual aid, membership in spill cooperatives, or through industry associations.

### 3.2 ICS and the Roles of Industry and Government Agencies

ICS is an operational framework for emergency response. The system facilitates communication, response activities, and cooperation, within and between organizations, and allows incidents to be managed in a cohesive manner.



Typical emergency management roles and responsibilities in BC include:

**Industry:** Industry is responsible for identifying all hazards associated with their operations. The permit holder determines the risks to people, environment, and infrastructure from the identified hazards, then plans for plans for worst-case situations / emergencies. This ensures there are sufficient resources (people and equipment) and initiates an emergency response appropriate to the incident. For the oil and gas sector in BC, this includes complying with the EMR<sup>3</sup> and developing emergency response programs that encompass:

- Training in emergency response management;
- Drills to prepare for specific emergencies and tasks;
- Emergency response exercises, to build confidence, confirm roles and test plans;
- Developed processes to evaluate the response to an incident;
- Public awareness, particularly for those living or working within Emergency Planning Zones (EPZ/ HPZ);
- Response contingency planning – this would include the ability to effectively respond to hazards identified with the oil, gas or geothermal operation, including spills, natural disasters applicable to the operating area (forest fire / flood, seismic, etc.) and security incidents;
- Regular communication with other emergency services, and maintaining an awareness of other hazards (fires, floods, etc.) that may affect the safety of oil or gas operations.

**Local government:** Local governments lead the initial response to most emergencies<sup>4</sup> and natural disasters that occur within communities and regions. For all incidents -natural or industrial- they have the authority to issue evacuation orders and declare states of emergency within their boundaries.

**First Nations:** Similar to local government, First Nations leaders have the authority to issue evacuation orders and declare states of emergency within their boundaries.

**BC Energy Regulator:** Oversees the activities of all permitted oil, gas and geothermal activities; ensures industry have the appropriate plans, staff and competencies necessary to meet regulatory obligations. The BCER can provide coordination and support for major incidents and, if required, will initiate / lead response to incidents when the permit holder is clearly incapable. *The permit holder remains liable for all costs associated with the incident.*

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<sup>3</sup> Application of the EMR will be managed through permit conditions for geothermal activities.

<sup>4</sup> Except where a responsible party has been identified in law or regulation

**Provincial government:** Emergency Management BC is government's lead emergency management agency. Other provincial agencies, such as the BC Energy Regulator and local governments have legislated emergency management responsibilities. EMBC provides coordination and support with provincial ministries, crown corporations, and local government. The province has the authority to issue evacuation orders and declare states of emergency anywhere within the province.

**Federal Government:** At the federal level Public Safety and Emergency Preparedness Canada, through the

[Emergency Management Act](#), develops programs and policies to prepare for national disasters.

Applicants and permit holders are encouraged to refer to Emergency Management BC's [British Columbia Emergency Management System](#) or the Regulator's [Toolbox Meeting Guides](#) for examples of the roles and responsibilities required to respond effectively to an emergency.

## CHAPTER 4: EMERGENCY RESPONSE PROGRAMS

### 4.1 Purpose of Programs

The purpose of a corporate Emergency Preparedness and Response Program (EPRP) is to ensure there is permit holder capability, competence, and capacity to respond effectively and safely to incidents, protect people, environment, and property.

The program will create and define the top-level policies and procedures that guide the [creation](#), [management](#) and [implementation](#) of an Emergency Response Plan (ERP). The purpose of an ERP is to prepare for, prevent, mitigate against, respond to and recover from an emergency and its effects. This section outlines the key elements of a successful emergency management program.

Section 3 of the EMR outlines the objectives of the program, key elements that include:

- Senior management accountability for the development and successful implementation of the program (CSA Z246.2 ss. 4.2);
- Appointment of a Program Coordinator to oversee the program and ensure the implementation the program;
- Submission to the Regulator and maintenance of current contact information for the emergency management program coordinator (ss. 13 (2) and 15(1) of the EMR). Updates to contact information must be sent to [EMP@bc-er.ca](mailto:EMP@bc-er.ca).

Under CSA Z246.2 ss. 4.7, the permit holder must maintain written records of the emergency response program. Records can be kept in hard copy or digital form but should be readily available and maintained in a manner that will ensure the document's integrity until the permit holder ceases to carry out any oil and gas activities for which a plan is required.

The emergency management program oversees the development and upkeep and document controls applied to all emergency response plans. The program manager ensures accurate record keeping for all documents, provides oversight of incident reporting, and the findings from all reportable incidents, records of accidents, review meetings, employee qualifications and certifications related to any assigned emergency response functions. (CSA Z246.2 ss. 4.8)

### 4.2 Training And Exercises

Permit holder capabilities and competencies to respond to incidents are mandated within the Energy Resource Activities Act, ensuring that response personnel know their responsibilities in an emergency and understand the permit holder's emergency response procedures. (EMR ss. 4 and CSA Z246.2 ss. 4.9)

## SUPPORT FOR TRAINING AND EXERCISES

The EPRP must include provisions for training and emergency response exercise programs. All training records must be maintained (CSA Z246.2 ss. 4.8.2 (d)) and permit holders should be prepared to present these records to the Regulator upon request.

## TRAINING OBJECTIVES

Training is distinct from the purpose of an exercise which is designed to test the functionality of emergency management plans, as well as the ability and confidence of staff to fulfil roles that have been designated within the ERP.

The objective of staff training is to ensure incident response personnel have the skills and competencies to initiate and sustain the appropriate response actions for all risks identified in the HRVA.

Personnel training should address specific issues and competencies such as:

- Incident Command - structure, roles and responsibilities.
- Hazards and risk analysis, including on-scene assessment processes.
- Incident management planning, with prioritization of response actions.
- Public protection measures required during an emergency including use of any specialized resources (plume modeling of a release and ignition, for example).
- Communications:
  - Technical competencies - use radios, sat phones, etc. and
  - Processes such as creating incident briefings and media statements.
- Map reading / use of mapping tools.
- Review of security protocols to prevent unauthorized access, securing evidence following an incident, when and how to report a security threat or incident.
- Use of equipment (both company held, as well as that provided by 3rd parties such as WCSS or other mutual aid or contracted groups) used to contain and control an incident.

## Incident Command System Training

The following table outlines the minimum recommended training for response staff:

Role	Training	
Incident Commander / EOC Director	<ul style="list-style-type: none"> <li>• Incident Command System levels 200 &amp; 300</li> <li>• EOC Operations Section</li> <li>• Hazard Assessment</li> </ul>	<b>All Response Staff:</b> <ol style="list-style-type: none"> <li>1. Introduction to Incident Command (ICS 100)</li> <li>2. Introduction to Emergency Operations Centres</li> <li>3. Emergency Operations Centre Essentials (includes scenario training in roles)</li> </ol>
Operations Section Chief	<ul style="list-style-type: none"> <li>• Incident Command Level 200</li> <li>• EOC Operations Section</li> <li>• Hazard Assessment</li> </ul>	
Other response team members	Subject-specific training as applicable: <ul style="list-style-type: none"> <li>• risk management</li> <li>• public information</li> </ul> <ul style="list-style-type: none"> <li>• logistics</li> <li>• planning</li> <li>• public protection</li> </ul>	
Companies should assess specific risks to public and environment, and consider additional training on assessment tools such as incident plume modeling, spill-to-water practical demonstration sessions hosted by Western Canada Spill Service Cooperative		

Training in the Incident Command System and Emergency Operations Centres / Incident Command Posts creates a solid foundation for any incident response. For this reason, it is highly recommended that all staff with an assigned role complete foundation and role-specific ICS courses, as well as general EOC training.

Staff with leadership roles in emergency response should complete higher-level incident command courses, and participate in more advanced EOC training such as the EOC Essentials course featuring scenario-based training. A quality service provider, recognized by ICS Canada or accredited post-secondary institution should be used to ensure training provided is consistent with [national standards](#).

### EMERGENCY RESPONSE EXERCISES

Exercises are designed to test both the emergency response program and the contents of an emergency response plan and to confirm the knowledge of emergency response personnel in their duties. An effective and well run exercise should:

- enable personnel to gain confidence in emergency roles
- provide an opportunity to test a new process, best practices, or tools
- reveal areas for improvement in a plan
- identify resource gaps and improve coordination
- clarify roles and responsibilities

- demonstrate operational capability
- demonstrate the emergency response plan to the public

When the Regulator attends an emergency management exercise, permit holders will be provided:

- Access to the evaluation tools used by BCER staff.
- A copy of the completed evaluation.
- An opportunity for feedback of the evaluation

[Appendix D](#) of this document provides an overview of the types and objectives of emergency response exercises that can be included in a permit holder's emergency response program.

Permit holders must conduct emergency response exercises annually for each operating area. These areas are typically separated into specific field, facility, or pipeline ERPs. A Full-Scale (Major) exercise is conducted at least once every three years. Section 10.5.2.4 of CSA Z 662 clarifies this requirement:

*“Operating companies shall have verifiable capability to respond to an emergency in accordance with their emergency procedures and response plans and shall demonstrate and document the effectiveness of such procedures and plans.”*

This verification process is achieved through the evaluation of emergency response exercises – both by the Regulator, and by the permit holder, a review of emergency response plans, and routine checks of training records maintained by emergency response programs. In addition to the exercise process, an assessment of actual incident responses may contribute to the evaluation.

In addition to the direction provided within the CSA standard, exercises must consider, and provide responding staff with the confidence and capability to manage “worst-case” scenarios. This can be accomplished by increasing the complexity of an exercise:

- By challenging staff to consider response options when primary control methods are unable to fully contain an incident.
- By testing resiliency and depth, including a mid-exercise transfer of responsibilities and / or by simulating a long-term incident response.
- By examination of significant incidents at similar operations, and building the exercise from lessons learned.

## EXERCISE NOTIFICATION

When permit holders are conducting an emergency management exercise in order to fulfil their minimum annual requirement, the Regulator requires 30 days advance notice of the exercise. At the Regulator's discretion, one or more BCER staff may participate in an evaluator role.

A copy of the exercise scenario and exercise objectives is also to be provided when the exercise notice is filed.

Companies are to use the exercise notification form available in the [Documentation](#) section of the BCER website.

Companies may be requested to adjust dates if there are already other permit holder exercises scheduled to enable BCER observation.

## EXERCISE EVALUATION PROCESS

Whenever BCER staff attend an exercise, an BCER evaluation of the exercise will be conducted. The evaluation will be used to confirm permit holder knowledge, skills and abilities to respond effectively to incidents relevant to their operations.

In addition to the criteria listed exercise evaluation tool, the complexity of a scenario will also be considered. It is important that staff and plans be exercised against potential worst-case scenarios. It is also recognized that these scenarios will be more likely to reveal gaps in plans, training and capacities so that they may be rectified in advance of an actual incident.

In some cases, a permit holder may also have assets regulated by other agencies, such as the Canada Energy Regulator (CER) or Alberta Energy Regulator (AER). In cases where responding staff and resources are substantially the same as would be applied to a BC regulated asset, a request to hold a single exercise to which several regulators would attend and evaluate will be considered. In such cases, the BCER may elect to jointly (with another regulator) or individually conduct an evaluation.

There are three possible outcomes from an exercise evaluation:

- 1) **Satisfactory / Pass** - The permit holder's exercise demonstrates an effective emergency management process is in place. Staff are capable of an effective response, and sufficient resources are present or readily available to address incidents ranging from minor to worst- case scenarios. There may still be opportunities for improvement identified.
- 2) **Satisfactory / Pass with conditions** - The permit holder's exercise demonstrates most elements of a competent emergency management process are in place, and, with minor adjustments, are able to address the full range of potential hazards. Some additional staff training, or method of bolstering current resources may be necessary to ensure an effective response.

A corrective action plan, outlining how these gaps will be addressed, assigning responsibilities, and deadlines for said responsibilities, is to be provided as part of the permit holder's own exercise evaluation report submitted to the Regulator. Items identified as urgent / critical must be completed within a time specified, and confirmation provided to the Regulator. Subsequent exercise evaluations will confirm corrective actions have been taken, and a non-compliance notice may be issued if not completed.

- 3) **Unsatisfactory** - The permit holder's exercise demonstrates a need for significant effort to meet requirements. Deficiencies which jeopardize public or responder safety exist in the permit holder's emergency management program, plan, staff training, responding resources, or some combination of these essential elements.

A corrective action plan, outlining how gaps will be addressed, assigning responsibilities, and deadlines for said responsibilities, is to be provided as part of the permit holder's own exercise evaluation report submitted

to the Regulator. When deficiencies are identified that affect public safety, the permit holder has 7 days from notification to respond with a corrective action plan.

Section 4.3 of the EMR outlines the specific measures which a permit holder may be directed to undertake for compliance purposes following an unsatisfactory exercise.

The Regulator may also provide guidance or suggestions for improvement, focused on process or training. Permit holders should strive to incorporate these items prior to their next exercise.

As exercises are complex activities, there may be occasions when additional documentation or records are requested or offered to confirm completion of specific actions, or participation of personnel at multiple locations. The evaluation process will allow the permit holder to provide this additional information prior to the BCER finalizing an evaluation report.

Following an exercise, the permit holder is to provide their own report within 60 days of the exercise. In some cases, the need for a corrective action plan may have been identified in the Regulator's own exercise report. This should be included in the permit holder's document.

A copy of the BCER's exercise evaluation forms (full-scale and tabletop versions) are available on the Regulator's website [here](#).

Additional support for exercise development can be found in Appendix and in the Toolbox Meeting Guides on the Regulator's website.



## CHAPTER 5: PROGRAM EVALUATION

An effective emergency management program includes processes to identify, evaluate, and implement opportunities for improvement. In addition to the data sources outlined in the emergency management CSA, permit holders may want to consider other options to identify new or emerging best practices.

### 5.1 EVALUATION OF AN EMERGENCY RESPONSE

In accordance with EMR ss.16 (4) and CSA Z246.2 ss.14.12, the permit holder's emergency response program will conduct an evaluation of any response to an emergency. The evaluation provides an opportunity for the permit holder to assess and update emergency response plans, policies, procedures, resourcing and training in response to a real-world emergency. A "Form D-[Permit Holder Post Incident Report](#)" is required for all emergencies [level 1-3 incidents,] all pipeline incidents, and may also be requested by the Regulator for minor incidents.

The focus of post-incident reports is to determine a root cause. Permit holders should include all factors that contributed to the incident, actions taken to prevent recurrence, and copies of any technical or process analysis that support the root cause findings.

