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CANADA

Wildfire Preparedness, Prevention & Response in the Oil & Gas Industry

Best Management Practices Guide

National Safety Association
for Canada's Energy Industry

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Disclaimer

This document is intended to be flexible in application and provide guidance to users rather than act as a prescriptive solution. Recognizing that one solution is not appropriate for all users and situations, it presents generally accepted guidelines that apply to industry situations, as well as recommended practices that may suit a company's needs. While we believe that the information contained herein is reliable under the conditions and subject to the limitations set out, Energy Safety Canada does not guarantee its accuracy. The use of this document or any information contained will be at the user's sole risk, regardless of any fault or negligence of Energy Safety Canada and the participating industry associations.

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What We Do:

- Deliver industry-recognized training to meet industry needs.
- Collaborate with industry to drive continuous safety improvements.
- Provide safety and labour market data, insights and tools.
- Serve as the industry certifying partner for the Certificate of Recognition program.

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PURPOSE

The Energy Safety Canada (ESC) Best Management Practices for Wildfire Preparedness, Prevention & Response in the Oil & Gas Industry is a comprehensive guideline for oil and gas companies in Western Canada (Alberta, British Columbia and Saskatchewan).

It aims to:

- Identify federal and respective provincial regulatory requirements, FireSmart™ principles and practices, Canadian Standards Association (CSA) and pipeline safety standards related to Wildfire.
- Capture learnings from after-action review findings and practical insights from previous Wildfires.
- Identify best practices to prepare, prevent, respond and recover as part of an organization's emergency management system related to Wildfire.
- Provide resources for developing wildfire preparedness documentation.

HOW TO USE THIS GUIDELINE

This guideline draws on lessons learned from past incidents, lessons learned, regulatory frameworks, industry discussions and subject matter feedback.

Each section identifies an issue, provides regulatory context, background, and recommended best management practices (BMPs).

- Companies should:
  - » Reference provincial and federal regulations to ensure compliance.
- Use the guideline to develop or evaluate Industrial Wildfire Control Plans (IWCPs), FireSmart™ plans, Emergency Response Plans (ERPs) pre-season preparedness, smoke management, pipeline crossing protocols, and evacuation procedures.
- Consult resources like the ESC Wildfire Field Guide, Wildfire Smoke Guideline, FireSmart™ Canada and the Provincial or Federal Agency.

SUPPORTING RESOURCES

The following document includes links to support information identified in this document and can be accessed here: ESC Wildfire Online Resources.

SCOPE

This guideline can be applied to oil and gas operations in Western Canada's f orested and grassland areas.

It identifies requirements, key wildfire risks (e.g., brush burning, flaring, smoke exposure, pipeline crossings, evacuations, and critical equipment protection), emerging issues (e.g., cybersecurity, responder collaboration, Indigenous engagement, partnerships with neighbouring facilities and communities), and proactive monitoring to ensure comprehensive wildfire management.

While this guideline is designed for the oil and gas industry, it can also support other sectors operating in forested or high risk wildfire areas—such as forestry, mining and utilities—in strengthening their preparedness and prevention efforts.

Although the Best Management Practice focuses on site-level readiness, industrial facilities exist within larger wildfire-prone landscapes that include communities, Indigenous lands and Wildland–Urban Interface (WUI) zones.

Reducing wildfire risk requires a shared responsibility approach that considers regional fuel conditions, suppression capacity and community planning. Aligning industrial measures with municipal and Indigenous preparedness initiatives enhances both public safety and operational continuity.

Operators are encouraged to consider regional risk, work with nearby jurisdictions, and connect site-level actions to broader landscape strategies.

Note: As regulations and legislative requirements are constantly updated or developed, this document might not include all current references at the time of publication.

INTRODUCTION

Wildfires pose a significant challenge for Western Canada's oil and gas industry, impacting worker safety, infrastructure integrity, operational and business continuity.

Annual wildfires are now a common occurrence, and a well-established plan needs to be in place regardless of this seasonal hazard and risk.

A critical component of planning is establishing evacuation triggers—clear, measurable conditions that prompt timely protective actions. These should be defined before wildfire season and communicated to all stakeholders.

For oil and gas facilities in forested and grassland regions, effective preparedness is critical to mitigate risks such as smoke exposure, worker health, equipment-related ignitions, fire encroachment, pipeline damage during crossings, evacuations and critical equipment vulnerabilities.

This document is built upon the collaborative work completed in mid-2000 facilitated by the Canadian Association of Petroleum Producers (CAPP), Government of Alberta, Partners in Protection, Alberta Government and industry.

- CAPP's Emergency Preparedness Guide for Hazards Associated with Wildfires (now ESC Wildfire Smoke Guideline for the Oil and Gas Industry)
- CAPP's Best Management Practice for Wildfire Prevention (now ESC Best Management Practices for Wildfire Preparedness for the Oil and Gas Industry)
- Supplemented with:
  - » ESC Wildfire Field Guide for the Oil and Gas Industry; and the,
  - » ESC Wildfire Field Risk Assessment for the Oil and Gas Industry.
- Aligned with FireSmart™ Canada principles and the current FireSmart™ Guidebook for the Oil and Gas Industry.

This ESC Best Management Practices for Wildfire Preparedness in the Oil & Gas Industry provides a high-level yet practical framework to assist companies in addressing these challenges by identifying a known issue, providing background information, and suggesting a practice to consider when building their own wildfire program.

Each company or organization must complete their own wildfire assessment and preparedness plan, which addresses its unique situation each wildfire season.

Visit www.energysafetycanada.com for additional resources, including webi nars.

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1.0 UNDERSTANDING THE WILDFIRE LANDSCAPE

Wildfires often threaten oil and gas operations, risking worker safety, asset and environmental damage, and financial losses.

Companies and operators should have a strong understanding of the regulatory requirements for wildfire prevention, preparedness, and response for each province in which they operate.

This Best Management Practice (BMP) distinguishes between actions that meet minimum regulatory requirements and leading practices that aim to materially reduce wildfire risk at scale.

Regulatory compliance establishes a necessary baseline for safety and due diligence. Leading practices apply a proactive, risk-based approach that prioritizes treatments and readiness where they will have the greatest impact, strengthens coordination with local authorities and Indigenous communities, and integrates wildfire considerations into planning, design and operations.

By emphasizing system-level resilience—through governance, collaboration, information sharing and outcome-oriented evaluation—operators can align site-specific actions with the province's broader shift toward proactive wildfire mitigation. Where feasible, this guide encourages going beyond minimum requirements to adopt scalable practices that reduce hazards, exposure and consequence across assets and the surrounding landscape

2.0 APPROACH TO PLANNING, PREPAREDNESS AND RESPONSE

The following are key activities which will assist companies and operators to fully understand and best manage risks associated with wildfires when developing their individualized wildfire program to protect people, the environment, critical infrastructure and assets.

By implementing processes and programs, the operator can establish a comprehensive approach to wildfire management, which includes, but is not limited to:

- Assessment – Companies should understand the hazards and risks associated with their operations and how they could potentially cause a wildfire or be impacted by a wildfire. Understanding these risks and hazards will support the development of prevention, preparedness, and response strategies.
- Preparedness – The operator is responsible to ensure that it is prepared for all emergencies including wildfires, enhancing facility resiliency to fire, and the developments of plans to respond to wildfire threats.
- Prevention – The operator is responsible to take steps to prevent wildfires from starting because of its operations, which may include implementing FireSmart™ principles such as comprehensive vegetation and fuel management.
- Response – The operator should understand how to prepare for and assess immediate risk from wildfires and wildfire smoke and respond accordingly. This may include evacuation planning, the development of evacuation triggers and associated actions, and training for those who may respond to a wildfire emergency, including the use and understanding of the Incident Command System (ICS).
- Emergency Response Plans (ERPs) should be included during exercise drills.
- Annual Review – The operator should continuously review its wildfire program, which may include reviewing and implementing learnings from the previous wildfire season, sharing learnings and identifying opportunities for improvement

3.0 ASSESSMENT

Background or Issue:

Wildfires pose a recurring and escalating threat to oil and gas operations across Western Canada.

Assessment of wildfire risks must be included in a company's emergency preparedness and response plans.

Operators must understand the hazards and risks associated with wildfires to effectively prevent wildfire ignitions from operations and protect personnel, infrastructure and the environment. This includes a thorough understanding of regulatory requirements specific to the province or territory in which they operate.

Assessment Objectives:

- Identify site-specific wildfire hazards (e.g., vegetation, equipment, access routes).
- Evaluate operational activities that may increase the likelihood of igniting a wildfire (e.g., flaring, brush burning, OHV use).
- Understand regulatory obligations across jurisdictions.
- Document critical infrastructure and its vulnerability to wildfire.
- Collection of data, including causal data to inform ignition cause and likelihood.
- Assess community and responder coordination capacity.

Regulatory Context:

- Alberta - Forest and Prairie Protection Act, Emergency Management Act, OHS Act, Pipeline Rules, AER Directive 071
- British Columbia – BC Emergency Management Regulations, Wildfire Act, Emergency Program Act, Oil and Gas Activities Act, Pipeline Regulation
- Saskatchewan - SPSA Wildfire Prevention Standard, Wildfire Act, Pipelines Act, Emergency Planning Act
- Federal - Pipeline Safety Act (CER), Canada Labour Code, Canadian Aviation Regulations

Best management practices:

- Site Hazard Assessment:
  - » CSA Z246.2-23 describes a multi-step hazard assessment process, emphasizing the need to identify site-specific ignition risks, characterize local fuel conditions, and implement physical and procedural controls where hazards are greatest. This includes recommendations for regular risk revaluation—especially as evolving land use patterns alter the regional fire risk profile.
  - » Conduct pre-season evaluations of vegetation, ignition sources, and evacuation route safety, utilizing FireSmart™ principles.
  - » Use GIS to map hazards and critical equipment locations.
- Wildfire Risk Profiling:
  - » For companies with high-risk operations—such as multiple sites with significant personnel in forested environments prone to wildfires, operations with high ignition potential (e.g., flaring, welding). Develop a comprehensive wildfire risk assessment. This assessment should evaluate both the risks of operations igniting wildfires and the threats posed by external wildfires to operations, personnel, and infrastructure.
  - » For lower-risk operations—such as isolated sites with minimal personnel, low ignition potential activities, or operations in less fire-prone areas—a detailed wildfire risk assessment may not be required. Instead, focus on basic site hazard assessments, seasonal risk evaluations, and adherence to standard FireSmart™ principles and provincial regulatory requirements to ensure adequate preparedness without overburdening resources.

