

Directive 087 (released March 2021) Stakeholder Feedback and AER Response



Stakeholder Feedback – Issue	Stakeholder	AER Response
General		
Have a reference section in the document that links all the associated Directives and regulations. (Make document more user friendly).	CAPP	We do not wish to start including long lists of cited documents because it is important that they be understood in context. For this directive, we have hyperlinked documents at every mention instead of just at first mention. We will continue to look at ways of making our documents as user friendly as possible.
<p>The Directive provides no allowance for alternative approaches to manage low rate SCVF/GM.</p> <p>Recommend CAPP to work with the AER to identify alternative approaches to manage low rate SCVF/GM, and develop a risk-informed approach to managing such well integrity issues post abandonment and reclamation.</p>	CAPP	This will require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It will also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something we can explore for future editions for the directive.
Section 1, “Introduction”		
<p>Provide clarification on the terminology “must”, “recommends” & “expects”. Common interpretation suggests that “must” and “expects” indicate industry “must” comply.</p> <p>[Section 1.2, page 2]</p>	CAPP	As section 1.2 states, the term “must” indicates a requirement, while terms such as “recommends” and “expects” indicate a recommended practice.
<p>In the Directive provide a link to the information available on the AER website regarding compliance and enforcement.</p> <p>[Section 1.2, page 2 AER Requirements]</p>	CAPP	We added a link to our compliance assurance program webpage.

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Records retention “for the life of the well plus two years, unless otherwise noted.”</p> <p>Recommend to change wording to ... Unless otherwise noted by the AER</p> <p>If the asset(s) get sold, eliminating environmental issues may easily go missing if anybody can note why they are not kept.</p> <p>Up to date and current SCVF and GM tests must be part of all disclosure. Keeping environmental records from tests done 25 years ago are worthless.</p> <p>[Section 1.4, page 3]</p>	<p>Surface Solutions</p>	<p>We have added the text “... unless otherwise authorized by the AER.”</p>
<p>Section 2, “Isolation Packers”</p>		
<p>The proposed 50 kPa and 24-hour pressure test limits are too restrictive. Keep the 3% of test pressure criteria in the current <i>ID2003-01</i> and retain the current 10-minute pressure test.</p>	<p>7Gen, Tervita, CAPP, Chevron, Rockpoint, Shell</p>	<p>The 3% threshold in <i>ID2003-01</i> currently equates to 42 kPa for tests performed at 1400 kPa, and we have moved to 50 kPa, providing a wider range than what is currently offered. <i>ID2003-01</i> did not allow licensees to test at a higher pressure in order to gain the benefit of a wider loss tolerance. If licensees were doing this in the past, they were not in compliance.</p> <p>The 24-hour test is intended to provide the tester with feedback on a slow leak that may cause pressure building in the annular space over time.</p> <p>The 15-minute test aligns with <i>Directive 051</i> and provides greater confidence when extending testing interval to triennial for class 2 wells.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
The proposed directive does not document the requirements for the initial placement and testing of packers in wells with 50 Moles/kMole H ₂ S.	CAPP, Surface Solutions	Section 7.050 of the <i>Oil and Gas Conservation Rules</i> requires producing wells with 50 moles per kilomole H ₂ S to be equipped with a packer, unless these wells are produced by artificial lift systems. <i>Directive 051</i> addresses the initial placement of packers for injection/disposal wells, and the proposed directive was not intended to cover this requirement. We recognize the gap in requirements for initial placement of packers in high H ₂ S wells and will consider how to address this in the future.
Clarity is needed when describing when packers must be left in the well for the life of the well.	CAPP	Revised the wording as follows: After initial placement, for all wells where a packer is required, the packer must remain in the wellbore, be tested for the life of the well, and meet all requirements of this directive until suspension requirements of <i>Directive 013</i> or abandonment requirements of <i>Directive 020</i> are met, or the well is converted to a well type where a packer is not required.
Clarity needed in Table 1 when referring to well classifications and multi-classed wells and where acid gas injection wells align.	Shell	Some wells have multiple classifications. The table is intended to highlight that wells must be tested at the highest risk class. Acid gas injection wells are classified as class III in <i>Directive 051</i> and follow that testing criteria. Acid gas wells may have additional requirements specified in approvals or other regulations.
Clarity is needed for class Ia wells that require a minimum 500 kPa and continuous monitoring systems on the annulus and whether these wells require a 24-hour build-up test.	Shell	Class 1a wells require a minimum 500 kPa pressure on the casing annulus at all times (unless a fluid level detection system is used). While a 24-hour build-up test is not typically required for class Ia wells with continuous monitoring systems, there may be situations where a build-up test is warranted.
Conducting packer tests as close as practical to normal operating conditions is difficult in some well types and configurations.	Tervita,	This is a should statement, not a requirement. Licensees must determine what's required to complete an appropriate packer isolation test.

Stakeholder Feedback – Issue	Stakeholder	AER Response
The required data frequencies for manual and electronic data logging recording are different.	Surface Solutions, Tervita,	The requirement to prove hydraulic isolation is that the trend over the pressure test period is stabilizing and licensees have the option to record the test data manually or by means of electronic data loggers. Electronic data loggers are capable of recording data at higher frequencies whereas manual recording is more practical at once per minute.
The yearly packer testing list and the Packer Test Record provided by the AER should include additional information and mandatory requirements for all wells that must be tested annually.	Surface Solutions	The list published annually is a guide only and should not be relied on. Currently, AER systems are not capable of providing such a list. The Packer Test Record is an optional resource provided to licensees and is designed to be a general record for all classes. Licensees must know their inventory and meet testing requirements according to the well class and status as stipulated in AER regulations.
Prescriptive suggestions were made to the testing procedures, durations, cases, and criteria to ensure potential well bore integrity concerns are identified i.e. H ₂ S present in the casing and 5 second recording of tubing and casing pressures.	CAPP, Surface Solutions, Tervita,	Licensees are responsible for reviewing all test results and investigating if those results indicate a potential failure. The addition of the “Case 4” option gives licensees the flexibility to design a well-specific testing procedure that will effectively identify any well integrity concerns or potential failures in the tubing, casing, packer seal, or wellhead seal assembly.
90 days does not provide enough time to develop a repair program or complete the necessary repair work and the AER should require follow-up testing when failed tests are reported.	Surface Solutions	We will consider extension requests as required for extenuating circumstances. Follow-up testing is at the discretion of the licensee.
Clarity needed for case 4 testing procedure to ensure effective testing.	Surface Solutions	Revised wording as follows: Test procedures must effectively identify any well integrity concerns or potential failures in the tubing, casing, packer seal, or wellhead seal assembly; meet the minimum pressure and duration requirements specified in table 1 when pressure testing; and be documented.

