

**Klingenberg C20-780 PAD**  
**MITIGATION MEASURES**

**COGCC Rule 604.c.(2)A. Noise.**

**Noise Mitigation:**

- ***Temporary operations*** – Baseline survey was completed, Engineered sound walls (16' tall) will be used along the north and east side of the drill pad. The use of equipment specific sound walls might be required around the rig generators in the event of sound impacts during operations.
- ***Permanent facility*** - Additional permanent location/equipment sound mitigation will be determined following sound surveys performed after facility startup.

**COGCC Rule 604.c.(2)B. Closed Loop Drilling Systems – Pit Restrictions.**

**Drilling/Completion Operations:**

- Closed loop drilling systems are required within the Buffer Zone Setback.
- Pits are not allowed on Oil and Gas Locations within the Buffer Zone Setback, except fresh water storage pits, reserve pits to drill surface casing, and emergency pits as defined in the 100-Series Rules.
- Fresh water pits within the Exception Zone shall require prior approval of a Form 15 pit permit. In the Buffer Zone, fresh water pits shall be reported within 30-days of pit construction.
- Fresh water storage pits within the Buffer Zone Setback shall be conspicuously posted with signage identifying the pit name, the operator's name and contact information, and stating that no fluids other than fresh water are permitted in the pit. Produced water, recycled E&P waste, or flowback fluids are not allowed in fresh water storage pits.
- Fresh water storage pits within the Buffer Zone Setback shall include emergency escape provisions for inadvertent human access.

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**COGCC Rule 604.c.(2).C. Green Completions – Emission Control Systems.**

**Emissions Mitigation:**

- Flow lines, separators, and sand traps capable of supporting green completions as described in Rule 805 shall be installed at any Oil and Gas Location at which commercial quantities of gas are reasonably expected to be produced based on existing adjacent wells within 1 mile.
- Uncontrolled venting shall be prohibited in an Urban Mitigation Area.
- Temporary flowback flaring and oxidizing equipment shall include the following:
  - Adequately sized equipment to handle 1.5 times the largest flowback volume of gas experienced in a ten (10) mile radius;
  - Valves and porting available to divert gas to temporary equipment or to permanent flaring and oxidizing equipment; and
  - Auxiliary fuel with sufficient supply and heat to sustain combustion or oxidation of the gas mixture when the mixture includes non-combustible gases.

**COGCC Rule 604.c.(2)D. Traffic Plan.**

**Traffic Control:**

If required by the local government, a traffic plan will be coordinated with the local jurisdiction prior to commencement of operations.

Temporary operations - Dust suppression (water trucks) will be used on the access roads and pads during construction, drilling, and completion activities. Stabilization activities in the form of a magnesium chloride application will be utilized along the dirt county roads surrounding the access road location.

**COGCC Rule 604.c.(2)E. Multiwell Pads.**

**Planning:**

- N/A (Single Well Pad)

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**COGCC Rule 604.c.(2)F. Leak Detection Plan.**

**Material Handling and Spill Prevention:**

- Noble Energy Inc. designs facilities to avoid releases and to be compliant with all regulations specific to leak detection and control (i.e. SPCC 40CFR112). Daily, monthly and annual inspections are performed at each facility to confirm operational integrity and regulatory compliance. Noble will perform maintenance if it is deemed necessary through any of the scheduled inspections. Automation technology is utilized to monitor any variations in pressures and fluid gauges which could indicate a leak.

**COGCC Rule 604.c.(2)G. Berm construction.**

**Construction:**

- Berms or other secondary containment devices in Designated Setback Locations shall be constructed around crude oil, condensate, and produced water storage tanks and shall enclose an area sufficient to contain and provide secondary containment for one-hundred fifty percent (150%) of the largest single tank. Berms or other secondary containment devices shall be sufficiently impervious to contain any spilled or released material. All berms and containment devices shall be inspected at regular intervals and maintained in good condition. No potential ignition sources shall be installed inside the secondary containment area unless the containment area encloses a fired vessel. Refer to American Petroleum Institute Recommended Practices, API RP - D16.

**COGCC Rule 604.c.(2)H. Blowout preventer equipment ("BOPE").**

**Drilling/Completion Operations:**

- Blowout prevention equipment for drilling operations in a Designated Setback Location shall consist of (at a minimum):
  - Rig with Kelly. Double ram with blind ram and pipe ram; annular preventer or a rotating head.
  - Rig without Kelly. Double ram with blind ram and pipe ram. Mineral Management certification or Director approved training for blowout prevention shall be required for at least one (1) person at the well site during drilling operations.

