COGCC Proposed Well Integrity and Well Construction Rules

Stakeholder Summary

2020

COLORADO
Oil & Gas Conservation Commission
Department of Natural Resources

Welcome

Monday, January 13, 2020

The mission of the Colorado Oil and Gas Conservation Commission (COGCC) is to regulate the development and production of the natural resources of oil and gas in the state of Colorado in a manner that protects public health, safety, welfare, the environment and wildlife resources. Our agency seeks to serve, solicit participation from, and maintain working relationships with all those having an interest in Colorado's oil and gas natural resources.

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Daily Activity Dashboard (DAD)

Upcoming Events

Tuesday
January 14, 2020
(10:30 AM - 12:00 PM)
Wellbore Integrity Rulemaking Stakeholder Meeting
Colorado Oil & Gas Conservation Commission
1120 Lincoln St #801
Denver, CO 80203
Wasatch Hearing Room

Thursday
January 16, 2020
(3:00 PM - 4:00 PM)
Wellbore Integrity Rulemaking Prehearing Conference
Colorado Oil & Gas Conservation Commission
1120 Lincoln St #801
Denver, CO 80203
Wasatch Hearing Room

News & Notices

Draft Wellbore Integrity Rules
Published: 12/31/2019
Wellbore Integrity draft rules are now available on the COGCC website HERE. The deadline to submit a Request for Party Status is 5 PM on Monday, January 13, 2020.

Sign-up for Rulemaking Email Notification
Published: 06/20/2019
This list is for informational purposes only. You will receive announcements related to Rulemakings.

Sign-up for General Email Notification
Published: 01/01/2003
Receive link to most recent staff reports, general and enforcement hearing matters and associated notices of hearings.

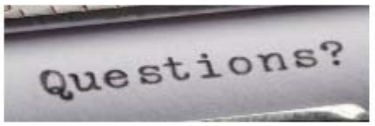
Archived News & Notices...

Senate Bill 19-181

Public Comments Portal

Click HERE for
Information & Guidance

Director's Final Objective Criteria (May 16, 2019)



dnr.ogcc@state.co.us
(Note if link does not open your email application properly, copy and paste address directly into email)
(303) 894-2100

Quick Links

Topics of Discussion

1. BACKGROUND FOR THE WELLBORE INTEGRITY RULES
2. CHANGES TO PERMITTING, CONSTRUCTION, OPERATION AND CLOSURE OF PRODUCTION WELLS CHANGES FOR SAFETY AND ENVIRONMENTAL PROTECTIONS DURING DRILLING AND HYDRAULIC FRACTURING
3. REQUIRE REGULAR INTEGRITY ASSESSMENTS FOR ALL OIL AND GAS PRODUCTION WELLS

SB19-181, Section 12 adds to Colorado Revised Statute 34-60-106 (18)

a. Address the permitting, construction, operation and closure of production wells [abandonment];

b. Require that wells are constructed using current practices and standards that protect water zones and prevent blowouts;

c. Enhance safety and environmental protections during operations such as drilling and hydraulic fracturing;

d. Require regular integrity assessments for all oil and gas production wells, such as surface pressure monitoring during production;

SB19-181, Section 12 add to Colorado Revised Statute 34-60-106 (18)

The commission shall promulgate rules to ensure proper wellbore integrity of all oil and gas production wells. In promulgating the rules, the Commission shall consider incorporating recommendations from the **State Oil and Gas Regulatory Exchange** and shall include the provisions to:

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Area Reports | Local Public Forums | Presentations | Special Projects | Staff Reports | Technical Reports

Technical Reports

Search Technical Reports:

Engineering White Papers and Presentations

Colorado's Regulations on Aquifer Protections and Wellbore Cement and Casing Design (11/15/2012)

Colorado's Wellbore Integrity Program – White Paper (09/15/2012)

State Oil & Gas Regulatory Exchange (SOGRE) Peer Assessment 2019 - Well Integrity (06/17/2019)

Final Reclamation Inspection and Implementation Program

Historical Plats

Horizontal Well Development

Independent Evaluation of COGCC Regulations and Processes

Induced Seismicity

Inter-Agency Cooperation

Lean Implementation

Miscellaneous

Orphaned Well Program

Public Health, Safety and Welfare

Risk-Based Inspections

Underground Injection Control (UIC)

Water Quality Control Commission (WQCC/WQCD) Annual Reports

Proposed Wellbore Rules Summary

The addition of new regulations, practices and concepts, rule revision for clean up and conforming, and the incorporation of existing policies.

