



**E&P Waste Management Plan  
Water-Based Bentonitic Drilling Fluids/Associated Drill Cuttings and Produced Water**

**Carrizo Oil and Gas, Inc.  
Carrizo Niobrara, LLC.**

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This Waste Management Plan outlines the operational plans for disposing of bentonitic drilling fluids and associated drill cuttings as well as produced water from various oil and gas production wells to maintain compliance with requirements under Colorado Oil and Gas Conservation Commission (COGCC) Rule 907 – Management of E&P Waste.

The drilling fluids and associated drill cuttings generated by Carrizo Oil and Gas, Inc. (Carrizo) will be hauled for disposal at multiple licensed commercial solid waste disposal facilities owned by Waste Management, Inc. (WM). Carrizo will comply with the following compliance items as applicable for drilling fluids and associated cuttings transport and disposal.

- Carrizo will ensure that the drilling fluids and associated cuttings are properly stored and handled on site prior to transportation for offsite disposal.
- Carrizo currently operates with pitless drilling systems. This allows for added environmental protection by storing the drilling fluids in portable steel containment, where it is recycled and reused from well to well until its integrity is no longer suitable for drilling. At that point, it is removed from the steel containment by transport trucks and hauled to the WM/CSI disposal facility.
- During drilling activities, drill cuttings are mechanically separated from the discharging borehole slurry. The cuttings are stored onsite in temporary containment. Following completion of drilling activities, the cuttings are hauled offsite in transport trucks to the nearest WM disposal facility.

Carrizo is not currently incorporating any drilling fluids or associated cuttings into surface soils as a beneficial amendment. At this time all drilling fluids and associated cuttings are hauled to contracted WM disposal facilities. Carrizo has approved waste profiles for drilling fluids and associated cuttings disposal on file with four WM disposal facilities to increase disposal efficiencies depending on the drilling locations. These commercial disposal facilities include:

- Buffalo Ridge Landfill (Cuttings) – Keenesburg, Colorado;
- Denver Arapahoe Disposal Facility (Cuttings) – Aurora, Colorado;
- North Weld Landfill (Cuttings) – Ault, Colorado; and
- WM/CSI Disposal (Drilling Mud) – Bennett, Colorado.

Carrizo stores produced water generated by drilling/completion activities and by normal oil and gas production on site in aboveground tank containment. Periodically, the tanks are drained by transport trucks and the produced water is hauled to the nearest permitted commercial disposal

facility. Carrizo is currently contracted with three produced water disposal facilities to increase disposal efficiencies depending on the drilling locations. These commercial disposal facilities include:

- Hi-Sierra Water Services, LLC. – Multiple Locations, Weld County, Colorado;
- Select Energy Services, LLC. –Weld County, Colorado; and
- Apollo Operating, LLC. – Weld County, Colorado.

Carrizo will maintain all E&P waste disposal records on file for five years as required in COGCC Rule 907.b.(2). These records include; date of transport, identity of the generator/transporter, location of the waste pickup site, waste type and volume, and the name of the disposal facility. This information is generally included on the waste manifests, which are used to document transportation and disposal of the E&P waste at the permitted disposal facilities.

