



COGCC OPERATOR GUIDANCE

OFFSET WELL EVALUATION AND HYDRAULIC FRACTURING TREATMENTS

Document Control:

Created Date:	November 2, 2020
Last Updated Date:	November 2, 2020
Last Updated By:	Diane McCoy
Document Owner:	David Andrews

Rule Citation

303.a.(5)G. Statewide Offset Well Evaluation.

- i. The Form 2 will include an Offset Well evaluation. The Operator will evaluate the construction and integrity of all Offset Wells within 1,500 feet of the proposed wellbore. The Operator will provide a plan to address all Offset Wells within 1,500 feet that do not meet isolation and integrity requirements.
- ii. The Operator will attach any consents obtained pursuant to Rule 317.v. to the Form 2.
- iii. The Operator will provide notice as required by Rule 317.w.

Related Rule Citations

317.u Statewide Wellbore Collision Prevention. An Operator will perform an anti-collision evaluation of all active (producing, shut in, or temporarily abandoned) offset wellbores that have the potential of being within 150 feet of a proposed Well prior to drilling operations for the proposed Well. The Operator will give notice to all offset Operators prior to drilling.

317.v Statewide Setback for Hydraulic Fracturing Treatment.

- (1) No portion of a proposed wellbore that will be treated by hydraulic fracturing may be located within 150 feet of an existing (producing, shut-in, or temporarily abandoned) or permitted interval of an oil and gas wellbore that has been or will be treated by hydraulic fracturing belonging to another Operator without the signed written consent of the Operator of the encroached upon wellbore. The Operator will attach any signed written consents to the Application for Permit-to-Drill, Form 2 for the proposed wellbore.

RULE #303.A.(5)G GUIDANCE

(2) The Operator will measure the distance between the proposed and offset wellbores using the directional survey for drilled wellbores and the deviated drilling plan for permitted wellbores, or as otherwise reflected in the Commission's well records. The Operator will measure the distance from the perforation or mechanical isolation device.

317.w Notice Prior to Hydraulic Fracturing Treatment. At least 90 days prior to the anticipated commencement of hydraulic fracturing treatment, the Operator of the wellbore that will be stimulated by hydraulic fracturing treatment will provide notice of hydraulic fracturing treatment commencement to all Operators of offset wells that were identified pursuant Rule 303.a.(5)G.i.

317.x Offset Wellheads and Surface Equipment. Prior to hydraulic fracturing treatments, the Operator will ensure offset existing wells within 1,500 feet of the wellbore to be hydraulically fractured that are producing, shut-in, or temporarily abandoned have surface equipment (wellhead and master valve) rated to a pressure adequate to contain anticipated surface pressures that could occur from the proposed hydraulic fracturing treatment. For offset wells that do not have adequately rated surface equipment, the Operator may instead use downhole mechanical isolation above perforations in the objective formation to prevent unanticipated migration of pressure.

317.y Consent to Offset Well Mitigation. When an offset well and a proposed well are under different operatorship, the Operator of the offset well will not refuse to have the offset well appropriately mitigated to meet the requirements of the Commission's Rules necessary to ensure protection of public health, safety, welfare, the environment, and wildlife resources.

317.z Communication Prevention. An Operator will take all necessary measures to prevent communication along any known conduits between a wellbore's hydraulic fracturing-treated interval and groundwater.

317.aa Surface Equipment Used in Hydraulic Fracturing Treatment. Prior to beginning a hydraulic fracturing treatment, the Operator will rig up and pressure test any surface equipment exposed to hydraulic fracturing treatment pressure. The Operator will test for the proposed hydraulic fracturing treatment design and, at a minimum, to 110% of the maximum anticipated surface hydraulic fracturing treatment pressure. The test will ensure an appropriate safety factor and prevent fluid losses.

RULE #303.A.(5)G GUIDANCE

Terms specific to this guidance

Proposed Well means the well that is listed on the Form 2, Application for Permit-to-Drill, Deepen, Re-enter or Recomplete and Operate (Form 2) that will be subjected to a Hydraulic Fracture Treatment, if the permit is approved.

Offset Well means an offset well that is located within 1,500 feet of the proposed well, measured in three dimensions.

Well of Concern means an Offset Well that does not have existing, adequate isolation of all hydrocarbons, Groundwater, and Potential Flow Zones before Hydraulic Fracturing Treatment of the proposed well.

Plugging Operator means the Operator that plugs or re-plugs a Well of Concern. The Plugging Operator may be the same as the Offset Well Operator, or it may be the Proposed Well Operator that is plugging the well as an “Other Operator.”