- DEFINITIONS (100 Series)
- GENERAL RULES (200 Series)
- DRILLING, DEVELOPMENT, PRODUCTION AND ABANDONMENT (300 Series)
- SAFETY REGULATIONS (600 Series)

GENERAL RULES (200 Series)

- **201. EFFECTIVE SCOPE OF RULES AND REGULATIONS**

Responsive to SOGRE recommendation 63 to add the following statement to affirm rule compliance….
Operators will ensure compliance with all applicable rules and regulations.

Global Performance Requirement

- **Rule 317.e.:** Drilling fluid, casing, and cement program to isolate hydrocarbon formations and protected water.

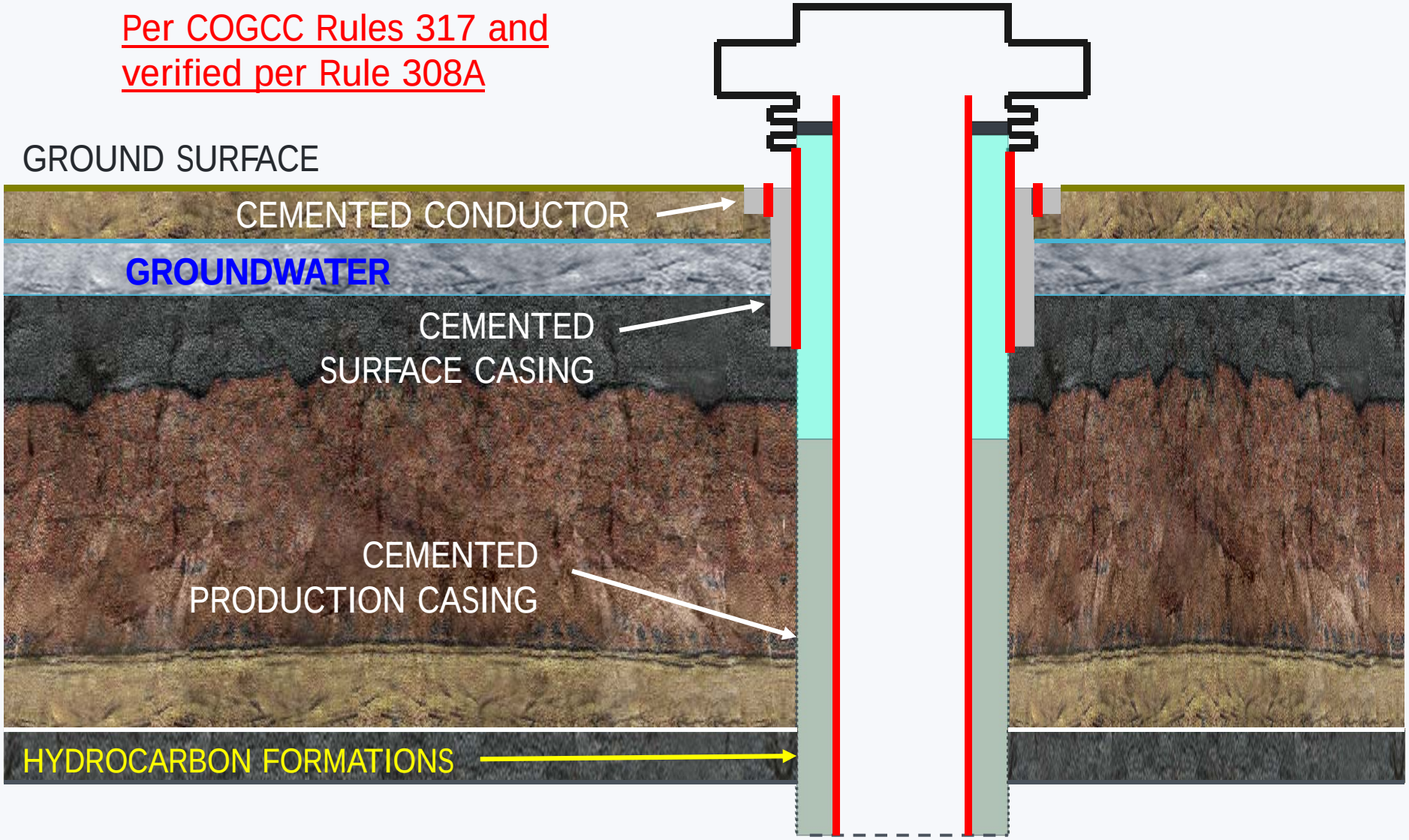
  (1) The casing and cement program for each well will prevent migration of oil, gas, and water within potential flow zones from one formation to another behind the casing. Protected water penetrated during drilling will be isolated from the infiltration of hydrocarbons or water from other formations penetrated by the well.