- Infrastructure Vulnerability:
  - » Document critical equipment (e.g., pumps, tankage, power supplies) and assess fire resilience.
  - » Evaluate ember transport and radiant heat exposure risks.
  - » Provide emergency response agencies with critical value/asset location to inform their emergency planning - i.e. wildfire response to support infrastructure critical to life safety or regional economies.
- Regulatory Compliance Mapping:
  - » Align site assessments with provincial and federal mandates (e.g., IWCP submission deadlines, fire permit requirements).
  - » Maintain a jurisdictional compliance matrix to track obligations.
- Community and Responder Coordination:
  - » Develop and/or participate in emergency exercises with local partners/jurisdictions to validate Emergency Response Plans (ERPs).
  - » Engage Indigenous communities and neighbouring facilities to share hazard data and response plans.
  - » Include responder access routes, safe zones and hazard profiles in Emergency Response Plans (ERPs).
- Documentation and Review:
  - » Record assessment findings in IWCPs and ERPs.
  - » Update annually and after significant infrastructure changes.
- Cross-Sector Applicability:
  - » Non-oil and gas industries (e.g., forestry, utilities, mining, warehousing, camps) operating in forested or wildfire-prone areas can adopt similar assessment protocols to enhance preparedness and reduce wildfire risk.

3.1 FireSmart™ Canada

Background or Issue:

FireSmart™ principles and practices are designed to reduce wildfire risk through vegetation management, structural protection measures and coordinated mitigation efforts. While industry-specific guidance has been developed for the oil and gas sector to support the identification, mitigation, and elimination of vegetation-related hazards around facilities located in wildfire-prone regions, these principles are equally applicable to other industries operating in similar environments.

Within this guide, FireSmart™ is framed as a comprehensive resilience system rather than a set of discrete fuel management tasks. In addition to physical mitigation activities—such as vegetation management, industrial zone clearing and maintenance of defensible space—FireSmart™ encompasses governance structures, integrated planning processes, inter agency collaboration and consistent information-sharing practices.

Operationalizing this system includes aligning site preparedness with local and regional emergency plans, clearly defining agency and industry roles, enhancing workforce awareness, and establishing standardized mechanisms for exchanging data and situational information during heightened wildfire conditions.

Best management practices:

- Participate in FireSmart™ programs, which focus on prevention and mitigation, creating wildfire-resilient infrastructure and communities.
- Maintain industrial zone clearing, pipeline crossing, evacuation, pre-season preparedness (including hazard assessments), and critical equipment.
- Utilize ESC Wildfire Field Guide and Risk Assessment for the Oil and Gas Industry documents when assistance is needed.

Industrial Zone 1: 0-10 metres from structure(s) on the disposition. (Priority One - personnel and structures are at risk from radiant heat and ember transport associated with a wildfire.)

Industrial Zone 2: 10-30 metres from structure(s) on the disposition. (Priority Two-personnel and structures are at risk from ember transport associated with a wildfire.)

Industrial Zone 3: 30+ metres, extensive forest area surrounding individual or multiple dispositions. (Priority Three- evacuation routes and evacuation staging areas can be impacted by smoke and wildfire activity outside the disposition.)

- Vegetation management
  - » The goal of vegetation management is to create a forest vegetation complex that will not support high-intensity crown fires.
  - » The three options of Vegetation Management are:
    - › Vegetation removal – Total removal of all flammable vegetation to eliminate the potential ignition of a wildfire.
    - › Vegetation conversion – Converting the vegetation species from highly flammable coniferous forest vegetation to less flammable deciduous forest vegetation.
    - › Vegetation reduction – Partially removing flammable coniferous/forest vegetation to reduce the crown fire potential and lower the wildfire intensity, spread, and spotting. *Note that in many cases, thinning may lower intensity but can increase the rate of spread by encouraging high canopy winds and more fine fuel buildup (e.g., grass).

3.2 Preparedness and response planning

Background or issue:

The annual wildfire risk underscores the need for robust emergency response plans.

Comprehensive plans emphasize equipment inventories, tabletop exercises, communication plans, critical equipment documentation, collaborative partnerships with neighbouring facilities/residents/communities, and site hazard assessments to mitigate risks to pipelines, evacuations, operations and the environment.

The plans are also required by regulators to be in place and submitted by the corresponding provincial body.

Regulatory Context:

- Alberta: Forest and Prairie Protection Act require Industrial Wildfire Control Plans (IWCPs)

by March 1, with fire permits (Sections 15–18), pipeline crossing rules (Alberta Pipeline Rules), evacuation planning (Emergency Management Act), equipment protection (OHS Act), and community engagement (2024 Emergency Status Amendment Act).

- British Columbia: Wildfire Act and Wildfire Regulation require prevention plans, burn registration via OFTS, pipeline crossing coordination (Oil and Gas Activities Act), evacuation orders (Emergency Program Act), and community collaboration.
- Saskatchewan: Industrial and commercial operators working in communities in and near provincial forests and parks are required to submit a wildfire prevention and preparedness plan (Saskatchewan Public Safety Agency (SPSA) by April 1st.
- Federal: CER's Pipeline Safety Act requires pipeline crossing protocols; Canada Labour Code mandates worker safety during evacuations.

Best management practices:

- Develop Comprehensive IWCPs & ERPs:
  - » Use guides and criteria established by the respective province:
  - » Alberta IWCP User Manual, British Columbia Industrial Wildfire Prevention Guide and the Saskatchewan SPSA Wildfire Plan Guide.
- Documentation:
  - » Map vegetation, infrastructure, pipelines, evacuation routes, and critical equipment (e.g., power, pumps, tankage, freshwater supplies) using GIS addressing ignition risks, smoke, crossings, evacuations, pre-season preparedness (including site hazard assessments), equipment protection, and community partnerships.
- Permit Compliance:
  - » Obtain fire permits for brush burning (Alberta: online at https://firepermits.alberta.ca or 310-FIRE (3473); BC: 1-888-797-1717) and coordinate pipeline crossings via One-Call (Alberta: 1-800-242-3447; BC: 1-800-474-6886). Permits are free and required for burning in the Forest Protection Area from March 1 to October 31, excluding campfires.
- Reporting:
  - » Ensure wildfire incidents are reported to the appropriate fire authority.
- Annual Updates:
  - » Submit IWCPs or ERPs by March 1st , as required, integrating post-season reviews, pipeline operator feedback, evacuation drills, pre-season preparedness (including site hazard assessments), , critical equipment documentation, contact inventories, and community partnership plans.
- Training:
  - » Train staff as identified on ERPs, incident command system, pipeline crossings, wildfire smoke response, evacuation procedures, pre-season preparedness (including hazard controls), critical equipment protection, and community collaboration.
- Collaboration:
  - » Engage the respective local/provincial/federal agencies and wildfire regulators, Indigenous communities and neighboring industrial operations, for emergency planning, equipment protection, and cooperative response.
- Equipment Readiness:
  - » Maintain equipment (e.g., backpacks, pumps, hoses), as mandated by respective provincial regulations.
- Indigenous Engagement and Traditional Ecological Knowledge:
  - » This BMP recognizes the rights, knowledge systems, and stewardship roles of Indigenous

Peoples. Engagement should be collaborative, timely, and tailored to local context, with a focus on practical integration of Traditional Ecological Knowledge (TEK) into mitigation decision-making. Operators are encouraged to work with Indigenous communities to identify cultural landscape values, seasonal considerations, and appropriate mitigation methods, and to establish respectful protocols for coordination before, during, and after wildfire events.

» When engagement occurs:

› Planning: Identify community priorities and cultural values; incorporate TEK into fuel treatment design, seasonal timing, and access considerations; confirm contacts and protocols.

› Mitigation: Coordinate site access and notifications; integrate TEK into vegetation management and maintenance practices; align communications and signage.

› Response: Share situational updates through agreed channels; coordinate on access control, safety perimeters, and interface operations; support community-led emergency protocols.

› Recovery: Include TEK in post-event rehabilitation, reforestation, and monitoring; participate in after-action reviews to document lessons and improvements.

» Engagements should be documented (e.g., meeting notes, shared maps, points of contact, agreed processes) to support continuity and accountability across seasons.

3.3 Other Assessment Considerations

Background or Issue:

Other related regulatory requirements may also involve Federal agencies such as those for pipelines, Supervisory Control and Data Acquisition (SCADA).

For example, the Energy and Pipeline regulator requires crossing and incident or damage reporting protocols.

Regulatory Context:

- Alberta: Pipeline Act, Oil and Gas Conservation Act (AER), OHS Act, Alberta Pipeline Rules, Emergency Management Act.
- British Columbia: Oil and Gas Activities Act, Pipeline Regulation (BCER), OHS Regulation, Emergency Program Act.
- Saskatchewan: Pipelines Act, OHS Regulations, Emergency Planning Act.
- Federal: Pipeline Safety Act (CER), Canadian Aviation Regulations (Transport Canada), Canada Labour Code.

Best management practices:

- Field Guide to the Canadian Forest Fire Behaviour Prediction System.

  » The Canadian Forest Fire Behavior Prediction (FBP) System is a systematic method for assessing wildland fire behavior potential. This field guide provides a simplified version of the system, presented in tabular format. It was prepared to assist field staff in making first approximations of FBP System outputs when computer-based applications are not available.

- Environmental Assessments:

  » Identify wildfire, smoke, pipeline, evacuation, critical equipment, and community risks, including site-specific hazards, per AER/BCER requirements. Non-oil and gas industries can adapt assessments for their facilities.

- Pipeline Safety:

  » Include crossing, evacuation, critical equipment and community mitigation in integrity plans, per CER guidelines.

» CAPP Wildfire Responders Working Near Pipelines Alert.

- Cybersecurity:
  - » Secure SCADA with encryption and backups, as determined

4.0 PREPAREDNESS

Background or Issue:

Pre-season preparedness ensures facilities are ready for wildfire risks such as inadequate planning, including equipment shortages, unverified evacuation routes, undocumented critical equipment, incomplete contact inventories, lack of community partnerships, and unaddressed site hazards.

Operators must ensure they are fully prepared for wildfire emergencies.

This includes implementing FireSmart™ practices, enhancing facility resilience, and developing comprehensive plans to respond to wildfire threats. Preparedness reduces risk to personnel, infrastructure, and the environment, and ensures regulatory compliance.