Parts that are determined to be a manufacturers' defect should note part or serial number, name of manufacturer, date in service, and service application (where and how used) in the report.

Post incident reports should be submitted to the Regulator within 60 days of an incident, however extensions may be granted when weather or other site conditions are impeding access, or when the results of a technical investigation or third-party report require additional time to complete.

Extensions should be requested prior to the 60-day submission deadline.

### 5.2 PUBLIC AND WORKER SAFETY

The requirements and processes described in the *Emergency Management Regulation* are designed to create a framework for the protection of the public, property and the environment from emergencies arising out of oil and gas activities. Worker safety is also an important issue and is subject to the [Occupational Health and Safety Regulation](#) administered by WorkSafe BC. Specific questions regarding employer obligations under the Occupational Health and Safety Regulation should be referred to WorkSafe BC.

## CHAPTER 6: EMERGENCY RESPONSE PLANS

### 6.1 EMERGENCY MANAGEMENT PLANNING

Through the *Emergency Management Regulation*, companies must develop emergency response plans that

address the complete range of risks (the “all-hazards” approach noted in Section 11.2 of CSA Z246.2) associated with their operations. This process begins with an HRVA – Hazard, Risk and Vulnerability Assessment<sup>6</sup>. As part of the HRVA process, it is important to consider the full scope of hazard management and mitigation. The HRVA should:

- Examine the full range of potential incidents and hazards, including worst-case scenarios – spills, leaks, equipment failure, natural disasters (fires, flooding, extreme weather, lightning strikes, etc.) communications failure / loss of control or monitoring, vandalism, etc.
- Identify current assets – equipment, trained and experienced staff, mutual aid agreements, contracted resources, etc.
- Analyze capabilities and capacities against assets – a “Gap Analysis” to determine any areas where the risks levels and resources don’t align.
- Create an Action Plan - Any shortfalls are addressed by the most appropriate means; a timeline and measurable objectives are set; and interim measures may be put in place to bridge short term gaps.
- Regularly review operations to see what factors may have changed – new staff, new equipment, new processes, changes in contracted suppliers, etc. and determine how these affect risk, and what steps may be necessary to manage them appropriately.

Sound emergency response planning must therefore begin with a thorough and systematic risk assessment.

**Hazard Recognition:** Hazards should be identified, assessed and then prioritized against potential vulnerabilities. Assessing the risks associated with all hazards in an integrated way helps reduce the vulnerability of people, property, the environment and the economy.

**Comprehensive Focus:** A comprehensive approach to emergency management should be adopted, considering the preparedness, prevention, mitigation, and the response and recovery components necessary for a sound plan.

<sup>6</sup>An [on-line sample of an HRVA tool](#) can be seen on EMCR’s website. Although focused on community hazards, it does provide insight into how risks may be assessed for those unfamiliar with the process.

**Partnerships / Mutual Aid / Other Sources of Assistance:** Collaboration, coordination and communication are the keys to effective emergency management. Real-life incidents rarely follow the scripts laid out in training and exercises. Identifying potential sources of assistance, and building awareness of capabilities and competencies within these sources enables the incident response team to improve decision-making and resource allocation.

**Continuous Improvement:** Lessons learned and knowledge generated from experiences, observations, and evaluations should be used to continually improve practices and prevent the same challenges from recurring. Continuous improvement should be shared widely and form an integral part of every emergency management function.

## 6.2 GENERAL REQUIREMENTS

### PURPOSE OF THE EMERGENCY RESPONSE PLAN

An emergency response plan is required for all oil, gas and geothermal activities where a hazard exists. Permit holders are required to maintain their plans, providing updates as necessary to ensure the actions outlined in the plan address the full range of identified hazards, and that all response resources are sufficient and available to meet such hazards.

When an oil or gas permit holder operates a dam for the purpose of water supply to their oil or gas operations, the provisions of the Dam Safety Regulation, Section 9, can be met within the scope of a field or facility emergency response plan. This is accomplished by adding the appropriate mapping (inundation zone) and hazard response processes specific to the dam site.

The purpose of an emergency response plan is to ensure processes and resources are in place to support a prompt and effective response to incidents. The plan demonstrates how emergency responses are initiated and coordinated, and includes:

- Criteria for assessing an emergency;
- Procedures for responding to an emergency;
- Procedures for mobilizing response personnel and agencies;
- Procedures for communicating and coordinating between all affected parties, and
- The process for documenting response actions for post-incident review.

This approach protects the public, those employed by the permit holder, and the environment. An ERP should thus:

- Be well organized to ensure quick access to critical information;
- Clearly establish priorities, roles and responsibilities of responders;
- Identify response organizations and how the ICS structure is filled;
- Assist personnel in determining, and performing remedial actions;
- Identify predetermined resources, required personnel, equipment, and services;

- Coordinate activities among industry responders, emergency services, local authorities, governments, and others who have a role in providing an effective response;
- Ensure communication with all parties involved in, or potentially affected by an emergency;
- Increase public confidence in the ability of industry to effectively respond to, and manage emergencies.

### 6.3 EMERGENCY RESPONSE PLAN REQUIREMENTS

All plans submitted to the Regulator must be compliant with the provisions of the *Emergency Management Regulation*, including the [routine maintenance](#) of these plans (EMR Section 8). CSA Z246.2 ss. 11 outlines both the contents, and objectives of a sound emergency response plan. The Regulator also provides a helpful checklist (available on the BCER website under [Industry Zone/Documentation / Emergency Response and Safety](#)).

Authorization holders for geothermal activities are also required to submit an emergency response plan not less than seven days prior to the start of any activity ([Geothermal Operations Regulation](#), S. 2(d)) and all plans must meet requirements as set out in permit conditions.

The Regulator must be provided with updated contents of any ERP:

- After any significant changes to site-specific hazards or risks;
- After an emergency response, when it is determined that changes in the plan must be made;
- At least once per year (time between reviews not to exceed 12 months).

Under CSA Z246.2 ss. 11.2 (e), all emergency response plans **must** include:

- The legal name and address of the applicant or permit holder's operations in BC.
- The permit holder's 24-hour emergency phone number. This is the same number that must be posted at all facilities.

Applicants or permit holders should also include the name and contact information of the program coordinator and local field / site supervisors. This will assist the Regulator when there is important, site-specific emergency information to be shared, such as notices of forest fire coordination calls, severe weather warnings, regional security concerns, etc.

### WHAT TO KNOW WHEN SUBMITTING AN ERP OR ERPUPDATE

All Emergency Response Plans must be submitted in both paper and electronic formats. BCER recommends that whenever the contents of a plan are changed, the electronic version of the plan is submitted for review. Upon acceptance, the revised plan (or pages if only minor adjustments) are mailed to the BCER.

A copy of the completed checklist should always accompany a new submission, and is necessary whenever a request to expedite review of a plan has been made by the permit holder. A completed checklist also supports faster review of the document's normal processing.

Unless an [extension](#) has been requested by the permit holder in advance of expiry, and granted in writing by the Regulator, a plan ceases to be valid one year after the date on which it was compiled or updated.

**EXAMPLE:** *A field supplemental emergency response plan was reviewed and updated on 15 April 2020, but only submitted to the Regulator 30 May 2020. The anniversary date by which an updated ERP must be submitted to the Regulator is 15 April 2021.*

## ANNUAL AND OTHER UPDATE REQUIREMENTS

Plans must be reviewed every year to confirm information contained remains accurate and relevant. In some cases, there may be no changes required to the plan. When this occurs, permit holders can re-submit their plans in electronic format only, with a new cover sheet showing:

- The date the review was completed. (anniversary date)
- The person responsible for the review. (approving authority within company)

## ROUTINE MAINTENANCE OF PLANS

Outside of the annual requirements, permit holders must ensure any changes to emergency response plans are implemented in every copy of the plan. Effective document control processes should be identified and employed to be certain that changes are made and recorded in all copies of the ERP, including the copy held by the BCER.

When submitting updates to assets, upload a new asset spreadsheet in e-submissions.

**PLEASE NOTE:** Routine maintenance of plans, such as updates to telephone numbers, the addition or revision of pages for a new facility, etc. do not constitute an annual review, which should be a comprehensive process to confirm all key actions, accountabilities, resources and public safety information remains current and valid.

Plans may also require a review and in some cases updating, under the following conditions:

1. After an emergency response evaluation as required under CSA Z246.2 ss. 14.10.
2. If site-specific risks of the oil and gas activity change significantly. As part of the review process the permit holder must:
  - Determine if persons or entities within the HPZ have changed;
  - Ensure that any new persons or entities within the HPZ have been provided with information about the hazards and risks of the oil and gas activity;
  - Provide updated information on the oil and gas activity to persons or entities within the HPZ; and,
  - Consider any responses that were provided by persons or entities after the plan or updated information was submitted to the Regulator.

## EXTENSIONS TO PLANS

There have been occasions when unexpected factors such as a change in ownership may delay the updating process, or weather factors affected completion of drilling operations slightly beyond the one-year anniversary. The Regulator will consider short extensions (on a case-by-case basis) to allow the continued use of an ERP beyond the one year mark.

As part of the considerations, permit holders must confirm that all hazards, hazard planning zones, contacts and any land use (such as residents, trappers, guide-outfitters, other tenure holders, etc.) within the HPZ identified in the original plan remain accurate and applicable.

Any requests for extension to a plan should be made in writing at least 30 days prior to the anniversary / expiry date. Extensions will not normally be considered for more than 60 days beyond the anniversary date.

## ERP BRIDGING

Bridging – the short-term use of one permit holder's ERP by another permit holder – is permissible when ownership of an asset or group of assets are transferred. The Regulator must be notified in writing, and by both parties, when a bridging agreement is in effect, including the term of the agreement. Any alterations or cancellations of agreements, in whole or in part must also be reported to the Regulator in the same way.

The ERP of the Transferor (initial owner) may be used by the Transferee (company receiving the asset) until such time as the Transferee's ERP can be updated to reflect the new asset(s). This should normally be concluded within 30 days of the change in ownership.

## ERPS AND CONTRACT OPERATING

In some cases, a permit holder may find that, for a small number of assets (particularly in remote areas), it may be beneficial to establish a relationship with another permit holding company also operating assets in the area, to oversee and manage the combined assets of both organizations on a contract basis. This would not be considered a mutual aid agreement, as all operating and incident response resources would be provided by one party.

The permit holder owning the assets (the "asset owner") has an agreement with another permit holder (the "operating permit holder") to contract operate one or more assets, and:

- The asset owner retains liability for meeting all regulatory requirements for the asset(s).
- Both permit holders agree to the use of the operating permit holder's emergency response plan for any potential incidents.
- The operating permit holder has sufficient response capacity (staff and equipment) to oversee the combined assets being managed.
- The assets being managed are included (listed and mapped) in the contract operator's ERP, meeting all regulatory requirements as if the assets were owned by the contract operator. This includes locations of any resident or rights /tenure holder within the HPZ, and protection of the confidentiality of resident information.
- The asset owner must provide the Regulator with their own emergency response plan for the assets being contract operated. While this may be an abbreviated form of the ERP, it must include a risk assessment for the asset(s) being managed, a list of available incident response resources appropriate to the risks, and contact information for both the asset(s) owner and the operating permit holder. A copy of the contract agreement must also be included in the ERP.

- The contract agreement must clearly state that the operating contractor has been provided the authority, to direct and engage, the resources required to initiate a response to any incidents related to the assets noted in the agreement.

## 6.4 CORE AND SUPPLEMENTAL PLANS

Under SS. 5 of the EMR the applicant or permit holder must submit both electronic and paper copies of the plan to the Regulator. The applicant or permit holder must also provide a copy of any updates to the plan. Plans must be submitted and reviewed before an oil and/or gas activity occurs.

In an effort to simplify and streamline the development, management and auditing of emergency response plans, plans must be separated into two distinct types:

- 1 CORE Plans
- 2 Supplemental Plans

This organization also supports the Regulator and industry's commitment to transparency, and allows timely and efficient public access to Core emergency response plans, which should not contain personal or sensitive company information more commonly found in supplemental (site- specific) plans.

Permit holders must be aware that the Regulator supports public access to these CORE plans and will not be responsible for redaction of any information contained within these plans.

Core plans will tend to be a more static document, with set processes, policies and procedures authorities to activate plans. The core will also include ICS structure, establishment of an emergency operations centres, corporate communications and information policies, ignition protocols, and processes for roadblocks, securing an incident site, preserving evidence, etc.

Creating core plans as a stand-alone document should also enable these to be maintained with minimal administration necessary to keep them current. In some cases, the only procedure necessary will be a review of contents, and an affirmation (documented) that all information remains relevant and accurate.

A supplemental plan will typically require a higher level of maintenance than core plans, and will be in one of the following two distinct categories:

1. **Drilling and completions** (sour or sweet) -- While these plans are valid for one year, [short extensions](#) are possible on request by permit holders, and review by BCER.
2. For well sites once drilling and completions activities have been concluded, the well(s) should be included in the appropriate Field Supplemental ERP by updating the applicable sections.

Workovers and maintenance activities that will create a short-term hazard beyond the HPZ contained in the applicable supplemental plan must submit a workover plan (and mapping if additional residents are affected) showing the temporary extension to the HPZ, and listing rights / tenure holders affected.

- 3. Facilities, Fields and Pipelines** – These supplemental plans are typically organized by operating area or when a large or unique facility requires specialized training for an effective incident response.

For transmission pipelines, the entire project may be included in a single supplemental plan; however it may be necessary to address regional differences in response equipment and personnel.

Supplemental plans will include:

**Description of the oil and gas activity** – This must include:

- A general description of physical assets, e.g. pipelines, facilities or wells including the geographical location(s) of the activity (UTMs)
- A description of the operations, including start-up and completion timelines (if applicable); and
- The type of activities and/or nature of the work.

### **Site-Specific Risks**

Under ss. 13 (2) (c)(i) of the EMR, the description of the oil and gas activity must include site- specific hazards and risks, identified in an all-hazard risk assessment. This assessment should:

- Identify all hazards associated with the oil and gas activity and operations.
- Identify all hazards which will likely impact operations and assets.
- Identify values at risk: people, property, and environment.
- Define the hazard controls to mitigate risks to people, property, and/or environment.
- For pipelines, the risk assessment should consider the cumulative risk and release potential when multiple lines share a right of way.
- For acid gas disposal sites, additional permit conditions with respect to risk mitigation may apply.

When conducting the risk assessment, it is recommended that the permit holder reference applicable recognized standards or guidance, such as CSA, ISO, NFPA or API.