WELLBORE DIAGRAM

PLACE & CEMENT CASING

Fluid inflow prevented by cement

Per COGCC Rules 317 and verified per Rule 308A



Topics of Discussion

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2. CHANGES TO PERMITTING, CONSTRUCTION, OPERATION AND CLOSURE OF PRODUCTION WELLS CHANGES FOR SAFETY AND ENVIRONMENTAL PROTECTIONS DURING DRILLING AND HYDRAULIC FRACTURING
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Well Records and Permitting

301. RECORDS, REPORTS, NOTICES-GENERAL

Such records on each well shall be transferred to and maintained by any subsequent owner.

303.a. (5) Form 2 Information Requirements *The following 3 items are now required and responsive to SOGRE 10, 13 & 76*

F. Casing and Cementing Plan.

Casing and cementing plan that addresses anticipated water, potential flow and hydrocarbon bearing zones, and subsurface hazards.

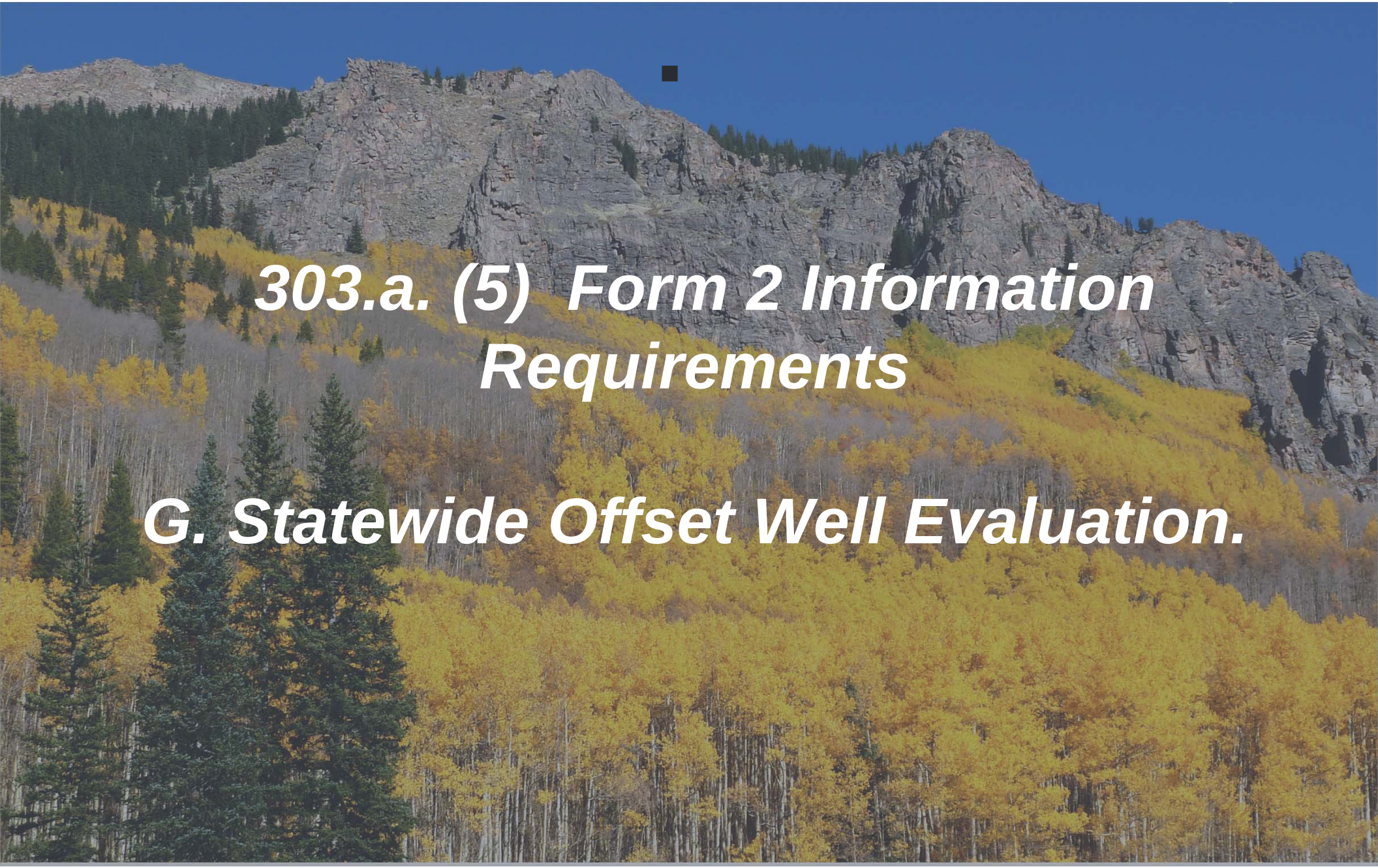
G. Statewide Offset Well Evaluation.