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**COGCC Rule 604.c.(2)I. BOPE testing for drilling operations.**

**Planning:**

- Upon initial rig-up and at least once every thirty (30) days during drilling operations thereafter, pressure testing of the casing string and each component of the blowout prevention equipment including flange connections shall be performed to seventy percent (70%) of working pressure or seventy percent (70%) of the internal yield of casing, whichever is less. Pressure testing shall be conducted and the documented results shall be retained by the operator for inspection by the Director for a period of one (1) year. Activation of the pipe rams for function testing shall be conducted on a daily basis when practicable.

**COGCC Rule 604.c.(2)J. BOPE for well servicing operations.**

**Planning:**

- Adequate blowout prevention equipment shall be used on all well servicing operations.
- Backup stabbing valves shall be required on well servicing operations during reverse circulation. Valves shall be pressure tested before each well servicing operation using both low-pressure air and high-pressure fluid.

**COGCC Rule 604.c.(2)K. Pit level indicators.**

**Material Handling and Spill Prevention:**

- Due to using a closed loop system pits will not be used.

**COGCC Rule 604.c.(2)L. Drill stem tests.**

**Planning:**

- Closed chamber drill stem tests shall be allowed. All other drill stem tests shall require approval by the Director.

**COGCC Rule 604.c.(2)M. Fencing requirements.**

**Construction:**

- Unless otherwise requested by the Surface Owner, well sites constructed within the Designated Setback location will be fenced to restrict access by unauthorized persons.

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**COGCC Rule 604.c.(2)N. Control of fire hazards.**

**Material Handling and Spill Prevention:**

- Any material not in use that might constitute a fire hazard shall be removed a minimum of twenty-five (25) feet from the wellhead, tanks and separator. Any electrical equipment installations inside the bermed area shall comply with API RP 500 classifications and comply with the current national electrical code as adopted by the State of Colorado.

**COGCC Rule 604.c.(2)O. Loadlines.**

**Drilling/Completion Operations:**

- All loadlines will be bullplugged or capped.

**COGCC Rule 604.c.(2)P. Removal of surface trash.**

**General Housekeeping:**

- All surface trash, debris, scrap or discarded material connected with the operations of the property shall be removed from the premises or disposed of in a legal manner.

**COGCC Rule 604.c.(2)Q. Guy line anchors.**

**Drilling/Completion Operations:**

- All guy line anchors left buried for future use shall be identified by a marker of bright color not less than four (4) feet in height and not greater than one (1) foot east of the guy line anchor.

**COGCC Rule 604.c.(2)R. Tank specifications.**

**Construction:**

- All newly installed or replaced crude oil and condensate storage tanks shall be designed, constructed, and maintained in accordance with National Fire Protection Association (NFPA) Code 30 (2008 version). The operator shall maintain written records verifying proper design, construction, and maintenance, and shall make these records available for inspection by the Director. Only the 2008 version of NFPA Code 30 applies to this rule. This rule does not include later amendments to, or editions of, the NFPA Code 30. NFPA Code 30 may be examined at any state publication depository library. Upon request, the Public Room Administrator at the office of the Commission, 1120 Lincoln Street, Suite 801, Denver, Colorado 80203, will provide information about the publisher and the citation to the material.

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**COGCC Rule 604.c.(2)S. Access roads.**

**Construction:**

- At the time of construction, all leasehold roads shall be constructed to accommodate local emergency vehicle access requirements, and shall be maintained in a reasonable condition. NEI plans on building the access road off of WCR 42 for Drilling and Completion activities.

**COGCC Rule 604.c.(2)T. Well site cleared.**

**General Housekeeping:**

- Within ninety (90) days after a well is plugged and abandoned, the well site shall be cleared of all non-essential equipment, trash, and debris. For good cause shown, an extension of time may be granted by the Director.

**COGCC Rule 604.c.(2)U. Identification of plugged and abandoned wells.**

**Planning:**

- The operator shall identify the location of the wellbore with a permanent monument as specified in Rule 319.a.(5). The operator shall also inscribe or imbed the well number and date of plugging upon the permanent monument.

**COGCC Rule 604.c.(2)V. Development from existing well pads.**

**Planning:**

- Where possible, operators shall provide for the development of multiple reservoirs by drilling on existing pads or by multiple completions or commingling in existing wellbores (see Rule 322). If any operator asserts it is not possible to comply with, or requests relief from, this requirement, the matter shall be set for hearing by the Commission and relief granted as appropriate.

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**COGCC Rule 604.c.(2)W. Site-specific measures.**

**Planning:**

- **Earthen ditch and berm will be used around the drilling rig pad. Drill rig lights will be positioned facing down and light plants will be pointed away from Building Unit owners.**