



**Kerr-McGee Oil & Gas Onshore LP**

**Odor Mitigation Plan**

**Tulip HZ Well and Facility Pads**

**Section 30, T4N R67W, 6<sup>th</sup> P.M.  
Weld County, Colorado**

**May 2024**

Odor Mitigation Plan as required per Colorado Energy & Carbon Management Commission (ECMC) Rule 304. c. (4) and Rule 426. a-c

**I. List of potential sources of odors (prior to mitigation measures):**

- A. Oil based drilling fluid is a potential source of odor. The following areas of the rig can be affected by oil-based drilling fluid odor if un-mitigated:
  - Shaker area and cuttings transfer tank
  - Active and reserve oil-based mud tanks
  - Three- sided cuttings collection/storage tanks
  - Drilling tubulars racked in derrick
  - Cuttings while in transport to landfill
- B. Hydrocarbons from the formation are a potential source of odor. The following areas can be affected by odor if unmitigated.
  - Any tanks that are open to the atmosphere

**II. Planned Drilling Fluid:**

- A. Hydrocarbon based drilling fluid at an approximate ratio of 70% hydrocarbon to 30% water.
- B. The 70% hydrocarbon portion of the drilling fluid will be comprised of a Group III non-aqueous fluid with low to negligible aromatic content. The Polycyclic Aromatic Hydrocarbons (PAHs) content of the Group III fluid will be less than 0.001% and contain no BTEX.

**III. List of odor-reducing, or suppressive additives planned for use:**

- A. Group III drilling fluids are considered to have negligible odor and do not require any type of additional additive to suppress nuisance odors.
- B. In the unlikely event that nuisance odors do become a problem during active production drilling operations, KMOG will have a contingency water-soluble odor neutralizer with essential oils available to treat the drilling fluid system on an as needed basis.

**IV. Description of Equipment and processes used to control odors for each source/activity:**

- A. Utilizing a Group III base oil drilling fluid will be the primary defense against odor control.
- B. The Group III drilling fluid eliminates odor in the following areas:
  - Shaker area and cuttings transfer tank
  - Active and reserve oil-based mud tanks
  - Three-sided cuttings collection/storage tanks
  - Drilling tubulars racked in derrick
  - Cuttings loads in transport to landfill
- C. Hydrocarbons from the formation are limited to the following locations:
  - During completions operations open top tank is on location as a precaution and used only in the event of a screen out. If a screen out occurs the fluid in the tank will be fresh water with trace amounts of odor causing hydrocarbons. Odors are not anticipated with this operation.
  - During flowback operations the open top tank is used to remove sand from the separators. There is no odor associated with this operation. Additionally, there are sensitive air monitors positioned around the location that alert the team to any emissions. Odors are solely associated with hydrocarbons and would therefore register

as an emission. If any emissions are registered the team is notified and can adjust drill out parameters.

**V. In addition to using a Group III base oil, the following techniques are used to further ensure the elimination and/or reduction of odor:**

- A. All cuttings on location are dried using centrifugal dryers to ensure only trace amounts of drilling fluid remain on the dry cuttings. This ensures odor is eliminated while waiting on transport and during transport to local landfills.
- B. Drill pipe and any other tubular pulled out of the hole are wiped down before being racked in the derrick or laid down on location.
- C. Base oil used to build new drilling fluid is transferred through a line outlet run to the bottom of the mix tank to minimize agitation (splashing) and reduce potential to create odor.
- D. Utilize closed-loop completion techniques to the maximum extent practicable during flowback and well completions to minimize emissions and the flaring of natural gas.

**VI. Cuttings management at location & odor management during transport:**

- A. All residual drilling fluid on cutting will be comprised of water and Group III base oil which is considered to have negligible odor.
- B. After passing over the shale shakers, cuttings are transported through a closed loop piping system to a centrifugal dryer which removes the majority of drilling fluid, leaving dry cuttings. The drilling fluid is then returned to the active pit system for reuse.
- C. Cuttings are transported to local landfills, generally remaining on location less than 24 hours. The dried cuttings with only trace drilling fluid will not have an odor because of the use of Group III base oil.
- D. In the event odor did become noticeable on cuttings on location or during transport, an odor neutralizing agent will be available as a contingency to treat the residual fluid on cuttings, but only applied if necessary.

**VII. Best Management Practices used to manage odor during pre-production operations:**

- A. All oil-based drilling fluids will be built using a Group III base oil with negligible aromatic content and PAH less than 0.001% so that it does not emit odor during all production drilling operations.
- B. Group III base oil will be utilized in a closed loop drilling fluid system. Group III base oil will eliminate odor at the shakers, transfer tank, active/reserve tanks, and cuttings in collection tanks and during transport.
- C. All drill cuttings are processed through centrifugal dryers to remove residual oil-based drilling fluid not removed by shale shakers.
- D. All tubulars pulled out of the hole will be wiped prior to being racked in the derrick or laid down.
- E. Cuttings storage time on location will be minimized prior to transport to local landfills.
- F. New drilling fluid will be built using transfer line outlets located below tank fluid level to minimize splashing/agitation. New fluid will only be built using Group III base oils.

**VIII. Best Management Practices used to manage odor during production operations:**

- A. KMOG uses pipelines to transport hydrocarbons (oil & gas) from the production facility eliminating odors that could occur during truck loading.

- B. Production facilities are inspected regularly by KMOG to make sure the equipment is working properly and necessary maintenance is performed to reduce potential odors. KMOG incorporates Audio, Visual, Olfactory (AVO) observations at production facility inspections.
- C. KMOG will use Best Management Practices to reduce unloading events and to reduce potential odor causing emissions when liquids unloading is necessary (i.e., maintenance activities to remove liquids from existing wells that are inhibiting production).
- D. KMOG remotely monitors production facilities, this reduces traffic onto production facilities which may create odors from truck traffic.