Utilization of wildfire monitoring systems such as Canadian Wildland Fire Information System (CWFIS), Moderate Resolution Imaging Spectroradiometer/Visible Infrared Imaging Radiometer Suite (MODIS/VIIRS), AB/BC interactive wildfire map providing real-time data.

Preparedness Objectives:

- Strengthen facility resilience to wildfire threats.
- Ensure readiness of firefighting and monitoring equipment.
- Establish and verify evacuation routes and shelter-in-place zones.
- Maintain accurate contact inventories and community coordination plans.
- Train personnel in wildfire response protocols.

Best management practices:

Although there will be more details provided further in the document on specific practices, a high-level view of critical activities are:

- Site Hazard Assessment and Controls:
  - » Conduct pre-season site hazard assessments to identify risks such as flammable vegetation, ignition sources (e.g., equipment, debris), pipeline vulnerabilities, and unsafe evacuation routes.
  - » Implement controls, including vegetation clearing (per FireSmart™'s IZ guidelines/ESC Wildfire Field Guide and Hazard Assessment), equipment maintenance, pipeline protection measures, and route improvements.
  - » Apply vegetation management and structural protection principles.
  - » Maintain Industrial Zones (IZ 1–3) with appropriate clearances and fire-resistant materials.
  - » Ensure compliance with fire permit regulations and vegetation management standards.
  - » Modify high-risk practices during elevated fire danger periods.
- Energy Safety Canada support tools:
  - » ESC Wildfire Field Guide for the Oil and Gas Industry
  - » ESC Wildfire Field Assessment for the Oil and Gas Industry
  - » ESC Wildfire Smoke Guideline
  - » ESC Wildfire Website Resources
- Equipment Readiness:
  - » Conduct an annual inventory of firefighting equipment (e.g., backpacks, pumps, hoses, extinguishers) as per regulatory requirements and risk assessment.
  - » Verify suppression systems and monitoring tools.

- Tabletop Exercises and After-Action Reviews (AAR):
  - » Conduct pre-season tabletop exercises to simulate wildfire scenarios. Involve, if possible, potential impacted stakeholders, community representatives, emergency response organizations and others.
  - » Evaluate plans post wildfire season and adjust.
  - » Include local/provincial/federal agencies, Indigenous communities, and neighboring facilities.
- Evacuation Planning:
  - » Identify and verify primary and secondary evacuation routes (6.1-meter-wide roads, heli-pads), avoiding pipeline ROWs without consent and addressing site hazards, mapped using GIS per Alberta Pipeline Rules.
  - » Designate shelter-in-place zones minimum 50 meters in facilities that are designed to withstand a burn over.
- Critical Equipment Documentation:
  - » Identify, map and inspect critical equipment (e.g., facility power, pumps, tankage, freshwater supplies) for wildfire resilience, ensuring backup power and water availability.
  - » Ensure backup power/water and share data with responders and regulators.
  - » Document equipment locations (e.g., GPS coordinates, site maps), their critical role (e.g., maintaining operations, ensuring community safety via power supply, preventing environmental excursions like spills from tankage), and protection measures (e.g., sprinklers, fire-resistant barriers), sharing with IMTs, pipeline operators, local/provincial/federal agencies, neighboring facilities/residents.
- Monitoring:
  - » Use CWFIS to assess fuel conditions, pipeline risks, evacuation routes, site hazards, and critical equipment locations.
  - » Fire Location Tracking: Use CWFIS, MODIS/VIIRS, and sites such as the BCWS's interactive wildfire map for real-time tracking.
  - » Employ cameras for wildfire detection in those locations where you have an increased number of accessibility to evacuate personnel.
- Contact Verification:
  - » Collect and confirm up-to-date contact details for critical stakeholders, including local (e.g., municipal emergency services, fire departments), provincial (e.g., BCWS, Alberta Wildfire, EMCR, SPSA), federal (e.g., CER, Transport Canada), IMTs, pipeline operators, and Indigenous communities.
  - » Maintain updated contact lists for internal resources, emergency services, and those involved in the incident command system.
  - » Wildfire status | Alberta.ca
- Training:
  - » Train staff on pre-season preparedness, including equipment use, tabletop exercises, evacuation routes, critical equipment protection, site hazard controls, emergency response procedures, incident command system, wildfire smoke response protocols, evacuation protocols, etc.
- Operational Adjustments:
  - » Restrict high-risk activities and ensure pipeline crossing consent during high fire danger, addressing site hazards and protecting critical equipment.
- Industry and Community Partnerships:
  - » Share pipeline, evacuation, site hazard, critical equipment, and community partnership data when and if practicable.

» Develop joint response plans, if practical.

- Emergency Response:
  - » Establishes the "command post" for unified incident management in coordination with government fire response agencies, utilizing incident command system (ICS) principles.
  - » Identification, when practical or available, of the on-site emergency response team that is trained in firefighting techniques, including wildfire suppression, to protect critical infrastructure.
  - » The response team may also include dozer operators and other heavy equipment that could be used in responding to a wildfire situation.

4.1 Wildfire Smoke

Background or Issue:

Wildfire smoke poses health risks and may impact personnel and disrupt operations. Effective management ensures compliance and safety.

Smoke and its byproducts can cause respiratory issues and visibility reduction, impacting operations or resulting in the need to reduce or remove operation staff through an evacuation.

Best management practices:

- Refer to the ESC Wildfire Smoke Guideline, [JI3.1]which provides preparation and response recommendations related to wildfire smoke impacts.
- Non-oil and gas industries in wildfire-prone areas face similar smoke risks.

4.2 Communications

Background or Issue:

Wildfire emergencies often unfold rapidly, requiring clear communication protocols to manage risk, ensure safety and maintain trust.

Structured communication before and during wildfires reduces confusion and ensures timely notifications about the wildfire situation. These communication strategies help build awareness, support engagement and reduce misinformation.

Operators must ensure timely, accurate, and coordinated messaging internally among staff and externally with responders, regulators, communities and the public.

Internal Communications Best Practices

- Crisis Communication Toolkit:
  - » Maintain updated contact lists for staff, emergency roles and key collaborators.
  - » Include alternate communication methods (e.g., satellite phones, radios) in case of power or network outages.
- Training & Exercises:
  - » Conduct annual media and crisis communication training for key spokespeople.
  - » Include communication protocols in tabletop exercises and ERP drills.
- Acute Messaging Protocols:
  - » Pre-develop acute response messages for wildfire scenarios by channel (e.g., SMS, radio, email, digital app notification).
  - » Ensure messages are clear, consistent and aligned with official sources.
  - » Ensure communication plans include the entire workforce that may be affected (e.g., employees, contractors, suppliers, visitors, etc.)
- Monitoring & Feedback:
  - » Monitor internal channels for confusion or misinformation.
  - » Use post-incident reviews to assess communication effectiveness and update protocols

External Communications Best Practices

- Coordination with respective Wildfire Response organizations, locally and provincially:
  - » Establish contact with emergency management agencies to encourage pre-season and ongoing wildfire collaboration to ensure timely information is mutually shared.
  - » These relationships are vital to ensure timely access to information related to fire risk, facility access, road closures, etc.:
    - › Sign up for updates, email distribution lists or obtaining direct contact information for Liaisons, Fire Prevention Officers, etc.:
    - › A specific forested area through the Wildfire status | Alberta.ca or
    - › A specific Fire Center through BC Wildfire Service .
  - » Road closures are managed differently in each province and additional collaboration may be required with other agencies such as RCMP or highway transportation personnel.
  - » Share site maps, hazard profiles and contact lists with responders and regulators.
- Public Messaging:
  - » Communicate proactively via websites, social media and local media outlets.
  - » Use consistent terminology (e.g., fire name, location) and avoid speculation.
- Trusted Sources & Verification:
  - » Refer media inquiries to designated experts.
  - » Share only verified information from official agencies (e.g., BCWS, Alberta Wildfire, CIFFC).
- Visitor & Community Engagement:
  - » Encourage sign-up for provincial/national alert systems (e.g., AlertReady).
  - » Provide multilingual resources and updates for non-English-speaking stakeholders.
- Post-Incident Communication:
  - » Share lessons learned and recovery plans with communities and partners.
  - » Coordinate messaging with Destination Canada or PTMOs if tourism or public access is affected.
- Strategic Communication Planning
  - » Use structured campaigns to build understanding of wildfire risks and mitigation actions.
- Crisis Risk Register:
  - » Maintain and update a register of probable wildfire scenarios and associated communication plans.
- Culturally Appropriate Messaging:
  - » Collaborate with Indigenous partners to assist in aligning messaging.

5.0 PREVENTION PRACTICES

Background or Issue:

Wildfires caused by industrial activities remain a significant concern.

In AB from 2012-2025, 53 per cent of wildfire caused by the Oil and Gas industry were related to flaring activity. 20 per cent was related to debris burning, 14 per cent to Operational activity, 6 per cent to OHV's and 4 per cent to flaring.

Operators are responsible for taking proactive steps to prevent wildfires from starting as a result of their operations.

This includes identifying ignition risks, modifying operational practices, and implementing controls to reduce the likelihood of fire starts. Establishing routine inspections / maintenance of oil and gas equipment (eg., flare stacks).

Regulatory Context:

- Alberta Forest and Prairie Protection Regulation, Directive 060 (Flaring), Directive 058 (Waste), OHS Act
- British Columbia Wildfire Regulation, Flaring and Venting Reduction Guideline, Drilling Waste Management Chapter
- Saskatchewan SPIGEC Guidelines, PNG036, S-20 Directives
- Federal Canadian Wildland Fire Prevention Strategy, Pipeline Safety Act (CER)
- CSA Z620.3 s(14.1.2) Flare stack inspections and maintenance

5.1 Ember Transport

Background or Issue:

The greatest wildfire threat to oil and gas facilities from an advancing fire front will come from airborne embers that can travel long distances on wind currents. Embers—also known as firebrands—can travel hundreds of metres ahead of a fire front, igniting spot fires and compromising oil and gas facilities even when the main fire is not yet nearby.

Recent wildfires in Canada and internationally have reinforced the critical role of airborne ember transport in structure and infrastructure ignition.

- During the 2023 and 2024 Canadian wildfire seasons, record-breaking fire activity was observed, with over 18 million hectares burned in 2023 and more than 5 million hectares in 2024, placing both years among the worst on record. These fires were characterized by intense ember storms, especially in wildland-urban interface (WUI) zones.
- Embers from the McDougall Creek wildfire travelled over 2.5 kilometres across Okanagan Lake to ignite the Walroy Lake and Clarke Creek wildfires. These findings highlight the need for proactive ember mitigation strategies, especially for oil and gas facilities located near forested areas.

