

Interim Statewide Horizontal Offset Policy

February 10, 2014

This Interim Statewide Horizontal Offset Policy ("Policy") was prepared to address concerns with the potential for communication between new horizontal wells that are hydraulically stimulated and nearby, existing offset wells. In early 2013, northeastern Colorado operators collected and analyzed data to understand the effects of horizontal well stimulations on offset wells. Based on the data collected, the Colorado Oil and Gas Conservation Commission ("COGCC") created a policy for the DJ Basin to evaluate the potential for stimulation communication and implement mitigation strategies to decrease that risk. COGCC and DJ Basin operators agreed that all existing offset wellbores ("Offset Wells") within 1500' of a proposed horizontal wellbore ("Proposed Well") would be evaluated for adequate zonal isolation of oil, gas, and fresh water bearing horizons. COGCC's primary concern is with existing isolation or lack thereof in Offset Wells that are drilled deeper than or to the same objective formation as the Proposed Well. The risk of communication may increase when Offset Wells do not have adequate zonal isolation of oil, gas, or fresh water bearing horizons ("Wells of Concern").

This Policy extends the concepts of the DJ Basin Policy statewide. The existing DJ Basin Policy will continue to govern Offset Well evaluation for that Basin and nothing herein should be construed to alter or amend the existing DJ Basin Policy. This policy does not apply to well that are not hydraulically fracture stimulated. This Policy shall govern Offset Well Evaluations for operations in the remainder of the state, subject to the effective scope of COGCC's authority, as described in COGCC Rule 201. If there is a conflict between Ignacio Blanco Field COGCC Order Nos. 112-156, 112-157, 112-180, and 112-181, then the orders shall take precedence over the requirements of this Policy.

COGCC staff understands that geomechanical characteristics and expected bottom-hole pressures may vary in different basins across the state, and we acknowledge that the 1500' buffer was developed specifically for operations in the DJ Basin. Rather than defining new, arbitrary values for other basins, the 1500' buffer will be used to review Offset Wells for other basins until industry presents data to support use of alternate, basin-specific thresholds. COGCC will consider a revision to this Policy when that occurs. Until then, operators may consider Mitigation Option No. 4 (described below) on a well-by-well basis for prior approval by COGCC.

For the purpose of this Policy, HYDRAULIC FRACTURING TREATMENT or STIMULATION shall mean all stages of the treatment of a well by the application of hydraulic fracturing fluid under pressure that is expressly designed to initiate or propagate fractures in a target geologic formation, and HORIZONTAL WELL shall mean a well which is drilled in such a way that the wellbore deviates laterally to an approximate horizontal orientation within the target formation with the length of the horizontal component of the wellbore extending at least one hundred feet (100') in the target formation, measured from the initial point of penetration into the target formation through the terminus of the horizontal component of the wellbore in the same common source of hydrocarbon supply.

Effective February 10, 2014, the Application for Permit to Drill, Form 2 (APD) for a Proposed Well shall include an Offset Well Evaluation of all Offset Wells within 1500' of the Proposed Well to determine if those wells have

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adequate zonal isolation. The Offset Well Evaluation shall include existing producing, shut-in, temporarily abandoned, plugged and abandoned, and dry and abandoned wells. The Offset Well Evaluation buffer is a 1500' lateral distance around the Proposed Well wellbore path, projected to surface in plan view. The Offset Well Evaluation spreadsheet is available for download or direct data-entry in eForm, and it is available on COGCC's website. The Proposed Well operator shall electronically incorporate the Offset Well data into the Offset Well Evaluation within the Proposed Well APD.

The COGCC Engineer will review the Offset Well Evaluation to determine if oil, gas, and fresh water zones in those wells are adequately isolated. In general, adequate isolation includes isolation of the Proposed Well objective formation(s), isolation of any other overlying oil and gas formations, and isolation of fresh water zones. Generally, COGCC Engineers use the following resources to determine the presence of fresh water: Colorado Geological Survey Ground Water Atlas of Colorado (2003), Colorado Division of Water Resources water well data and Aquifer Determination Tools, any local published water resource data, and geophysical well logs. Mitigation will not be required for Offset Wells that were drilled to and terminate in objective formations shallower than the Proposed Well objective formation unless the Proposed Well operator has designed for communication with those overlying formation as part of the stimulation job. Shallow wells must be listed on the Offset Well Evaluation, but the operator merely needs to add a comment that the well terminates in a shallow formation, above the objective stimulation of the Proposed Well.

