

Technical Considerations from Feb. 2023 Engagement

Topic	Summary of Technical Input Provided
Unlit Flares	Set requirements for new and existing flare stacks to be equipped with auto-igniters, flame out detection, or active monitoring/regular inspection of flare stacks using technology or visual means capable of determining if the flare is unlit and maintain supporting records.
Unlit Flares	Replace inefficient flare stacks with higher efficiency flares.
Unlit Flares	Specify a destruction and removal efficiency limit (maybe 98%) for all enclosed combustors.
Surface Casing Vent Flows (SCVFs)	Given that SCVF is likely a minor contributor to overall methane emissions for the oil and gas sector but may result in very high abatement costs together with the technical challenges, it is recommended that research be supported to ensure SCVF repair and risk-based closure activities continue to inform solutions.
Surface Casing Vent Flows (SCVFs)	For inactive, non-producing, or abandoned wells, prescriptive inspection requirements for SCVFs are not recommended, rather a risk-based approach or a minimum detection limit approach is proposed. Considerations include accessibility challenges on reclaimed leases, costs of re-entering well bores and risk to wellbore integrity.
Surface Casing Vent Flows (SCVFs)	For active wells the challenges associated with abatement options may be on a case-by-case basis. Common issues that may occur are technical, such as addressing risks associated with placing backpressure on the surface casing, extremely high abatement costs and risk of production shut-ins given the lack of ability to control or destroy emissions from this source without re-entering producing wells and risking their integrity while others are regulatory, related to ownership of resource rights associated with the natural gas leak.
Glycol Dehydrators	Establish a venting limit for new glycol dehydrators - less than 20 tonnes/ year/dehydrator for any glycol dehydrator.
Glycol Dehydrators	For existing glycol dehydrators, propose a fleet-average approach (e.g. no more than 25 tonnes /year) for a permit holder's overall inventory instead of equipment-specific requirements. A fleet approach allows permit holders to flexibility to choose their focus areas such as higher emitting systems or those with longer asset life.
Glycol Dehydrators	Establish a performance thresholds for new glycol dehydrators - must achieve a 95% methane control efficiency.
Well Liquids Unloading	It is noted that well liquids unloading events are infrequent and of short duration and there are constraints for existing infrastructure depending on facility design, health and safety risks, process conditions, lease size that limit options for conservation and/or destruction. It is recommended that research be supported to simplify and increase the efficacy of mitigating liquids unloading emissions activities continue to inform solutions.
Well Liquids Unloading	For new sites establish design requirements to ensure the destruction (flaring) of methane emissions.