The Form 2 will include an offset well evaluation of wells within 1,500 feet of the proposed wellbore.

H. Stimulation at Depths 2,000 Feet or Less.

i. Geology and Hydrogeology Assessment.
ii. Engineering Assessment.

321. Directional Drilling Wellbore Plan and Survey Requires a three dimensional format directional survey for deviated wells and an inclination survey for newly drilled vertical holes. *(SOGRE recommendation 8)*



303.a. (5) Form 2 Information Requirements

G. Statewide Offset Well Evaluation.

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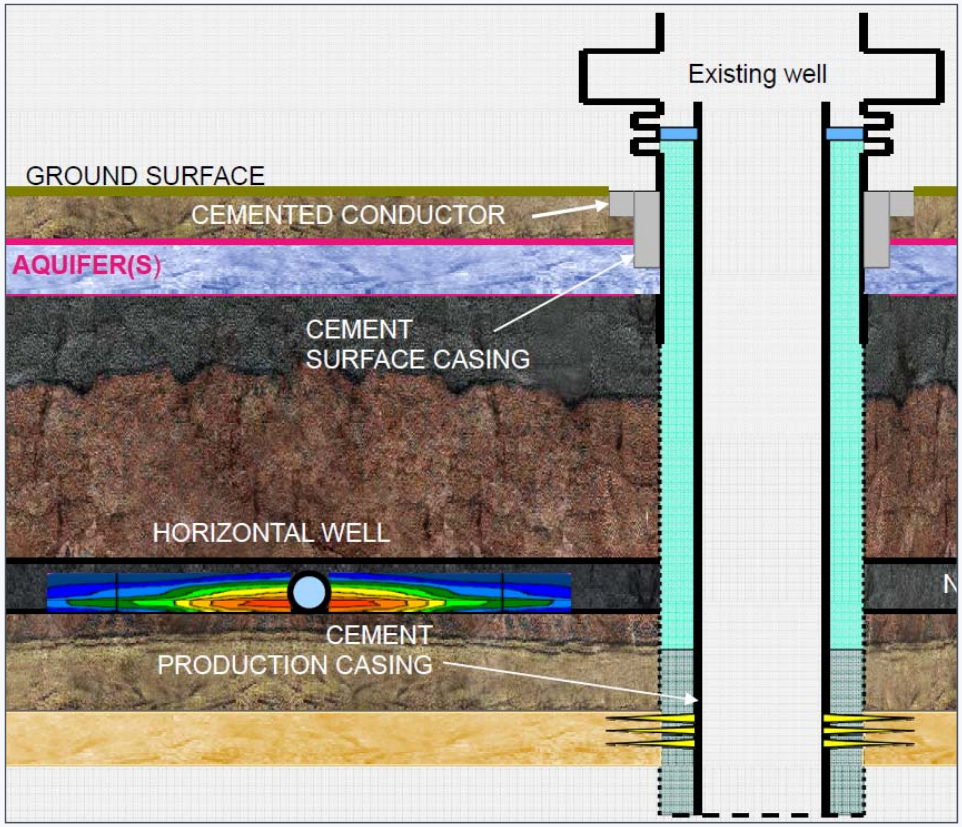
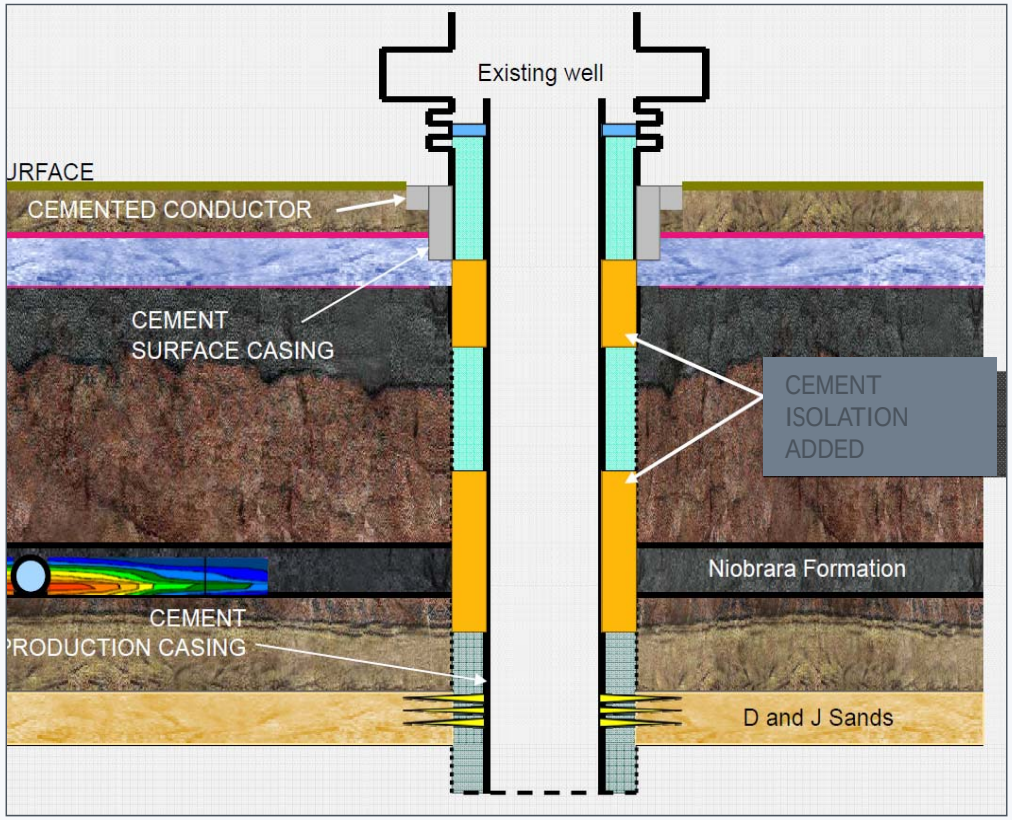
Existing Well Review- remediation to isolate known groundwater or hydrocarbon producing zones.

- Add production casing cement to isolate water and hydrocarbon behind production casing