### **Emergency response mapping**

Under ss. 13 (2) (b) of the EMR, and S. 5.7.4 of the Oil and Gas Activity Applications Manual, an emergency response map must show all of the following applicable information:

- The location of the oil and gas activity that is the subject of the plan.
- The HPZ and Emergency Awareness Zone.
- The location of roads, including oil and gas roads, within the HPZ.

If the area, feature, structure or location may be affected by an emergency or may affect the response to an emergency the emergency response map must also show all of the following information:



- The area adjacent to the HPZ.
- Surface and environmental features and structures, including stream crossings and lakes within the HPZ.
- The location of commercial, industrial or critical infrastructure operations within the HPZ<sup>2</sup>.
- The location of a registered trap line, guiding territory or Crown range within the HPZ.
- The location of any other areas within the HPZ that may be used by the public, including, without limitation, dwellings, schools, churches, community centers and public facilities, campgrounds, fair grounds and recreation areas.
- The distance in kilometres to the nearest occupied dwelling<sup>3</sup>. This may be provided as a note if the scale of the map does not allow for inclusion of the dwelling.
- For pipelines, the map should include tie-ins (including the name of the upstream company, if different) block and ESD valve locations. Project and segment numbers should be shown.

In unincorporated areas where there is no, or minimal response capacity from a local authority, mapping must be sufficient to provide comprehensive guidance to permit holder staff who may be tasked with public protective actions. Distances are to be indicated for all regularly occupied structures located within the EPZ. This includes, but may not be limited to: residences, places of business, schools, places of worship, community centres, and medical facilities.

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<sup>2</sup> This includes any critical infrastructure such as water inlets or discharges. Pipelines within a common right of way not owned by the same permit holder can be noted on the map, and should indicate where lines cease to run in a common right of way.

<sup>3</sup> In remote areas, it is acceptable to ground truth the area out to the edge of the Emergency Awareness Zone (EAZ) and estimate the distance to the nearest occupied dwelling when it is outside of the larger of the HPZ or a 2km radius.

## 6.4.1 CREATING AN EMERGENCY RESPONSE PLAN

### DETERMINING HAZARD PLANNING DISTANCES

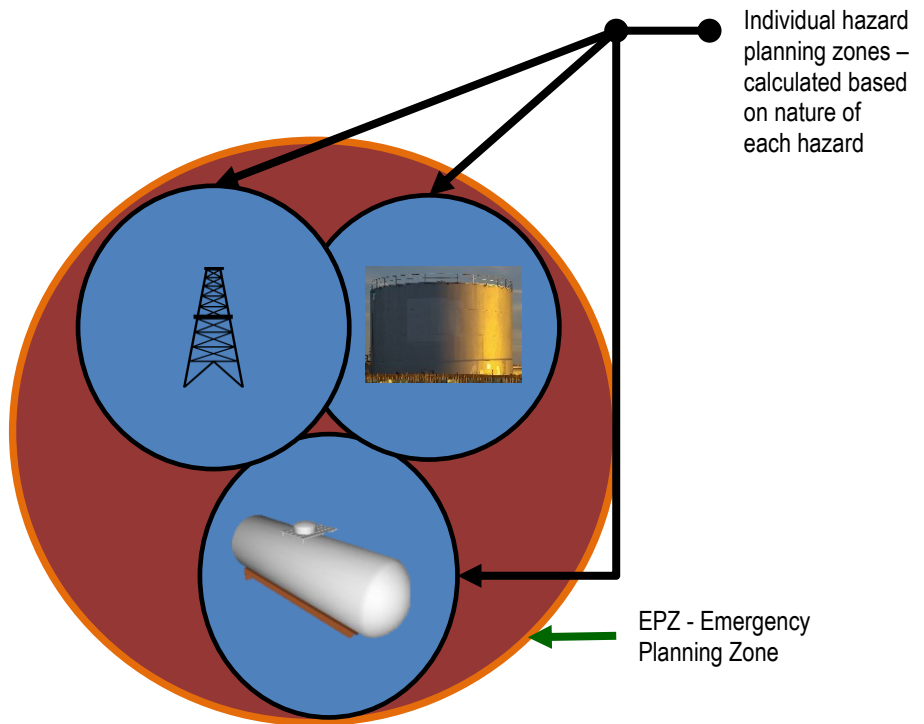
Hazard planning distances are used to identify a geographical area (a hazard planning zone) within which persons, property, or the environment may be affected by an emergency.

The combined geographic areas of hazard (emergency) planning zones are used by the applicant or permit holder to identify an EPZ where immediate response actions are required, in the event of an emergency. The EPZ is a foundation element for the applicant or permit holder's plan and is used to help identify persons or entities that must be involved in emergency management planning in accordance with s.7 of the EMR.

The EPZ is based upon the greatest hazard present, or expected to be normally present, for which the Emergency Response Plan has been developed. In many cases, oil and gas operations will have a number of products associated with their operation, such as propane bullets, condensate storage, containment for produced water, etc. that create a hazard area. When present, H<sub>2</sub>S is typically the greatest hazard and will often determine the extent of an HPZ.

Section 7 of the EMR defines a hazard planning distance as a horizontal distance measured from the site of an oil and gas activity that is the subject of the plan. Permit holders with assets near airports should consider the vertical dispersion of vapours. Where an HPZ overlaps any part of an airport zoning area, engagement with the airport authority is required.

The applicant or permit holder must calculate the hazard planning distance for fluids containing hydrogen sulphide using *Schedule A* of the EMR (for facilities), *Schedule B* of EMR (for wells) or *Schedule C* of the EMR (for pipelines).



In some cases, companies have incorrectly referenced only the nomographs in Schedules A, B or C for activities where no H<sub>2</sub>S is present, and attempted to proceed with an HPZ of zero.

For all hazards other than hydrogen sulphide, a person who is licensed or registered as either a professional engineer or a professional geoscientist under the Engineers and Geoscientists Act must determine the hazard planning distances. This person may follow the following process to be compliant:

- 1) Determine hazard scenarios (natural or human caused; internal or external to the activity).
  - a. Representative scenarios may be selected from the results of a hazard identification study or risk assessment.
  - b. The hazard scenarios should be representative of the full range of incidents that require specific emergency response planning.
  - c. Credible worst-case consequences should be used.
- 2) Conduct consequence modelling of the selected scenarios including
  - a. flammable vapour dispersion to ½ LFL
  - b. radiant heat to 5 kW/m<sup>2</sup>
  - c. acute exposure to chemicals other than hydrogen sulphide
  - d. overpressure to 1 psi
  - e. environmental impacts from liquid containment failure
  - f. BLEVE incidents and debris impact area
- 3) The consequence modelling may produce a number of hazard planning zones with specific emergency response requirements.
- 4) Each hazard planning zone should encompass applicable impact areas to persons, property or the environment as determined by the consequence modelling.
- 5) The emergency planning zone is defined by the EMR to encompass all hazard planning zones for an activity.
- 6) Permit holders should also consider the potential impacts of worst-case scenarios on any adjacent critical infrastructure, even if outside of the EPZ. An example of this would be fluid migration into a downstream water supply inlet.

A best practice, particularly for sour operations, is to round up the calculated HPZ by 10 per cent for distances under one kilometre, or to the next highest 100 metre increment for distances over one kilometre. This effectively addresses one of the challenges that can arise when a small increases in a hazard, release rate or H<sub>2</sub>S concentration affects the HPZ.

Ultimately, the applicant or permit holder will identify an EPZ for an emergency response plan that will encompass all hazard planning zones of the oil and gas activity that is the subject of the plan.

## PIPELINE HAZARD PLANNING DISTANCES

For pipelines carrying low volatility, low toxicity product with an HPZ distance equal to or less than the Right-of-Way, the right of way distance may be used, extending the length of the pipeline. In no case should the HPZ be less than the right of way.

For pipelines carrying a high volatility or high-hazard product, the HPZ distance should be calculated from the

edge of the right-of way.

When multiple pipelines share a right of way, or when rights-of-way overlap, the HPZ distance must consider the cumulative effect of each pipeline, using maximum licensed values.

For H<sub>2</sub>S, the calculations must conform to the EMR, ss. 7(2), however it may be possible with very low percentages of H<sub>2</sub>S that other hazards will determine the HPZ distance.

## WELL SITE HAZARD PLANNING DISTANCES

The HPZ for sour wells must conform to the EMR, ss. 7(2). Please review section 8.3.9 “Special Sour Wells” in the [Oil and Gas Activities Manual](#) for additional guidance and conditions, which may apply.

Acid gas disposal wells will typically have additional permit conditions, and permit holders must clearly indicate in their plans if the acid gas can be ignited in the proportions under which it is being stored, or if additional fuel gas would be required to support combustion. While it is permissible to use the AERH<sub>2</sub>S tool for calculating the HPZ for an acid gas well, a 10-minute release time is to be used.

Observation wells, or other wells that are in communication with a disposal formation, should use the maximum licensed reservoir pressure provided to the disposal well operator in a Section 75 order when calculating the HPZ for any such wells.

Sweet well HPZ's will be calculated by the permit holder based on AOF, plume dispersion, LEL and considering any additional hazardous materials on site.

For geothermal wells, the HPZ should consider the potential impact of uncontrolled surface dispersion of fluids encountered while drilling or during production of a geothermal source.

## FACILITY HAZARD PLANNING DISTANCES

The EPZ for facilities that process sour product must conform to S. 7(2). of the *Emergency Management Regulation*, however it may be possible when there are very low percentages of H<sub>2</sub>S that other hazards will determine the EPZ distance.

To determine hazard-planning distances, a risk assessment will need to be conducted. When a permit holder has multiple facilities of a similar type, managing similar products and volumes, a generic hazard assessment and HPZ can be applied.

## 6.4.2 EMERGENCY RESPONSE RESOURCES

Under CSA Z246.2 ss.7.2 (d) and ss. 11.3, an applicant or permit holder must identify and describe predetermined resources available for deployment in an emergency. The description should include the location of required personnel, equipment and services, and consider any challenges that may affect the timely arrival of any off-site resources, such as seasonal impacts.

Types of equipment may include, but are not limited to, the following:

- Primary communications (types of equipment, radio frequencies, etc.);
- Back-up emergency communication systems
- Roadblock kits (number and contents);
- Ignition equipment (locations on or near site, and how to access additional off-site);
- Gas monitoring equipment (number and type, and how to access additional off-site).
- Initial spill response equipment (maintained on site)
- Additional nearby resources (available through mutual aid, spill cooperative membership or on contract) such as booms, skimmers, portable tank / containment, absorbent materials, earth moving machinery (berm and bell hole building), vac trucks, etc.
- A comprehensive resource list should consider other potential sources of assistance for critical tasks, like deployment of spill containment equipment, staff roadblocks, assist with evacuations and roving, etc.

Under ss. 12 (a) of the EMR, and S. 13 of CSA Z246.2, the emergency communication system must be capable of enabling communications between the following:

- The permit holder.
- The emergency response staff (employee and contracted).
- The public.
- The Regulator.
- Government agencies and authorities.

The emergency communication system must be tested annually to confirm the equipment is functional. As a best practice, staff should consider an additional test as part of their annual exercise scenario.

The plan should describe the internal and external methods of communication that the permit holder will use to inform affected parties of the details of an emergency, and to facilitate emergency communications between emergency responders. [Appendix D](#) provides an outline of issues that should be addressed in the plan.

## **DEPLOYMENT, MONITORING AND COMMUNICATION PROCEDURES**

Under ss. 13 of the EMR, and sections 11 and 13 of CSZ Z246.2, the plan must include a description of how the applicant or permit holder will:

- Deploy and monitor the emergency response resources in an emergency.
- Monitor for, and determine the extents of the hazard impacted area.

- Notify those persons and other entities who may be affected by an emergency.
- Provide information to those persons and other entities regarding an emergency, including shelter in place or evacuation decisions, as applicable.

## SHARE INFORMATION WITH PERSONS OR ENTITIES IN THE HPZ

Persons or other entities that may be in harm's way need to have information about applicant or permit holders emergency response programs and understand how an emergency response plan will affect them. Applicants and permit holders need information about persons or other entities, in order to develop an effective emergency response plan.

Under s. 13 of both the EMR and CSA Z246.2, before submitting a plan to the Regulator, an applicant or permit holder must provide emergency management information to persons or other entities located within the HPZ regarding the potential hazards of the oil and gas activity. Public information packages must be provided to all persons living within an HPZ or required to transit an HPZ to access their residence or tenure.

The applicant or permit holder must also request that the person or other entity describe how they may be affected by an emergency.<sup>8</sup>

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**8.** The exchange of emergency management information is not the same as consultation. The Energy Resource Activities Act and the Requirements for Consultation and Notification Regulation require oil and gas applicants to conduct consultation and/or notification prior to submitting an application for an oil and gas activity. Consultation and notification must be completed before an application is submitted

The EMR requires the exchange of emergency management information in order to ensure that all hazards that may threaten public safety, infrastructure or the environment have been considered in the development of an emergency response plan. In addition, the exchange of information ensures that there is a process to contact persons or other entities in an HPZ and if necessary, evacuate them in the event of an emergency.

The Regulator recommends the use of informational meetings (particularly in advance of entering the sour zone) as a useful way of confirming contact information for persons within the HPZ, updating emergency response plans (ERP's) with any new or changed contacts, and considering any new factors within the community that may impact the way in which an ERP is implemented.

The Energy Safety Association's "Site Specific Orientation Guideline" provides a useful summary of the key topics that should be addressed in these informational meetings with both employees and contract crews.

The EMR requires that emergency management information be provided to persons or other entities located within the HPZ regarding the potential hazards of the oil and gas activity.

The applicant or permit holder must also request the person or other entity describe how they may be affected by an

emergency.

## INFORMATION REQUESTED FROM PERSONS WITHIN THE EPZ

Under ss. 13 (2) (d) of the EMR the applicant or permit holder must request that the person or entity provide:

### 1. NAME AND CONTACT INFORMATION

Contact information that can be used for ongoing communications and for contact in the event of an emergency. The applicant or permit holder should request that the person or other entity identify a preferred method of contact for regular communications and emergencies. This should include:

- 24 hour telephone number for emergencies;
- Legal address of any residence, business or facility. In the event that the legal address is not tied to the actual location being occupied (i.e. a post office box), the applicant or permit holder should request the address or location that should be used by emergency responders;
- Email address for non-emergency communications;
- Any other communication method as identified by the person or entity.

The applicant or permit holder can also request additional relevant information regarding other occupants at the location including family members or employees, their personal contact information, and information regarding patterns of attendance such as school or seasonal use.

