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ONSITE RECLAMATION E&P WASTE MANAGEMENT PLAN

Onsite Reclamation Through Land Application & Incorporation of Water-Based Bentonitic Drilling Fluids & Associated Drill Cuttings

Bonanza Creek Energy Operating Company, LLC.

This Onsite Reclamation Exploration and Production Waste Management Plan (ORWMP) outlines the procedures Bonanza Creek Energy Operating Company, LLC. (Bonanza Creek) and its contractors will adhere to during remediation and incorporation of drilling fluids and associated cuttings at individual well pad locations.

Prior to development of the ORWMP, Bonanza Creek conducted characterization of the water-based bentonitic drilling fluids and associated drill cuttings produced throughout the Bonanza Creek operations area. Discreet samples were collected from the mud tank and shale shaker at discreet intervals along the length of the production well borehole. Samples were collected from multiple production wells that were completed in the three main formations from which Bonanza Creek produces oil. These include the Niobrara B Bench, Niobrara C Bench, and Codell Formation. A total of 16 drilling fluid samples and 18 drill cuttings samples were collected and analyzed for the parameters listed in the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1. The analytical results obtained from the characterization sampling were used to prepare the ORWMP as detailed below.

Drilling Fluids

The drilling fluids will be hauled offsite for spreading and incorporation at a Bonanza Creek permitted land application site. If upset drilling conditions result in degraded drilling fluids, the drilling fluids will be hauled to a licensed disposal facility.

Drill Cuttings

The drill cuttings will be land treated on the drill pad and incorporated in the area of well pad footprint reduction during interim reclamation. The cuttings will be applied as a beneficial soil amendment that increases water retention in the surface soil and fosters vegetative growth. Bonanza Creek may also use the remediated cuttings as compliant fill material for facility maintenance. An example Site Map depicting the potential treatment and remediated cuttings storage area is provided as Figure 1. The sections below detail operational procedures for land treatment and incorporation of associated drill cuttings into the surface soil during reclamation of the well pads and tank battery facilities.

1. Bonanza Creek is currently employing closed loop drilling at all well pad locations. The cuttings are mechanically separated from the drilling fluids at the drilling rig and are conveyed into a cuttings bin. The cuttings are initially semi-saturated as they are deposited into the cuttings bin.

2. Bonanza Creek will use solidification material to further dry the cuttings. This material can range from native soil on location to manufactured products such as wood derived or plant derived absorbents.

3. As contractors remove cuttings from the cuttings bin, the cuttings will be mixed with solidification material. The cuttings will then be stockpiled on the drill pad surface for treatment and temporary storage.

4. Once the drilling and completion activities have concluded, the stockpiled cuttings will be spread out on a portion of the well pad surface and tilled to further mix the cuttings and solidification material. The treatment of the cuttings prior to incorporation will be conducted in accordance with procedures listed in COGCC Rule 907.e.(2). This mixing will aerate the cuttings mixture, which will increase biological degradation of residual hydrocarbons. Bonanza Creek anticipates the cuttings mixture will achieve compliance with COGCC Table 910-1 concentration levels in approximately 30 days. Bonanza Creek will periodically conduct operational sampling and analysis of the treated cuttings to ensure the bioremediation process is achieving the desired results and the duration of treatment is sufficient.

5. Following treatment of the cuttings, Bonanza Creek will stockpile the cuttings until interim reclamation is initiated or the cuttings are used for other beneficial reuse purposes. Due to the initial treatment with the solidification/bioremedaition products described above, natural attenuation will continue to degrade residual hydrocarbons present in the cuttings during storage.

6. During interim reclamation activities, the initial well pad footprint (5-6 acres) is reduced to approximately 3-4 acres. When Bonanza Creek is ready to conduct reclamation activities, the surface area between the original well pad footprint and the interim reduced footprint will be stripped of any road base material. Once the native soil is exposed, Bonanza Creek contractors will return the top soil from the onsite stockpile to re-establish the topsoil in the reclaimed area. After application of the topsoil, contractors will remove cuttings from the cuttings stockpile and incorporate the cuttings mixture into the topsoil within the reclaimed area. Incorporation of the cuttings into the topsoil will be conducted in accordance with the procedures listed in COGCC Rule 907.d.(3).B.ii.

7. The cuttings and the topsoil will be tilled thoroughly to ensure even distribution of the cuttings mixture into the topsoil. Once the tilling is completed, the area will be seeded with native grasses and crimped with straw to prevent erosion.

8. Upon completion of interim reclamation with the treated cuttings, a composite sample will be collected from the incorporated area to confirm the beneficially amended soil is compliant. Bonanza Creek will collect a 3-4 point composite confirmation sample from the well pad areas where the surface is reclaimed with treated cuttings. Confirmation sampling will include organic parameters listed in COGCC Table 910-1 such as benzene, toluene, ethylbenzene, total xylenes, total petroleum hydrocarbons (C_4-C_{28}), arsenic, electrical conductivity, pH, and sodium adsorption ratio. Following

sampling activities, Bonanza Creek will submit the analytical results to the COGCC via Sundry Form 4.

9. Bonanza Creek will conduct onsite reclamation with cuttings in operation areas where the topsoil quality is very poor (clean sand). The addition of shale cuttings will increase water retention by increasing overall clay content in the topsoil. If sawdust and/or wood pellets are used to solidify the cuttings, the wood content will increase overall organic content in the soil similar to mulching.

10. Bonanza Creek has battled the poor soil conditions and lack of water retention at a majority of reclamation sites. Bonanza Creek believes the addition of solidified cuttings in the well pad reclamation process will beneficially amend the soil characteristics. This beneficial amendment may improve reclamation through increased vegetative cover, reduced time to achieve reclamation thresholds, and prevention of soil erosion.

11. Bonanza Creek will obtain written authorization from the surface owner to utilize solidified drill cuttings on site to complete reclamation activities.

12. Bonanza Creek will use best management practices (BMP) at the site to control stormwater run-on and run-off during treatment and temporary storage of the cuttings. A perimeter BMP, such as a soil berm, will be installed around the cuttings during storage in order to prevent potential run-on and runoff.

13. Bonanza Creek will maintain records of the following information:

    - Name of the on-site well where cuttings were generated at the pad;
    - Areas on the former well pad where cuttings were spread and incorporated during reclamation;
    - Analytical results from the confirmation soil sampling where the cuttings were incorporated around the well pad;

14. If interim reclamation is completed and additional cuttings remain at the site, Bonanza Creek still retains the ability to transport the cuttings to permitted land application sites. Record keeping of the cuttings transported to the land application sites will be documented as detailed in a previous COGCC approved Bonanza Creek waste management plan for land application activities.

FIGURE 1
RIG LAYOUT WITH DRILL CUTTINGS TREATMENT AND STORAGE AREAS
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BONANZA CREEK ENERGY OPERATING COMPANY, LLC.