Purpose of Rule 303.a.(5)G

This rule codifies previous policies: Interim Statewide Horizontal Offset Policy February 10, 2014 and Horizontal Offset - DJ Basin Policy December 17, 2013. Engineering Staff developed these policies to address potential concerns with communication (commonly known as a “frac hits”) between new horizontal wells subjected to Hydraulic Fracturing Treatment and nearby, existing Offset Wells. The potential for communication increases and the Offset Well becomes a “Well of Concern” if it does not have adequate zonal isolation of oil, gas, or fresh water bearing horizons pursuant to Rule 209 and and Rule 317.e, and it penetrates the same objective formation as the Proposed Well.

Rule 303.a.(5)G. expands Offset Well Evaluations statewide for all Proposed Wells of any orientation that will have a Hydraulic Fracturing Treatment, including vertical, drifted, directional, and horizontal wells.

The Operator will submit an Offset Well Evaluation with their Form 2, Permit to Drill Application. The Offset Well Evaluation spreadsheet is available for download or direct data-entry in eForm, and it is available on COGCC’s website.

Guidance

RULE #303.A.(5)G GUIDANCE

For all Offset Wells within 1,500' of the proposed well, the Operator will determine that adequate wellbore isolation exists, the Operator will propose a plan to mitigate potential communication risks with the Offset Wells, or the Operator will indicate that Hydraulic Fracture Treatment will not be performed in the Proposed Well.

Adequate wellbore isolation:

1. Prevents Fluids in the objective formation(s) from migrating to other oil and gas formations that are not otherwise commingled with the objective formation
2. Prevents Fluids in the objective formation(s) from migrating to Groundwater formations that are being used or could potentially be used for domestic or agricultural water
3. Prevents Groundwater from migrating to other formations in the well

The Operator's demonstration of adequate wellbore isolation may include cementing records (if available) and cement bond logs (CBL) in COGCC's well files showing cement isolation of all hydrocarbons, Groundwater, and Potential Flow Zones, in accordance with Rule 209 and Rule 317.e.

Scope of Offset Well Evaluation

The Offset Well Evaluation will include all producing, shut-in, temporarily abandoned, plugged and abandoned, and dry and abandoned wells within 1,500 feet of the proposed well in three dimensions. The Operator will identify Offset Wells with inadequate wellbore isolation as Wells of Concern. The Operator will also identify Offset Wells with sustained surface casing pressure (or "bradenhead pressure") above the applicable threshold pursuant to Rule 341 or a Commission Order as Wells of Concern.

Mitigation will not be required for Offset Wells that were drilled to and terminate in other objective oil and gas formations shallower than the Proposed Well's objective formation unless the Proposed Well operator has designed for communication with those overlying formations as part of the Hydraulic Fracturing Treatment or the separation distance between the formations suggests that communication may occur. The Operator will list shallow wells that do not require mitigation on the Offset Well Evaluation, but the Operator will indicate that the shallow well terminates in a different, shallower objective formation, and adequate confining layers exist between the shallow well and the Proposed Well's objective formations to prevent Fluid migration between zones.

Offset Well Mitigation Methods

RULE #303.A.(5)G GUIDANCE

The Operator will propose, or the Director will require that the Operator perform cement remediation or re-plug Wells of Concern that penetrate the proposed well's objective formation and do not meet the wellbore isolation requirements of Rule 209 or Rule 317.e. The Proposed Well operator will submit mitigation plans to address all Wells of Concern that do not have adequate wellbore isolation. Mitigation Options 1 through 3 are presumptively acceptable to Engineering Staff to satisfy this requirement. Engineering Staff will consider alternative measures on a well-by-well basis under Mitigation Option Number 4.

Option 1. If the Well of Concern is to remain, provide remedial cement needed to adequately isolate all hydrocarbons, Groundwater, and Potential Flow Zones prior to Hydraulic Fracturing Treatment of the Proposed Well.

Option 2. If the Well of Concern is to be plugged, plug the Well of Concern to adequately isolate all hydrocarbons, Groundwater, and Potential Flow Zones prior to Hydraulic Fracturing Treatment of the Proposed Well.

Option 3. If the Well of Concern is plugged and abandoned or dry and abandoned, re-enter and re-plug the Well of Concern to adequately isolate all hydrocarbons, Groundwater, and Potential Flow Zones prior to Hydraulic Fracturing Treatment of the Proposed Well.

Option 4. Secure COGCC Staff approval for alternative measures or agreement that additional mitigation is unnecessary under the circumstances and the well will otherwise be actively monitored or addressed during the offset stimulation activity.