### 2. DESCRIPTION OF HOW THE PERSON OR ENTITY MAY BE AFFECTED BY AN EMERGENCY

This requirement provides an opportunity for a person or entity to identify concerns, vulnerabilities or make requests regarding response procedures and individual emergency response requirements.

Issues that can be noted include health sensitivities, mobility issues, effects on and needs of pets and livestock, and concerns about security of the premises during an emergency.

Under ss. 13 (3) of the EMR, the applicant or permit holder must consider the response of a person or entity to the emergency planning information package when preparing the plan.

Any responses received by a permit holder after the plan has been submitted to the Regulator must be considered when the plan is reviewed and updated (ss. 8 (3) of the EMR).

Information collected from the person or other entity may be personal information as defined by the [Personal Information Protection Act \(PIPA\)](#)<sup>9</sup>. Private sector organizations that collect personal information in British Columbia are subject to the Act, which sets out the rules for how personal information may be collected, used or disclosed.

Applicants and permit holders should ensure that they comply with PIPA when collecting information from persons or entities within the HPZ. Applicants and permit holders can contact the [Office of the Information and Privacy](#)

[Commissioner for British Columbia](#) for more information.

As a public body, the Regulator is subject to the [Freedom of Information and Protection of Privacy Act \(FOIPPA\)](#). Any personal information contained in plans submitted to the Regulator will be subject to the protection and security requirements identified in FOIPPA.

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<sup>9</sup> Personal information is defined as information about an identifiable individual, which includes (but is not limited to) their name, home address, phone number, medical information, and employment information.

## INFORMATION THAT MUST BE SHARED BY THE PERMIT HOLDER

Under ss. 13 (2) of the EMR the applicant or permit holder must provide emergency planning information to a person or entity occupying or having jurisdiction over land within the HPZ before submitting the plan to the Regulator. This allows the applicant or permit holder to identify key contacts and collect relevant information that should be considered in the development of an emergency response plan.

The following information must be included in the emergency planning information package:

- The applicant or permit holder's name and contact information
- The applicant or permit holder's emergency information and a 24-hour emergency telephone number from which an emergency response action can be initiated.
- A map of the HPZ. Where a permit holder operates a dam, the inundation zone must be shown, including slope contourlines.

In accordance with ss. 13 (2) (b) of the EMR the map must show the location of the EPZ in relation to roads (including resource roads), dwellings, schools, and public and private facilities.

The map should include easily understandable labelling which could include compass orientation, a bar scale and legend that explains any map symbols. The map can be specifically drawn for inclusion in the information package, or the applicant or permit holder can use an existing map as long as the existing map is understandable to the target audience and clearly illustrates the requirements outlined above.

## DESCRIPTION OF HAZARDS AND RISKS

The intent of this requirement is to provide persons or other entities in the HPZ a realistic understanding of the nature of the hazards and risks of the oil and gas activity, how the hazards may affect a person or entity, and to provide relevant information on the actions to take, in the event of an emergency. The hazard description should be provided in a way that is understandable to the target audience, and can include drawings or pictorial representations that will assist the person or other entity to understand the planned emergency response procedures.

The description must include:

- The site-specific hazards and risks of the oil and gas activity.
- How the applicant or permit holder's response to an emergency may affect the person or other entity.



- How the applicant or permit holder will provide notification on whether the person or entity should shelter in place or evacuate in the event of an emergency.
- How the person or other entity can get to safety in an emergency.

### Defining a person who occupies land

It is important to know which persons are occupying land within the HPZ so that emergency responders can effectively identify, communicate, and if necessary evacuate individuals in the event of an emergency. A person occupying land within the HPZ may include:

- Permanent and part-time residents, including those residing on dead-end roads beyond an EPZ, where occupants are required to egress through the HPZ.
- Business owners and/or operators and industrial operators, including oil and gas operators with staffed facilities.
- Indigenous nations, who have / use areas of cultural significance which intersects an EPZ.
- Private and public recreational property owners and/or operators (e.g., campgrounds, trapper cabin, private cabins, etc.) In and adjacent to an HPZ.
- The users of public facilities, such as schools and community centers in or adjacent to an EPZ.
- Non-resident landowners or farmers renting land who do not dwell on the property but whose lands are within an EPZ. These persons should be considered in the development of the ERP and be advised their property lies within the HPZ.

Timing considerations are an important factor in identifying if a person occupies land within the HPZ. For example, an applicant or permit holder would provide emergency management information to a person who has a secondary residence or cabin in the HPZ, but who may only be at the residence during specific periods during a year.

### A local authority

For the purposes of the EMR, a local authority is defined in the same manner as the [Emergency Program Act](#) and also includes band councils of Indigenous Nations. Local authorities are accountable for the direction and control of emergency response within their jurisdiction. The applicant or permit holder must share emergency management information with local authorities to ensure coordination of emergency response activities, and to ensure that the applicant or permit holder is familiar with the local authority's communication procedures and chain of command.

Under ss. 13 (1) (f) of the EMR, a municipality must also be contacted when any part of the HPZ is located within the right of way of an arterial or municipal highway within that municipality.

Applicant and permit holders should contact the local authority to determine which routes have been designated as a municipal highway within the local authority's area of jurisdiction. Arterial highways are designated by the Ministry of Transportation and Infrastructure (see 2.1.6 below).

## The Government of Canada

When there is an existing federally owned installation or federally regulated land within the HPZ, emergency management information must be provided to the federal agency or organization.

Applicants or permit holders should provide the information to the appropriate local federal government contact. Examples of federal installations and federally regulated land include:

- First Nations reserves.
- Harbour facilities.
- Military bases.
- Office buildings or other structures.
- Railways.
- National parks.

Locations of federal buildings and structures can be obtained from the federal government's [Directory of Federal Real Property](#).

## Indigenous Nations

Indigenous Nations have constitutionally protected aboriginal or treaty rights to practice traditional activities on Crown lands throughout British Columbia. These rights are practices, customs or traditions integral to the distinctive culture of an Indigenous Nation and they may be historically connected to a particular area of land. Examples may include hunting, fishing, plant gathering and use of wood for domestic purposes. More than one Indigenous Nation may have rights in the same area and the types of rights may vary across communities. First Nations may be able to assist the applicant or permit holder to identify Indigenous Nation activities on the land base that should be considered in the development of an emergency response plan.

Under ss. 13 (1) (d) of the EMR if all or a portion of an Indigenous Nation's reserve is located within the HPZ the applicant or permit holder must provide emergency management information to the First Nation. Applicants or permit holders should also contact the Indigenous Nation if a portion of the Indigenous Nation's traditional territory is within the HPZ.

Applicants and permit holders can use "GeoBC's [First Nations Consultation Areas](#)" to identify and find contact information for Indigenous Nations who may have interests within the EPZ. Applicants or permit holders may also contact the Ministry of Indigenous Relations and Reconciliation or the Regulator for assistance in identifying First Nations in the EPZ.

## The Ministry of Transportation and Infrastructure

Arterial highways are provincially regulated highways located within a municipality. Emergency management information must be provided to the Ministry of Transportation and Infrastructure if any part of the HPZ is located within the right of way of an of an arterial highway. Locations of arterial highways are available from the [Ministry of Transportation and Infrastructure](#) and can be found on [iMapBC](#).

### A rights holder

A rights holder is a person granted non-intensive occupation or use of Crown land by the Government of British Columbia by a permit, licence or other approval. For the purposes of this manual, a rights holder does not refer to a First Nation that holds constitutionally protected aboriginal or treaty rights .

Applicants or permit holders must consider the activities of rights holders when developing an emergency response plan. Rights holders may have buildings, structures or other facilities located within the HPZ, or may have workers operating within HPZ.

Although not specifically identified in the Regulation, the Regulator considers recreation sites established under Section 56 of the Forest and Range Practices Act as tenure holders. Applicants or permit holders should contact the [Ministry of Forests](#) for more information.

In accordance with the EMR, a “rights holder” is defined in s. 1 of the [Requirements for Consultation and Notification Regulation](#) and holds the rights noted in Table 1 below.

**TABLE 1: RIGHTS HOLDERS UNDER VARIOUS LEGISLATION**

<b>Legislation</b>	<b>Permission</b>
<a href="#"><u>Land Act</u></a>	Temporary Occupation of Crown Land, non-intensive use
	Licence of Occupation, non-intensive use
<a href="#"><u>Forest Act</u></a>	Forest Licence
	Forestry licence to cut (major)
	Community forest agreement
	Timber sale licence
	Tree farm licence
	Woodlot licence
<a href="#"><u>Range Act</u></a>	Grazing permit
	Grazing licence
<a href="#"><u>Wildlife Act</u></a>	Guide outfitter's licence
	Guiding territory certificate for Crown land
	Registered trap lines (including trap lines held by a member of a First Nation)
<a href="#"><u>Mineral Tenure Act</u></a>	Mineral claim
<a href="#"><u>Water Sustainability Act</u></a>	Water licence

## CHAPTER 7: RESPONDING TO INCIDENTS AND EMERGENCIES

During a permitted activity, an unanticipated incident may occur that is outside normal operations. An emergency response begins when an incident is imminent or immediately after an event occurs.

An incident becomes an emergency if the response requires actions by the permit holder to protect persons, property or the environment. See Section 7 of the EMR for information on incident classification.

Permit holders are the primary responders when emergencies or incidents occur, and must implement their emergency response plans immediately. As soon as practicable (within the first hour), the permit holder must inform the Regulator, via EMCR. The Regulator will provide oversight and monitor events during incident and emergency response.

Incidents classified as minor must be reported within 24 hours of discovery.

### ERAA S. 37 - Spillage

- (1) A permit holder and a person carrying out an oil and gas activity must
  - (a) Prevent spillage, and
  - (b) Promptly report to the commission any damage or malfunction likely to cause spillage that could be a risk to public safety or the environment.
- (2) If spillage occurs, a permit holder or person carrying out an oil and gas activity must promptly do all of the following:
  - (a) Remedy the cause or source of the spillage;
  - (b) Contain and eliminate the spillage;
  - (c) Remediate any land or body of water affected by the spillage;
  - (d) If the spillage is a risk to public safety or the environment, report to the Regulator:
    - (i) The location and severity of the spillage, and
    - (ii) Any damage or malfunction causing or contributing to the spillage.
- (3) A person who is aware that spillage is occurring or likely to occur must make reasonable efforts to prevent or assist in containing or preventing the spillage.

## RESPONDING TO AN INCIDENT OR EMERGENCY

Permit holders are responsible for carrying out their response activities until the incident is resolved. When an incident occurs that is the result of permitted activity, ss.10 (2) of the EMR and s. 14 of CSA Z246.2 requires that the permit holder:

- Implement their emergency response plan immediately.
- Take such other actions as necessary to respond effectively and adequately to the emergency.

A response includes the execution of emergency plans and operational activities designed to protect persons, property and the environment. In the event of an incident that involves a spill, permit holders must also comply with s.37 of ERAA, and s. 16(2.1) of the EMR.

The plan must be implemented in accordance with the following order of priorities:

- 1) Protection of incident responders.
- 2) Protection of the public.
- 3) Protection of property.
- 4) Protection of the environment.

Permit holders are expected to immediately carry out all tactical actions necessary to protect the public. At the earliest opportunity, the authority having jurisdiction must be notified of any such actions that may impact their normal area of responsibility. An example of this would be the tactical closure of a highway to prevent public from entering an incident hazard area.

## CLASSIFYING AND REPORTING THE INCIDENT

In accordance with section 10 and 11 (1) of the EMR, when a permit holder becomes aware of an incident, the permit holder must classify and report the incident. Failure to report an incident is a significant failure of a permit holder's obligations under regulation.

The classification of an incident is determined for each event or circumstance by identifying the probability of escalation or control of the event or circumstance at the time it is discovered using the Incident Classification Matrix contained in Schedule D of the EMR. From time to time, the nature and scope of an incident may not be immediately clear, and adjustment to the level of incident may be required as more information becomes available or the incident evolves.

The classification process should be well understood, and responsible staff should be able to assign a level to the incident within a very short period of time (i.e. minutes.) Incident levels are to be considered guides for internal and external responders and supporting agencies, providing a quick context for incident severity, and the anticipated scale of responding resources needed to manage the incident. As more information about an incident is obtained, adjustments to the incident level can be considered.

For minor incidents – those with a total score of two or less on the Classification Matrix, permit holders are

responsible for directly entering information into the Regulator's on-line reporting tool [Kermit] within 24 hours of discovery. A [guide for this tool](#) is available online.

For incidents that involve the release of a reportable volume / product – as defined under the [Spill Reporting Regulation](#) – a Dangerous Goods Incident Report (DGIR) must be obtained from Emergency Management BC [EMCR.]

The initial report (via EMCR) must include the product type, estimated volume and the specific incident location, preferred in the form of a **street address, UTM or Latitude / Longitude** as NTS / DLS descriptions may not be sufficiently precise.

When reporting a spill incident, the permit holder should indicate if the spill has been fully resolved. In cases where clean-up has not been completed at the time of the initial incident report, there are additional regulatory reporting requirements (EMR, S. 2.1) whereby a permit holder must:

- Provide a written status report every 30 days following the initial report, until the spill has been resolved, and;
- Provide a final report within 30 days of remediation having been completed.

Interim reports provide information on the status of the spill cleanup, or identify any growing impacts from the spill.

Once cleanup has been completed, submit a Form D- Post Incident Report, including soil/water sampling and spill mapping documentation.

**NOTE:** For smaller scale incidents, there may only be need to submit a single report if the spill has been fully remediated at the time the initial report is filed with the Regulator. This can be done directly into KERMIT as part of minor incident reporting. Form D is not usually required for minor incidents, but can be requested by the Regulator.

**NOTE:** All interim reports are to be sent to [EMP@BC-ER.CA](mailto:EMP@BC-ER.CA) and must reference the DGIR and / or Kermit incident number.

Please note that incidents involving a form of transportation (truck, rail, marine) also have [reporting requirements](#) under federal Transportation of Dangerous Goods (TDG) regulations, and some products have significantly smaller reportable thresholds under the federal process. A spill to a body of water of a product listed in the Spill Reporting Regulation is reportable at any volume.

When a sour gas product is released, any reading of 5 ppm or greater measured at 1 metre from the source of the leak requires reporting as an incident. Protective actions to prevent public access must be taken. This requirement applies to leaks from any source, including surface casing vent assemblies.