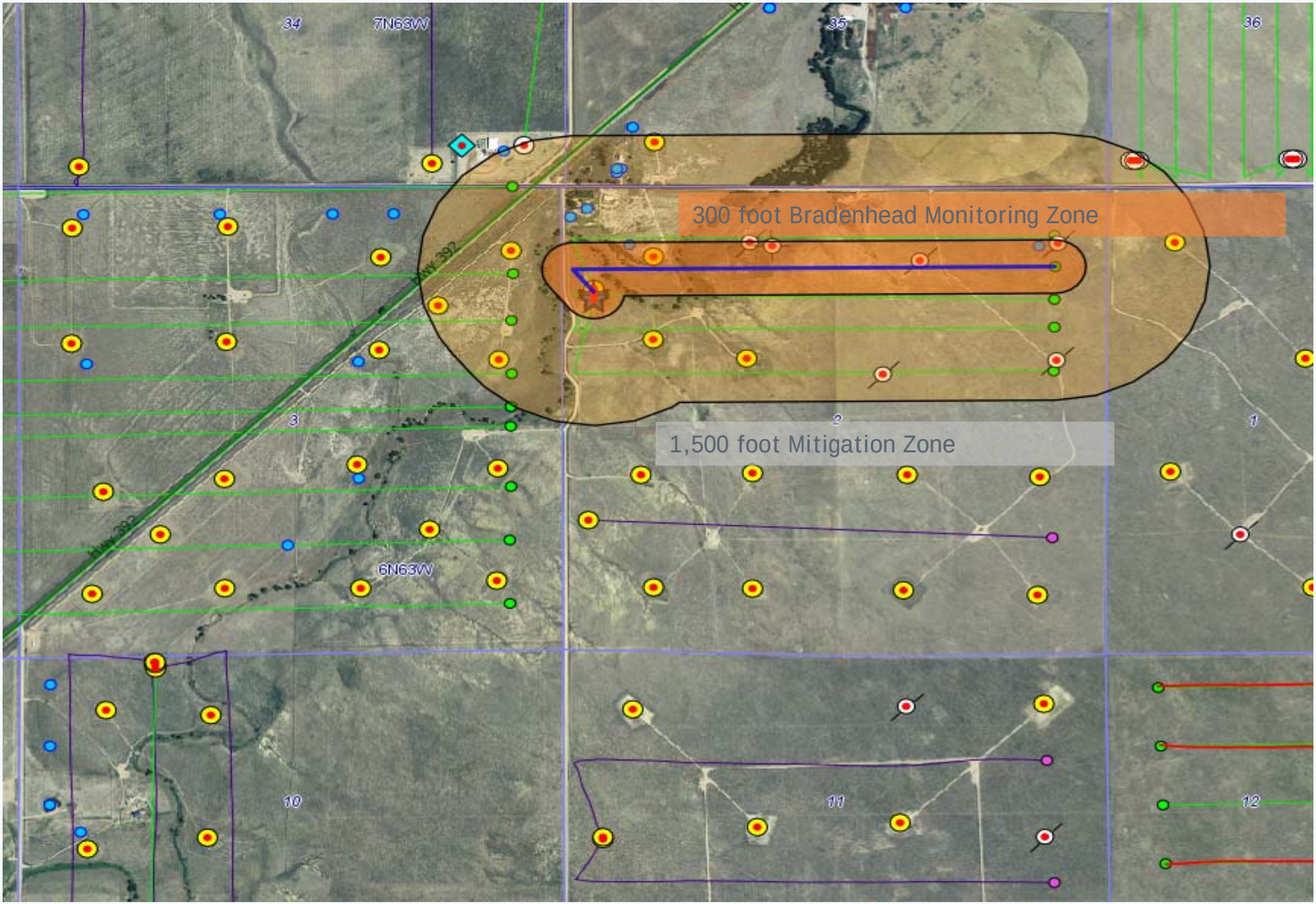
Well with Inadequate Isolation



Remediated Well with Isolation



Per COGCC Rules 317.i, j, & k and verified per Rule 308A


300 foot Bradenhead Monitoring Zone
1,500 foot Mitigation Zone
34
7N63W
35
36
3
2
1
6N63W
10
11
12
Hwy 392
Hwy 392

DRILLING AND COMPLETION RULES

The major amendments and revises to the 317 General Drilling and Completion section related to SOGRE recommendations are:

- **317.a.** Blowout prevention equipment
- **317.e.** Drilling fluid, casing, and cement program to isolate hydrocarbon formations and protected water
- **317.f.** Cementing
- **317.g.** Casing Centralization.
- **317.h.** Wellbore circulation
- **317.i.** Surface casing where subsurface conditions are unknown
- **317.j.** Surface casing where subsurface conditions are known
- **317.l.** Surface and intermediate casing cementing**.**
- **317.m.** Production casing cementing.
- **317.n.** Surface casing pressure testing.
- **317.o.** Intermediate casing pressure testing.
- **317.p.** Production casing and stimulation string pressure testing.
- **317.q.** Casing pressure test monitoring and success criteria for all casing strings.
- **317.w.** Remedial cementing.
- **317.aa.** Offset wellheads and surface equipment.
- **317.dd.** Surface equipment used in hydraulic fracturing treatment.
- **317.ee.** Hydraulic fracture treatment monitoring.