Surface Equipment or Downhole Temporary Abandonment

The operator will ensure that, in addition to adequate wellbore isolation, producing, shut-in, or temporarily abandoned wells within 1,500 feet of the proposed well in three dimensions will have surface equipment (wellhead and master valve) rated to a pressure adequate to contain anticipated surface pressures that could occur from the proposed Hydraulic Fracturing Treatment. When the objective formation is the same in the Proposed Well and the Offset Well, and the Offset Well is normally exposed to lower pressures, Offset Well downhole mechanical isolation above the objective formation is an acceptable alternative in lieu of high pressure surface equipment, in accordance with Rule 317.x.

Other Related Requirements

The Proposed Well Operator will comply with all other Rule 317 requirements for Statewide Wellbore Collision Prevention, setbacks from Offset Wells or signed consents, and 90-day notices to all Operators of offset wells that are identified in the

RULE #303.A.(5)G GUIDANCE

Offset Well Evaluation. When an Offset Well and the Proposed Well are under different operatorship, the Offset Well operator will not refuse to have their well appropriately mitigated, pursuant to 317.y.

Mitigation Option Process

Option 1: If the Well of Concern is to remain, provide remedial cement needed to adequately isolate all hydrocarbons, Groundwater, and Potential Flow Zones.

1. The Proposed Well Operator will provide an acknowledgement of the proximity of the Well of Concern and agree to provide the necessary mitigation and applicable documentation based on the mitigation option selected.
2. Engineering Staff will add a corresponding Condition of Approval to the Proposed Well Form 2, and the Proposed Well Form 2 will be approved.
3. The Well of Concern Operator will submit a Form 4, Sundry Notice - Well Repair for the Well of Concern. The Form 4 will describe proposed remedial actions required to isolate all hydrocarbons, Groundwater, and Potential Flow Zones.
4. If the well has adequate wellbore isolation from prior work, but that isolation is not properly documented in COGCC well files, the Operator will submit the appropriate documentation on a Form 4, or other COGCC form as appropriate, certifying that required isolation is present in the offset well. If applicable, the form will reference the Proposed Well or the related Oil and Gas Location that prompted the work.
5. After completing remedial cementing, the Operator will submit a Form 5, Drilling Completion Report - Final and a CBL run across the remediation interval to verify compliance with the proposed remedial cement plan.
5. Remedial cementing will be completed prior to Hydraulic Fracturing Treatment of the Proposed Well.
6. The Proposed Well Operator is responsible for ensuring that a Form 42 (“OFFSET MITIGATION COMPLETED”) is submitted, stating that mitigation has been completed, prior to the Hydraulic Fracturing Treatment of the Proposed Well. The Form 42 may be submitted by either the Proposed Well Operator or the Well of Concern Operator.

RULE #303.A.(5)G GUIDANCE

Option 2: If the Well of Concern is to be plugged, plug the Well of Concern to adequately isolate all hydrocarbons, Groundwater, and Potential Flow Zones.

1. The Proposed Well operator will provide an acknowledgement of the proximity of the Well of Concern and agree to provide the necessary mitigation and applicable documentation based on the mitigation option selected.
2. Engineering Staff will add a corresponding Condition of Approval to the Proposed Well Form 2, and the Proposed Well Form 2 will be approved.
3. The Plugging Operator will submit Form 6, Well Abandonment Report: Notice of Intent to Abandon.
4. The Plugging Operator will submit Form 6, Well Abandonment Report: Subsequent Report of Abandonment after plugging is completed.
5. Plugging will be completed prior to Hydraulic Fracturing Treatment of the Proposed Well.
6. The Proposed Well Operator is responsible for ensuring that a Form 42 OFFSET MITIGATION COMPLETED is submitted, stating that mitigation has been completed, prior to the Hydraulic Fracturing Treatment of the Proposed Well. The Form 42 may be submitted by either the Proposed Well Operator or the Well of Concern Operator.

Option 3: If the Well of Concern is plugged or dry and abandoned, re-enter and re-plug the Well of Concern to adequately isolate all hydrocarbons, Groundwater, and Potential Flow Zones.

1. The Proposed Well Operator will provide an acknowledgement of the proximity of the Well of Concern, agree to re-enter and re-plug the Well of Concern, and agree to provide the applicable documentation based on the mitigation option selected
2. Engineering Staff will add a corresponding Condition of Approval to the Proposed Well Form 2, and the Proposed Well Form 2 will be approved.
3. The Proposed Well Operator will have adequate Financial Assurance for the proposed Re-entry and Re-plugging operations.
5. The Proposed Well Operator will submit Form 6, Well Abandonment Report: Notice of Intent to Abandon to re-enter and re-plug the existing PA or DA well. Typically, the Proposed Well Operator is also the Plugging Operator for Option 3, and therefore Form 6 will indicate “Re-plug by Other Operator.”