Incidents scoring 3 or higher are classified as emergencies, and are reported through EMCR. The Regulator's duty emergency officer will be notified by EMCR, and will directly contact the permit holder (or representative) who has assumed the on-scene incident commander role. A DGIR is also obtained if there is release of product.

All emergency level incident, and any pipeline incident (where pipeline integrity may have been compromised) require completion of a Post Incident Report (Form D, available on the Regulator's website).

Line exposures without a release are also reportable, and should include information on:

- How to limit public access to the site;

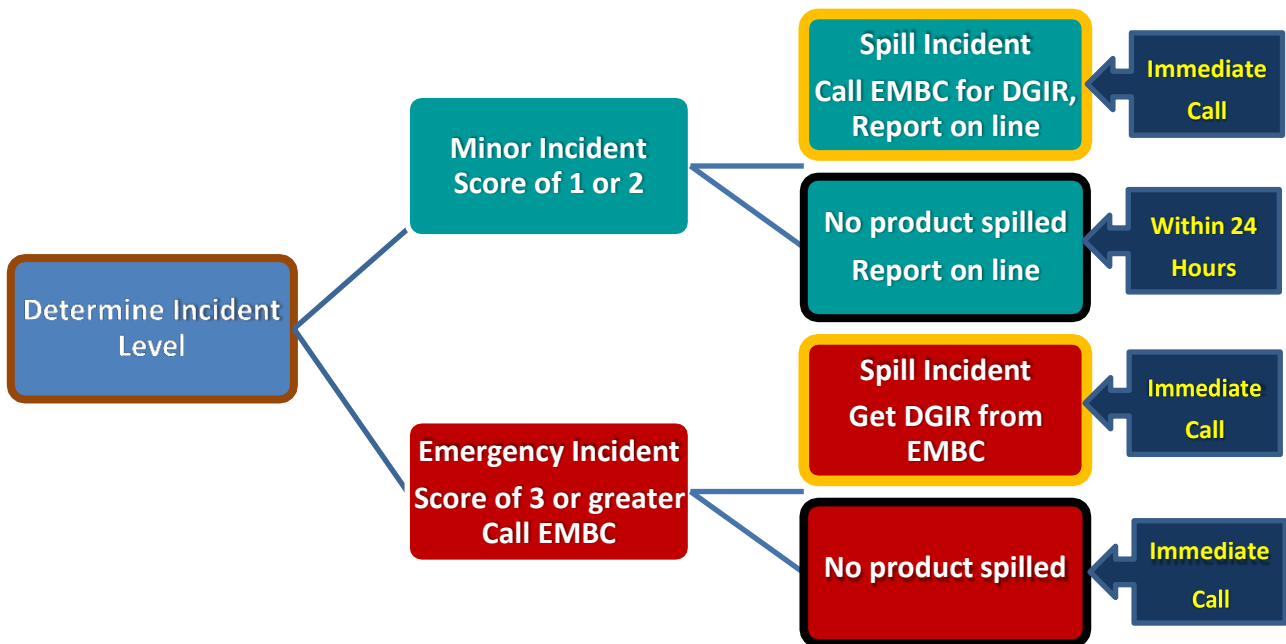
- Managing / mitigating potential for damage, such as from boats, strong currents, etc.;
- Assessment of failure potential from additional and unplanned stresses;
- Timeline to initiate and complete repairs.

A post-incident report may also be requested for any other incident.

See [Appendix C](#) – Post incident Reporting for additional guidance on completing this process.

## INCIDENT REPORTING PROCESS

All contact with EMCR is through the 24-hour reporting line at 1-800-663-3456.



For Minor Spill incidents, EMCR is called promptly. EMCR will issue a Dangerous Goods Incident Report (DGIR) number.

Minor incidents (both spill and non-spill) are reported through the Regulator’s KERMIT system, and the entry must be completed within 24 hours. The DGIR number is to be entered in Kermit by the permit holder. For proprietary product spills where familiarity with the hazard and appropriate protective actions may not be commonly known, the CAS number(s) and material safety data sheet (MSDS) are to be included in the incident report.

If a spilled product is ignited, it is still considered a reportable spill, and an estimate of the volume of consumed product should be included in the report. In cases where there are known toxic by-products from an ignited release, volumes of the by-product are also reportable.



Dam safety incidents are reported through EMCR to the Regulator's Duty Emergency Officer. When reporting to EMCR, permit holders should ensure the EMCR operator is aware that their dam facility is under BCER jurisdiction.

For further assistance with dam incident classification, please review incident classification in the next section.

## REPORTING THE INCIDENT

Third-party activities such as unauthorized digging or pipeline crossings that have not caused any detectable impacts are not recorded as incidents. These activities should still be reported through the Compliance and Enforcement process as they are tracked by the Regulator, and may result in enforcement actions against the offending parties.

Level 1-3 incidents are classed as emergencies, and permit holders must notify the Regulator by calling EMCR at 1-800-663-3456 as soon as possible, with the reporting standard generally considered to be within one hour of the discovery of the incident.

When reporting incidents, permit holders must clearly identify the oil and gas activity that was affected by the event or circumstance, the extent of, and steps being taken to remedy the incident, and contact information for the incident / on-scene commander (for Level 1, 2 or 3) or other company representative for minor incidents.

The [incident-reporting matrix](#) available on the Regulator's website can be downloaded and included in emergency response plans, and provides a quick reference guide to incident levels.

## EVALUATING THE EMERGENCY RESPONSE

Under ss. 16 (4) and (5) of the EMR a permit holder must evaluate the response to an emergency as soon as the circumstances permit. If there are any concerns with the ERP or supporting processes identified, these should be identified and addressed promptly. A report should include:

- A description of the emergency, including the cause or suspected cause.
- A description of the permit holder's response to the emergency.
- An assessment of the permit holder's response.

The evaluation provides an opportunity for the permit holder to review the effectiveness of its emergency response program and plans. The assessment should include:

- Lessons learned.
- Outcomes.
- Changes, corrective actions and/or recommended actions.
- Follow-up actions required.

A formal Post Incident Report (Form D plus any supplemental documentation / reports) is necessary for any emergency response, as well as for any pipeline incidents (at any level).

## DETERMINING AN INCIDENT LEVEL

The incident classification matrix is used to determine the level of any incident, from minor to a level 3 emergency. A copy of the matrix should be included in every ERP.

When using the incident classification matrix, begin at the highest Consequence rank, read the descriptions, and check off the first one that best matches the situation.

There can be multiple checks, however only the highest ranked item is used in the calculation of incident level.

When considering consequence levels with respect to spills, the amount of affected area and type of landscapes must also be factored in to the incident level. Spills into navigable or fish bearing waters have added significance, while a spill affecting 500 hectares is going to have greater consequence than something that is confined to a few hundred metres. Examples of consequence levels can be found in the next section.

Next, consider the Probability table, and select the best choice based on what you know about the incident AT THE TIME OF DISCOVERY.

The Probability level is the likelihood that an incident can escalate.

It is a measure of control at the exact moment that the incident occurs, or is first noticed.

Rank	Event or Consequence	
4	<input type="checkbox"/>	Major on site equipment or infrastructure loss
	<input type="checkbox"/>	Persistent and malicious equipment damage or tampering.
	<input type="checkbox"/>	Liquid spill or gas release beyond site, affecting public safety, environment, or property
3	<input type="checkbox"/>	Major on site equipment failure
	<input type="checkbox"/>	Malicious equipment damage or tampering
	<input type="checkbox"/>	Liquid spill or gas release beyond site, potentially affecting public safety, environment, or property
	<input type="checkbox"/>	Occurrence of magnitude 4.5 or greater induced earthquake (felt at surface, Probability must be recorded as 2 or higher)
2	<input type="checkbox"/>	Major on site equipment damage
	<input type="checkbox"/>	Kick size in excess of 3 cubic meters or Shut-in Casing Pressure in excess of 1000kpa
	<input type="checkbox"/>	Persistent / multiple minor vandalism or security incidents
	<input type="checkbox"/>	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"/>	Minor vandalism or facility security incident
	<input type="checkbox"/>	Liquid spill or gas release confined to site
	<input type="checkbox"/>	Occurrence of magnitude 4.0 or greater induced earthquake (felt at surface, Probability must be recorded as 2 or higher)
0	<input type="checkbox"/>	No consequential impacts

Rank	Probability (of escalation)	
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

## CONSEQUENCE LEVELS EXPLAINED

Consequence 0 – “No consequential impacts” – At this level, there are no reportable spills, no equipment damages, no cracks or signs of instability (dams) and no reason to interrupt normal operations.

Consequence 1 - At this level, there has been some minor effect on operations; a spill had to be cleaned, equipment fixed with a minor repair, etc. For a toxic product spill such as H<sub>2</sub>S, the level must not exceed the STEL (Short Term Exposure) limit at the source point of the spill with no detectable levels off lease. For dams, small slumps and insignificant settlement is observed but they unlikely lead to massive slope failure, dam breach or overtopping. Total incurred incident costs are typically under \$50,000.

Consequence 2 – At this level, impacts have become more pronounced; there may be some loss of production capability (temporary stoppages, reduced output, etc.) or the incident may have, or has the potential to extend off lease / beyond ROW. Any toxic product release exceeding the STEL or imminent threat of dam containment failure must have a consequence level of 2 or more indicated due to the threat to public, workers, and environment.

Consequence 3 - At this level impacts have had a noticeable effect on operational capabilities, affected public or environment, or have raised significant concerns for operational safety - such as malicious equipment tampering, a pattern of failure in an equipment type or process, or loss of dam containment with short-term impact on fish habitat - without harm to people or private property. Any hazardous product release that meets or exceeds the value as immediately dangerous to life and health (IDLH) or greater where public could encounter the release must have a minimum consequence of 3 assigned.

Consequence 4 - At this level, operations would typically be suspended or impossible to continue, at least in the short term. Critical equipment would be damaged / destroyed, or in the event of a dam failure, there were significant direct impacts to people, property or environment, such as loss of life, home, highway, or long-term damage to fish-bearing habitat. Direct impacts can also include remote consequences, such as the loss of heating fuel supplies to a community during winter, or pollution of a domestic water system that ingested some portion of a toxic release.

## PROBABILITY LEVELS EXPLAINED

**Probability 0** – “Will not escalate; no hazard; no monitoring required” – This level is typical of a fixed quantity spill that is completely contained by a berm or impoundment, or able to be immediately remediated. A probability of zero cannot be assigned if the source of the spill has not been controlled, accurately identified, or the extent of the spill fully defined. Spills to water are highly unlikely to have a probability of zero, given the likelihood of spill migration and impacts.

Examples of a Probability 0 event include:

- A vac truck hose splits, and a few hundred litres within the hose are released on the lease site.

- A tank sight glass gets broken and contents leak into a berm or similar containment area;
- A generator sump is overfilled with lubricating oil, and spills within the building, Example of a

Example of a Probability 0 event for a dam:

- Very minor cracks and slumps that are not accelerating or worsening, and repair is in maintenance scope.

**Probability 1** – “Escalation highly unlikely; controlled or imminent control” - Small equipment failures that are easily isolated would be rated at this level. Turning off power or closing valves to / from the equipment bring the incident under control, with very little possibility of further damage or release of product. For dams, some deficiencies found but they are in stable condition and are not worsening and not accelerating.

Examples of a Probability 1 event include:

- A broken diaphragm on a pressure-regulating valve,
- A burst hydraulic / high-pressure hose during a drilling or fracturing operation
- A leaking flange or access port that can be tightened.
- For a dam, the spillway may have minor damages but is in stable condition.
- A first occurrence of a security incident may also fit in this category.

**Probability 2** – “Escalation unlikely; controlled or likely imminent control” - This level is typical of incidents where the cause of the incident is easily determined, and control measures can be enacted promptly and successfully.

Examples of a Probability 2 event include:

- A release to surface of drilling mud during a stream crossing, as there is a greater possibility that a second attempt at boring could release fluid, or that some portion of fluids entered the waterway;
- Liquid pipeline leaks should commonly be classified at this level or higher, since the extent of sub-surface migration of fluids is not known at the time the leak is discovered.
- Dams showing early signs of containment failure such as over-topping, seepage, minor cracks and slumps but which the permit holder can address by lowering water levels and effecting repairs.

**Probability 3** – “Escalation possible; under or imminent control” - Pit gains of 10M<sup>3</sup> or greater during a drilling operation, or a fire on site that was of limited scope – such as a fire in a holding tank or generator shack, or an observed slope failure on a dam but where stabilization is possible would normally be ranked as a Probability 3. Additional considerations in this example would be the potential for expansion such as to other nearby equipment or forested areas, or possible need for an evacuation of a public area or residents. Repeating, related or similar security incidents, such as ongoing vandalism targeting a particular site or type of operation would use this probability level. Dams showing signs of containment failure, or where water volumes entering the dam are exceeding spillway capacity and over-topping is imminent or occurring but with favourable weather conditions leading to a likely decline in water flows should be scored as a probability of 3 or greater.

**Probability 4** – “Uncontrolled, with control unlikely in near term” – Describes an equipment failure that has caused uncontrolled release of product beyond the ability of the operator to control – such as a massive dam slope failure or dam breach or dam overtopping or piping (internal erosion.) Typically, the incident is occurring and progressing at high pace where control or stoppage is impossible, such as a facility explosion, a pipeline rupture with uncontained product moving into the environment, or a fire that is spreading / growing without possible containment with the resources at hand all be classified as Probability 4.

**INCIDENT CLASSIFICATION FOR SPECIAL CASES**

Fluid Release:

- When a gas release exceeds 2,000 M<sup>3</sup> or when the duration of the release is uncertain and the volume is unknown, a Consequence Level of 2 or more must be selected based on the expected migration of gas beyond lease.
- When a sour gas product is released, any measurement of 5 ppm (STEL) or greater measured at 1 metre from the source of the leak requires reporting as an incident, and protective actions to prevent public access must be taken. This requirement applies to leaks from any source, including surface casing vents. A site that is enclosed / fenced and signed to note the presence of sour product meets the protective action requirement so long as the detected value at the fence line is at or below 1ppm. This guidance does not imply permission for continuance of off-site odour impacts, but is intended for safety purposes only.

Seismic activity has the potential to result in on or off-site damage. The reporting of seismic activity assists permit holders and the Regulator to monitor equipment and reduce the possibility of such incidents. Please see the [Induced Seismicity Data and Submission](#) page for additional information.

In the event that an induced seismicity event causes damage to permit holder equipment or to other public or private property, the event is reportable as an incident.