DRILLING AND COMPLETION RULES (continued)

317.a. Expanded the requirement to have Blowout Prevention Equipment when deepening, re-entering, recompleting, workover, and plugging a well. *(SOGRE recommendation 20)*

317.e. Drilling fluid, casing, and cement program to isolate hydrocarbon formations and protected water

(1). Expanded the rule to prevent migration of oil, gas, and water within *potential flow zones* from one formation to another behind the casing and isolate water zones from hydrocarbons or water from other formation. *(SOGRE recommendations 33, 34, & 35)*

(2). Require the surface casing hole be drilled with *fresh water, air or nitrogen*. *(SOGRE recommendation 41)*

(3). Require the used of *steel casing*. *(SOGRE recommendation 42)*

(4). All casing will be hydrostatically pressure tested, a casing evaluation tool on the casing or mill pressure tested prior to placing in the hole.

DRILLING AND COMPLETION RULES (continued)

317.f. Cementing. *Responsive to recommendations on elements 45-50, 53-55*

(1). Requires cement be place by the pump and plug method.

(2). Requires a minimum 1-1/2 inch difference between the diameters of the drilled hole and the surface casing. All other annular spaces must be at least 0.42 inches.

(3). Requires cement be placed to prevent channeling and monitor pump rate, density, and design parameters

(4). Requires the use of a cement slurry that isolates all water, hydrocarbon, corrosive, potential flow, or hydrogen sulfide zones.

(5). Requires the operator to place cement slurry to the designed density, to minimize free fluid content, to ensure free water separation does not exceed 3 milliliters per 250 milliliters of cement, and the cement mix water chemistry is appropriate.

(6). Requires the cement mixture will be tested at a period not least than every 6-months or when for operating conditions change.

DRILLING AND COMPLETION RULES (continued)

317.g. Casing Centralization: Provide surface, intermediate and production centralization. *(SOGRE recommendations 44, 56 & 71)*

317.h. Wellbore circulation: Operator is to clean and condition the wellbore prior to cement placement. *(SOGRE recommendations 51 & 52)*

317.i. Surface casing where subsurface conditions are unknown: Require the surface casing be run to a depth approved by the Director below all known or reasonably estimated groundwater, and for well control at a minimum depth of 10% of true vertical depth or as required by Commission order. *(SOGRE recommendations 14 to 18)*

317.j. Surface casing where subsurface conditions are known: Operator will place the surface casing to a depth approved by the Director. *(SOGRE recommendations 14 to 18)*

317.l. Surface and intermediate casing cementing: Revised the language for better readability and clarity.

317.m. Production casing cementing: **:** Added language for isolation of specific geologic intervals specified in the permit, or as required by Rule 317.e. *(SOGRE recommendations 74 &75)*

Increased the top of cement height to 500-feet above the producing horizon.

DRILLING AND COMPLETION RULES (continued)

317.n. Surface casing pressure testing and

317.o. Intermediate casing pressure testing. Both the surface and intermediate casings are to be pressure test to 1,500 psi or to a pressure approved by the Director prior to drilling out the casing shoe to confirm mechanical integrity.
(SOGRE recommendations 78)

317.p. Production casing and stimulation string pressure testing: The production casing and stimulation string are to be pressure tested to 500 psi over the maximum anticipated surface pressure.
(SOGRE recommendations 78, 87,88, & 89)

317.q. Casing pressure test monitoring and success criteria for *all* casing strings:

(1) A successfully pressure test is when:

A. The surface pressure reading do not change more than 5%;
B. The pressure does not change more than 1% during the last 5 minutes; and
C. The bradenhead pressure does not change more than 5%.

(2) If there is an indication of loss of mechanical integrity, the operator may not conduct hydraulic fracturing treatment until mechanical integrity has been confirmed.

DRILLING AND COMPLETION RULES (continued)

317.w. Remedial cementing: Added the reference to 317.e for isolation of potential flow, water and hydrocarbon zones and that placed remedial cement is to be confirmed by cement evaluation tools.
(SOGRE recommendations 77 & 79)

317.y. Statewide Setback for Hydraulic Fracturing Treatment. Clarified language that no well within 150 feet of an existing well may be hydraulically fractured without the consent of the adjacent operator.

317.z. Notice prior to stimulation. At least 90 days prior to a stimulation, the operator will provide notice to all offset well operators that were identified pursuant Rule 303.a.(5)G.i.