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Clarity is needed for when a casing failure is discovered as a result of a packer isolation test to allow the well to be abandoned, suspended, or converted to another well type where a packer is not required.</p>	CAPP	<p>Revised wording as follows:</p> <p>If a casing failure is discovered as a result of packer isolation testing or repairs, the casing failure must also be reported through the designated information submission system within 30 days of detection. The failure cannot be considered repaired until a satisfactory packer isolation test is conducted and reported, or until AER suspension requirements of <i>Directive 013</i> or abandonment requirements of <i>Directive 020</i> are met.</p>
Section 3, “SCVF/GM”		
<p>Recommend to prescribe the “formation leak off pressure” at the surface casing shoe to define a serious SCVF.</p> <p>[Section 3.1.1, Page 7]</p>	7Gen	<p>Surface casings are set in various formations (various rock properties) and at various depths; therefore, max pressure allowed will vary from well to well.</p> <p>Data on formation leak-off pressure at surface casing shoe is often not available. (Data usually obtained during drilling operations. Data would be difficult to obtain after intermediate or production casing is cemented in place)</p> <p>11 kPa/m is used as a conservative gradient.</p>
<p>Provide clarification regarding a flow/pressure identified through intermediate casing annuli (whether these are vent flows or not).</p> <p>Reporting annular pressure on intermediate casing annuli enables risk assessment to ensure an adequate response.</p> <p>Recommend creating a new DDS incident report. This will allow AER to track the frequency and record the data for these types of failures.</p> <p>[Section 3, page 7]</p>	CAPP, Shell	<p>Section 12.141 of the <i>OGCR</i> requires the licensee to notify the AER immediately on detection of a casing leak or failure. Flow identified through intermediate casing annuli falls under this definition. It should be repaired as per the requirements for a casing failure or a “serious” vent flow.</p> <p>A new DDS report cannot be created at this time.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Going forward, will wells that were previously reclassified to “considered non-serious” vent flows (that AER accepted as non-serious provided certain criteria were met) be reclassified as serious or be grandfathered?</p> <p>[Section 3.1, Page 7]</p>	CAPP	<p>Licensees should review their inventory to confirm that the conditions are still applicable and that vent flow should still be considered non-serious within 12 months of the release of this directive. No grandfathering is being instituted. If the SCVF is now classified as “serious,” the licensee can repair the well or submit a deferral of repair request to Well Operations.</p>
<p>Remove item “(f) the well was previously abandoned (cut & capped)” from the expanded criteria for classification of a ‘Serious’ SCVF</p> <p>Risk of a vent flow should be driven by risk to public and the environment.</p> <p>As part of a well integrity directive, including well status as part of a severity consideration seems inappropriate.</p> <p>[Section 3.1.1 (15) f, Page 7 and Section 3.1.4 (18) b, Page 8]</p>	CAPP	<p>Risk is higher if the well was abandoned in a safe and secure state, and that state has now changed (well integrity is compromised and now the well is leaking).</p> <p>There is no regular surveillance on these wells to flag when there is a well integrity issue. The issue is usually only identified when environmental damage is observed at surface.</p> <p>We classify “leaking abandoned wells” as higher risk as it directly impacts environmental and public safety.</p>
<p>Provide guidelines as to what constitutes a gas migration and specify the parameter to be used to classify the gas migration as serious or nonserious.</p> <p>[Section 3.1.5, Page 8]</p>	CAPP	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider in future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Consider extending the SCVF testing requirement to within 60–90 days of detecting a SCVF for logistical reasons.</p> <p>[Section 3.2.1, Page 9]</p>	<p>CAPP</p>	<p>Current regulations require a licensee to report an SCVF incident (flow rate and stabilized build-up pressure) within 30 days of detection. Intention is to investigate and verify that the SCVF is not serious in a reasonable amount of time (e.g., immediate action may be required if H₂S leaking from the well).</p> <p>This requirement is also meant to cover detection of any fugitive emissions throughout the entire life cycle of the well.</p> <p>This criterion is necessary with respect to other methods used for conducting fugitive emissions surveys or screening as required by <i>Directive 060</i>. If fugitive emission is detected by one of the methods above, you are required to investigate and confirm if an SCVF issue is present and determine if it is “serious” (confirm the fugitive emissions is coming from the well).</p>
<p>For vent flows that are very low rate (too small to measure), it can be a challenge to obtain a stabilized flow rate and stabilized shut-in build-up pressure trend.</p> <p>Define a minimum level for reporting and what is the threshold for TSTM.</p> <p>[Section 3.2.1 (22), Page 9]</p>	<p>CAPP</p>	<p>Defining a minimum level would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and government. This is something to consider in future editions of the directive.</p> <p>Because we do see cases where flow rate is very low but shut-in pressure is high, we do not want to exclude measurement of both rate and pressure in these cases.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Clarify what is meant by “Where an SCVF test (such as a bubble test) indicates that a leak may be present, and a vent flow is confirmed, ...”</p> <p>Recommend to remove the wording “and a vent flow is confirmed”.</p> <p>[Section 3.2.1 (22), Page 9]</p>	<p>CAPP, Tervita</p>	<p>We use the general term “SCVF test” to indicate that there are more ways than a bubble test to detect if a vent flow is present (e.g., various methods are used to conduct fugitive emissions surveys or screenings; see <i>Directive 060</i> and <i>Manual 016</i>). If fugitive emission is detected by one of these other methods, you are required to confirm if an SCVF issue is present (confirm the fugitive emissions is coming from the well).</p> <ul style="list-style-type: none"> • The bubble test is a fast and cheap method for identifying a vent flow that all operators can easily do with minimum effort. • Use of a bubble test for screening, followed by an actual rate measurement (m³/day) and shut-in build-up pressure (kPa) was the cost-effective tradeoff for implementing higher accuracy methods.