RULE #303.A.(5)G GUIDANCE

- a. Reason for Abandonment is OTHER; Other Describe: Re-enter to Re-Plug
 - b. Required Technical Detail/Comments:
 - a. State that the purpose is to re-enter and adequately re-plug prior to Hydraulic Fracturing Treatment of a Proposed Well
 - b. State that a closed loop system will be used
 - c. Describe details of the proposed re-entry procedure in the Technical Details/Comment box or attach the procedure
 - d. Describe details of the proposed re-plugging procedure in the Technical Details/Comment box or attach the procedure
 - c. Required Attachments:
 - a. Signed Surface Use Agreement or Surface Owner Consent (contact COGCC for a case-by-case evaluation if the surface owner refuses consent)
 - b. Current and Proposed Plugged Wellbore Diagrams
 - c. Proposed re-entry procedure, if not already described in Technical Detail/Comments
 - d. Proposed Plugging Procedure, if not already described in Technical Detail/Comments
 - e. Current site photos - minimum of 4 color photographs, 1 from each cardinal direction; each photograph will be identified by: date taken, well name, and direction of view.
6. No pits will be constructed for the Re-entry and Re-plugging operations; a closed loop system is required.
7. If as-built well location GPS data has not been reported for the well, the Proposed Well Operator will obtain the GPS data pursuant to Rule 215 and submit it on the Form 6, Well Abandonment Report: Subsequent Report of Abandonment
8. The Proposed Well Operator will contact the COGCC Field Inspector for a joint onsite inspection prior to any new disturbance.
9. The Proposed Well Operator will immediately notify the Director upon discovery of existing contamination from previous oil and gas operations.

RULE #303.A.(5)G GUIDANCE

10. The Proposed Well Operator is responsible for reporting and remediating any and all spills or releases resulting from their work during re-entry and re-plugging operations.

11. The Proposed Well Operator is responsible for 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 the COGCC Field Inspector (if held). Whenever possible, the Proposed Well Operator will utilize procedures that minimize surface impact, such as the use of truck-mounted rigs with rubber tires.

12. The Proposed Well Operator will 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).

13. Re-plugging will be completed prior to Hydraulic Fracturing Treatment of the Proposed Well.

14. Proposed Well Operator will submit a Form 42 - OFFSET MITIGATION COMPLETED for the re-plugged well, referencing the Proposed Well or the related Oil and Gas Location that prompted the work and reporting that appropriate mitigation was completed prior to the Hydraulic Fracturing Treatment of the proposed well.

15. The Proposed Well Operator will begin Final Reclamation as soon as practicable and submit Form 4, Sundry Notice to report the date that Final Reclamation will commence. (Use eForms “Submit by Other Operator” to submit Form 4.)

16. The Proposed Well Operator will submit a Form 4 when Final Reclamation is complete and the site is ready for inspection. (Use eForms “Submit by Other Operator”)

Option 4: Secure COGCC Staff approval for an alternative form of mitigation or COGCC Staff agreement that additional mitigation is unnecessary under the circumstances, but the well will otherwise be actively monitored or addressed during the offset stimulation activity.

1. The Proposed Well Operator will provide an acknowledgement of the proximity of the Well of Concern and explain why the alternative mitigation is sufficient to

RULE #303.A.(5)G GUIDANCE

mitigate the potential for communication or why additional mitigation is unnecessary for this purpose.

2. The Director will approve the alternative mitigation or exempt the Well of Concern from additional mitigation.
 - a. If the Director approves alternative mitigation:
 - i. Engineering Staff will add a corresponding Condition of Approval to the Proposed Well Form 2, and the Proposed Well Form 2 will be approved.
 - ii. The Proposed Well Operator will submit the necessary forms and perform the appropriate work based upon the approved alternative mitigation.
 - iii. The alternative mitigation will be completed prior to Hydraulic Fracturing Treatment of the Proposed Well.
 - iv. The Proposed Well Operator will submit a Form 42 (“OFFSET MITIGATION COMPLETED”) stating that the appropriate mitigation has been completed, prior to the Hydraulic Fracturing Treatment of the Proposed Well.
 - b. If the Director exempts the Well of Concern from additional mitigation, then:
 - i. Engineering Staff will attach the operator’s statement and the exemption to the submitted Form 2.
 - ii. Engineering Staff will remove the well from the list of Well(s) of Concern on the Offset Well Evaluation, and Engineering Staff will add a form comment indicating why the well was removed.
 - c. If the Director neither approves the alternative mitigation nor exempts the Well of Concern from additional mitigation, then the Proposed Well Operator must select another mitigation option.

Document Change Log

Change Date	Description of Changes
November 2, 2020	Document Created and Finalized

RULE #303.A.(5)G GUIDANCE

--	--