

Grand Mesa Operating, Co (GMOC)

Waste Management Plan (WMP)

Hickok 1-26 API 05-121-11042-00
NENE 26-3S-5W

GMOC is filing a GOGCC Form 4 Sundry Notice to change the permit conditions for the Hickok 1-26.

Per COGCC Rule 907(a)(3) GMOC is requesting approval to land apply the drilling fluids and solids resulting from the drilling process. GMOC is incorporating a closed loop drilling fluid system and a de watering unit. This system will allow GMOC to separate the drilling solids and fluids prior to land application. GMOC will follow the land application standards listed in COGCC Rule 907(d)(3)(B) –

- Average thickness of water –based bentonitic drilling fluid waste applied shall be no more than three (3) inches prior to incorporation
- The waste shall be applied to prevent ponding or erosion
- The waste shall be incorporated as a beneficial amendment into the native soils within ten(10) days of application
- The resulting concentrations shall not exceed those in Table 910-1 – see attached
- Operator shall obtain written authorization from the surface owner prior to land application – see attached
- Operator shall maintain a record of waste generator information including source, volume, location where land application occurred. Records shall be maintained for 5-years
- Operators with control and authority over the wells from which the drilling fluids are obtained retain responsibility for the land application

GMOC will test the fluids prior to the land application and if the fluids do not qualify per Table 910-1 they will be transported and disposed of at an approved state of Colorado disposal facility per our original application approved April 8, 2014.

912. VENTING OR FLARING NATURAL GAS

- a. The unnecessary or excessive venting or flaring of natural gas produced from a well is prohibited.
- b. Except for gas flared or vented during an upset condition, well maintenance, well stimulation flowback, purging operations, or a productivity test, gas from a well shall be flared or vented only after notice has been given and approval obtained from the Director on a Sundry Notice, Form 4, stating the estimated volume and content of the gas. The notice shall indicate whether the gas contains more than one (1) ppm of hydrogen sulfide. If necessary to protect the public health, safety or welfare, the Director may require the flaring of gas.
- c. Gas flared, vented or used on the lease shall be estimated based on a gas-oil ratio test or other equivalent test approved by the Director, and reported on Operator's Monthly Production Report, Form 7.
- d. Flared gas that is subject to Sundry Notice, Form 4, shall be directed to a controlled flare in accordance with Rule 903.b.(2) or other combustion device operated as efficiently as possible to provide maximum reduction of air contaminants where practicable and without endangering the safety of the well site personnel and the public.
- e. Operators shall notify the local emergency dispatch or the local governmental designee of any natural gas flaring. Notice shall be given prior to flaring when flaring can be reasonably anticipated, or as soon as possible, but in no event more than two (2) hours after the flaring occurs.

Table 910-1
CONCENTRATION LEVELS¹

| Contaminant of Concern | Concentrations |
|---|--------------------------------|
| Organic Compounds in Soil | |
| TPH (total volatile and extractable petroleum hydrocarbons) | 500 mg/kg |
| Benzene | 0.17 mg/kg ² |
| Toluene | 85 mg/kg ² |
| Ethylbenzene | 100 mg/kg ² |
| Xylenes (total) | 175 mg/kg ² |
| Acenaphthene | 1,000 mg/kg ² |
| Anthracene | 1,000 mg/kg ² |
| Benzo(A)anthracene | 0.22 mg/kg ² |
| Benzo(B)fluoranthene | 0.22 mg/kg ² |
| Benzo(K)fluoranthene | 2.2 mg/kg ² |
| Benzo(A)pyrene | 0.022 mg/kg ² |
| Chrysene | 22 mg/kg ² |
| Dibenzo(A,H)anthracene | 0.022 mg/kg ² |
| Fluoranthene | 1,000 mg/kg ² |
| Fluorene | 1,000 mg/kg ² |
| Indeno(1,2,3,C,D)pyrene | 0.22 mg/kg ² |
| Napthalene | 23 mg/kg ² |
| Pyrene | 1,000 mg/kg ² |
| Organic Compounds in Ground Water | |
| Benzene | 5 µg/l ³ |
| Toluene | 560 to 1,000 µg/l ³ |
| Ethylbenzene | 700 µg/l ³ |