<p>Provide clarification for this requirement...</p> <p>After detecting a “nonserious” or “considered nonserious” SCVF, the licensee must perform an SCVF test in each of the following two calendar years to detect possible changes.</p> <p>As written, one could interpret the requirement as tests in years 1, 2, 3 & 6.</p> <p>Consider the initial test as year 1 and test one additional year as confirmation. (Recommend testing in year 1, 2 & 5.)</p> <p>[Section 3.2.1 (23), Page 9]</p>	<p>CAPP</p>	<p>Under current regulation and practice, the five annual SCVF tests are conducted after reporting the initial test results that confirm the SCVF is non-serious. (The initial detection test was not counted as part of the five annual tests required.)</p> <p>Two data points are not enough data to establish a reliable trend. The requirement is that after initial test, follow-up tests must be conducted in years 1, 2, and 6.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Regarding the requirement ... licensees must investigate the problem and submit a mitigation plan with proposed timing for the repair of the well to WellOperations@aer.ca within 90 days of the detection date.</p> <p>Ensure that a monitoring plan for low-risk wells (mirroring annual testing requirements for new SCVF) is considered as part of timing for the repair.</p> <p>Also, repair timing should be done on a risk-based approach, so it can be done efficiently as part of ABC projects as appropriate.</p> <p>In the past it was recommended to add “re-entered for repair” as a license status.</p> <p>[Section 3.4 (36), Page 11]</p>	<p>CAPP</p>	<p>This applies to wells that have already been surface abandoned (cut & capped). Risk is higher because this well was abandoned in a safe and secure state, and that state has now changed (well integrity is compromised and now the well is leaking).</p> <p>There is no regular surveillance on these wells to flag when there is a well integrity issue. They are usually only identified when environmental damage is observed at surface.</p> <p>We already classify “leaking abandoned wells” as higher risk as it directly impacts environmental and public safety.</p> <p>The requirement as written provides flexibility and provides a reasonable amount of time to investigate the problem and prepare a mitigation plan with proposed timing for the repair.</p> <p>At the moment, we are not prepared to create a new licence status.</p>
<p>Recommend revising wording to state, “Pumping any type of fluid down the surface casing annulus for the purpose of shutting off SCVF is strictly prohibited.”</p> <p>[Section 3.4 (37), Page 12]</p>	<p>CAPP</p>	<p>The wording has been revised as follows:</p> <p>A licensee must not pump any type of fluid down the surface casing annulus for the purpose of repairing an SCVF or gas migration.</p>
<p>Provide clarification on the minimum requirements to support determination of origin source of SCVF (e.g. Is fluid analysis sufficient enough for determining source?).</p> <p>[Section 3.4.1 (2nd bullet), Page 12]</p>	<p>CAPP</p>	<p>This is left open intentionally to allow industry experts to determine the appropriate tools necessary to confidently identify the source of the SCVF/GM (with examples provided of some diagnostic tools.)</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Reinstate option for deferral of SCVF repair by “Capping with Pressure”.</p>	<p>CAPP, NuVista</p>	<p>Well integrity issues that have not been repaired before being abandoned can potentially escalate in nature (e.g., corrosive fluids exposed to casing could lead to premature casing failure and result in public safety and environmental concerns).</p> <p>In the event of a well strike scenario, this could also lead to public safety and environmental concerns.</p> <p>The requirements as written in <i>Directive 020</i> (installation of a vented cap) allow for detection of a well integrity issue at well location.</p>
<p>These sections use the term “should”</p> <p>“Should” is not included in Section 1.2 “AER Requirements”. Provide clarification on expectations and requirements for end user.</p> <p>Include and define “Should” within section 1.2</p> <p>[Section 3.4.3, (Deferral with Installation of a Burst Plate & by Producing a Serious SCVF), Page 14]</p>	<p>CAPP</p>	<p>The term “must” indicates a requirement, while terms such as “expects” and “should” are not requirements.</p> <p>The term “should” is used to allow for some flexibility on deferral request and provide a list of possible information to submit with the request.</p>
<p>Provide clarification on SCVF testing requirement... “If these tests indicate that the stabilized shut-in pressure or flow rate is trending towards becoming a “serious” SCVF, then additional annual testing is required until the licensee can reasonably demonstrate that the SCVF status will not become a “serious” SCVF.”</p> <p>“... until licensee can reasonably demonstrate” – does this mean monitoring is required for an additional 2 calendar years?</p> <p>[Section 3.2.1 (23 b), Page 9]</p>	<p>Chevron, Tervita</p>	<p>If the trend based on the three data points (initial test, year 1 and 2) is trending towards becoming a “serious” SCVF (will eventually trigger one of the criteria used for “serious” SCVF classification), then additional annual testing must be done until you can reasonably demonstrate that the SCVF will not become “serious.”</p> <p>The wording “the ‘nonserious’ SCVF is not trending towards becoming a ‘serious’ SCVF” was unanimously agreed to in workshops with CAPP.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Provide clarification on repair requirement (casing integrity test component) that “the pressure test trend must demonstrate a decreasing rate of change approaching a stabilized pressure close to the maximum operating pressure over a minimum 10-minute period.”</p> <p>[Section 3.4.1 (last bullet), Page 13]</p>	<p>Chevron</p>	<p>Intentionally left open to provide some flexibility for industry experts to determine the appropriate pressure at which to conduct the pressure test to verify casing integrity under normal operating conditions.</p>
<p>Provide clarification that this requirement is only required on single-barrier frac systems as per Directive 083.</p> <p>[Section 3.2.1 (21 c), Page 8]</p>	<p>IPCC</p>	<p>Requirement 20(b) and(c) have been revised as follows:</p> <p>b) before initial fracturing operations for a single-barrier system (see <i>Directive 083</i>);</p> <p>c) between 60 and 90 days after completing fracturing operations for a single-barrier system (see <i>Directive 083</i>);</p>
<p>Recommend revising wording to allow for testing under differing weather conditions provided reliable results can be obtained.</p> <p>Restricting GM testing to summer months which may delay surface abandonment or otherwise impede abandonment timing and costs.</p> <p>[Section 3.2.2 (25), Page 9]</p>	<p>IPCC</p>	<p>Requirement provides flexibility by stating “... when environmental conditions will provide a relevant and reliable reading.”</p> <p>Licensees should take into consideration the impact of soil saturation levels, shallow water table, the necessity to have the sample probe in the vadose zone, and the possibility that the wellhead may be located in a fully saturated surface depression.</p> <p>Licensees should take into consideration atmospheric conditions such as temperature, wind speed, smog, and humidity (e.g., fog, rain, snow, sleet) must be suitable for drawing a detection sample.</p> <p>Licensees should use equipment that is capable of measuring methane.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Provide clarification on the terminology “...wells with one casing string...” Unclear if this applies to shallow gas wells with conductor and production casing.</p> <p>Require GM testing only when a well does not have a surface casing vent assembly and on wells located in the test area per Directive 020 Section 7.1.1.</p> <p>Gas Migration tests for abandonment wells is not always practical (timing presently generally restricted to summer) and it also raises costs.</p> <p>[Section 3.2.2 (26), Page 9]</p>	<p>IPCC</p>	<p>For wells with one casing string, or wells with only conductor and production casing set, there are no alternative testing methods (gas migration testing is only option available).</p> <p>Typically, a vent assembly is not installed on the annulus between the conductor and production casing. If there is a vent assembly installed, you are able to conduct SCVF test to confirm if there is a well integrity issue or not.</p> <p>Licensees are responsible for knowing their well inventory and conducting gas migration testing when environmental conditions will provide a relevant and reliable reading. They are also responsible for reviewing all test results and investigating if those results indicate a well integrity issue is present.</p>
<p>Suggest removal of this recommendation that all wells be tested for gas migration before abandonment.</p> <p>Section 3.2.2 lays out risk-based reasoning for completing GM testing. This recommendation potentially undermines this.</p> <p>[Section 3.2.2 (27) Page 10]</p>	<p>IPCC</p>	<p>This is a recommendation and not a requirement.</p>
<p>Provide rationale for creating the new category of “Considered Nonserious” Surface Casing Vent Flow?</p> <p>Recommend to keep the two existing categories of “Serious” and “Nonserious” Surface Casing Vent Flow.</p> <p>[Section 3.1.2, Page 7]</p>	<p>NuVista</p>	<p>“Considered Nonserious” Surface Casing Vent Flow is an existing classification.</p> <p>This classification is for any gas and liquid coming to surface via the surface casing vent with a differentiation for the coverage of the nonsaline water zones, especially if it is a liquid flow (which is an SCVF).</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Suggest to redefine the criteria of a surface casing vent flow.</p> <p>Define a lower limit for flow rate or shut-in build-up pressure that is considered insignificant and acceptable to leave “as is.”.</p> <p>Recommend a minimum vent flow rate of 0.5 m3/day.</p> <p>The current approach to repairing SCVF/GM makes no consideration of cost vs. benefit or net environmental benefit. Allocating resources to address these very low rate vent flows diverts attention and resources away from more significant issues. The net environmental benefit of addressing these low rate vent flows is questionable as repair scenarios may result in greater net emissions, waste or land disturbance.</p> <p>[Section 3.1.1 (15), Page 7]</p>	<p>NuVista</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>The request to notify if a vent flow is identified through the intermediate casing is new to the Directives without specifying the reporting, testing and repair requirements.</p> <p>In the Directive provide the reporting, testing, and repair requirements for well integrity issues identified on an intermediate casing annulus (similar to the guidance provided for a SCVF).</p> <p>[Section 3.0, Page 7]</p>	<p>Shell</p>	<p>Section 12.141 of the <i>OGCR</i> requires the licensee to notify the AER immediately on detection of a casing leak or failure. Flow identified through intermediate casing annuli falls under this definition. It should be repaired as per the requirements for a casing failure or a “serious” vent flow.</p> <p>A new DDS report cannot be created at this time.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Consider defining where/when a vent meter is required to classify the stabilized flow rate (i.e., above a certain bubble/minute count rate).</p> <p>Low bubble/min rate vent flows will not exceed the 300 m³/d serious criteria.</p> <p>Establishing a bubble/min criteria for when flow rate testing is required will enable more efficient SCVF testing while still safeguarding well integrity.</p> <p>The requirement to add a meter to all failed bubble tests is more stringent requirement than previous.</p> <p>[Section 3.2.1 (22), Page 9]</p>	<p>Shell</p>	<p>Appendix 2 indicates that “equipment selection should be based on previous observations indicating what flow rate and pressure range can be expected. A calibrated flow meter capable of measuring low or intermittent flow rates is necessary to measure low volumes accurately.”</p> <p>Better quality data for flow rate and build-up pressure are required after an SCVF has been confirmed.</p>
<p>Provide clarification on what would be considered a repair attempt for count purposes.</p> <p>[Section 3.4 (35), Page 11]</p>	<p>Shell</p>	<p>As indicated in section 3.4.1, option 1, a routine SCVF/GM repair attempt might include perforating or creating slots and cementing the casings either</p> <ul style="list-style-type: none"> • at or below the source and circulating cement across the source formation or • at the barrier immediately above the source, if performing a cement squeeze.