317.aa. Offset wellheads and surface equipment. Prior to hydraulic fracture treatments, the operator will ensure offset existing wells within 1,500 feet are adequate to contain anticipated surface pressures that could be encountered by the adjacent well.
(SOGRE recommendations 4 to 7 &13)

DRILLING AND COMPLETION RULES (continued)

317.bb. 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 these Rules necessary to ensure protection of public health, safety, welfare, the environment, and wildlife resources.

317.cc. Communication Prevention. An operator will take all prudent measures to prevent communication along any known conduits between a stimulated interval and a groundwater source.

317.dd. 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 to 110% of the maximum anticipated surface treating pressure.
(SOGRE recommendations 90)

317.ee. Hydraulic fracture treatment monitoring: The operator will monitor and record hydraulic fracturing treatment parameters.

Well Abandonment

311.b. Subsequent Report of Abandonment, Form 6

Language has been added regarding the review and approval process for the Subsequent Report of Abandonment. If the Director has identify deficiencies in the abandonment, the operator is to correct the deficiencies which may require reentering the well. *(SOGRE recommendation 132)*

319. Abandonment

319.a.(1). Added language requiring cement plugs isolate hydrocarbon and water zones as specified in Rule 317.e and cement conforms with the requirements of Rule 317.f. *(SOGRE recommendations 123 & 126)*

319.a.(6). Added language requiring an operator to monitor the last plug for 5-days prior to capping or seal the well.

319.a.(7). Added language requiring an operator verify the deepest groundwater plug by tagging or by an alternative method approved by the Director. *(SOGRE recommendation 129)*

319.b.(3). Added the requirement to plug "dry holes" within 6-months. *(SOGRE recommendation 117)*

316C.g. Added operator requirement to give at least 48 hours advance notice prior to plugging any well through a Field Operations Notice, Form 42 - Start of Plugging Operations.

SAFETY REGULATIONS (600 Series)

Responsive to SOGRE recommendations 20, 27, 29, 30, 106, 108 & 109 to clarity several well control practices and standards.

603.e. Statewide well control equipment and other safety requirements.

(1) Operator is to design, maintain and monitor the drilling fluid and fluid levels to assure well control is maintained.

(2) The Director will have access to the drilling fluid records related to the fluid's properties used to control the well. The operator will retain all records for a period of 5 years.

(3) When the conditions and tests indicate a need for a change in the drilling fluid program in order to ensure control of the well, the operator will use due diligence in modifying the program.

(4) An operator will maintain well control using blowout preventer systems and/or diverter systems for wells drilled with air, nitrogen, or foam.

(6) Updated the reference to the most current API Standard 53: "Well Control Equipment Systems for Drilling Wells," 5th Edition (December 2018)

(9) Added language requiring an operator equip the wellhead assemblies to monitor pressure containing annuli at surface, unless exempted by the Director.

(11) The operator will inspect and service the wellhead, tree, and related surface control equipment to maintain pressure control throughout the life of the well.

(12) The operator will conduct pressure testing of the casing string in accordance with Rule 317.

(13) An operator will complete a formation integrity test (FIT) after drilling out below the surface casing shoe and any intermediate casing shoes for a minimum of one well on each oil and gas location.

(18) Each operator will have a functioning emergency response plan that provides for the effective management of emergency situations that arise from oil and gas operations.

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BRADENHEAD MONITORING, TESTING, AND REPORTING

Responsive to SOGRE recommendations 94, 95, 106, 108, and 109

341.a. Equipment requirements.

(1) The operator will equip bradenhead access on all wells.
(2) Allow for COGCC visual inspection at all times, all valves will remain exposed and can be in a ridged housing, and
(3) These equipment requirements apply to all wells, regardless of function.

341.b. Bradenhead monitoring at the following well stages of drilling and completions

Report to the Director anytime the pressure exceeds 30% of the surface casing's total vertical depth *(30% * depth of SC is feet = pressure threshold in psi)*

(1) At Rig Release.
(2) During stimulation.
(3) Thirty days after stimulation.
(4) Through the remaining life of the well.

341.c. Annual Bradenhead Testing and Reporting. For all wells other than CBM wells, operator will perform an annual bradenhead test and submit the data to the Director on a Form 17 or other Director-approved method. For CBM wells, operator will perform bradenhead testing in accordance with Rule 608.e.

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