If COGCC identifies Wells of Concern that do not have adequate isolation and were drilled deeper than or into the Proposed Well objective formation, then the Proposed Well operator will be required to submit mitigation plans to address the Wells of Concern. COGCC will not approve the Proposed Well APD until COGCC Staff approves the Proposed Well operator's mitigation plans. Mitigation Options 1 through 3 presumptively would be acceptable to COGCC to satisfy this requirement. Alternative measures would be considered on a well-by-well basis under Mitigation Option No. 4.:

1. If the Well of Concern is to remain, provide remedial cement needed to adequately isolate all hydrocarbon and fresh water formations.
2. If the Well of Concern is to be plugged, plug the Well of Concern to adequately isolate all hydrocarbon and fresh water formations.
3. If the Well of Concern is PA or DA, re-enter and re-plug the Well of Concern to adequately isolate all hydrocarbon and fresh water formations.
4. Secure COGCC approval for alternative measures or COGCC agreement that additional mitigation is unnecessary under the circumstances.

In addition to wellbore isolation, Offset Wells that are producing, shut-in, or temporarily abandoned shall have surface equipment (wellhead and master valve) rated to a pressure adequate to contain anticipated surface pressures that could occur in the event of stimulation communication with the Proposed Well. Rather than defining new, arbitrary values for other basins, the 5000 psi will be used for Offset Wells for other basins until industry presents data to support use of alternate, basin-specific thresholds. COGCC will consider a revision to

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this Policy when that occurs. As an alternative to high-pressure surface equipment on Offset Wells that are normally exposed to lower pressures, adequate Offset Well downhole mechanical isolation above production perforations in the Proposed Well objective formation may be used.

Beginning with APDs received on or after February 10, 2014, Proposed Well operators shall provide notice to all Offset Well operators listed on the Offset Well Evaluation 90 days prior to the anticipated commencement of stimulation.

When an Offset Well and the Proposed Well are under different operatorship, the Offset Well operator shall not refuse to have their well appropriately mitigated to meet the requirements of this Policy. This Policy is explicitly intended to protect Public Health, Safety and Welfare and not correlative rights. This Policy shall not be interpreted to provide any legal presumption that production of Offset Wells is impacted positively or negatively.

Requirements for the Mitigation Options

Option 1: If the Well of Concern is to remain, provide remedial cement needed to adequately isolate all hydrocarbon and fresh water formations.

1. Proposed Well operator shall provide an acknowledgement of the proximity of the Well(s) of Concern and agree to provide the necessary mitigation and applicable documentation based on the mitigation option selected.
2. COGCC staff will attach this statement to the submitted Form 2 APD and provide the applicable COA.
3. The Proposed Well APD will be approved.
4. Well of Concern operator shall submit Form 4 Sundry Notice for a Well Repair on the Well of Concern.
 - a. Describe proposed remedial cement required to isolate all hydrocarbon and fresh water formations and receive approval of the same.
5. After remedial cementing is completed, operator shall submit a Cement Bond Log and a Final Form 5 Drilling Completion Report to verify compliance with the proposed remedial cement plan.
6. Remedial cementing shall be completed prior to hydraulic stimulation of the Proposed Well.
7. Well of Concern operator shall submit a Form 42 ("OFFSET MITIGATION COMPLETED") stating what mitigation occurred and that mitigation has been completed, prior to the hydraulic stimulation of the Proposed Well.

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Option 2: If the Well of Concern is to be plugged, plug the Well of Concern to adequately isolate all hydrocarbon and fresh water formations.

1. Proposed Well operator shall provide an acknowledgement of the proximity of the Well of Concern(s) and agree to provide the necessary mitigation and applicable documentation based on the mitigation option selected.
2. COGCC staff will attach this statement to the Proposed Well APD and provide the applicable COA.
3. Proposed Well APD will be approved.
4. Plugging operator shall submit Form 6 Well Abandonment Report: Notice of Intent to Abandon.
 - a. Required attachments: Current and Proposed Plugged Wellbore Diagrams.
 - b. Attachment: proposed plugging procedure.
 - c. If no As-built well location GPS has been reported, COGCC staff will place COA on Form 6 - Intent to submit as-built GPS on Form 6: Subsequent Report of Abandonment.
5. Plugging operator shall submit Form 6 Well Abandonment Report: Subsequent Report of Abandonment after plugging is completed.
 - a. Required attachments: Plugged Wellbore Diagram and all applicable Plugging Verification Reports for each person or contractor actually setting the plugs. As determined by the COGCC Engineer, this may include, Cement Job Summary, Wireline Job Summary, Operations Summary, and any other reports describing the plugging.
 - b. If required by COA on Form 6 – Notice of Intent to Abandon: As-Built GPS well location data.
6. Plugging shall be completed prior to hydraulic stimulation of the Proposed Well.
7. Plugging operator shall submit a Form 42 (“OFFSET MITIGATION COMPLETED”) stating what appropriate mitigation occurred and that it has been completed, prior to the hydraulic stimulation of the Proposed Well.