<p>Description of “serious” gas migration is incomplete.</p> <p>Explicitly define air emissions an environmental impact.</p> <p>Specify an acceptable rate of GM emission.</p> <p>[Section 3.1.4 (18), Page 8]</p>	<p>StFX</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Description of “serious” gas migration lacks relationship to test procedure.</p> <p>Normally “serious” gas migration would be assessed quantitatively, and then the other criteria (fire hazard, near aquifer wells, etc.) would be applied secondarily. So, why is a test procedure even recommended if its results do not factor into the ranking? If it’s because the test procedure is weak or qualitative, then it should be replaced.</p> <p>[Section 3.1.4 (18), Page 8]</p>	<p>StFX</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>The Directive is missing guidance on measurement to identify the problem.</p> <p>This section outlines two testing methods: “Surface” and “In-soil,” however, the Directive provides methodologies for only the “In-soil” techniques, and does not for “surface” techniques.</p> <p>Provide methodologies for conducting “Surface” tests.</p> <p>Recommend to convene a working group and consult experts and literature to update gas migration testing methodologies.</p> <p>[Section 3.2.2 (25), Page 10]</p>	<p>StFX</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>The proposed Directive specifies that gas migration “in-soil” measurements should not be done in the winter or wet soil conditions. There is apparently no seasonal limitation for “surface” measurements. Seasonal and other limitations are measurement- methodology dependent. Where there is no methodology specified for “surface” measurements, seasonal limitations should not be implied. Modern measurement methodologies for “in- soil” measurement may not actually be restricted by either winter or wet soils.</p> <p>Recommend to convene a working group and consult experts and literature to update gas migration methodologies.</p> <p>The regulation should be science-based.</p> <p>In respect of gas migration, the proposed Directive methodologies reflect industry practices as they have evolved organically over time.</p> <p>[Section 3.2.2 (25), Page 10]</p>	<p>StFX</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p> <p>Requirements do not prevent a licensee from conducting additional testing during winter conditions, but we require that they verify the results with in-soil testing during suitable environmental conditions.</p> <p>We are open to the use of more modern soil gas measurement methods to demonstrate the gas migration is not posing a risk to the environment and public safety. This would be reviewed on a case-by-case basis.</p>
<p>The two flow paths of migration are similar in definition only, and need separate mandates, procedures, and focus.</p> <p>Classification is centered around serious or non-serious. What constitutes a serious Gas Migration? Very little focus on this revision is around methane leaking at surface.</p> <p>Directive 79 and many abandonments are faced with increased gas migration issues – these issues are not only focused in certain parts of the province.</p> <p>[Section 3.0, Page 7]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Explain why “Note that steam and Steam condensates” is important in the Directive.</p> <p>Recommend to remove the procedures outlined in Appendix 2.</p> <p>Include updated procedures in Section 3 (same as the procedures for Packer Isolation Testing).</p> <p>Wells in different parts of the province may have unique circumstances. These unique circumstances need to be understood and communicated to the testing company so they have a better understanding of the history and the underlying reasons that may be influencing the SCVF/GM test results.</p> <p>If thermal wells, or monobore wells need their own section, this is the time.</p> <p>[Section 3.0, Page 6]</p>	<p>Surface Solution</p>	<p><i>ID 2003-01</i> did not account for unique situations for thermal wells. Steam and steam condensates (with no hydrocarbons or other fluids present) venting from the annulus of an operating thermal well does not in itself indicate an SCVF. Anything else being detected must be reported to the AER.</p> <p>Creating a new section for thermal wells and updating the suggested testing procedures for both SCVF and gas migration (appendices 2 and 3) is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Recommend to test all intermediate casing annuli the same as surface casing vents. Internal migration could also be measured and defined as intermediate casing vent flow.</p> <p>Using the wellbore design standards in 6.1.0 the intermediate casing can act as another safety annulus in case of loss of well control that gives a much high fracture gradient at 11 kPa/m.</p> <p>Where an SCVF is present, testing the intermediate annulus gives insight into wellhead seals, source determination, and interwellbore communication (D083).</p> <p>If the design of an intermediate casing annuli is the same construction as the surface casing vent, I don't see any reason not to mandate testing them for internal gas migration.</p> <p>[Section 3.0, Page 6]</p>	<p>Surface Solution</p>	<p>A new DDS report cannot be created at this time.</p> <p>Section 12.141 of the <i>OGCR</i> requires the licensee to notify the AER immediately on detection of a casing leak or failure. Flow identified through intermediate casing annuli falls under this definition. It should be repaired as per the requirements for a casing failure or a “serious” SCVF.</p> <p>Guidelines on testing all intermediate annuli is something to consider for future editions of the directive.</p>
<p>Lower the stabilized average gas flow to 100 m3/day</p> <p>If the mandate to reduce methane emissions is truly 45% we can support this by lowering this flowrate.</p> <p>Looking at the AER 2019 SCVF list a case may be made that it is achievable and cost effective to mandate a lower flowrate expectation even further.</p> <p>Allowing high rates of methane to vent to atmosphere contradicts the Alberta government’s mandate on the AER website.</p> <p>[Section 3.1.1 (15 b), Page 7]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Include “Non-saline water zone” information on the datasheet and public tracking page.</p> <p>The average service company testing SCVF doesn’t know this information so it never gets verified by an AER upload (DDS) or tracked for future reference such as an abandonment database for educational purposes.</p> <p>[Section 3.1.1 (15 a), Page 7]</p>	<p>Surface Solution</p>	<p>These data are not available.</p> <p>The data that is reported to us regarding SCVF/GM is available through our Product and Services Catalogue. (SCVF/GM parameters reported may not be updated with current testing results.) OneStop includes a module that allows the BGWP depth to be calculated.</p>
<p>Divide flowrate into ranges, so that if the SCVF falls into certain ranges then follow up remedial work is mandatory.</p> <p>Leaving SC vent shut in while performing intermediate casing vent flow test or gathering carbon isotope samples are all part of the information gathering value point that can ultimately support abandonment/repair.</p> <p>E.g.: 25 – 50 m³/day must have wellhead seal test and retest within 7 days (keeps ambient effects/changes to a minimum).</p> <p>E.g.: 50 – 100 m³/day must be submitted with corresponding Gas Migration test within 7 days.</p> <p>[Section 3.1.1 (15 b), Page 7]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Recommend to delete or include in the formation leak off pressure in public database records.</p> <p>Most commonly used is the 11 kPa/m x surface casing set depth rule.</p> <p>[Section 3.1.1 (15 b), Page 7]</p>	<p>Surface Solution</p>	<p>Surface casings are set in various formations (various rock properties) and at various depths; therefore, max pressure allowed will vary from well to well.</p> <p>Data on formation leak-off pressure at surface casing shoe is often not available. (Data usually obtained during drilling operations. Data would be difficult to obtain after intermediate or production casing is cemented in place.)</p> <p>11 kPa/m is used as a conservative gradient.</p> <p>This is something to consider for future editions of the directive.</p>