Best Management Practice

- Fuel and Vegetation Management
  - » Rigorous vegetation removal through cutting, mowing, brush removal, controlled burns around critical infrastructure, oil and gas facilities, wellheads, gas plants and compressor stations, etc.
  - » Innovative fuel management techniques are being explored, such as prescribed grazing, targeted mechanical thinning, use of fire-resistant landscape materials and geospatial mapping technologies to monitor vegetation regrowth after restoration.
- Structural Protection
  - » Construct facilities using non-combustible materials and fire-resistant designs.
  - » The roof of a structure is the most vulnerable component for fire ignition. Roofs catching fire are the main cause of structural losses.
    - › Building codes have long recognized the role roofing plays in the spread of fires. These codes use roofing classifications A, B and C based on the combustibility of the exterior roofing surface. Fire rating class A is the best classification assigned to roofing, and it includes materials such as metal roofing.
  - » Screen all vents, soffits, and openings with fine mesh to prevent ember ingress.
  - » Install skirting around the base of structures to block ember accumulation.
  - » If practical, equip flammable structures with roof-mounted sprinkler systems to suppress embers as they land.
- Flammable Material Storage
  - » Storage of flammable materials on site, such as hydrocarbons or propane tanks, creates an additional threat to structures on the disposition based on:

- Presence or absence of hydrocarbons on site;
- Flammable material rating;
- Potential for accumulation of airborne embers on tanks;
- Distance from storage sites to forest vegetation.

- Hydrocarbon Storage and Propane Tanks
  - To reduce the potential of a storage tank ignition from airborne embers, the tank top should be cone shaped and designed in such a way that airborne embers will not become lodged around tank openings or vents.
  - Vent openings must be turned downward to prevent airborne embers from falling into the vent opening.
  - Use of floating top storage tanks should be
  - minimized; floating tops will catch large amounts of embers.
  - Store flammable petroleum products in containers that resist accumulation of airborne embers on the container's surface
  - or at the base of the container.
  - Remove vegetation away from storage tanks (e.g., grass, shrubs, trees, etc.).
  - Turn propane tanks off. Propane tanks should be maintained vegetation-free for a minimum of 3 meters to reduce radiant heat exposure.
  - Equip the tank tops with water or foam sprinkler systems and turn the sprinklers on during a wildfire incident to prevent ignition from airborne embers.
  - Equip hydrocarbon storage tanks with fixed or semi-fixed fire suppression systems, if water capabilities and capacity allow.
- Emergency Response
  - When a wildfire threat is imminent:
  - Activate sprinkler systems to pre-wet surfaces.
  - Deploy fire crews to monitor ember accumulation zones.

5.2 Radiant Heat

Background or Issue:

Recent wildfires in Canada have demonstrated the extreme radiant heat potential of crown fires and their devastating impact on nearby infrastructure.

In the 2023 wildfire season, Canada experienced its most destructive fire year on record, with over 16.5 million hectares burned—nearly seven times the historical average. Fires were hotter, faster moving, and more difficult to contain due to prolonged drought, record temperatures, and dry fuel conditions.

Best Management Practice

- To reduce the risk of wildfire damage from radiant heat exposure, utilize the ESC Wildfire Fire Guide and ESC Wildfire Hazard Assessment for the Oil and Gas Industry, which provides additional criteria and follow respective provincial requirements.
- Structural Materials
  - The roof of a structure is one of the most vulnerable components for fire ignition.
  - Building codes recognize the role roofing plays in the spread of fires. These codes use roofing classifications A, B and C based on the combustibility of the exterior roofing surface. Fire rating class A is the highest classification assigned to roofing materials, including metal roofing.
- Flammable Material Storage
  - Storage of flammable materials on site, such as hydrocarbons or propane tanks, creates an additional threat to structures on the disposition based on:
    - Presence or absence of hydrocarbons on site;

- › Flammable material rating;
- › Potential for accumulation of airborne embers on tanks;

5.3 Flaring

Background or Issue:

Flaring petroleum by-products is a routine part of oil and gas operations, but when conducted in wildland environments, it poses a significant wildfire risk.

While overall flaring use is declining due to improved technologies, challenges persist, particularly during windy afternoon conditions in seasons when grass and vegetation are cured, making ignition more likely.

Despite its necessity in some scenarios, flaring must be managed carefully to prevent wildfire ignition. Flaring can be conducted safely by ensuring that burning materials from a flaring operation do not come into contact with flammable vegetation.

Some common flaring situations:

- Well Completion and Testing: To assess production capacity and determine appropriate infrastructure.
- Routine Maintenance: At gas processing facilities to safely depressurize equipment.
- Solution Gas Disposal: At oil wells where gas volumes are too small to economically recover.
- Emergency Situations: To safely burn off uncontrolled gas releases during equipment failure or pipeline issues.
- Common causes of flaring-related fires include:
  - » Flare knock out drum (FKOD) failures may result in hydrocarbon carryover through the flare tip, causing burning liquid to be expelled.
  - » Flare tip maintenance deficiencies may lead to carbon deposition and the release of burning particulate matter into surrounding vegetation during high pressure flaring.
  - » Insufficient mineral soil buffers between flare sites and wildland fuels
  - » Flaring during high or extreme wildfire danger periods

Regulatory Context

- Alberta: Governed by Directive 060 (Flaring, Incinerating, and Venting) and Directive 071 (Emergency Preparedness and Response), which require fire mitigation planning and suppression equipment. Forest and Prairie Protection Regulation.
- British Columbia: The Flaring and Venting Reduction Guideline outlines site-specific requirements, dispersion modeling, and ambient air quality evaluations.
- Saskatchewan: Follow federal and provincial wildfire mitigation strategies, including the Canadian Wildland Fire Prevention and Mitigation Strategy.

5.3.1 Best Management Practices

There are provincial specific requirements related to Flare Pits and Flare Systems. Review those related regulations where your operations are located

The following is a summary for each jurisdiction:

- Alberta:

Under the Forest and Prairie Protection Regulation, flare pits must have:

- » A 30-metre debris-free buffer including combustible materials (including vegetation)
- » These areas must be inspected semi-annually.

Flaring operations must also comply with Directive 060, Section 7.11, which mandates:

- › Flare tips angled ≥30° below horizontal
- › Pit construction that contains flare discharge

- British Columbia:

The Flaring and Venting Reduction Guideline requires:

  - » Site-specific risk assessments
  - » Ambient air quality evaluations
  - » Notification protocols for non-routine flaring

- Saskatchewan:

Governed by Directive PNG036 and Directive S-20, which require:

  - » Design and operation of flare systems to destroy waste gases
  - » Audits for facilities flaring >900 m^3/day

- AER Directive 060 - Upstream Petroleum Industry Flaring, Incinerating, and Venting
- CSA Z620.3 - Flaring, Incineration, and Enclosed Combustion

This area can be maintained through mechanical, chemical or engineering means. Where there are extremely high flare stacks, removal of all forest vegetation may not be practical. In these instances, fireproofing through the removal of ladder fuels, thinning to provide an open canopy, and removing ground fuels and shrubs should be considered.

- When conducting flaring operations in flare pits at facilities constructed after 1996, operators must follow the requirements of AER Directive 060, Section 7.11. In addition, the flare pit must be constructed to restrict flare materials from discharging beyond the pit and the discharge tip of the flare line is directed into the flare pit at an angle of not less than thirty (30°) degrees below horizontal.
- The Flare pit must be constructed to restrict flare materials from discharging beyond the pit, and the discharge tip of the flare line is directed into the flare pit at an angle of not less than thirty (30°) degrees below horizontal.
- Maintain the area around a flare pit free of flammable vegetation through mechanical, chemical or engineering means.
- Operators will perform regular maintenance of flare stacks and pipes to reduce the buildup of carbon. The ignition devices shall be inspected and maintained to ensure operation is within appropriate parameters.
- Operators will perform regular maintenance of any associated fluid tanks at the base of flare stacks to avoid burping.
- Operators shall develop an inspection program whereby all flare devices in an operating area are inspected on a regular basis to ensure that vegetation control and the devices are maintained. The results of this program shall be maintained for internal audit purposes.
- Compliance with the Forest and Prairie Protection Regulation requires that, in order to ignite gas at a flare, a flare device may be used on public land only in the event of an emergency, and all residue from such flares shall be extinguished by the user before he leaves the site thereof.
- To avoid the unnecessary dispatch of firefighting resources, the operator shall provide the following notifications to Forestry and Parks during the Fire season:

  - » For those operations with intermittent flaring for testing or maintenance procedures, the operator shall advise the local Fire Centre at least one hour prior to ignition of the flare.
  - » For those operations where unexpected or emergency flaring is necessary, the operator shall advise the local Fire Centre as soon as is practical, given the situation.

- Flaring should not be conducted during periods of high or extreme fire hazard, except in case of an emergency.
- Operators shall endeavour to complete flaring operations during the evening or early morning when the vegetation ignition risk is at its lowest due to higher relative humidity and lower

temperatures. Flaring should be avoided during the spring and fall when there is an abundance of cured grass and other vegetation.

5.4 Utility Corridors and Access to Well sites and other developments

Background or Issue:

Services and access to oil and gas plants, well sites, and other developments are routinely provided through a common corridor, minimizing the disturbance footprint.

Proactive fire prevention planning can avoid fire risk on service corridors and access roads by understanding potential fire risk. Power line routing and construction is one operation that can be assessed for the level of fire ignition risk and mitigated at the planning stage.

Although the utility company is responsible for the power service, it is in the interest of the oil and gas industry to coordinate the planning to reduce the risk of fire. Access routes, particularly for operating plants and other major facilities, will be used for evacuation during emergency fire situations, requiring that a safe escape route is certain for workers on site.

Power line fires usually result from adjacent trees falling across the wires during wind events and creating high-energy arcing that can ignite dry forest materials. Wind velocities associated with power line fires are also responsible for extreme fire behaviour once a fire is established and begins to spread.