Well Liquids Unloading	For new or existing sites establish a monthly non-routine vent volume limit per site with additional consideration for less stringent and fleet average limits on existing sites.
Pipeline Blowdowns	Practical constraints must be recognised that may limit how methane emissions associated with pipeline blowdowns can be controlled by conservation or destruction. Practical considerations must account for health and safety concerns preventing damage to people, the environment, or equipment, as well as technological limitations that occur under certain conditions, including low gas flow rates and volumes , pressure threshold and system reliability. Proposed regulatory solutions must recognize the differences between planned and unplanned pipeline blowdowns. Regulation must consider an appropriate phase in period to implement any approach and limits.
Pipeline Blowdowns	For new or existing sites establish a monthly non-routine vent volume limit per site with additional consideration for less stringent and fleet average limits on existing sites.
Uncontrolled Storage Tanks	For new and existing tanks decrease the tank venting limits, consider approaches for tank venting limits as set by Colorado. Consider design controls on tanks and monitoring such as proposed by the United States Environmental Protection Agency (US EPA).
Uncontrolled Storage Tanks	Implement a fleet average approach to allow permit holders flexibility in addressing factors such as efficiency in reducing overall emissions, cost effectiveness, physical limitations of existing sites, technical considerations of different tank types/applications and health and safety issues.
Compressor Engine Exhaust	It is noted that emissions associated with compressor engine exhaust is still a poorly understood source. It is recommended that research be conducted by the BC Methane Emissions Research Collaborative (MERC) to identify issues specific to BC. And, any regulatory solutions and timelines must be informed by research results, the availability of deployable technology and time required to design, order and install new equipment.
Compressor Engine Exhaust	One broader policy recommendation is that the BCER work with government partners to understand and address challenges around electrification at oil and gas facilities.
Compressor Engine Exhaust	Another broader policy recommendation is that BCER work with government partners to seek regulatory alignment and consistency in regulatory frameworks around existing engine exhaust regulations (e.g., Multi-Sector Air Pollutant Regulations).
Compressor Seals	Mitigation options should include the use of both gas conservation and destruction equipment. Any revision to existing requirements around the use of equipment- specific and fleet average methane emission limits should be informed by a review of the Drilling and Production regulation methane emissions 2022 reported data and proposed US EPA requirements.
Performance Thresholds for Methane Conservation and Destruction Equipment.	<p>Establish performance thresholds for conservation and destruction equipment based on the Original Equipment Manufacturer specifications instead of arbitrary numbers and ensure options support the widest range of technological solutions.</p> <p>Where performance thresholds are set it should consider factors such as sound operating conditions in control of the operator, equipment downtime (including equipment failures, upsets, inspections, maintenance and repairs), future procurement challenges and impacts of retrofitting at existing sites and the potential impacts due to current investments in equipment with high destruction efficiencies.</p>

Pneumatic Devices	<p>For newly installed pneumatic devices establish design requirements to ensure it is zero-bleed.</p> <p>For pumps and pneumatic devices at existing facilities establish an appropriate timeline (maybe 2035) to be non-emitting.</p> <p>Regulatory provisions must make accommodations for equipment that is used infrequently, safety critical or emergency equipment, or cost of conversions and where natural gas is the only option to power pneumatic devices.</p>
Pneumatic Devices	Require all new and existing pneumatic devices and pumps to be non-emitting or to capture their emissions starting in 2025 or in line with US EPA Proposed Rule.
Pneumatic Devices	One broader policy recommendation is that the BCER work with government partners to assess how programs with financial instruments (output-based pricing system -OBPS) can incent the change-out of newly installed low-bleed devices.
Pneumatic Devices	Replace pneumatic gas with compressed air.
Equipment Leaks and leak detection and repair (LDAR)	<p>Complementing current survey requirements with an annual industry-wide top-down survey of all facilities identify emissions sources not identified by current leak inspections and develop a program for ground-level follow-up to determine source attribution and appropriate action.</p> <p>Identify the possibility of provincial measurement based LDAR program or collective action to achieve economic efficiency related to leak detection.</p>
Equipment Leaks and leak detection and repair (LDAR)	<p>Continue to permit and explicitly allow for the approval of alternative LDAR approaches in regulation.</p> <p>Increase BCER's enforcement to improve compliance with LDAR requirements; consider penalty framework for non-compliance with reporting similar to that of New Mexico.</p> <p>Adopt an internationally recognised measurement and reporting framework.</p>
Equipment Leaks and leak detection and repair (LDAR)	Identify any additional requirements for leak detection and repair including frequency and timelines for repair based on a risk-based and facility/source type approach, informed by limitations of existing approaches, BC MERC research on ground level fugitive inspections; unique challenges for reliability, safety and availability associated with the transmission sector and proposed US EPA rules on routine fugitive emissions targeting largest emissions.
Existing Facilities	For new facilities set more stringent standards for new equipment as compared to existing operations. This will allow permit holders to incorporate new and emerging methane abatement technologies.