<p>Delete section 3.1.3 as it already implied anything that is not deemed serious (section 3.1.1) is classified as nonserious.</p> <p>[Section 3.1.3 (17), Page 8]</p>	<p>Surface Solution</p>	<p>Need to define “Non-serious” in this way since have two other categories: “Considered Non-Serious” and “Serious.” “Non-serious” is anything that doesn’t fit in the other two categories.</p>
<p>Recommend revising statement to read ... a vent flow is classified as serious if there is any fluid flow from SC vent in the stabilized testing period.</p> <p>Producers will argue that surging liquid is not liquid flow. They will suggest shorter term flow tests or flow tests at separate times of year where environmental conditions (winter conditions) may provide a false negative test result (liquid flow appears to be eliminated because SCV assembly is frozen).</p> <p>[Section 3.1.1 (15 d & e), Page 7]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Set a threshold for stabilized flow rate to determine flow test duration.</p> <p>Stabilized vent flow may only be flow tested for 1 hour.</p> <p>Over the course of a day the flow rate from SCVF can vary and if measuring for methane emissions taxation/credits this needs to be further defined. It would be easier to mandate a 48-hour flow test then at the end of the flow test pull out a stabilized rate – much like the buildup rate based on a shorter time period like 2 hours. Cumulative volume may be also important here.</p> <p>[Section 3.1.1 (15 b), Page 7]</p>	<p>Surface Solution</p>	<p>Industry experts may determine how much time is required to collect relevant data.</p>
<p>Conduct gas migration with every SCVF that has a stabilized build-up pressure +100 kPa.</p> <p>Need to be able to define the “problem.”</p> <p>The AER SCVF report form doesn’t allow to add a gas migration “problem” therefore the problem can’t be tracked.</p> <p>Because this is a determining factor on whether or not the SCVF is deemed serious, a gas migration test must be done with every vent flow test.</p> <p>[Section 3.1.1 (15 i), Page 7]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Add testing procedures in the directive for SCVF’s caused by wellhead seal failure. Make the issue part of the annual tracking information (may provide a possible reason for the flow rate to fluctuate)</p> <p>Nowhere in the testing procedures does it ask to test the wellhead seals. There is never a reason to test the seals because it isn’t mandated, therefore it is extremely unlikely for criteria: g) The SCVF was caused by a wellhead seal or casing failure, to ever be a reason for “serious classification”</p> <p>[Section 3.1.1 (15 g), Page 7]</p>	<p>Surface Solution</p>	<p>After detection of an SCVF, industry best practice is to check whether the SCVF is a result of a wellhead seal leak without being mandated by the AER.</p>
<p>Define a threshold for how much gas flow constitutes a fire, public safety, or environmental hazard. If LEL is a factor in this situation, please detail the limit.</p> <p>This vague description contradicts itself.</p> <p>Every vent flow that emits methane could be seen as posing an environmental hazard.</p> <p>A SCVF greater than 200 m3/day definitely has a detrimental effect on the environment but that would be hard to justify being that 210 m3 is also seen as a non - serious flow rate. That flowrate may also be fire hazard but not on a windy day.</p> <p>[Section 3.1.1 (15 h), Page 7]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>There needs to be a separate Gas Migration Section.</p> <p>With the advent of orphan wells and the focus on well abandonment issues, it is now more important for gas migration and the methods/measurements used/reported to have their own focus.</p> <p>[Section 3.1.4, Page 8]</p>	Surface Solution	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>ID 2003-01 was written before orphan wells, methane emissions, offset well bore communication, and many other issues came to light.</p> <p>There is technology to do better in sampling, reporting, and repairing. Gas Migration must be a separate part of this directive (such as Packer isolation Testing) to be taken more seriously by industry.</p> <p>[Section 3.1.4, Page 8]</p>	Surface Solution	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Recommend to mandate 48-hour flow rate test duration.</p> <p>Currently the flowrate/day may be misleading as a rate if the sample time doesn't include for ambient / production changes that can affect volume of gas emitted.</p> <p>The nature of a vent flow to atmosphere allows for intermittent flow. Allowing the tester to pick their timeline in determining a “stabilized” flowrate gives too much room for error in reporting methane emissions. Mandating a longer flow duration and allowing to pick a stabilized rate over a 6-hr. period (like the 2kpa/hr. rule) will show varying volumes emitted to atmosphere.</p> <p>Prorating short duration of stabilized flow may have challenging outcomes when taxing for carbon emissions.</p> <p>Total test volume may be interesting to discuss here.</p> <p>[Section 3.2.1 (22), Page 9]</p>	<p>Surface Solutions</p>	<p>Definition of stabilized shut-in pressure is in alignment with <i>Directive 40</i> requirements.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Stabilized flowrate must correlate to the build-up pressure. Too often our current technology can show TSTM or zero only to see better quality pressure recorders show inflow.</p> <p>Allow for closed chamber testing to be an approved method if there is a known cement top. More discussion is needed for this type of SCVF testing method.</p> <p>Compare gas flowrate vs build- up pressure. You can't have 0 rate with buildup pressure indicating inflow.</p> <p>Using only one parameter (pressure) to calculate flow could eliminate the bad flowmeter – “good” pressure recorder issue is clearly visible in the annual report for SCVFs.</p> <p>[Section 3.2.1 (22), Page 9]</p>	<p>Surface Solutions</p>	<p>Requirements for more accurate measurements devices for SCVF testing is something to consider for future editions of the directive.</p> <p>For the purpose of screening a well to determine if an SCVF is present, you need to have cost effective method that provides more accurate measurement of vent flow parameters.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>This needs a digital record with date/time stamps. That coincides with the build-up pressure recorder. There are systems that can do this, but the cost is greater.</p> <p>By reducing the testing frequency over the life of the well and without better equipment to reduce GHG, will make unaccountable practices remain in place. AER must support moving technology forward not only by mandating newer technology but supporting the use and knowledge gained from that technology.</p> <p>If we allow analog or dial based equipment (PD meter) we have no proof of the actual flow.</p> <p>Government is taxing based on no digital proof of the actual flow.</p> <p>Government is committing to reducing GHG emissions without digital proof.</p> <p>[Section 3.2.1 (22), Page 9]</p>	<p>Surface Solutions</p>	<p>Requirements for more accurate measurements devices for SCVF testing is something to consider for future editions of the directive.</p>
<p>The AER created D060 to detect, measure and reduce emissions, yet is allowing a shortened timeframe on which to detect measure and reduce in the ID 2003-01 amendment?</p> <p>[Section 3.2.1 (23), Page 9]</p>	<p>Surface Solutions</p>	<p>The purpose of the annual tests is to monitor the SCVF and determine if the flow parameters are stable, declining, or increasing. Whether further remedial action is required will be determined based on these test results.</p> <p>Not requiring a well to be retested does not mean the licensee does not have to follow <i>Directive 060</i> requirements (continue to measure and report emission volumes).</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Allowing less methane emissions testing based on a 3-year trend that can be modified without digital data uploads into the DDS system is absurd. Every producer paying a carbon-based tax, as well dependent investment based on ESG, will not be encouraged to reduce emissions when they can simply massage a three-year trend and stop testing.</p> <p>[Section 3.2.1 (23 a & b), Page 9]</p>	<p>Surface Solutions</p>	<p>DDS system limitations prevent input/tracking of test results. A new DDS report cannot be created at this time.</p> <p>Not requiring a well to be retested does not mean the licensee does not have to follow <i>Directive 060</i> requirements (continue to measure and report emission volumes).</p>