Best Management Practices

- Utility Corridors
  - » When practical, the power line should be located between the pipeline and the access road; if this is not possible, it should be located on the opposite side of the access road and/or pipeline in relation to prevailing winds. This reduces the likelihood that a tree will strike the power line if it should blow down.
  - » Average height and fuel type of the adjacent forest may affect the power pole height.
  - » When practical, the corridor and power line route should avoid the highly flammable forest stands such as black spruce.
  - » Dangerous trees are removed when new power line corridors are constructed, and ongoing maintenance should be completed every five years at a minimum to identify and remove new dangerous trees.
- Access Roads
  - » If the main access could potentially be cut off by wildfire, alternative emergency routes should be identified. Where an alternative emergency route is not available or not practical, alternative strategies around safe zone usage and alternative evacuation methods (including by air) should be identified.
  - » During a wildfire, all-weather gravel roads can be used as access or act as evacuation routes for emergency vehicles or workers.
  - » Narrow or dead-end roads without proper turnarounds (hammerhead T's) are a particular problem for wildfire suppression vehicles since they may not be able to turn around when necessary (ring roads are optimal).
  - » Whenever possible, access or evacuation routes should double as barriers to fire spread to help slow or impede the spread of wildfire.
  - » Fire service access routes should connect to principal roadways.
  - » The road surface should provide two-way access with a travel surface of not less than 6.1 metres.
  - » Roadway curvature radius should be at least 30 metres, measured from the centerline.

» Road gradient should not exceed 10 percent.

» Dead-end roadways that are more than 90 metres in length should be constructed with a turnaround at the terminus having no less than 18 metres turning radius or a hammerhead "T" alternate turnaround.

» All gates should be located at least 9 metres off the main roads and should not open outward. Gate openings should provide a clear opening of at least 0.6 metres wider than the travelled way.

» Fire and other emergency service personnel shall be provided with ready access to any locking mechanism.

» Bridges should be designed and built with an all-weather surface capable of supporting heavy pieces of equipment travelling across the bridge. Weight limits should be clearly posted at the approaches to each bridge.

5.5 Safe Areas for Use During Fire Emergencies

Background or Issue:

Under high and extreme fire danger levels, wildland fire behavior becomes erratic and unpredictable, especially when fast-moving cold fronts shift wind direction in minutes. During evacuation alerts or unavoidable entrapment scenarios, the identification and preparation of safe areas for staging or survival is critical to protect personnel and assets.

The ideal location for an open, safe area is upwind of the approaching fire, to avoid the intense heat and smoke associated with the fire front.

5.5.1 Best Management Practices

- Open Safe Areas
  - » Guidance from National Institute of Standards and Technology recommends a clear area of separation of at least four times the expected flame height or eight times the vegetation height
  - » Should have alternate access routes, if possible
  - » Must accommodate personnel, vehicles, and equipment.
  - » GPS coordinates should be recorded in the ERP.
- Enclosed Safe Areas (Structures)
  - » Surrounded by mineral soil.
  - » Equipped with exterior sprinkler systems and adequate water supply, if practical.
  - » Constructed of non-combustible materials.
  - » Fitted with HVAC filters to reduce smoke exposure.

5.6 Facility Evacuation (Permanent and Temporary)

Background or Issue:

The 2025 Bird River Fire and Red Earth East Complex demonstrated rapid fire spread (60 km/day), necessitating evacuations.

Clear protocols for staffing levels, confirmation of safe locations, critical equipment protection, site hazard controls, community partnerships, and coordination with responders are critical.

Evacuations not only result in potential millions of dollars in costs due to facility or operational shutdowns, the emotional impact on workers and the community can also be traumatic.

Evacuation routes are critical for evacuating personnel from a disposition during a wildfire emergency. (Note: Visibility may be drastically reduced due to smoke drifting across access roads).

Regulatory Context:

- Alberta: Emergency Management Act mandates evacuation plans; OHS Act requires worker

safety; 2024 Emergency Status Amendment Act (community coordination).

- British Columbia: Emergency Program Act governs evacuation orders; OHS Regulation ensures safety; Orders to Leave, and Restricted Areas.
- Federal: Canada Labour Code mandates evacuation safety.

Best management practices:

- Evacuation Triggers:
  - » Establish clear evacuation triggers tied to specific actions. Triggers should be based on measurable criteria (e.g., fire proximity, AQHI, official alerts) and scaled to site complexity. Document and communicate them pre-season.
  - » Refer to ESC Wildfire Smoke Guideline.
  - » Establishing clear evacuation triggers is critical for timely, coordinated action during wildfire events. Triggers are pre-defined conditions that signal when to escalate protective measures—such as reducing staffing, pausing non-essential work, preparing shelter-in-place, or initiating full evacuation.
  - » Define triggers early: Document them in ERPs before wildfire season.
    - › Use measurable criteria: Examples include fire proximity, rate of spread, wind alignment, smoke thresholds, and official alerts.
    - › Tie triggers to actions: Each trigger should correspond to a specific operational response (e.g., scale back work, activate shelter-in-place, evacuate).
    - › Keep it scalable: Companies may choose two, three, or multiple trigger levels based on complexity and risk profile.
    - › Communicate and rehearse: Share triggers with all stakeholders and include them in tabletop exercises.
  - » Why flexibility matters:
    - › The number of trigger levels should reflect site complexity, workforce size, and operational risk. Whether two broad stages or multiple graduated steps, the goal is clarity and speed of decision-making.

Trigger Level	Example Criteria	Example Actions
Initial Trigger	Fire detected within defined distance; elevated fire danger	Heightened monitoring, confirm contacts
Escalation Trigger	Fire approaching with adverse wind; visibility, health impacts	Reduce non-essential work, prep evacuation
Final Trigger	Fire imminent or official Evacuation Order	Full shutdown and evacuation

- Evacuation Routes:
  - » Identify current roads to the disposition. Assess the threat of wildfire on the potential evacuation routes.
  - » Identify safe helicopter landing areas for air lift evacuation. Where road access has been cut off, helicopters may provide the only means of evacuation.
  - » Identify adjacent waterways that can be accessed by boat.
- Safe Location Confirmation:
  - » It is recommended that a process is in pace to confirm employees and/or contractors have adequately evacuated to a safe location.
  - » Maintain an updated roster with emergency contacts.
- Staffing Levels:
  - » Implement phased reductions based on fire proximity:
- Communication Protocols:
  - » In areas with poor cell reception, that communication by radio or sat phone as a primary or backup method could be used to coordinate with IMTs, pipeline operators, Indigenous communities, local/provincial/federal agencies, and neighboring facilities/residents, including critical equipment and site hazard updates.
- Training:
  - » Conduct annual evacuation drills.
- Mental Health Support:
  - » Provide access to EAP and psychological first aid during evacuations; include guidance for supervisors on stress recognition and referrals; communicate available services in evacuation briefs.
  - » Recognize that mental health support may be needed prior to, or after a wildfire event.
- Collaboration:
  - » Coordinate with the respective local/provincial/federal agencies, neighboring facilities/residents to ensure safe evacuation routes.
  - » Owners, contractors, service providers and consultants.

5.7 Water Sources

Background or Issue:

Most wildfire ignitions are successfully contained by early and aggressive initial attack

One of the key factors determining the success of initial attack is the availability of a water source that is accessible and capable of supplying a continuous volume for the initial attack operation and facility use such as sprinklers or other available firefighting equipment.

Generally, there are many opportunities to either identify natural water sources or develop dependable water sources adjacent to oil and gas facilities.

These can be used for pump and hose operations, sprinkler lines, water trucks or helicopter bucketing operations. The water sources do not necessarily have to be on site but should be in the general vicinity of the facilities or equipment at risk.

Best Management Practices

- Identify the availability of large water tankers in the region.
- Identify natural water sources such as streams and small lakes in the immediate area.
- Ensure access to natural water sources for tanker trucks and/or portable pump set-ups are developed and identified.
- Have a water supply for the purpose of firefighting, which meets the requirements of either the Fire Underwriters Survey Guide or the National Fire Protection Association (1231)

Standard on Water Supplies for Suburban and Rural Firefighting.

- If natural water sources are not available, consider developing a water storage facility on the site. Non-draining borrow pits or tanks may be used for storing large volumes of water.
  - » Include water sources in ERPs and site maps for potential use by Wildfire Emergency Response personnel.

5.8 Pipeline Crossing During Wildfire situations

Background or Issue:

Pipeline crossings during wildfires pose risks to infrastructure, worker safety, and the environment.

There are times when operators and/or wildfire responders may need to cross a pipeline, which requires careful planning, notification, collaboration and reporting.

Pipeline Right of Ways (ROWs) are not designed as roads, and heavy equipment use in these areas can cause damage.

Regulatory Context:

- Alberta: Alberta Pipeline Rules require written consent for crossings.
- British Columbia: Oil and Gas Activities Act and Pipeline Regulation mandate operator consent via BC One-Call.
- Federal: CER's Pipeline Safety Act mandates crossing protocols.

Best management practices:

- Pre-Season Coordination:
  - » Establish agreements with pipeline operators for crossing protocols, addressing site hazards and protecting critical equipment.
- Crossing Consent:
  - » Contact operators (via 24-hour emergency numbers) for consent, ensuring perpendicular crossings, per Alberta Pipeline Rules.
- Mitigation Measures:
  - » Use temporary matting or air bridging to mitigate site hazards, per CER guidelines.
- Firebreak Usage:
  - » Coordinate with operators to shut in lines before using ROWs as firebreaks, protecting critical equipment.
- Ground Disturbance:
  - » Request emergency locates via One-Call before digging within 30 meters of pipelines, per Alberta Pipeline Rules.
- Pipeline Leaks or Damage:
  - » Report leaks or damage to operators and regulators (AER, BCER, CER)
- Training and Communication:
  - » Train responders on crossing protocols.
  - » Utilize guidance such as the CAPP Wildfire Responders Working Near Pipelines Alert.

5.9 Brush Burning

Background or Issue:

In AB from 2012-2025 20% of wildfires linked to the oil and gas industry are caused by the burning of woody debris. These fires often escape containment after the initial burn, smoldering for days or even months before reigniting. Such incidents are preventable through the adoption of Best Management Practices (BMPs) that emphasize safe burn site selection and thorough extinguishment procedures.

While total disposal of woody debris through burning is a regulated requirement for most oil and gas dispositions, brush pile burns pose

a significant liability. Escaped fires from these operations frequently violate the respective legislated requirements, underscoring the need for safer practices.

Unsafe burning practices include:

- Inadequate buffer zones between burn piles and surrounding forest vegetation
- Conducting burns during windy conditions or periods of high to extreme fire danger
- Failing to fully extinguish burn piles

Most wildfire ignitions stem from holdover fires—smoldering remnants buried in deep duff layers or large brush piles containing fibrous organic topsoil. These fires can reignite under dry, windy conditions and spread rapidly into flammable forest areas. Often, they go undetected until they are well-developed and burning under conditions that make containment extremely challenging.