Well Kicks	Induced Seismicity
<p><b>Consequence Level 2:</b> Kick size in excess of 3 cubic metres or shut-in casing pressure in excess of 1000kpa.</p>	<p><b>Minimum of Consequence Level 1:</b> Occurrence of induced earthquake causing damage to permit holder’s own equipment.</p>

<p><b>Consequence Level 3:</b> Kick size in excess of 65% of current kick tolerance or shut-in casing pressure in excess of 65% current MACP.</p>	<p><b>Consequence Level 2 or greater:</b> Occurrence of induced earthquake causing damage to equipment, structures or other public or private property.</p> <p><b>Consequence Level 3 or greater:</b> Occurrence of multiple induced earthquakes (related to the same project) causing damage to equipment, structures or other public or private property.</p>
<p><b>Consequence Level 4:</b> Kick size in excess of 85% of current kick tolerance or shut-in casing pressure in excess of 85% current MACP.</p>	

## SECURITY INCIDENTS AND INCIDENT REPORTING LEVELS

Consequences for security-based incidents will typically be determined by the outcome and impact on operations. An example of a minor incident would be a piece of equipment is vandalized which affects the ability to continue some minor activity, such as theft of a grounding wire needed to transfer fluid to a truck. An example of a major incident would be a cyber intrusion causing a loss of process control with significant release of product or widespread equipment damage.




There may be occasions when a permit holder is advised of a credible threat, and takes additional precautions that have some impact on operations, such as shutting in a well or facility, or significantly enhancing security precautions that affect normal activities. Precautionary actions are encouraged, but are not reportable.

Acts of theft or vandalism that create a public safety risk are reportable, and permit holders should always notify their local police service.

## INCIDENT CLASSIFICATION EXAMPLES

Setting an incident level should be done quickly and early in the response process. The examples below are provided to assist in determining at what level an incident would typically be reported. This is not meant to be a complete guide to incident levels or types; the sound judgement of on-site staff responding to the incident is an essential part of determining an incident level.

## Appendix A: Guide to Incident Levels

<b>Minor Incidents</b>	
	<p>Liquid spill or gas release confined to site will not escalate; no monitoring required</p> <p>Consequence 1: Reportable spill during transfer to transport truck (broken clamp) About 2M<sup>3</sup> of produced water with some hydrocarbons, on lease. Product was not sour (affecting worker/ public safety or environment)</p> <p>Probability 0: The spill is a known volume, the cause is both obvious and controlled, and there are no significant health or environmental risks associated with the spilled product.</p>
	<p>Consequence 1: Small fire damaged a minor piece of equipment; staff on site quickly isolated the fuel supply and extinguished the fire. Equipment is repairable.</p> <p>Probability 1: Moderate on site equipment damage; escalation highly unlikely</p>
	<p>Liquid spill or gas release confined to site will not escalate; monitoring required</p> <p>Consequence 1: Reportable spill from a leaking flange, no public or worker safety impacts.</p> <p>Probability 1: The installation was new, and the leak found during commissioning. Escalation possibility based on condition of similar fittings (tightness.)</p>



**Level 1 Incidents**



Horizontal boring release of drilling mud to surface, approximately 10M<sup>3</sup>; within ROW

Consequence 1: While there was a stream nearby, the mudflow was stopped before entering the waterway.

Probability 2: While it is unlikely that this incident will escalate, there is a higher probability of another release due to the ground and operating conditions present.



No residents or public affected; line quickly ESD'd and depressurized.

Consequence 3; Major on site equipment failure - Sand erosion.  
 Probability 1: Escalation highly unlikely - This probability level chosen because of the small possibility of adjacent equipment also failing due to erosion, so some form of monitoring / inspection would clearly need to take place.

**Level 2 Incidents**



Tank fire, not put out, all fuel source was consumed.

Consequence 2: Major on site equipment damage – It may be possible to repair the tank;

Probability 4: Uncontrolled, with control unlikely in the near term - No immediate resources to extinguish the fire

Emergency response was not available on site, equipment needed significant work to repair, and site was not functional until repairs completed.



Liquid spill beyond site, affecting environment and property

Probability 2: Escalation unlikely (line shut-in, product not migrating)

Consequence 4: Pipeline break with fluid release. Amount of spill not determined, but impacted private property and environment.



Dam slope failure with no damage to public infrastructure or private property structures, no long- term damage to fish habitat, minimal risk to public safety.

Probability 2: Escalation unlikely (no greater release possible) Weather is favorable, flood is retreating and storm is stopped.

Consequence 3: Off-site damage to public or private lands through inundation and erosion.

**Level 3 Incidents**



Major on site equipment or infrastructure loss (Consequence 4);  
Escalation possible. (Probability 3)

Flare knock-out tank explosion, ignited a forest fire that was growing – this fire was reason for selecting higher probability.



Massive dam slope failure or dam breach or dam overtopping or piping (internal erosion) is occurring and progressing at high pace where control or stoppage is impossible.

Uncontrolled, with control unlikely or impossible.

(Consequence 4, Probability 4)



Major on site equipment or infrastructure loss (Consequence 4);  
Uncontrolled, with control unlikely in near term (Probability 4)

Blowout causing fire, loss of drill rig, threatening surrounding forested areas or possible expansion to other wells on site.

## Appendix B: Emergency Communications

1. **Technical systems** – This defines type of communications tools used, such as radios, cell phones, sat phones and computer systems used in support of the emergency response. It also includes the process for switching between these tools in the event one system fails.

Technical systems may provide or support public notification when incidents occur, and must therefore be robust and resilient.

Both a primary and alternate means of communication should be tested on a regular basis.

2. **Information management** – Defines the procedures by which information about an incident is gathered, analyzed, and communicated internally and to regulators, media and the public.

Internal and external methods of communication should be routinely checked, confirming that systems used to inform affected parties of an emergency and to facilitate communications between incident responders are fully functional.

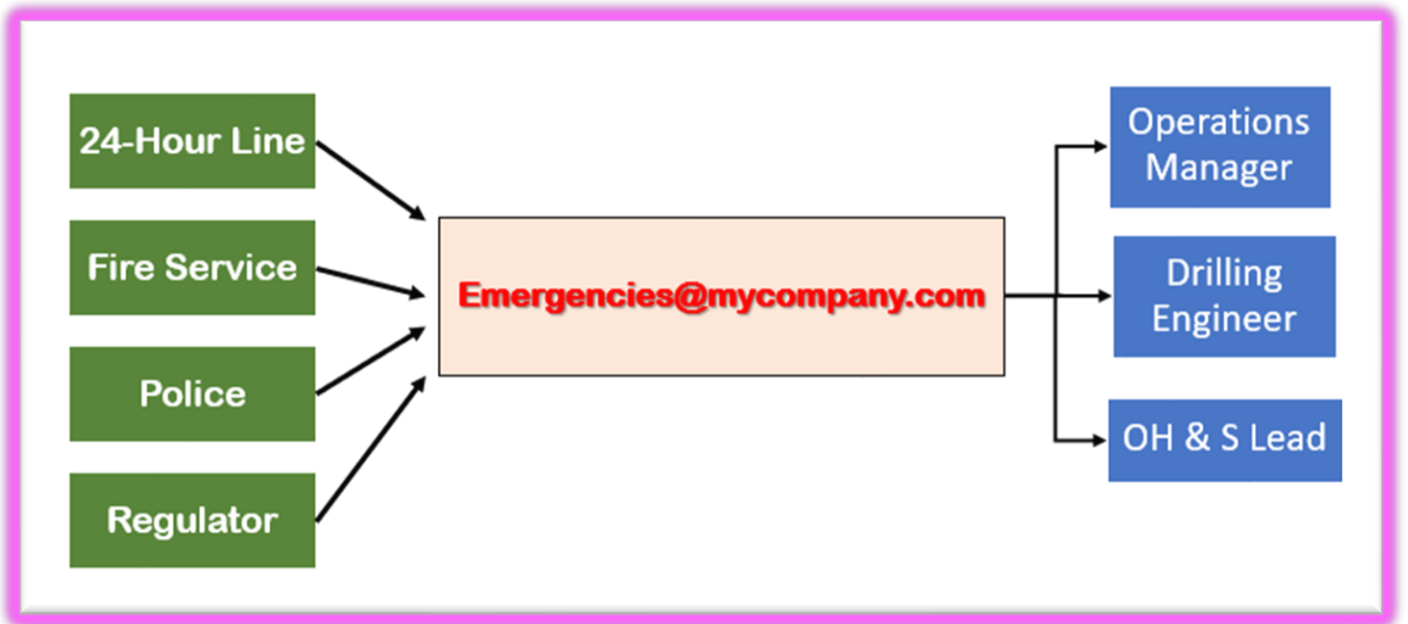
The description of public information systems should include:

- Roles and responsibilities - including procedures for controlling and disseminating internal information about an emergency
- Communication plans for government agencies including:
  - A list of government agencies that would require notification of, or be involved in, the incident;
  - Procedures for contacting government agencies and regulatory authorities; and
  - The 24-hour telephone numbers for these government agencies.
- Communication plans for emergency response resources including:
  - Procedures for who will contact the external response resources and when; and
  - A list of the type of external resources to be used, including the services they provide, with 24-hour phone numbers for the resources (e.g., air monitoring, well control, fire suppression, safety companies, helicopters, etc.).
- Communications plans for the general public including:
  - Procedures for who will release what information to the general public, when and how.
  - Social media monitoring and response

For many natural disaster events, email is often the most efficient means to connect quickly with multiple organizations. For this reason, the Regulator strongly encourages all permit holder to create a “positional e-mail” address as a point of contact for such urgent communications.

The email account should be set up to enable distribution to a number of key permit holder staff; ensuring communications are timely and successful even when one or more persons are out of contact. Using this process, a permit holder only needs to adjust membership on the internal distribution list whenever people filling a role change.

This will also enable external agencies to have a consistent and reliable point of contact to use for important notifications to supplement telephone services, without the need to maintain contact lists and risks of having any company left out of important notifications.



## Appendix C: Post Incident Reports

Submission of a Post Incident report is required for all Level 1, 2 and 3 Emergency incidents, for all pipeline incidents and for other minor incidents when requested by the BCER. Post Incident reports fulfill several critical functions:

1. Provide a detailed summary of the incident from initiation to stand-down. This includes implementation of the permit holder's emergency response plan, any impacts on the public, and measures taken to safeguard the public safety and the environment.
2. Provide information on the cause(s) of the incident including immediate and basic (root) cause, preventive and corrective actions. This information ensures that appropriate corrective actions have been identified and implemented and is used to identify incidents trends that can be used to improve performance across industry.
3. Provide information on the quantity of materials spilled, measures taken to remediate the spill and the status of cleanup. Include environmental reports on the response and remedial actions taken, as well as the outcomes of any clean-up required.

**NOTE:** A copy of the SDS and CAS number(s) for any spilled chemical product should be included in the environmental report. When clean up is expected to take more than three months to complete, one or more interim reports showing progress on clean-up and restoration may be required. These will be added to the incident record.

The Post Incident report must be submitted to the BCER within 60 days of the incident. In situations where the permit holder requires additional time to complete the Post Incident report due to the complexity of the incident investigation or limited access (e.g. winter access required to excavate a failed pipeline), the permit holder may request an extension from the BCER. Extension requests can be submitted by email to [EMP@bc-er.ca](mailto:EMP@bc-er.ca).

For all Level 2 and 3 emergencies, the permit holder should complete a full root cause analysis of the incident.

For complex incidents, supporting information such as consultant's reports should be attached and referenced as applicable.

Detailed guidance on completing specific sections of the post incident report is as follows:

### Part A – Permit Holder

Permit Holder Name: Provide the full permit holder name as registered with the BCER.

Contractor(s) Name(s): Provide the names of any contractors that were directly involved in the incident. This does not include contractors that were involved in the incident response on behalf of the permit holder. For example, a drilling incident should include the drilling contractor and could include other contractors as applicable (e.g. cementing, pressure testing, managed pressure drilling contractors).

### **Part B – Date, Time and Oil and Gas Activity ID**

Incident Date and Time: Provide the incident date and time. For clarity, the time zone must be included.

Provide the oil and gas activity identification number for the incident (e.g. well authorization #, facility id, pipeline project and segment number, road number and segment number).

### **Part C – Spills and Releases**

1. Provide the spilled product, volume released and volume recovered in litres or m<sup>3</sup>. For products not listed in the Kermit menu options (e.g. methanol, lube oil, corrosion inhibitor), include the product description and CAS# and attach the MSDS sheet.
2. Indicate if the incident included a fire or explosion and if anyone was directly exposed to the spill product. Exposed persons include employees, contractors and members of the public, and should include any secondary exposure, such as when a product enters a water body used for domestic, farm or recreational use. Indicate if anyone required medical treatment as a result of the incident. If yes, additional information will be required in Part D of the report.
3. End of spill report – Submitted upon completion of clean-up and restoration activities, and included in FORM D. Information submitted should outline how the total volume of spilled material was determined, and provide an assessment of the area affected, including size of area, impact on waterways (including seasonal), volume of any contaminated materials removed, and the disposal facility. Final reports for any off-lease spills should include any third-party environmental assessments that were conducted.

### **Part D – Injury or Fatality**

Provide a high level summary of injuries or fatalities as a result of the incident. For example, one worker was hospitalized with burns.

### **Part E – Narrative of Incident**

Provide a complete description of the incident, including conditions and events leading up to, and following, the incident. Attach any additional information that may supplement the narrative such as 1) drawing of the incident site; 2) photographs; 3) schematics; 4) maps; 5) reports (drilling, servicing, etc.). Attach additional sheets of narrative as required.

## Part F – Incident Response

Indicate if the Emergency Response Plan was activated, if an Incident Action Plan was created and if an Incident Command System organization chart was created. Attach copies of the Incident Action Plan, time and event log, and ICS Organization Chart as applicable.

Describe how the Emergency Response Plan was implemented and outline specific steps that were taken to:

- Provide for the safety and health of responders.
- Protect public health and safety.
- Protect critical infrastructure.
- Protect property.
- Protect the environment.

These may include steps such as evacuations, establishing road blocks, air monitoring, establishing a reception centre, ignition of a well and deploying spill response staff and equipment. Email records showing resource requests, communications with external agencies, indigenous groups and local authorities should be available on request from the BCER.

Please note that additional documentation, such as role-specific time and event logs may be requested as part of any subsequent investigation.

## Part G – Component Failure / Malfunction

If a component failure or malfunction contributed to the incident, provide the component description, manufacturer, model number or material and grade (for piping), manufactured date, installation date and last certification / inspection date, as applicable. The BCER recognizes that for some installations, not all of the requested information will be available.