Option 3: If the Well of Concern is PA or DA, re-enter and re-plug the Well of Concern to adequately isolate all hydrocarbon and fresh water formations.

1. Proposed Well operator shall acknowledge the proximity of the Well of Concern and agree to re-enter and re-plug the Well of Concern.
2. COGCC staff will add a corresponding COA to the pending Form 2 APD for the proposed horizontal well.
3. Proposed Well APD will be approved.
4. Proposed Well operator shall have adequate Financial Assurance for the proposed Re-entry and Re-plugging operations.
5. Proposed Well operator shall submit Form 6 Well Abandonment Report: Notice of Intent to Abandon to re-enter and re-plug the existing PA or DA well. (Use eForms “Re-plug By Other Operator” to submit Form 6.)
 - a. Reason for Abandonment is OTHER; Other Describe: Re-enter to Re-Plug
 - b. Required Technical Detail/Comments:
 - i. Purpose is to re-enter and adequately re-plug prior to hydraulic stimulation of Proposed Well per Policy
 - ii. Closed loop system will be used
 - iii. Describe details of proposed re-entry procedure or attach Operations Summary
 - iv. Describe details of proposed re-plugging procedure or attach Proposed Plugging Procedure

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- c. Required Attachments:
- i. Signed Surface Use Agreement or Surface Owner Consent (contact COGCC for a case-by-case evaluation if the surface owner refuses consent)
 - ii. Current and Proposed Plugged Wellbore Diagrams
 - iii. Operations Summary of proposed re-entry procedure if not in Technical Detail/Comments
 - iv. Proposed Plugging Procedure if not in Technical Detail/Comments
 - v. Current site photos - minimum of four (4) color photographs, one (1) from each cardinal direction; each photograph shall be identified by: date taken, well name, and direction of view.
6. No pits shall be constructed for the Re-entry and Re-plugging operations; closed loop system is required
7. If no as-built well location GPS data has been reported for the well: Proposed Well operator shall obtain the GPS data and submit it on the Form 6 Well Abandonment Report: Subsequent Report of Abandonment
8. If site has not undergone Final Reclamation, Proposed Well operator shall contact COGCC Field Inspector for a joint onsite inspection prior to any new disturbance.
9. If the Proposed Well operator discovers existing contamination from the previous oil and gas operations it shall be immediately reported to the Director (see Rule 906).
10. Proposed Well operator shall be responsible for reporting and remediating any and all spills or releases related to their re-entry and re-plugging operations.
11. Proposed Well operator shall be responsible for the reclamation of the site to pre-disturbance conditions as shown in site photos submitted with the Form 6 – Notice of Intent to Abandon and as verified in a joint onsite inspection with COGCC (if held). Whenever possible, Proposed Well operator shall utilize procedures that minimize surface impact, such as the use of truck-mounted rigs with rubber tires.
12. Proposed Well operator shall submit Form 6 Well Abandonment Report: Subsequent Report of Abandonment after plugging has been completed. (Use eForms “Re-plug By Other Operator” to submit Form 6).
- a. Reason for Abandonment is OTHER; Other Describe: Re-enter to Re-Plug.
 - b. Required Technical Detail/Comments: i. Purpose is to re-enter and adequately re-plug prior to hydraulic stimulation of Proposed Well per Policy.
 - c. Required Attachments:
 - i. Plugged Wellbore Diagrams
 - ii. All applicable Plugging Verification Reports for each person or contractor actually setting the plugs. As determined by the COGCC Engineer, this may include: Cement Job Summary, Wireline Job Summary, Operations Summary, and any other reports describing the plugging.
 - d. If required by COA on Form 6 – Notice of Intent to Abandon: As-Built GPS well location data.
13. Re-plugging shall be completed prior to hydraulic stimulation of the Proposed Well.
14. Proposed Well operator shall submit a Form 42 - OFFSET MITIGATION COMPLETED for the re-plugged well, referencing the API Number of the proposed horizontal well, to report that appropriate mitigation was completed prior to the hydraulic stimulation of the proposed horizontal well.
15. Proposed Well operator shall begin Final Reclamation as soon as practicable and submit Sundry Notice, Form 4 to report date Final Reclamation will commence. (Use eForms “Submit By Other Operator” to submit Form 4.)
16. Proposed Well operator shall submit Sundry Notice, Form 4 to report Final Reclamation is complete; site is ready for inspection. (Use eForms “Submit By Other Operator” to submit Form 4.)