5.9.1 Regulations

- Alberta: Governed by the Forest and Prairie Protection Regulation Sections 2 & 9 and Directive 058 from the Alberta Energy Regulator, which outlines oilfield waste handling, treatment, and disposal.
- British Columbia: Brush and drilling waste disposal must follow the Drilling Waste Management Chapter of the BC Oil and Gas Handbook, including sump construction, containment, and tracking systems.
- Saskatchewan: The Saskatchewan Petroleum Industry and Government Environmental Committee (SPIGEC) provides guidelines for waste storage, drilling fluid disposal, and transportation.

5.9.2 Best Management Practices

- Site Preparation and Salvage
  - » Pre-log and salvage merchantable timber when feasible.
- Mulching
  - » Prefer mulching for non-salvaged debris, especially in muskeg and willow areas with high organic soils.
- Mulching supports reclamation and reduces fire intensity and rate of spread. Recommend mulching no more than 3-5cm in depth otherwise future growth is inhibited.
- Burning
  - » Allow piles to cure for one season (with approval) for cleaner burns.
  - » Burn during winter months (Nov 1–Mar 31) when snow-covered.
  - » Burn only on sites with <15 cm duff (deciduous/mixed wood areas).
  - » Avoid deep duff zones (muskeg/coniferous).
  - » Maintain 15 m buffer from uncleared areas.
  - » Windrows: max 60 m length, 8 m breaks; round piles: 15 m apart.
  - » Ensure clean piles—no soil mixing.
  - » Consider alternatives before burning debris piles next to highways.
  - » When possible and with the approval of the respective regulatory authorities, allow piles to cure for one season before burning. This will result in a cleaner, more efficient burn.
  - » An option to piling debris for burning is to utilize burning sleds, towed by heavy equipment. This is particularly effective for burning green woody debris.
- Timing and Permits
  - » Confirm Fire permit requirements, usually between April 1–Oct 31 or year-round in some municipalities.
- Safety and Monitoring
  - » Follow strict hot work permitting and oversight.
  - » Avoid burning near highways unless visibility risks are mitigated.

» Burn only under favorable weather; avoid temperature inversions.

› Burning locations should be shared with the local fire authority so they are aware of high-risk areas of spring ignitions.

› Confirm extinguishment through the use of heat probes.

› Spread and mix piles with water/snow to eliminate residual fire.

› Maintain adequate water, pumps, and manpower on-site.

› Alternative Disposal

› Use burning sleds for green debris.

› Partner with co-generation facilities to convert woody material into energy.

5.10 Equipment Failure

Background or Issue:

Fires occurring at oil and gas sites are normally confined within the plant site because of the accessibility by emergency response units on hand or close by. The spread of surrounding forest vegetation would be infrequent.

If equipment failure results in a pipeline eruption, well blowout or emergency flaring in a remote area, may result in a higher risk for a rapidly spreading wildfire in surrounding vegetation.

Other situations that could occur outside of a plant perimeter are pipeline breaks with an ignition or isolated well site storage tanks which are at risk of lightning strikes.

Best Management Practices

- Anticipated scenarios and include in ERPs: pipeline release/rupture, well control incident/ blowout, tank fire, equipment fire with ember production, energized equipment arcing.
- Immediate actions (first minutes):

» Protect life: establish exclusion zone; account for personnel; cease non-essential work.

» Control ignition: shut down potential ignition sources where safe; establish hot zone controls.

» Notify: internal emergency line, pipeline/ operator control center, provincial wildfire agency, and regulators per ERP.

» Assess wildfire risk: check fuels downwind, wind alignment, and potential ember generation; deploy on site suppression if safe.

- After-action:

» Document ignition source, suppression effectiveness, and any wildfire involvement; feed lessons into the post season AAR.

5.11 Off Highway Vehicles (OHV)

Background or Issue:

The risk of wildfires caused by ATVs is highest in the spring and fall months (April, May, October and November) when natural fine fuels such as grass are in their cured state and highly flammable. These fires are entirely preventable with proper awareness and implementation of best practices.

The Forest Engineering Research Institute of Canada (FERIC) conducted a study demonstrating that OHVs can ignite wildfires when organic debris (e.g., grass, moss) accumulates around the hot exhaust system. This material can reach ignition temperature within 15 minutes, smolder, and fall to the ground, igniting dry vegetation.

Many OHV operators are unaware of the ignition risk and often lack fire suppression equipment or the ability to report fires promptly, compounding the hazard.

Best Management Practices

- Equipment Maintenance

» Regularly inspect and clean OHVs, especially around the engine and exhaust system.

Exhaust systems heat up to temperatures in excess of 204°C

- » Inspect equipment at the start of the day, during and upon completion of travels.
- » Have a tool to use to safely remove debris.
- » Ensure spark arrestors are installed and functioning
- » Check for grass, moss, or debris buildup after riding through tall vegetation or muskeg.
- » Fire Suppression Readiness
- » During the fire season, carry basic firefighting tools:
  - › Fire extinguisher
  - › Collapsible pail
  - › Shovel or Pulaski
  - › Backpack or container of water
- » Train operators on fire reporting protocols and initial suppression techniques.

- Operational Awareness
  - » Ensure operators (employees/contractors) understand the hazards, response and notification requirements.
  - » Avoid OHV use during high or extreme fire danger periods.
  - » Consult local fire danger ratings before field deployment.
  - » Limit OHV use and parking in sensitive areas with cured vegetation or high organic soil content.

5.12 Light & Heavy Equipment

Background or Issue:

The oil and Gas industry in Alberta relies on light and heavy equipment for the construction of pipelines, access roads, well and plant sites.

Gas powered light vehicles usually have catalytic converters that get very hot and if in contact with dry grass that could start a wildfire.

Diesel engines that idle for long periods of time build up carbon in the exhaust system and when throttled up and placed under load, can expel small very hot carbon particles that are capable of igniting dry forest vegetation and becoming a wildfire.

Using heavy equipment in forest areas for clearing forest vegetation, or working in tall, cured grass or in very fibrous soils, can result in an accumulation of fine, highly flammable organic material on or near the exhaust systems.

Graders operating on gravel roads during very dry periods have also caused ignitions from the sparks that result from the steel blades coming in contact with rocks especially along the edges of the ditch line.

Best Management Practices

- Equipment Maintenance
  - » Clean engine compartments and exhaust systems daily during wildfire season.
  - » Install and maintain spark arrestors on all equipment.
  - » Inspect and clean diesel particulate filters (DPFs) and ensure proper regeneration cycles are completed away from flammable vegetation.
  - » Do not park vehicles with catalytic converters in tall, dry grass.
- Ensure Mufflers are in good condition.
- Fire Suppression Readiness
  - » During the fire season, carry basic firefighting tools:
    - › Fire extinguisher
    - › Collapsible pail
    - › Shovel or Pulaski

  - Backpack or container of water with hand pump
- Train operators on fire reporting protocols and initial suppression techniques.

- Operational Controls
  - Avoid idling equipment in or near flammable vegetation.
  - Conduct pre-operation inspections to remove organic debris from undercarriages and engine bays.
  - Use fire-resistant mats or cleared mineral soil pads at maintenance and fueling sites.
  - Avoid operating heavy equipment during high or extreme fire danger periods.
  - Monitor local fire weather indices and adjust work schedules accordingly.

5.13 Power tools and equipment

Background or Issue:

Using mowers in ditches or right of ways has on occasion started a wildfire from sparks caused by the mower blades contacting rocks or other metal objects. The sparks may cause an ignition in very dry grass or other fine fuels.

Mulcher heads are steel with carbide tips that rotate at high speeds and when they encounter rocks or metal cause a shower of sparks. These sparks can ignite dry grass and fine fuels and when conditions are right will cause wildfire to start.

Power tools such as power saws, power pumps, brush saws, mowers and mulchers are used extensively by the oil and gas industry in the agricultural and forest areas of the province. During high and extreme fire danger periods, especially when the grass is in a cured and very dry state, there have been occasions when wildfires are started by light equipment.

Operating power saws for long periods of time will result in very hot exhaust systems and if it comes in contact with dry fine forest vegetation, ignition can occur. Hot power saws and power pumps have been known to ignite fires during refueling.

Best Management Practices

- Power Saws and Small Engines
  - Maintain a 3-metre clearance between power saws and fuel containers during startup.
  - Do not place hot or running saws on flammable materials (e.g., grass, duff, moss).
  - Allow engines to cool before refueling to prevent fuel vapor ignition.
- Mowers and Mulchers
  - Inspect undercarriages for debris buildup, especially after driving through vegetation.
  - Avoid idling in flammable areas.
  - Evaluate fire risk before conducting operations during high or extreme fire danger periods.
  - Activities such as mechanical brushing, mowing, and grading are classified as high-risk and may be restricted.
- Fire Suppression Readiness
  - If operations must proceed during high-risk periods:
  - Carry an approved fire extinguisher at the worksite.
  - Deploy a water tanker with hose, pump, and crew to patrol behind the operation.
  - Ensure all personnel are trained in initial attack procedures and fire reporting protocols.

5.14 Welding

Background or Issue:

The oil and gas industry uses welding extensively during pipeline construction or for regular maintenance of their facilities and for repairs to on-site equipment.

Wildfires resulting from welding are rare however the risk of starting a wildfire does exist during high and extreme fire danger periods and prevention measures should be considered.

To prevent the risk of starting a wildfire from welding and established practice should be in place.

Regulatory context:

- Alberta: Welding is regulated under the Occupational Health and Safety Code, Part 10 – Fire and Explosion Hazards. Employers must ensure hot work is conducted with proper safeguards.
- British Columbia: The Wildfire Regulation requires fire prevention measures for industrial activities, including welding.
- Saskatchewan: Follow federal and provincial wildfire mitigation strategies and hot work protocols outlined in the Canadian Wildland Fire Prevention Strategy.

Best Management Practices

- Site Preparation and Shielding
  - » Conduct welding on bare mineral soil whenever possible.
  - » Use non-flammable welding shields to contain sparks and prevent spread.
  - » If mineral soil is unavailable, wet down the work area with water or wildfire foam (e.g., Fire Foam 104) to reduce ignition risk.
- Fire Suppression Readiness
  - » During high fire danger periods, welding operations should be accompanied by a water tanker with hose, pump, and crew to patrol and extinguish any ignitions.
  - » Maintain fire extinguishers and fire blankets at the welding site.
  - » Fire Foam 104 is a Class A fire suppressant that enhances water penetration into organic layers and expands water volume by 5 to 20 times, depending on mix ratio and equipment.
  - » Foam acts as a fire suppressant, extinguishing flaming and glowing combustion phases when applied directly to vegetation.