<p>Recommend to revise wording to: “After detecting... licensee must test each year for the life of the well or until two consecutive years of 0 kPa stabilized build up pressure (or a reasonably defined version of “died out”)</p> <p>You cannot reduce what isn’t measured.</p> <p>[Section 3.2.1 (23), Page 9]</p>	<p>Surface Solutions</p>	<p>AER decisions need to be risk based. The licensee must be able to demonstrate the risk is low.</p> <p>Not requiring a well to be retested does not mean the licensee does not have to follow <i>Directive 060</i> requirements (continue to measure and report emission volumes).</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Test based on SCVF threshold.</p> <p>Example: 0.01 – 0.5 m³/d = triennially, 0.5 – 1.0 m³/d = biannually, 1.0 – 25.0 m³/d = annually, with additional testing procedures for GM, 25+ m³/d quarterly with additional testing procedures – Note less frequent testing = less innovation and importance placed on test.</p> <p>Being that venting flow can fluctuate based on ambient conditions at different times of the year and even within a 24-hour period it is possible to create a declining trend in order to omit the well from being tested.</p> <p>For illustration – (understand every SCVF could conceivably fall into this category)</p> <p>A trend for a non-serious vent could start at 290 m³/d and trend down to 280 m³/day over two years. Get tested on the sixth year declining to 270 m³/d without becoming serious and this SCVF would require no further testing.</p> <p>[Section 3.2.1 (23 a & b), Page 9]</p>	<p>Surface Solutions</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p> <p>Regarding the example provided, this would FAIL the test for the licensee to “reasonably demonstrate that the SCVF will not become serious” and would warrant continued further testing until a true trend was observed. Using two data points for determining trend is not adequate; a minimum of three tests (includes initial test) plus the fourth test in year six will give more confidence in trend analysis.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Threshold testing as it relates to Directive 20. If the SCVF shows less than 0.05 m3/day and less than 10 kPa and is digitally recorded - allow the abandonment. After the next 2 years a gas migration confirms no methane to atmosphere, then close the file. The rationale here is allowing a sensible amount of gas to be cut and capped. It does make sense to burn GHG emissions (abandonment equipment) to chase less annual methane than comes from a cattle feedlot in 1 day.</p> <p>Being that this document is related and referred to in Directive 20 thought must be given to how these parameters and procedures affect the abandonment process. Without regular and up to date testing the one doing the abandonment loses the opportunity to see the “health history” of the SCVF.</p> <p>[Section 3.2, Page 9]</p>	<p>Surface Solutions</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>This whole section must be taken out of the shadow of the SCVF test. It relates by definition only and needs a completely new focus.</p> <p>Appendix 3 only offers suggested procedures for in-soil testing.</p> <p>[Section 3.2.2 (25), Page 10]</p>	<p>Surface Solutions</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>A focus group should be formed to bring forward thoughts here – this is not a simple amendment because there has been little to no focus on GM.</p> <p>Non-serious to Serious SCVF classification can be dependent on Gas Migration testing yet it isn't mandated to test for GM while testing or reporting the SCVF. If less SCVF testing is required – every time we do a GM test followed by a bubble test the definition of that SCVF is serious. 3.1.1 15i) doesn't define “problem” well enough because there is a very weak definition of serious GM.</p> <p>[Section 3.2.2, Page 10]</p>	<p>Surface Solutions</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>This amendment offers with it a new packer isolation test form that I commented on in earlier feedback. Please take this time to understand the relationship between wellhead seals, different annuli, source determination, casing failure effects, ambient effects, and the correlation between internal and external migration when it comes to drafting a new SCVF reporting sheet.</p> <p>A comment section at the bottom of a report never sheds light on opportunities to learn and pass that knowledge “SCVF health history” as I like too to call it over to the group responsible for a proper abandonment. By lowering the reporting standards, the AER loses the ability to effectively pass along the knowledge. This may ultimately cost the taxpayer more trying to abandon wells.</p> <p>[Section 3.2.2, Page 10]</p>	<p>Surface Solutions</p>	<p>Currently DDS system limitations prevent capturing all the information submitted. A new DDS report cannot be created at this time. We are exploring how this can be accommodated within OneStop.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Include datalogging the next barrier for the entire duration of the SCVF test. In the current SCVF test procedures there is no way to know if the SCVF is due to or even related to a casing failure.</p> <p>Much like the relationship between tubing and casing when it comes to packer isolation testing a second channel should identify larger more complex issues.</p> <p>[Section 3.3 (30), Page 10]</p>	<p>Surface Solutions</p>	<p>If an SCVF is detected, it is the licensee’s responsibility to investigate and determine the source. If the licensee suspects the SCVF is a result of a casing failure, there are many ways to confirm speculation (i.e., gas analysis comparisons, set a plug in the well, run a test packer, etc.).</p> <p>It is the licensee’s responsibility to maintain casing integrity and well control.</p>
<p>Regarding gas migration classification, provide a “serious” gas migration definition that includes some testing parameters based on a testing frequency.</p> <p>See the weak terminology of Serious gas migration to see that only GM from cut and capped well (let’s call it abandoned from now on) is measurable by the directive.</p> <p>Question: Can a SCVF repair cause a gas migration?</p> <p>[Section 3.4 (32), Page 11]</p>	<p>Surface Solution</p>	<p>The requirement addresses the timeframe that industry is expected to complete repairs for serious SCVF or GM.</p> <p>Testing frequency requirement is provided in section 3.2</p> <p>Yes, a SCVF repair attempt can potentially result in the development of a gas migration issue, thus the focus on finding the geological source of the flow.</p> <p>Improving the definition of gas migration would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Separate gas migration here as in 3.4.1 the producer is allowed 3 attempts to repair a gas migration without AER approval.</p> <p>I recommend reviewing the cementing process in option 1, especially if the producer can have 3 attempts to stop gas migration.</p> <p>Lumping GM into SCVF in this section of the document has a much different lens. The repair of gas coming up the outside of a wellbore will be approached differently than inside pipe and as such should have separate focus.</p> <p>[Section 3.4 (35) Page 11 & Section 3.4.1, Page 12]</p>	Surface Solution	<p>It is the licensee’s responsibility to understand if dealing with an SCVF, GM, or both, and to take this into considerations when designing their repair program.</p>