Indicate if a third party analysis of the equipment or pipe failure has been completed. If a third party analysis is underway but not complete, contact the BCER to discuss an extension to the Post Incident report submission until the information is available.

Third party analysis should be completed for major incidents (Level 2 and 3), anywhere that the cause of failure is not obvious and when requested by the BCER. The permit holder should ensure that evidence is collected and secured as soon as possible after an incident and that a chain of custody is maintained.

Third party analysis may include, as applicable:

- Initial visual examination, documentation of condition and any damage. Measurement of bending, deformation if evident.



- Sectioning and examination of failed components.
- Cleaning, examination and geometry measurements of threads.
- Chemical composition and hardness testing of failed materials, comparison to materials specifications.
- Analysis of weld and heat affected zone.
- For a fire or explosion, during maintenance of a tank, pressure vessel or piping with hydrogen sulphide present, chemical testing for evidence of iron sulphide.
- For a corrosion failure, chemical testing for corrosion products.

For significant incidents (Level 2 and 3), the permit holder should review the testing plan with the BCER prior to proceeding. Once testing is completed, tested components should be maintained until the BCER has reviewed the final report.

### Part H – Repair Description

Provide an outline of any repairs completed as a result of the incident and the date of return to service, if applicable.

### Part I – Incident Cause

Select the immediate and basic incident cause. Multiple causes may be selected where appropriate. Provide a rationale for how the immediate and basic causes were selected. Definitions for immediate and basic causes are listed below.

Immediate Causes	
Defect and Deterioration	Defects in manufacturing processes or materials, or deterioration as a result of damage or service life limitations, lack of inspection or maintenance.
Corrosion and Cracking - Internal	Internal corrosion or cracking caused by contaminants, lack of maintenance, damage to internal coating system: weld cracking as a result of stress or workmanship issues.
Corrosion and Cracking - External	External corrosion or cracking caused by damage to coating systems or failed coating systems: weld cracking as a result of stress or workmanship issues.
Equipment Failure	A failure of equipment components. Examples of equipment include valves, electrical power systems and control systems.

Incorrect Operation	Typically, personnel fail to follow procedures or use equipment improperly.
External Interference	External activities that cause damage. Examples include excavation damage and vandalism. For external interference, indicate if the damage resulted from an employee / contractor working for the permit holder or a third party.
Natural Force Damage	Damage Caused by natural forces, such as earthquakes, landslides and wash-outs.
Construction	Construction defect, damage, or deficiency.
Other Causes	Other cause not included in the list of acceptable values, (specify)
Unknown	Unable to identify the cause (specify why)

<b>Basic Causes</b>	
Engineering and Planning	Failures of assessment, planning or monitoring that may be related to inadequate specifications or design criteria, evaluation of change, or implementation of controls.
Maintenance	Inadequate preventive maintenance or repairs, and excessive wear and tear.
Procurement	Failures in the purchasing, handling, transport and storage of materials
Tools and Equipment	Tools and equipment that are inadequate for the task or used improperly.

Standards and Procedures	Inadequate development, communication, maintenance or monitoring of standards and procedures.
Communication	Loss of communication with people, automatic devices, or equipment.
Supervision and Training	Lack of training or oversight of a contractor or employee during construction or maintenance activities.
Human Factors	Individual conduct or capability, or physical and psychological factors. Consider if Standards and Procedures, and Supervision and Training were adequate before selecting Human Factors as a cause.
Natural or Environmental Forces	External, natural or environmental conditions.
Other Causes	Other causes not included in the list of acceptable values, (specify)
Unknown	Unable to identify the cause (specify why)

**Part J – Preventive and Corrective Actions**

Preventive and corrective actions should be selected to address the incident causes identified in Part I.

In addition to addressing the incident causes the BCER expects that permit holders will consider if:

- incident causes are systemic in nature, related to management systems or programs; and
- actions are required to correct the incident causes at other similar locations that are held by the permit holder.

Corrective and preventive actions are defined as follows.

Corrective Actions: actions taken to remove or control the cause(s) (most often the immediate cause) in order to eliminate the hazard or minimize the associated risk (e.g. fix an existing problem)

Preventive Actions: actions taken to remove or reduce the likelihood of the occurrence or recurrence of the incident cause(s) in order to anticipate the hazard or minimize the associated risk that could occur. Typically actions are preventive if they proactively address comparable or potential causes.

Preventive actions can be further broken down into:

Tier I – actions taken to address causes at additional locations where similar/identical situations exist in order to proactively eliminate the identified risk.

Tier II – actions taken to address systemic causes, typically associated with a permit holder's programs or management systems.

An example of preventive and corrective actions for a piping failure due to sand erosion could be as follows:

Corrective action – replace the failed piping.

Tier I preventive action – inspect similar piping at other sites and replace as needed.

Tier II preventive action – modify the permit holder Sand Management Plan to change the piping design, reduce flow velocities in the permit holder's piping and increase the frequency of ultrasonic testing.

### **Part K – Name of Person Conducting the Company Incident Investigation**

Provide the name and contact information for the permit holder incident investigator.

### **Part L – Name and Title of Company Representative Filing the Report**

Provide the name and contact information for the person filing the report on behalf of the permit holder.

## Appendix D: Submission Requirements- Mapping and ERPs

All ERP's are to be submitted through the Regulator's E-Submissions portal, Please see the [USER GUIDE](#) for more information. Plans must also be submitted hard-copy format.

A valid plan MUST be received and accepted by the Regulator prior to the start of any permitted activity for which a plan is required. When updating plans, the complete revised version of the electronic plan must be submitted. Please ensure all update information is shown – see [Table 2](#) for an example.

Checklists for emergency management plans are available on the [BCER's website](#), and a completed copy of the checklist should accompany each new plan submitted for review.

Upon receipt of a new or updated plan, the Regulator conducts a limited scope audit, and advises the permit holder of any deficiencies. This process is typically completed within 2-3 business days, though failure to submit a checklist may increase the review time required. Contents of an ERP should be searchable by key word. This assists in quick location of critical information during any incident response. For this reason, the use of scanned pages is discouraged.

Maps accompanying electronic plans are accepted in SHAPE file format only. Please review the Regulator's [Spatial Data Submission Standards Manual](#) for further details on formatting.

Mapping information in Shape or KML files supports the Regulator's ability to identify areas and values at risk, including permit holder assets. This information may also support decision making when resources are being tasked in response to wide area emergencies such as wildfires and flooding.

Mapping may be included in PDF or Word documents to support responders accessing the ERP on a digital device; however, this does not replace the Shape / KML file requirement.

Hard copy submissions of each ERP should include mapping at not more than 1:20,000 scale, include a legend, and all identifying texts must be legible.

**Table 2: Sample update table**

Type of Update: <input checked="" type="checkbox"/> Annual Update <input type="checkbox"/> Update resulting from an emergency response evaluation <input type="checkbox"/> Update in response to significant changes in hazards and risks Name of Field: Doe Dawson <span style="float: right;">Date: 12 Sep 2018</span> Contact Name and Phone number for questions: T. Smith, (403) 425-1111		
LOCATION	REMOVE/DESTROY PAGES	INSERT PAGES
Table of Contents	Pages i to iv	Page i to iv
Section 5 –Roles & Responsibilities	Pages 5-1 to 5-10	Pages 5-1 to 5-12
Section 8 – Map (green tab)	Rev. 6 2016-06-09	Rev. 7 2018-07-19
Section 10 – Standard Guidelines	NEW	Insert section 10 after Section 9 blue tab

## Appendix E: Emergency Response Exercises

Section 4 of the *Emergency Management Regulation and CSA Z246.2, Appendix A* outline the requirements for emergency management exercises. The purpose of an exercise is to confirm Permit Holders emergency response preparedness. There are several types of emergency management training courses. These courses should be included in a robust and successful emergency management program that meets the objectives set out in CSA Z246.2, ss. A4.9.2 and A4.10.

Permit holders are required to hold both tabletop and full-scale exercises, and are evaluated on both capabilities (overall ability to respond) and performance demonstrated by staff at these exercises. In situations where staff are more experienced, and the permit holder wishes to provide a more intensive and engaging learning experience, a functional exercise can be substituted for a tabletop exercise. Other forms of training such as drills, workshops and seminars are strongly encouraged, but are not directly evaluated by the Regulator.

To assist in the development and evaluation of emergency response exercises, the Regulator has created a series of short guides that address ICS roles. Additional resources in the form of templates, checklists and lessons learned can be found in the [emergency response and safety section](#) of our website.

Scenarios that test against the full range of identified challenges – technical (systems failures) external (deliberate or accidental damage) or natural (forest fires, floods, landslides, etc.) build confidence and maintain interest, and are a check that the plan is capable of addressing each of these hazard situations. Conversely, overly simplistic exercises are unlikely to find gaps in planning or training, and may fail to engage participants in a meaningful way.

Tabletop exercises allow participants to build comfort using response plans, checklists and procedures, while the use of handouts and challenges developed for specific functions ensures key participants have the opportunity to check and confirm actions and information relevant to their position.

An exercise is a demonstration of the permit holder's ability to respond effectively, and is the culmination of a complete training process involving drills such as evacuations, donning SCBA, casualty clearing, walk-throughs of isolation / shut-down processes, etc. and skill-building, such as completion of ICS courses, map reading / GIS program familiarity, and job-shadowing. It is vital that permit holder staff be given every opportunity to manage the incident scenario with the personnel that would typically be on site or quickly available at the time of the incident. Where mutual aid or reliance on a contracted third party or local authority is essential to a response, these persons or groups should always be included in an exercise.

### Role of the Exercise Facilitator

An exercise facilitator sets up and provides clarification (as necessary) around the scenario. They may respond to questions about the scale / scope of the incident, or address uncertainty about what is meant by a direction or term noted in the scenario, or provide additional details such as weather inputs or other factors that are important to the conduct of the exercise decision making.

For tabletop or functional exercises, the facilitator can add considerable value to the exercise by providing simulated inputs. For a tabletop, the facilitator can represent inputs or feedback from an EOC, local government or regulator, or play the role of contract services (helicopter, vac truck, firefighters, etc.). In a functional exercise, the facilitator limits interactions to

providing injects or offering clarifying information such as wind direction or status of an injured person.

At the end of scenario play, the facilitator should be able to provide critical analysis of the exercise in their debriefing, and contribute to the final report based on their observations and interactions with the exercise players.

### Table Top Exercise

- Should be held annually for each CORE and supplemental ERP, except in years when a full scale exercise is held. Validation of both plans can occur within the same exercise.
- Facilitated discussion on a relevant emergency situation, develops a response based on plans, training and experience, supported by (but not led by) questions or problem statements to resolve.
- Focuses on familiarization with roles and responsibilities, plans, policies and procedures.
- Allows for thorough discussion between players, and analysis of actions taken and decisions made.
- Includes practice problem-solving with limited time pressures.
- Practices coordination of services.
- Does not involve deployment or actual use of equipment or resources (though the ERP, maps, guides, forms and similar aids should be used)
- Includes simulated or actual interaction with an Emergency Operations Centre.

Table-top exercises provide an excellent opportunity to discuss “what-if” scenarios, such as how weather conditions or holiday staffing could affect a response, or who would be next in line should a designated incident commander be injured or otherwise be unable to communicate. These exercises are also a chance to build depth in the emergency response organization, allowing select staff to job-shadow and become familiar and comfortable in a new or expanded role.

### Functional Exercise

- May be held as a more interactive substitute for a table-top exercise and provide an improved level of engagement for experienced operators.
- Is a simulated interactive exercise.
- Involves participants practicing a coordinated, effective response in a time-pressured, realistic emergency simulation.
- Includes a description of the situation, a timed sequence of messages, and communication between players and an external simulation team or remote members of the response team.
- Uses phones, radios and computers.
- Induces a moderate-high level of stress.
- Is designed to practice multiple emergency functions e.g. “direction and control”, “resource management” and “communications.”
- Evaluates individual and system performance.
- Includes a simulated interaction with an Emergency Operations Centre.
- Functional exercises are an opportunity to test the plan in a limited way with other agencies and local organizations, confirming communications links and expectations of services and supports from contractors and other sources of aid.



## Full Scale Exercises

- Must be held at least once every three years.
- Induces higher stress – realism is key.
- Adds a field component that interacts with a functional Emergency Operations Centre exercise through simulated and real messages.
- Coordinates actions of several agencies, tests several emergency functions and requires Emergency Operations Centre and field participation.
- Requires mobilization of emergency personnel, equipment and resources.
- Evaluates the deployment of resources not regularly used.
- Involves all levels of personnel: policy, coordination, operations and field(site).
- In situations where licensees have multiple area ERPs with the same response personnel and infrastructure, the ERPs can be tested simultaneously through one exercise.
- For companies that have multiple regulatory obligations to hold emergency management exercises, it may be possible to meet several requirements with the same exercise.

## Joint / Coordinated Exercises

In some cases, smaller permit holders may find it beneficial to conduct a joint exercise with another permit holder. This is a suggested approach when the number of employees for one or both permit holders in a given area would not allow for a comprehensive response to a significant incident as identified by the permit holder's hazard assessment. The Regulator will consider allowing a joint exercise when the following conditions are met:

- There is a mutual aid agreement between the participating permit holders. A copy of this agreement would be present in each permit holder's emergency response plan (ERP.)
- The participating permit holders are familiar with any unique protocols contained in the other participating permit holder's ERP.
- The exercise scenario clearly addresses a potential risk common to each participating permit holder.

When a joint exercise is undertaken, and the Regulator provides an assessment, both permit holders will receive a common evaluation, and both will be provided with a copy of the document. Each permit holder may respond individually with comments or commitments to address any items that may have been noted for corrective actions.

Both participating permit holders in a joint exercise should be able to fill any of the expected incident management roles. Joint exercise participants should alternate leadership and role responsibilities within the incident management team from year to year, or provide for a mid-exercise change of command, ensuring both parties have a sufficient level of familiarity to manage incidents effectively.

<b>Responsible Party</b>	<b>Exercise #1</b>	<b>Exercise #2</b>
<b>Permit holder 1</b>	Provides incident management team, Permit holder 2 may shadow some roles	Provides rovers / roadblock crews, assists with other tasks as assigned.
<b>Permit holder 2</b>	Provides rovers / roadblock crews, assists with other tasks as assigned.	Provides incident management team; Permit holder 1 may shadow some roles

## Appendix F: Sample Scenarios for Emergency Management Exercises

These scenarios are provided as a simplified demonstration of the key elements normally developed as part of a good emergency management exercise. Each scenario includes a situation, outlines available or likely external resources, and includes a series of inputs to add realism and complexity.