5.15 Using Fire Safely

Background or Issue:

Many sectors of the oil and gas industry routinely utilize fire for cooking, warming, and burning refuse. In addition, smoking and improper extinguishment of smoking materials in a forest work site are also common practices.

When fire is carelessly used or smoking material is improperly extinguished and discarded in a wildland environment, there is a risk of ignition of the surrounding vegetation.

Occasionally workers ignite cooking or warming fires during the fire season. Wildfires can result from ignition of surrounding vegetation (unsafe fire) or abandoned fires that are not properly extinguished. Winter fires (if placed on deep humus soils) can hold over in the ground and surface when burning conditions are favorable in the spring.

The activities relating to the burning of refuse in incinerators or other receptacles have also resulted in fires attributed to the oil and gas industry. Incinerators utilize a burning chamber with a mesh over the chimney to prevent sparks from being discharged from the unit. On occasion glowing embers will dislodge from the mesh as a result of an accumulation of foreign matter on the mesh or pass through the mesh opening and are transported on the convection current

created by the incinerator heat and by winds to flammable forest vegetation and cause a wildfire ignition.

Other methods of refuse disposal are burning in a pit or barrel.

These methods require a fire permit during the fire season.

Key Practices (summary)

- Open fires should be avoided during High/ Extreme fire danger ratings and prohibited under fire bans.
- Build warming/cooking fires only on mineral soil or non combustible base; keep a 1 m cleared radius; never leave unattended; fully extinguish (cold to touch).
- Use approved incinerators with intact spark arrestor/mesh; clear combustibles within 3 m; inspect screens for residue.
- Maintain water and extinguishers at any location where fire is used.

Regulatory context:

- Alberta: Forest and Prairie Protection Act.

Best Management Practices

- Cooking And Warming Fires
  - » Open fires should be prohibited during periods of high or extreme fire danger conditions. This can be a voluntary measure taken by industry or if conditions dictate, Sustainable Resource Development or municipal authorities may issue a Fire Ban which would include all open fires.
  - » Consider the use of alternative methods for cooking and warming.
- Refuse Burning
  - » Burning of non-industrial wastes within the forest protection area shall be carried out in a fully enclosed incinerator constructed of incombustible material and the draft and smoke vents thereof covered with a heavy gauge metal screen of a mesh size not greater than 6 millimetres.
  - » An incinerator used within the forest protection area shall be located over bare rock, gravel, sand, mineral soil or concrete at least 30 metres from a stand of trees or shrubs and the ground surrounding it outward from its base to a distance of at least 3 metres shall be clean mineral soil or be covered by any of the aforesaid materials.
  - » Burning in forest protection area outside the fire season. An owner or operator of an industrial operation or industrial camp located in a forest protection area at which burning of debris is carried on outside the fire season shall ensure that the operation or camp is patrolled daily for fire.
  - » During the active fire season ensure the mesh on top of the incinerator is free of any carbon or other foreign matter that can turn into a glowing ember, become dislodged and spread to surrounding flammable forest vegetation during high winds.

6.0 EMERGENCY RESPONSE

Background or Issue:

Wildfire emergencies demand rapid, coordinated, and informed action to protect personnel, infrastructure, and communities.

Effective wildfire response includes:

- Maintaining access to real-time fire weather and smoke data.
- Ensuring responder safety through ICS protocols and hazard briefings.
- Coordinating with responders and regulators.
- Protecting critical infrastructure and maintaining business continuity.
- Establishing trigger points for evacuation and shutdown.

This integrated approach ensures that operators can respond decisively and safely to wildfire threats while maintaining compliance and protecting assets.

Best management practices:

- ERP Integration: Include wildfire, smoke, pipeline crossing, evacuation, critical equipment, site hazard, and community partnership scenarios in ERPs.
- Water and Sprinkler Systems: Install sprinklers meeting NFPA 1231 standards to protect critical equipment and mitigate site hazards, if possible.
- Identify water sources for emergency response personnel.
- Fire Weather and Smoke Monitoring: Use local monitoring data, when available.
- ICS Training: Train staff on ICS for coordination with BCWS/EMCR, pipeline operators, Indigenous communities, local/provincial/federal agencies, and neighbouring facilities/residents, including equipment, hazard, and community protection, per ESC recommendations.
- Response Coordination: Communicate with local/provincial/federal agencies, and neighbouring facilities/residents for updates, equipment, site hazards, and water availability.
  - » Establish contact with emergency management agencies to encourage pre-season and ongoing wildfire collaboration to ensure timely information being mutually shared.
  - » These relationships are vital to ensure timely access to information related to fire risk, facility access, road closures, etc.:
    - › This can be through signing up for updates or accessing blogs or obtaining direct contact information for Liaisons, Fire Prevention Officers, etc.:
    - › A specific forested area through the Wildfire status | Alberta.ca or
    - › A specific Fire Center through BC Wildfire Service .
- Mental Health Support: Provide EAPs and stress management training, when required.

6.1 Incident Command System (ICS) - Collaboration with Wildfire Responders

Background or Issue:

Collaboration with responders and the use of the Incident Command System is vital. Structured processes are in place for defining roles and responsibilities for the responding organizations.

Best management practices:

- Planning for Collaboration:
  - » Establish a Wildfire Response Liaison to coordinate with IMTs, BCWS, EMCR, pipeline operators, Indigenous communities, local/provincial/federal agencies, and neighboring facilities/residents.
- Facility Information Package:
  - » Include site maps, hazardous materials, pipeline locations, evacuation routes, critical equipment (e.g., power, pumps, tankage) with locations and importance (operations, community safety, environmental protection), site hazard assessments, local/provincial/federal contacts, and community partnership plans, shared with IMTs, pipeline operators, and Indigenous communities.
- ICS Training:
  - » Enroll in ICS-100/200/300/400 courses, as identified by role in emergency response plan.
- Communication Protocols:
  - » Use radio frequencies or satellite phones for updates with IMTs, pipeline operators, Indigenous communities, local/provincial/federal agencies, and neighbouring facilities/

residents, including equipment, site hazard, and community risks, per IWCP protocols.

- Documentation:
  - » Update ERPs and IWCPs with responder, pipeline crossing, evacuation, critical equipment, site hazard, local/provincial/federal contact, community partnership, and Indigenous engagement.
- Cross-Jurisdictional Coordination:
  - » Coordinate with provincial and federal regulators and neighboring provinces for pipelines and critical equipment spanning jurisdictions.
- Public Communication:
  - » Share updates via social media or community briefings during wildfires near pipelines, critical equipment, or facilities, involving neighboring communities, per Enbridge's Wildfire Response Framework.

6.2 Training Needs

Background or Issue:

Operational activities may result in potential ignition during operations like flaring, or conducting preventative work such at brush burning, clearing, use of chainsaws, mowers, etc.

Trained personnel are important for mitigating, eliminating and responding to wildfires, if they should occur.

As well, in the event an encroaching fire on personnel, a facility or critical equipment.

Best management practices:

- FireSmart Training:
  - » Identify key resources that are well versed and knowledgeable in the use of FireSmart assessments and development of mitigation plans.
- Fire Season Preparedness Training:
  - » Operations training on flaring, including site hazard controls, critical equipment protection, incident command, fire suppression preparation and use.
  - » Scenario based drills should occur at least annually.
- Fire Prevention Training:
  - » Operations training on flaring, including site hazard controls, critical equipment protection, incident command, fire suppression preparation and use.
- Wildfire Safety Training:
  - » Conduct annual meetings on hazards, smoke, pipeline protocols, evacuation procedures, pre-season preparedness (including site hazard assessments),
- Suppression Training:
  - » Trained emergency response personnel for onsite incidents and identify expectations for additional response support outside of facility footprint.
- Cross-Training:
  - » Partner with fire services, pipeline operators or as part of a mutual aid agreement.

7.0 RETURNING TO FACILITIES POST-EVACUATION

Background or Issue:

Returning to facilities after wildfire evacuations requires structured protocols to ensure safety, operational readiness, and compliance, and to reduce the risk of delays due to inadequate re-entry plans.

Re-entry requires coordination with responders, pipeline operators, communities, and regulatory agencies.

Regulatory Context:

- Alberta: OHS Act mandates safe re-entry; Alberta Pipeline Rules require pipeline inspections; 2024 Emergency Status Amendment Act (community coordination).
- British Columbia: OHS Regulation and Pipeline Regulation govern re-entry and pipeline safety.
- Federal: Pipeline Safety Act (CER) requires post-incident inspections.

Best management practices:

- Coordinate with or receive re-entry approval by respective regulatory authority.
- Conduct pre-re-entry inspections including detailed damage assessments for all assets, utilities, and access roads.
- Implementing restoration and remediation actions, including the repair or replacement of damaged infrastructure, remediation of fuel or chemical spills, and clearance of hazardous debris.
- Restoration of critical infrastructure such as utilities, water, etc.
- Monitoring for secondary impacts, such as landslides, flooding, or ecological changes triggered by vegetation loss
- Pipeline Inspections: Coordinate with operators to verify pipeline conditions via locates or pressure tests, per Wildfire Response Pipelines July 2024.
- Worker Accountability: Confirm all personnel are accounted for via check-in systems before re-entry.
- Operational Restart: Resume operations in phases:
  - » Initial Assessment: Essential personnel (e.g., safety, maintenance) verify facility integrity, site hazard controls, and critical equipment functionality.
  - » Partial Restart: Resume critical operations (e.g., pipeline monitoring, critical equipment operation) after safety clearance.
  - » Full Restart: Return to normal staffing after regulatory and community approval, per AER/BCER guidelines.
  - » Communication: Notify IMTs, pipeline operators, Indigenous communities, local/provincial/federal agencies, neighbouring facilities/residents, and regulators (AER, BCER, CER) of re-entry plans, including critical equipment and site hazard status.
- Post-event Wellbeing: Offer debriefs and access to mental health supports for personnel affected by fire impacts or prolonged smoke exposure; include information in the re-entry briefing.
- Public Communication: Issue community updates via social media or briefings, involving neighbouring communities, to confirm safe re-entry.
- Documentation: Record re-entry assessments, pipeline inspections, site hazard controls, critical equipment checks, community coordination, and worker feedback.