<p>Regarding a deferral of repair – bullet point 3 (the proposed monitoring schedule, and ...).</p> <p>If a non-serious SCVF is no longer required due to falling off the list do they need a testing frequency?</p> <p>If a wellbore has a non-serious SCVF and horizontal fracturing identifies the offset well for D83 monitoring does the offset well get post frac SCVF and GM testing?</p> <p>[Section 3.4.3, Page 14]</p>	Surface Solution	<p>Most of the deferral options require either continuous monitoring and reporting on monthly volume reports OR rate and pressure data before being approved.</p> <p>We have seen cases (injection wells, hydraulic fracture operations, etc.) where there is communication with an offset well resulting in blowout, kicks, etc. Licensees of both offset and subject wells are responsible for maintaining control of their licensed wells at all times.</p> <p>Regarding hydraulic fracturing operations, a licensee must comply with the requirements in <i>Directive 083</i>. Licensees of at-risk offset wells are expected to engage and work cooperatively with licensees of subject wells in the development of well control plans. Licensees of both offset and subject wells are responsible for maintaining control of their licensed wells at all times.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>“Written assertion that the SCVF is only non- saline water” makes the surface casing vent serious with concerns about freezing and ice plugs in winter.</p> <p>Only allow burst plate deferral in summer months since there is a concern that the ice plug may trap pressure before the burst plate ruptures.</p> <p>[Section 3.4.3, Page 14]</p>	<p>Surface Solution</p>	<p>Measures must be put in place to prevent the SCV assembly/burst plate from freezing during the winter months.</p> <p>Liquids that are coming to surface can freeze/expand and potentially damage the casing and vent assembly or can cause a buildup of pressure downhole.</p>
<p>Define producing as any valuable use of the SCVF gas including Instrument gas, heaters, flare pilots, pneumatics heating to reduce chemical injection pumps saving cost and GHG.</p> <p>[Section 3.4.3, Page 14]</p>	<p>Surface Solution</p>	<p>Current requirement is that the SCVF be continuously measured and reported on the monthly production reports.</p> <p>Existing practices (nonroutine requests for “Deferral of repair by producing” or “Deferral with Burst Plate”).</p> <p>Would also entertain utilization of the gas from an SCVF for other oil & gas applications.</p>
<p>Remove pressure testing to the maximum operating pressure for 10 minutes and retain the standard 7.0 MPa casing integrity pressures test post-workover due to concerns about maximum pressure design in disposal/injection wells.</p> <p>To avoid ambiguity, explicitly state the recommended equation the AER wishes industry to use when evaluating the rate & pressure change if the pressure test trend must demonstrate a decreasing rate of change approaching a stabilized pressure.</p> <p>[Section 3.4.1 (last bullet), Page 13]</p>	<p>Tervita</p>	<p>Casing integrity under operating conditions must be confirmed prior to putting the well back into operation. If it can only pass a 7.0 MPa test during non-operating conditions, then we are concerned about the risk during normal operating conditions.</p> <p>The directive states, “the pressure test trend must demonstrate a decreasing rate of change approaching a stabilized pressure close to the maximum operating pressure over a minimum 10-minute period.” This wording was agreed to by CAPP.</p> <p>The staged pressure change requirement recognizes that any pressure change during a test can indicate a possible failure. Test pressures take time to stabilize or level out, and the stabilization generally takes place during the first portion of the pressure test. Ideal conditions would show zero pressure change.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
Section 4, “Surface Casing Vent Assemblies”		
<p>As thermal wells are being treated as unique, separate requirements should be articulated and applied consistently with intent of this section for non-thermal wells.</p> <p>Recommend including a section in the Directive for thermal wells, as they are specifically excluded from this section. It is recognized that this may be viewed as out of scope at present, however, it is recommended that these be considered and addressed in the near term to ensure consistency and appropriate management of risk.</p> <p>[Section 4.1 (41), Page 15]</p>	<p>CAPP</p>	<p>This would require research on receptor impacts, fugitive emissions, thermal implications, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>Once the assembly has been installed both GM and SCVF should be mandated on these wells not just SCVF.</p> <p>Being that there are wells without surface casing vent what is the frequency of gas migration testing.</p> <p>[Section 4.1 (42), Page 15]</p>	<p>Surface Solution</p>	<p>The “when” (appropriate frequency) and “how” (what testing method is appropriate and to be used) will require discussions with various internal and external SMEs. This is something to consider in future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
Section 5, “Casing Failures”		
<p>The Directive indicates ... If a section of casing in the well is preventing the licensee from performing any type of downhole operation, then the well must be repaired</p> <p>Recommend to reword this portion of the paragraph since the statement of ‘any type of downhole operation’ is too restrictive.</p> <p>Suggested wording: “If a section of casing in the well is preventing the licensee from maintaining well control, then the well must be repaired”</p> <p>[Section 5.0 (43), Page 15]</p>	<p>CAPP, Tervita</p>	<p>The directive states, “if a well is no longer capable of operating without fluid containment concerns due to a lack of casing integrity, or if a section of casing in the well is preventing the licensee from performing any type of downhole operation, then the well must be repaired using one of the options in section 5.2 or the licensee must justify to the AER why the current wellbore configuration should be acceptable.”</p> <p>The last statement already grants sufficient flexibility. If there is casing issue that is preventing the licensee from performing any type of downhole operation, and repairs are undesirable, the licensee can avoid them if it can justify to the AER why the current wellbore configuration should be acceptable.</p>
<p>Consider treating casing failures identified between surface and the surface casing set depth on well abandonment as a ‘routine resolution’.</p> <p>[Section 5.2 (47), Page 16]</p>	<p>CAPP</p>	<p>This is a well integrity issue; containment has been compromised. This is a potential flow path to surface and puts public safety and environment at risk (especially if a well is sitting in suspension for an indefinite amount of time).</p> <p>Current practice is to submit a nonroutine request for a shallow casing failure repair waiver. Repair waivers are granted when the well is going to be abandoned (at this point in time, SCVF/GM issues or other well integrity issues have been addressed, zonal abandonments are completed, and any porous zone/protected interval have been segregated as required therefore making it lower in risk). In addition, installation of a vented cap will help identify any well integrity issues that may develop over time.</p> <p>Treating a shallow casing failure as a routine resolution is something to consider in future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Consider the casing failure repair method, installation of a casing patch, as a routine operation.</p> <p>Recommend making the installation of a casing patch a “routine” repair option to address a casing failure (provided a high quality casing patch is used).</p> <p>Provide AER’s rationale for why this is non-routine.</p> <p>[Section 5.2 (48), Page 16]</p>	<p>7Gen, CAPP, Tervita</p>	<p>We require that we be notified of nonroutine attempt to repair casing failures to ensure that proposed repair method does not result in unacceptable risks to public safety or the environment.</p> <p>Examples of concerns include: whether the casing patch is permanent or retrievable, will the reduced ID be a concern for running downhole equipment, will it impact conducting packer isolation testing, have hydraulic isolation issues been addressed (porous/protected interval isolation) prior to running casing patch, have any well integrity issues been addressed, how will installation impact future operations (i.e., resume fracture stimulation operations), etc.</p> <p>This is something to consider in future editions of the directive.</p>