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Option 4: Secure COGCC approval for an alternative form of mitigation or COGCC agreement that additional mitigation is unnecessary under the circumstances.

1. Proposed Well operator shall provide an acknowledgement of the proximity of the Well(s) of Concern and explain why the alternative mitigation is sufficient to mitigate the potential for communication or why additional mitigation is unnecessary for this purpose.
2. The COGCC Engineer will decide whether to approve the alternative mitigation or exempt the Well(s) of Concern from additional mitigation.
 - a. If the COGCC Engineer approves alternative mitigation, then:
 - i. COGCC staff will attach the operator's statement to the submitted APD and provide the applicable COA.
 - ii. APD for proposed well will be approved.
 - iii. Proposed Well operator shall submit the necessary forms and perform the appropriate work based upon the alternative mitigation approved.
 - b. If the COGCC Engineer exempts the Well(s) of Concern from additional mitigation, then:
 - i. COGCC staff will attach the operator's statement and the exemption to the submitted APD.
 - ii. APD for the Proposed Well will be approved.
 - c. If the COGCC Engineer neither approves the alternative mitigation nor exempts the Well(s) of Concern from additional mitigation, then the Proposed Well operator must select another mitigation option.
3. Alternative form of mitigation shall be completed prior to hydraulic stimulation of the Proposed Well.
4. Proposed Well operator shall submit a Form 42 ("OFFSET MITIGATION COMPLETED") stating what appropriate mitigation occurred and that it has been completed, prior to the hydraulic stimulation of the Proposed Well.

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Workflow for Mitigation Options

1. COGCC Engineer reviews the Offset Well Evaluation submitted by the Proposed Well operator and all wells within 1500' of the Proposed Well for adequate isolation and enters the comment, "Evaluated offset wells for adequate isolation."
2. If COGCC Engineer determines all wells within 1500' of the proposed wellbore have adequate isolation, then the Proposed Well APD will be approved.
3. If COGCC Engineer determines that at least one Well of Concern does not have adequate isolation, then:
 - a. COGCC Engineer places Proposed Well APD "on hold" with comment detailing situation and listing the Well(s) of Concern.
 - b. COGCC Engineer emails Proposed Well operator notification of:
 - i. Inadequate isolation determination
 - ii. Proposed Well APD "on hold" status
 - iii. The options to mitigate the situation for APD approval
 - iv. Attaches this Policy to email to operator
 - v. Copies COGCC Permit Tech on email
 - c. Proposed Well operator notifies COGCC Engineer and Permit Tech of acknowledgement of Well of Concern proximity and agreement to mitigate per the Policy.
 - d. COGCC Engineer takes APD off "on hold" when requirements for APD approval are satisfied and enters appropriate comments and COAs to explain the operator's acknowledgements and required mitigation.
 - e. Proposed Well APD will be approved.
 - f. Proposed Well operator shall submit the necessary documentation and perform the appropriate work based on the mitigation option selected, as specified above. All such documentation shall be submitted or copied via email (Subject: HZ Offset Well Mitigation Please Respond) to the COGCC Engineer.
 - g. COGCC Engineer and other COGCC staff shall approve all necessary documentation for the mitigation option selected as soon as practicable following their submittal.
 - h. Prior to the hydraulic stimulation, Proposed Well operator may select and secure COGCC approval for a different mitigation option. To seek such approval, Proposed Well operator shall submit a Sundry Notice Form 4 identifying the new mitigation option. The Proposed Well operator must also submit the necessary documentation and perform the appropriate work for the new mitigation option.
 - i. Well of Concern operator or Proposed Well operator shall submit a Form 42 ("OFFSET MITIGATION COMPLETED") stating what appropriate mitigation occurred and that it has been completed, prior to the hydraulic stimulation of the Proposed Well.

NOTE: This process shall also apply to any Change of Location Sundry Notice Form 4 that results in a Proposed Well being within 1500' of a Well of Concern, as defined above.