7.1 Reclamation

Background or Issue:

Many regulatory bodies require that an operator must reclaim all dispositions according to the terms and conditions of their operating approval.

The reclamation process can affect the future potential for wildfire in two ways:

- The establishment of vegetation growth on disturbed sites, and
- The windrowing of woody debris along the edge of linear disturbances.

In the past, the practice normally involved the use of non-native plants that grew very densely and tall producing flash fuels which during periods

of high to extreme fire hazards are ideal for very rapid buildup and spread of wildfires.

With today's knowledge of vegetation impact on fire spread and with the support of the indigenous communities, a focused and thoughtful approach to replanting the most appropriate species is a better practice.

Best Management Practices

- Engage the affected indigenous community where the reclamation activities are to occur to assist in the identification of vegetation to be restored, if required.
- Consider the use of shorter less dense grass growth supplemented with the planting of deciduous shrubs on disturbed areas. The deciduous shrub growth when established provides shade to the disturbed areas and will reduce grass density over time. Deciduous forest vegetation, except during the spring, will not normally sustain high intensity wildfires and are easier to control.
- Consider planting a short growing deciduous species where height of forest vegetation needs to be kept to a minimum. By using short growing deciduous species vegetation management may only be required once every 15 to 20 years (check latest reclamation standards to ensure site and ecological conditions allow planting of deciduous).
- Wherever possible, use mulching on all exploration and winter access roads to eliminate the debris windrows and reduce the wicking during wildfires, increase the probability of containment of fires on linear disturbances, and enhance reclamation by spreading the mulched debris over the clearing which promotes vegetation growth and reduces erosion.
- If windrowing of debris is used, ensure that windrows are not piled against standing forest cover, are no more than 60 metres in length and separated from adjacent windrows by a minimum clearing of eight metres.
- Wherever possible, during the reclamation process, windrows should be scattered and crushed with heavy machinery and made to lie flat. This not only reduces the potential of wicking but also allows the woody debris to decompose more rapidly.
- Leaning trees resulting from clearing operations can provide a ladder for fire to reach the crowns of adjacent trees. All leaners should be felled and made to lie flat.

8.0 PROGRAM EFFECTIVENESS & CONTINUOUS IMPROVEMENT

8.1 Post-Fire Season Review

Background or Issue:

The 2025 wildfire season revealed critical gaps in responder coordination, pipeline crossings, evacuation planning, and equipment protection.

A systematic after-action review (AAR) processes are essential for capturing lessons learned and driving continuous improvement in wildfire emergency management.

Best management practices:

Conducting a post wildfire season After Action Review is very important in identifying improvement opportunities in your emergency response and preparation plans.

Recent guidance from FEMA and Canadian provincial authorities provide structured templates and facilitation protocols for effective AARs.

- A robust AAR typically includes:
  - » Chronological reconstruction of incidents and decision points
  - » Assessment of whether objectives were met and if protocols were followed

» Solicitation of feedback from all participants (operations, contractors, affected communities, regulators)

» Identification of successful strategies and areas requiring change (gaps, delays, resource constraints, communication barriers)

» Actionable recommendations prioritized for immediate adoption and long-term planning

» Operators should continuously review their wildfire programs to ensure they remain effective, compliant, and responsive to evolving wildfire risks. This includes integrating lessons learned from previous wildfire seasons, sharing insights across teams and regions, and identifying opportunities for improvement.

- Incident Analysis:

  » Document fire, smoke, pipeline crossing, evacuation, equipment, site hazard, and community coordination incidents.

  » Use CWFIS data to assess ignition sources, smoke impacts, and response effectiveness.

- FireSmart™:

  » Evaluate adherence to vegetation management, evacuation planning, and equipment mandates.

  » Evaluate pre-season preparedness (including site hazard assessments), critical equipment, contact inventories, community partnerships, and equipment mandates.

- Stakeholder Engagement:

  » Collaborate with Provincial, Municipal and Federal Government Fire Services, Indigenous communities, pipeline operators, and neighboring facilities to share insights and improve coordination.

- Performance Metrics:

  » Assess downtime, smoke incidents, pipeline crossing safety, evacuation efficiency, pre-season preparedness (including site hazard controls), critical equipment protection, contact coordination, and community partnership effectiveness.

- Tabletop Exercises:

  » Conduct post-season drills to test updated ERPs, IWCPs, and response protocols, including site hazard controls and equipment protection.

- Mental Health Review:

  » Evaluate EAP usage and stress management needs for personnel affected by wildfires, post evacuation and/or return to site activities.

- Communication Review:

  » Assess the effectiveness of internal and community updates regarding the resource coordination during wildfires.

- Recommendations and Follow-Up:

  » Summarize lessons learned and propose updates to wildfire plans, training programs, and community engagement strategies.

8.2 Program Evaluation and Continuous Improvement

Background or Issue:

To support consistent quality and adaptive management, operators are encouraged to periodically assess the effectiveness and maturity of their wildfire preparedness programs. Without being prescriptive, organizations may choose to adopt a simple self-assessment or scorecard to evaluate readiness elements such as vegetation hazard reduction outcomes, exercise performance and lessons implementation, equipment reliability and maintenance, and the timeliness and clarity of inter-agency communications.

Best Management Practice:

A practical approach to describing program maturity is to identify targeted actions that move specific components forward over time. Outcome-oriented indicators (e.g., reduction of priority fuels within defined zones, proportion of personnel trained to role, corrective actions closed from exercises or events, and time-to-notification during elevated wildfire indices) can help track progress season over season. Annual reviews should capture decisions, document improvements, and refresh objectives for the coming year.

9.0 SUMMARY

The modern oil and gas industry has improved its preparedness and response to the challenge of annual wildfire risks.

By embracing these principles and implementing the recommendations in this document, operators can reduce the impact of future

wildfires, safeguarding people, property, and the environment.

For additional resources on wildfire safety, visit EnergySafetyCanada.com/Resources

APPENDIX A: HIGH-LEVEL SUMMARY OF ACTIONABLE RECOMMENDATIONS

Prevention

- Implement routine vegetation and fuel management programs in all high-risk zones, prioritizing areas within 50–100m of critical assets.
- Maintain dynamic records of all potential ignition sources; instate strict controls and seasonal activity limitations aligned with local fire bans and forecast indices.
- Invest in layered fire detection technology (sensors,, satellite monitoring); ensure integration with regional/provincial wildfire intelligence platforms.
- Establish a robust routine inspection and maintenance program for oil and gas equipment such as flare stacks.
- Foster partnerships for landscape-scale fuel management with local governments, forestry agencies, and Indigenous rightsholders.

Preparedness

- Complete multidisciplinary risk assessments updated before each wildfire season, incorporating the latest hazard mapping and lessons learned.
- Develop, review, and exercise ERPs annually, ensuring all staff are trained on wildfire-specific hazards, evacuation, and notification protocols.
- Build and test robust emergency communication tools, including redundant notification channels and backup systems.
- Deepen engagement with local authorities and neighboring operators to identify shared threats and resources and formalize mutual aid agreements.
- Define and communicate evacuation triggers in ERP; rehearse them during tabletop exercises.

Response

- Ensure round-the-clock monitoring for signs of wildfire, institute clear protocols for incident escalation and notification in line with regulator expectations.
  - » Pre-stage firefighting and suppression resources; train crews in site-specific tactics and integration with incident command systems.
- Prioritize personnel safety at all stages; enact defined air quality/travel restrictions and ensure availability of personal protective equipment.
- Rigorously document all response actions for subsequent review and regulatory compliance.

Recovery

- Develop, resource, and regularly update business continuity and recovery plans, including explicit support for staff health and well-being.
- Establish steps for rapid re-entry, restoration, and remediation, adhering to environmental and regulatory obligations.
- Engage in structured after-action reviews following each incident, and institutionalize lessons learned into future planning and risk mitigation.

APPENDIX B: SAMPLE BRIEFING TEMPLATE FOR WILDLAND FIREFIGHTERS

Facility Name/Location: [Details]

Key Contacts: [Emergency Coordinator, Phone/ Radio]

Hazards Summary:

- Flammable Tanks: [Locations/Quantities] – Risk of explosion.

- H2S Areas: [Locations] – Toxic; use monitors, stay upwind.
- Access: [Routes, Gate Codes].

Resources: Water sources at [locations]; foam systems available.

Resource capability / Capacity for Firefighting

Equipment availability

Map: [Include diagram].

By following this guidance, your company can foster effective collaboration, reducing risks for all involved.

APPENDIX C: ABBREVIATIONS

- AAR: After-Action Review
- AER: Alberta Energy Regulator
- AQHI: Air Quality Health Index
- AQI: Air Quality Index
- ATV: All-Terrain Vehicle
- BCER: British Columbia Energy Regulator
- BCWS: British Columbia Wildfire Service
- BMP: Best Management Practice
- BMPs: Best Management Practices
- CAPP: Canadian Association of Petroleum Producers
- CER: Canada Energy Regulator
- CIFFC: Canadian Interagency Forest Fire Centre
- CSA: Canadian Standards Association
- CWFIS: Canadian Wildland Fire Information System
- DPF: Diesel Particulate Filter
- EAP: Employee Assistance Program
- EMCR: Emergency Management and Climate Readiness (BC)
- ENR: Environment and Natural Resources (NWT)
- ERP: Emergency Response Plan
- ESC: Energy Safety Canada
- FBP: Forest Fire Behaviour Prediction System
- FKOD: Flare Knock-Out Drum
- GIS: Geographic Information System
- GPS: Global Positioning System
- HVAC: Heating, Ventilation and Air Conditioning
- ICS: Incident Command System
- IMT: Incident Management Team
- IWCP: Industrial Wildfire Control Plan
- IZ: Industrial Zone
- MODIS/VIIRS: Moderate Resolution Imaging Spectroradiometer / Visible Infrared Imaging Radiometer Suite
- NFPA: National Fire Protection Association
- NIST: National Institute of Standards and Technology
- 5OFTS: Open Fire Tracking System (BC)
- OHS: Occupational Health and Safety
- OHV: Off-Highway Vehicle
- PTMOs: Provincial/Territorial Marketing Organizations
- RCMP: Royal Canadian Mounted Police
- ROW: Right-of-Way
- SCADA: Supervisory Control and Data Acquisition
- SPIGEC: Saskatchewan Petroleum Industry and Government Environmental Committee
- SPSA: Saskatchewan Public Safety Agency
- TEK: Traditional Ecological Knowledge
- WUI: Wildland–Urban Interface

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