Existing Facilities	<p>For existing facilities provide flexibility for permit holders to assess and identify the best opportunities for methane abatement. Inputs into decision-making include: operational or physical site limitations which were designed and approved under different regulatory requirements, technology readiness and effectiveness, extent of engineering required, supply chain capabilities such as material availability and availability of trained and qualified resources to use or install the technology, financial impacts including early closures aging fields, direct/indirect contributions to the province's economy, and for some permit holders reliability of gas supply to customers.</p> <p>Regulatory options include a performance-based approach, use of fleet averages, or use of a decision- tree approach.</p> <p>Regulation must consider an appropriate phase in period to implement any approach and limits.</p>
Existing Facilities	<p>One broader policy recommendation is that the BCER work with government partners to assess how programs with financial instruments (such as output-based pricing system -OBPS) can incent adoption of new methane abatement technologies.</p>
Survey Methodologies for Leak Detection and Repair- (LDAR)	<p>Continue to and enable alternative approaches for detection technologies/LDAR programs that allows flexibility for permit holders, promote innovation, streamline requirements through clear criteria for evaluation of alternatives and adopt compliance tools such as audits and reporting rather than a reliance on theoretical modelling where alternative technologies have been proven successful in neighbouring jurisdictions.</p>
Survey Methodologies for Leak Detection and Repair- (LDAR)	<p>Assess where the increase of survey frequency for well sites and facilities brings overall additional benefits in leak reduction and the role quantification and detection plays in an effective and comprehensive methane reduction strategy. It has been observed that an increase in survey frequency at well sites may bring limited value in methane emissions abatement since the quantity of emissions from well sites is much less than that at large facilities and the overall cost benefit does not add value especially for wellsite's that are very remote, have winter-only access when one weighs that costs, emissions, and safety concerns associated with access using ice roads and truck or helicopter.</p>
Decision-Tree Approaches	<p>There is general support for the use of a decision-tree approach to guide methane emission reductions since it can serve to simplify regulatory language and offer flexibility to permit abatement opportunities based on consideration of many factors such as: safety, technical feasibility, economics (including carbon pricing mechanisms, life expectancy of fields, fines) geography and accessibility and operational response time.</p> <p>The decision-tree process must clearly state the sources to which it applies and does not apply.</p> <p>The decision-tree process must balance administrative burden and ensuring permit holders demonstrate due diligence in assessment of options.</p>
Performance-based Regulation	<p>There is general support for the use of performance-based regulations which can be implemented as a complement to source-specific regulations with formal off ramps, where required. Models include: existing fleet averages and site limits used by BCER, operator-level performance based approaches such as adopted by Saskatchewan's Oil and Gas Emissions Management Regulations or intensity targets that early or voluntary methane abatement actions already taken by permit holders.</p> <p>Broader policy options include regulation supported by overall emissions limits for activities based by production types and financial instruments (such as taxing of methane) based on measurement of emissions vs quantification using emission factors).</p>

Performance-based Regulation	Performance-based regulations provides more flexibility for certain sub-sectors (such as natural gas transmission pipelines) to reduce methane emissions at a system level rather than at the facility level.
Performance-based Regulation	Any regulation must ensure that emission reductions at well sites of varying sizes and vent rates are included and that the focus is not only on larger-emitting facilities.
Other	<p>A number of other specific issues have been identified (this is not an exhaustive list):</p> <p>Create special considerations for emergency venting intended to safeguard people and the environment and avoid damage to operational equipment.</p> <p>Expand source to include reporting requirements for pipes, hatches, and sampling and pressure relief systems; revisit existing provisions for exemptions for pneumatic compressor starters and evaluate options for crankcase venting.</p> <p>Adopt a super emitter response program as proposed by the US EPA. The proposed program is intended to supplement LDAR inspections and find additional super-emitters that can occur in between routine LDAR inspections.</p> <p>Accelerate timelines and targets for 2030 and create a framework for permit holders to make net-zero commitments.</p> <p>Broader policy are to encourage BCER government partners to use an up to date global warming potential (GWP) for methane not the 2007 GWP numbers; increase use of economic instruments such as fuel tax and pricing for methane from oil and gas operations.</p> <p>Confirmation of whether BCER's monitors capped well sites to determine if there are methane emissions.</p>