It is the Regulator's intent that the degree of difficulty and complexity for an exercise scenario will be considered when determining the overall permit holder capabilities. The Regulator recognizes that a more challenging scenario is likely to reveal more areas for improvement, to test capacities of staff and equipment, and to challenge the expectations used in the development of an emergency management plan. It is our view that an exercise should not only confirm training and process, but also build confidence within the responder team in their ability to manage a worst-case situation.

- Scenario #1 [Gathering Line Leak from multi-well pad](#)
- Scenario #2 [Pipeline leak with residents and recreational activity in area](#)
- Scenario #3 [Loss of Process Control Systems](#)

## SCENARIO #1

- Objectives:**
- Confirm responding staff are familiar with key policies and processes outlined in the emergency management plan.
  - Demonstrate the adequacy of displays and documentation to support the emergency operations during the exercise.
  - Check that the appropriate protective actions are considered and implemented, and that the correct priorities are applied (safety of responders, then public, then environment)
  - Ensure that appropriate roles are assigned, and an effective span of control is maintained by the incident command staff.

### Situation:

- Day:** Saturday, January 2<sup>nd</sup>
- Weather:** Slightly overcast, winds from the northeast at approximately 10KPH. Yesterday's freezing rain was followed by about 10cm of snow overnight, and more is forecast for later in the day. Temperature is -8<sup>C</sup>
- Staffing:** Calgary head office is closed; many senior staff are still away for the holidays. Several of your usual contractors are covering wider areas to allow for staff vacations.
- Resources:** The nearest air quality-monitoring unit with staff available is in Grande Prairie. The nearest Vac truck available is at least two hours away given the icy road conditions. Other resources as per company local equipment and staffing availability

### Incident begins:

- At 08:30 your field supervisor receives a call from the emergency line operator. The call originated from a trapper who was out checking his lines [INSERT - general area] when he notices a smell of rotten eggs and called the Emergency number posted on a sign on the road where he parked his truck.
- The trapper has turned around and headed south away from the odour and back towards his truck.
- The field supervisor calls in two operators.
- The [INSERT - well site or pipeline] in the area are typically about [INSERT] % sour.

As one of the operators called in and dispatched to the area, describe what actions you will take, what information you have at hand, any additional equipment you will want to have in the vehicle with you, and where you would get it.

### Additional resources:

The site where the incident takes place is in the regional district, the closest fire service is almost an hour drive away, and it is a fully volunteer department. Their fire chief and several of the volunteers did take part in your last major exercise, although that was held at another site closer to town.

The local police detachment is also about an hour away. It is a small detachment with three constables and a corporal. With holiday staffing, they have one officer on duty, and one on call.

### Operators Arrive on site

- It is now about 9:15am as the operators proceed towards the general area. The access road is on the south side of the multi-well pad, and as they drive in, they soon notice a rotten egg smell. Exiting the truck, their personal monitors show 1ppm H<sub>2</sub>S, with the display occasionally flicking up to 2ppm. Turning the truck off, they listen carefully, and can hear a faint whistling roar from up ahead. The source of the sound is about 500 metres away, and the access road has not been plowed out for several days.
- Cell service is reasonably good, but your partner forgot to charge his phone, and it has almost no power left. Your phone is fully charged. Radio service in the area is unreliable.
- You are familiar with this area and know that there are several residents about XX km to the south. Their main access road joins the one you're on about half a kilometre to the (insert direction) of your present location.
- While you are on the phone with the field supervisor, you notice that your H<sub>2</sub>S meter is now showing 3ppm.

As one of the operators, describe what actions and safety precautions you will take, and what steps you will recommend.

### Field supervisor

As the field supervisor you receive the call from the operators confirming there is a gas release. While you are talking to them, you get another incoming call from operations. Putting the operators on hold for a moment, you listen as control verifies a pressure drop in the flow line coming from the well pad. You are at home, about 40 minutes' drive from the site. Your field office is about a ten minute drive to the south, away from the incident site.

- What information would you be most interested in obtaining, and what are the sources for that information?
- What are your immediate priorities?
- What steps you will recommend?

**Your Emergency Response Plan is now activated . . .**

- Who will be the incident commander, and where will they be located?
- What level would you classify this incident?
- When, how and to whom does this incident need to be reported?
- What additional staff would you call in, and what roles will they assume?

Time is now a few minutes before 10am. Operations have remotely triggered the ESD valves, and monitored pressure has dropped slightly, down by about 200kpa.

Develop your initial incident action plan.

**Inputs / updates (pick one or more)**

1. The decision is made to try and view the well pad.
  - a. The operators are instructed to circle round the site and approach from the north using snowmobiles. Regular readings are being taken, and the operators have SCBA and have been instructed to mask up and walk in at 50 metres or 5ppm – whichever comes first.

As they drive in to the site, they notice other snowmobile tracks.
  - b. Arriving close to the site, the noise is noticeably louder. Personal detectors are showing about 3 ppm, with wind blowing gently towards the site. The operators mask up and begin walking in. As they get to the lease line, it becomes apparent that an elbow coming off a well head leading to the gathering line is spewing gas and some liquid. A patch of ground about 10m square appears to be saturated.
  - c. Both operators return to their snowmobiles, and call in what they have seen. While one operator is on the phone, the other wanders around a bit, and comes across more snowmobile tracks. Next to the tracks, he finds some large rifle shell casings.
2. You are the field supervisor, and have established an incident command post at your field office. Five additional staff have arrived, and have been assigned roles in your incident command team, but you are still struggling to fill critical roles.
  - One of your incident team seems very ill. You overhear him speaking to another member of the response team about how late the dinner and party went New Year's night.
  - Your ERP identifies another local operator as having a mutual aid agreement with your company. Your phone call to the only contact you have in your ERP goes to voicemail.
3. Field operations calls the incident command post, and reports that one of the wellhead automated valves does not appear to be responding. While the pressure in the gathering system had dropped over the last half hour, it now appears to be holding.

4. Local media have learned of the incident, and arrived at your roadblock. The reporter is demanding a statement about what is going on, and wants to take pictures of the incident site. Your roadblock team direct the reporter to call your media relations line, and asks the reporter to leave the area.

A few minutes later you notice the reporter leaning against the passenger side of your truck with his recorder. You've just had an update call with your EOC where you tell them bluntly that the response is not going well.

5. It is now noon. Calgary operations calls [incident commander **or** operations section chief] and advises that they are monitoring a small pressure drop in another nearby wellsite, and have SCADA readings showing a release of gas.
  - a. Two operators are dispatched to investigate, and discover almost identical conditions to the first site, with the elbow on a pipe riser leaking gas with a small amount of condensate misting over the ground.
  - b. You decide this is a deliberate act and that the police should be called. Who makes this phone call?
  - c. The police operator on duty is at a call center in Prince George, has no understanding of the NTS / DLS mapping system, and says they cannot dispatch without an accurate location.
  - d. What recommendations has your planning section developed based on this new information?
  - e. With multiple sites releasing gas, you need 2 more air quality monitoring units. Your normal contractor has already provided you with their only available unit.

With this information, create your incident action plan for the next 12-hour period.

**SCENARIO #2**

- Objectives:**
- Confirm the process used to classify an incident
  - Check that a comprehensive hazard assessment is completed, and staff dispatched to the incident area have been provided with a safety briefing.
  - Test unified command with mutual aid partners, and confirm emergency response processes are consistent between companies.

**Day:** Last weekday of June, school has just let out.

**Weather:** Light overcast, temperature is about 32<sup>C</sup> with moderate winds from (Direction) It has been hot and dry for over a week. Forecast is for possible thundershowers throughout the late afternoon.

**Staffing:** Crews have put in a lot of overtime recently, replacing a defective batch of PSV's, and several have decided to take a long weekend of well-deserved downtime.

**Resources:** All resources identified in your ERP are available. With some staff at contractor companies (helicopter, Vac Truck, Environmental, etc.) also taking off early for the weekend, there may be delays in expected response times.

**Location:** TBD

**Incident begins:**

- Shortly after 4pm, you receive a call from your emergency line. A couple of quadders were running down a pipeline right of way when they ran into a cloud of vapor. One of the youths was overcome by the fumes, and his friend had to drive him out, then take him to the hospital before he called in the incident to your 24-hour number.
- You receive an approximate location, and you also know you share a right-of way with another company for a short distance - about 3km – in the general area of the suspected leak.
- Your operations center has checked their control systems, and can't identify any abnormal readings.
- There are several other permit holders with a few kilometres of this area.

As one of the operators called in and dispatched to the area, describe what actions you will take, what information and other resources you have at hand, any additional equipment you will want to have in the vehicle with you, and where you would get it.

**Additional resources:**

The site where the incident takes place is in the \_\_\_\_\_ regional district, the closest municipal fire service



is \_\_\_\_\_ hour(s) drive away. There is no nearby police detachment – the closest is over \_\_\_\_\_ hours away.

*As the field supervisor, what briefing did you provide to the person(s) dispatched to the incident area?*

*Who is in charge of leading the response to this incident? Would you consider unified command with the other permit holder company? Why, or why not?*

### **Operators Arrive on site**

- You are familiar with this area, and know that there are several residents about XX km to the south.
- About XX away is an area that is popular for (tubing / fishing / camping site)
- You immediately pick up low level (H2S or LEL) readings on your personal meter, and can smell released product.

As one of the operators, describe:

- what actions and safety precautions you will take
- what steps you will recommend
- What role you will assume in the incident command organization

### **Field supervisor**

- What information would you be most interested in obtaining, and what are the sources for that information?
- What are your immediate priorities?
- What steps will you recommend based on your current knowledge of the situation?
- What role will you assume in the incident command organization?

### **Your Emergency Response Plan is now activated.**

- What level would you classify this incident?
- When, how and to whom does this incident need to be reported?
- Who will be the incident commander, and where will they be located?
- What additional staff would you call in, and what roles will they assume?
- What outside agencies might be directly affected or concerned by this incident?
- What are your current and planned actions?

**Inputs and updates (pick one or more)**

1. While checking the area to ensure there are no public in or near the hazardous area, you come across about a dozen teenagers who have taken a break from river tubing / or are camping. They are only a few hundred metres away from the leak site, and you notice a fairly pungent odor (not gas) quickly determine that the entire group is impaired. What do you do?
2. You know that the other company's line in the right-of-way is a major transmission line, and discover that it is regulated by the Canada Energy Regulator (CER). What additional calls are you required to make – if any?
3. You get a call from Wildfire management that they have discovered a small forest fire just a few kilometres away. While it is not heading towards the leak site, it is moving towards your only access road and could force it to close in just a few hours.
  - a. The hydrovac truck you've called to expose the line is about two hours away...
  - b. The fire is advancing more quickly, you decide to evacuate all of your personnel. Describe how you will manage this process, and what agencies should be contacted.
4. Helicopter incident:
  - a. The helicopter company you've called to assist with roving arrives, and the inexperienced pilot starts circling the incident site only 30 -40 metres above ground level. (*opportunity to call pilot and warn of gas plume – test of communications – if successful don't proceed to part b*)
  - b. The pilot flies through the gas plume and it ignites, destroying the helicopter and setting fire to surrounding bush.
5. Leaking gas from the pipeline ignites, and the explosion ruptures the other line in the right-of- way. There are now two lines releasing gas. Describe how this changes the way in which the incident will be managed.

With the information provided, create your incident action plan for the next 12-hour period.

### SCENARIO #3

- Objectives:**
- Confirm field staff have resources to identify an emerging threat and implement actions to mitigate a loss of control incident.
  - Verify that response plan, or related supporting guidance is able to address this type of threat.
  - Verify operator actions to minimize risks of escalation and limit additional loss of containment
  - Confirm support from internal or external resources is available and understood.
  - Test communications and OS / IT system management protocols.
- Day:** Sunday morning in September.
- Weather:** Seasonal, clear and cool.
- Staffing:** Normal facility staffing, no contractors on site.
- Resources:** All resources identified in your ERP are available.
- Location:** TBD

#### Background:

During a recent turn-around, a number of PLC's were updated / replaced. Due to some shortened timelines, these were obtained from a new supplier, and were supposed to have been shipped directly from the manufacturer.

The Canadian Cyber Centre has recently issued an alert about a new malware targeting a specific vulnerability in certain ICS /HMI software programs. The malware can replicate itself over networks with vulnerable systems. The centre is working to identify the various ways that the malware is entering control systems, but little is known at this time as there have only been a few reported cases.

#### Incident Begins

**Inject 1** – During checks of running machinery, one of the (compressors / pumps) seems a bit off – it sounds like it is not maintaining a constant speed. When you get back to the control shack, all readings appear normal, and there's no log of any inconsistencies.

**Inject 2** - The night shift operator notices some apparent system slowness in the control system and logs on to perform manual checks. During this process, the operator notices that the screen flickers several times, but there is no other evidence of a problem. He continues to perform manual checks of the devices and equipment, confirming that everything seems to be running normally.

**Inject 3** – Just after hand-off to the day shift operator, a number of safety systems activate and close off several critical process valves, sending all incoming gas to flare, where the knock-out drum is quickly filled and fluid carries over to the flare stack, starting a ground fire. None of the controls are responsive to operator inputs.

**Consider:**

- i. How do you prioritize the current challenges?
- ii. What are the potential risks to your responders?
- iii. What protocols exist in your company to address such an event?
- iv. How would you classify this incident, and to which agency / agencies would you report this?
- v. Which part(s) of your organization would be included in your incident management team?

**Inject 4** – At head office, an email is received demanding 100,000 bitcoins be paid, or the problems at (XX site) will escalate. (assume 1 bitcoin = approximately \$15 USD)

**Consider:**

- i. Who would your organization contact internally or externally about the incident?
- ii. Would your company contact the downstream pipeline operator? What information would you provide?
- iii. How might your public relations department be involved?

**Post-Incident:**

As part of the exercise stand-down / debrief process, the facilitator should look for discussion on:

- Preservation of evidence – both physical (any damages to equipment, identified physical point of entry, such as a remote site's OT control node) and cyber, such as log files.
- Standing down the incident response phase (containment and control)
- Engineering assessment of damages and requirements for notification on repairs and restarting.
- Functionality of each section of emergency plans
- Resourcing, including:
  - external suppliers / services / responders, and
  - internal such as mapping, IT and IS, depth in roles,