| | |
|---|---|
| Xylenes (Total) | 1,400 to 10,000 µg/l^{3,4} |
| Inorganics in Soils | |
| Electrical Conductivity (EC) | <4 mmhos/cm or 2x background |
| Sodium Adsorption Ratio (SAR) | <12⁵ |
| pH | 6-9 |
| Inorganics in Ground Water | |
| Total Dissolved Solids (TDS) | <1.25 x background³ |
| Chlorides | <1.25 x background³ |
| Sulfates | <1.25 x background³ |
| Metals in Soils | |
| Arsenic | 0.39 mg/kg² |
| Barium (LDNR True Total Barium) | 15,000 mg/kg² |
| Boron (Hot Water Soluble) | 2 mg/l³ |
| Cadmium | 70 mg/kg^{3,6} |
| Chromium (III) | 120,000 mg/kg² |
| Chromium (VI) | 23 mg/kg^{2,6} |
| Copper | 3,100 mg/kg² |
| Lead (inorganic) | 400 mg/kg² |
| Mercury | 23 mg/kg² |
| Nickel (soluble salts) | 1,600 mg/kg^{2,6} |
| Selenium | 390 mg/kg^{2,6} |
| Silver | 390 mg/kg² |
| Zinc | 23,000 mg/kg^{2,6} |
| Liquid Hydrocarbons in Soils and Ground Water | |
| Liquid hydrocarbons including condensate and oil | Below detection level |

COGCC recommends that the latest version of EPA SW 846 analytical methods be used where possible and that analyses of samples be performed by laboratories that maintain state or national accreditation programs.

¹ Consideration shall be given to background levels in native soils and ground water.

² Concentrations taken from CDPHE-HMWMD Table 1 Colorado Soil Evaluation Values (December 2007).

³ Concentrations taken from CDPHE-WQCC Regulation 41 - The Basic Standards for Ground Water.

⁴ For this range of standards, the first number in the range is a strictly health-based value, based on the WQCC's established methodology for human health-based standards. The second number in the range is a maximum contaminant level (MCL), established under the Federal Safe Drinking Water Act which has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. The WQCC intends that control requirements for this chemical be implemented to attain a level of ambient water quality that is at least equal to the first number in the range except as follows: 1) where ground water quality exceeds the first number in the range due to a release of contaminants that occurred prior to September 14, 2004 (regardless of the date of discovery or subsequent migration of such contaminants) clean-up levels for the entire contaminant plume shall be no more restrictive than the second number in the range or the ground water quality resulting from such release, whichever is more protective, and 2) whenever the WQCC has adopted alternative, site-specific standards for the chemical, the site-specific standards shall apply instead of these statewide standards.

⁵ Analysis by USDA Agricultural Handbook 60 method (20B) with soluble cations determined by method (2). Method (20B) = estimation of exchangeable sodium percentage and exchangeable potassium percentage from soluble cations. Method (2) = saturated paste method (note: each analysis requires a unique sample of at least 500 grams). If soils are saturated, USDA Agricultural Handbook 60 with soluble cations determined by method (3A) saturation extraction method.

⁶ The table value for these inorganic constituents is taken from the CDPHE-HMWMD Table 1 Colorado Soil Evaluation Values (December 2007). However, because these values are high, it is possible that site-specific geochemical conditions may exist that could allow these constituents to migrate into ground water at levels exceeding ground water standards even though the concentrations are below the table values. Therefore, when these constituents are present as contaminants, a secondary evaluation of their leachability must be performed to ensure ground water protection.

LETTER AGREEMENT

WHEREAS, Grand Mesa Operating Company (GMOC) intends to drill the Hickok #1-26 Well in the NE/4 of Section 26-3S-53W, Washington County, Colorado, on or about June 15, 2014.


WHEREAS, Brent L. McCracken (McCracken) is the owner of the surface estate under the NE/4 of Section 26-3S-53W and hereby gives GMOC permission to save the cuttings from the drilling of this well and spread them over the surface of these lands after all drilling operations have been completed in accordance with COGCC Rule 907(d)(3).

WHEREAS, GMOC will be utilizing a de-watering system which will be part of the closed loop system for handling the drilling fluids required for drilling this well. The de-watering system will treat the fluids separated from the cuttings and the water will be saved in large frac tanks. After all drilling has been completed, the water in all frac tanks will be tested and if the laboratory tests meet or exceed the standards set forth in Table 910-1 of Rule 900 of the COGCC Rules, McCracken will allow GMOC to disburse the water over the SE/4 of Section 26-3S-53W. If the water does not meet these standards, GMOC will see that the water is hauled to an approved disposal site owned by CSI/Waste Management in Bennett, Colorado.

THEREFORE, all parties have signed this agreement this 6th day of June, 2014, and agree to be bound thereby.

GRAND MESA OPERATING COMPANY

By:


Michael J. Reilly
President


Brent L. McCracken