<p>Mandate a SCVF and Gas Migration test within 90 days of casing repair and annually/regularly. If SCVF or GM was reported prior to the casing repair include the before and after in casing failure report and whether the SCVF was due to the CF</p> <p>Cause and affect assurance that the repair didn’t harm the wellbore integrity.</p> <p>[Section 5.1 (44), Page 16]</p>	<p>Surface Solution</p>	<p>After repairs are completed, the casing is pressure tested to confirm integrity, and typical practice is also to conduct an SCVF test to confirm there is no SCVF present. If a well integrity issue is detected after the repair work is completed, it must be reported as a new incident, investigated, and repaired as per the requirements of this directive.</p>
<p>Appendices</p>		
<p>Single-pen static pressure recorders were specifically excluded from packer isolation testing.</p> <p>Reword this section to be consistent with current requirements and technology.</p> <p>[Appendix 2 (Recommended Equipment), Page 22]</p>	<p>CAPP</p>	<p>We have removed the reference from the appendix.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Regarding recommendations made in Appendix 3 for the test point locations for gas migration testing, consider reviewing the recommendation to test at any points within 75 m of wellbore where there is apparent vegetation stress, with subject matter experts and Industry and reducing in a future iteration of the directive.</p> <p>[Appendix 3, Page 23]</p>	<p>CAPP</p>	<p>The directive does not prevent licensees from conducting additional GM testing to confirm extent of gas migration away from well center. (Typically, 25 m from well center is used for GM baseline level comparisons.)</p>
<p>Consider reviewing testing procedure to determine if making a hole 50 cm depth is required. Recommend <30 cm to preclude the need for ground disturbance permits.</p> <p>Consider revising recommended equipment as newer technologies capable of higher precision may be available.</p> <p>[Appendix 3 (Recommended Equipment), Page 23]</p>	<p>CAPP</p>	<p>Appendix 3 provides a suggested procedure for testing for gas migration (not mandatory). We acknowledge the use of these procedures within the province; it also recognizes that there are various methods of testing for gas migration.</p> <p>The directive provides flexibility and allows industry to select appropriate methods for their specific situation that will provide relevant and reliable readings.</p> <p>The directive also states the following:</p> <ul style="list-style-type: none"> • Licensees should take into consideration the impact of soil saturation levels, shallow water table, the necessity to have the sample probe in the vadose zone, and the possibility that the wellhead may be located in a fully saturated surface depression. • Licensees should use equipment that is capable of measuring methane. • Instruments should be calibrated in accordance with manufacturers specifications and checked daily when in use.

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>What is the relevance of mentioning that this methodology was developed by the Lloydminster Area Operations Group Gas Migration Team?</p> <p>Recommend to delete this reference.</p> <p>Modern regulation should be based in modern knowledge.</p> <p>[Appendix 3, Page 23]</p>	<p>StFX</p>	<p>It acknowledges the technical team that developed the suggested testing procedure (where this procedure came from) and also acknowledges that there are various methods that can be used to test for GM.</p> <p>A complete review of this appendix would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>There are 2 issues with this Appendix:</p> <ol style="list-style-type: none"> 1. The measurement methodology described here is only for “in-soil” investigations which comes after identification using “surface” tools, but the initial “surface” screening process is not prescribed. 2. This methodology is out of step with all other areas of fugitive regulation (and SCVF in this proposed Directive) where sources are quantified on the basis of volumetric emission rate. <p>[Appendix 3, Page 23]</p>	<p>StFX</p>	<p>The requested changes would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Suggestion to rewrite Appendix 2 “Suggested procedures for SCVF” from scratch utilizing current methods and technologies to create reports that educate for the eventual abandonment.</p> <p>E.g.: Source determination – somewhere during the non-serious flow source must be determined. At time of abandonment better technology may be available to pinpoint sources but if not, there is a starting point.</p> <p>Stopping SCVF tests after a shorter timeframe will negatively impact the efforts to reduce emissions.</p> <p>[Appendix 2, Page 21 & 22]</p>	<p>Surface Solution</p>	<p>Current regulations allow non-serious SCVFs to be addressed at the time of abandonment. While in operational phase, more frequent surveillance is going on and any escalation in the SCVF parameters to serious must be reported to the AER and repaired accordingly.</p> <p>Not requiring a well to be retested does not mean the licensee does not have to follow <i>Directive 060</i> requirements (continue to measure and report emission volumes).</p>
<p>Suggestion to rewrite Appendix 3 on “Suggested Procedures for GM” from scratch utilizing methods and technologies to support and learn about gas migration. Write the procedures in such a way as to get increased awareness and control of gas migration and value out of testing by seeing if there are relationships between external and internal migration as they relate to D79 and D20 and D83.</p> <p>[Appendix 3, Page 23]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Take this time to correlate your needs with all other regulators in Canada.</p> <p>Standardizing results and making reports accessible to public across regulatory bodies will mean more uptake in testing.</p> <p>Correlating needs helps industry afford and adopt new technology from different jurisdictions because the needs are greater.</p> <p>[Appendix 3, Page 23]</p>	<p>Surface Solution</p>	<p>This would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.</p>
<p>Why isn't Bubble Testing mentioned in Appendix 4 on Gas Identification Techniques but is mentioned and even referred to in Appendix 2 by the LAOGMT</p> <p>It is the standard procedure in the document and mentioned several times as a PASS/FAIL test for SCVF.</p> <p>[Appendix 4, Page 25]</p>	<p>Surface Solution</p>	<p>Appendix 4 is specific to wells without a surface casing vent assembly (provides various methods and monitoring devices considered acceptable by the AER for testing surface casing annular flow).</p> <p>Once a surface casing vent assembly has been installed, a bubble test can be performed as per appendix 2.</p>

Stakeholder Feedback – Issue	Stakeholder	AER Response
<p>Casing Stub Exposed – bullet 3 mentions installing a vent assembly if hydrocarbon liquid is present and mandates further testing...</p> <p>Casing stub not exposed mentions if gas is present – need to be more specific regarding gas testing and levels observed.</p> <p>If the assembly is installed and the flow detected is gas, a SCVF and gas migration test should be performed when the SCVF test has reached a stabilized build-up pressure. A second pressure recording should be used during the test to capture the pressure response of the next barrier for casing failure determination.</p> <p>[Appendix 4, Page 26 & 27]</p>	Surface Solution	This change would require research on receptor impacts, fugitive emissions, and supporting data on new technologies. It would also require engagement with industry, various stakeholders, and possible revision of Government of Alberta policies. This is something to consider for future editions of the directive.