CIVITAS
Extraction Oil & Gas, Inc.

Substantially Equivalent Odor Mitigation Plan

This document is being submitted as a substantially equivalent Odor Mitigation Plan for the Washington Pad Form 2A. This odor mitigation plan was developed as a part of the operator agreement process with City of Thornton. This document complies with all requirements outlined in Colorado Oil and Gas Conservation Commission Rule 304.c.(4). For this reason, Extraction believes this satisfies the substantially equivalent information requirements and requests that it is accepted pursuant to Rule 304.e.

4.0 ODOR MITIGATION PLAN

Odor Mitigation Plan

Potential Receptors

Operator will strive to minimize or eliminate odor from being a nuisance to the Residential Building Units (RBUs) within 2000' of the proposed Working Pad Surface. The predominant average hourly wind direction in City of Thornton prevails from the west at this location *(source: Weather Spark).* As such, it is not anticipated that odor will be a nuisance since the nearest RBUs are located to the west of the proposed Working Pad Surface.

Development Phase

Operator will comply with the requirements of Rule 426 during development through the mitigation methods outlined below. In addition to what is being proposed, Operator reserves the right to incorporate evolving technologies aimed at reducing odor during operations should conditions warrant additional controls. Operator will endeavor to prevent odors from emanating from the Oil and Gas Location by proactively addressing known sources of odor – i.e., drilling mud.

Operator will use a filtration system and additives to the drilling and fracturing fluids to minimize odors. Use of fragrance to mask odors is prohibited. In order to meet the requirements of Rule 426, Operator shall implement the following measures:

1. Operator shall utilize a closed-loop, pit-less mud system for managing drilling fluids.
2. Operator shall employ the use of IOGP Group III drilling fluids with extremely limited levels of total aromatics and polycyclic aromatic hydrocarbons during drilling operations after the surface casing is set and freshwater aquifers are protected.
3. Operator shall remove drill cuttings daily and as soon as waste containers are full.
4. Operator shall employ pipe cleaning procedures when removing drill pipe from the hole; these procedures may include "wiping" the pipe before racking it in the derrick.

In the event a person living in a Residential Building Unit in proximity (e.g., 2500') of the Oil & Gas Location's Working Pad Surface complains of odor, Operator shall assess current operations and atmospheric conditions at the time of the complaint to determine whether the odor may have been caused by the Operator's operations. Once a preliminary determination is made, Operator will provide its findings to the complainant, the Director, and Relevant or Proximate Local Government within 24 hours. If the complaint is justified and unable to be resolved, Operator will work with the Director on necessary and reasonable actions to reduce odor including but not limited to the following:

1. Operator may utilize a mud-chiller to reduce odor breakout.
2. Operator may increase concentration of odor-mitigating additives in mud system.

Production Phase

Operator will comply with the requirements of Rule 426 during development by utilizing the following best management practices outlined below. The primary source of odors during the production phase is gas that is vented during maintenance or normal production operations.

1. Operator will utilize a maintenance vessel system which eliminates venting from the location.
2. Operator will utilize a pneumatic air system to power the facilities on location which will eliminate the small amount of venting that would normally occur during production operations.

Proposed Best Management Practices

1. Operator will use a filtration system and additives to the drilling and fracturing fluids to minimize odors.
2. Operator shall utilize a closed-loop, pit-less mud system for managing drilling fluids.
3. Operator shall employ the use of IOGP Group III drilling fluids with extremely limited levels of total aromatics and polycyclic aromatic hydrocarbons during drilling operations after the surface casing is set and freshwater aquifers are protected.
4. Operator shall remove drill cuttings daily and as soon as waste containers are full.
5. Operator shall employ pipe cleaning procedures when removing drill pipe from the hole; these procedures may include “wiping” the pipe before racking it in the derrick.
6. If a justified complaint is received, Operator may utilize a mud-chiller to reduce odor breakout and increase concentration of odor-mitigating additives in mud system.
7. Operator will utilize a maintenance vessel system which eliminates venting from the location.
8. Operator will utilize a pneumatic air system to power the facilities on location which will eliminate the small amount of venting that would normally occur during production operations.