



Kerr-McGee Oil & Gas Onshore LP

Waste Management, Reuse, and Recycling Plan

FERN OGDP

Township 3 North, Range 66 West, 6th P.M.

SW 1/4 SE 1/4 Section 31

Weld County, Colorado

October, 2024

1. Waste Management

Kerr-McGee Oil & Gas Onshore LP (KMOG) operations will meet the requirements Weld County Code Sec. 21-5-320.B.6, Sec. 21-5-422, and the Colorado Energy & Carbon Management Commission (ECMC) 900 Series Rules and EPA CFR 40 & 49, including 40 CFR 261.4(B)(5). All waste management and Best Management Practices (BMP) will be conducted in accordance with the operational requirements listed below.

2. Waste Storage, Handling, and Best Management Practices

The proper handling and storage of waste is essential to ensuring protection of human health and the environment, while minimizing company liability. The following guidelines identify proper waste handling and storage practices to be employed by personnel at this Well Pad and Facility.

- a. Best management practices specific to each phase of operation are detailed in the attached site-specific Table 1. Waste type, storage container, disposal facility, volumes, frequency, waste characterization, potential hazards, Resource Conservation and Recovery (RCRA) exemption status are included in the table.
- b. Wastes will be stored in containers or on lined containment that are chosen for compatibility and checked periodically for leaks or integrity problems. Examples of containment include but are not limited to 3-sided steel tanks, steel tanks, lined containment, plastic totes, drums, etc.
- c. All specific wastes in the attached site-specific Table 1 will have a detailed Safety Data Sheet available which includes information such as the properties of the wastes; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical.
- d. The proper personal protective equipment will always be worn when handling waste. Employees will refer to the Safety Data Sheet for additional information.
- e. Good housekeeping measures for trash included closed receptacles designed to exclude potential wildlife and prevent overflowing.
- f. During drilling, completions, and facility construction, human waste and septic from temporary buildings will be stored in tanks. These tanks will be emptied via vacuum truck for disposal. Temporary portable restrooms will also be available for workers during this phase. Good housekeeping measures for these include regular servicing and inspections. Temporary portable restrooms will be staked to the ground to prevent from tipping over.
- g. Waste will be segregated and stored according to its waste type.
- h. When feasible, wastes will be recycled, re-used, or treated onsite. As a BMP, fluids are generally re-used from location to location if possible. No onsite treatment or recycling is planned onsite for this location. In the event that onsite treatment or recycling is feasible, a written management plan will be submitted to the ECMC Director for approval on a Form 4.
- i. All waste streams will be transported off location for recycling or disposal in a timely manner in accordance with local, state, and federal regulations.
- j. During drilling, completion, and facility constructions, inspection of trash receptacles, sewage tanks, temporary restrooms, waste and material storage areas are performed by a third party and documented during regular stormwater inspections.
- k. All spills or leaks will be cleaned up upon discovery in accordance with local, state, and federal testing and cleanup standards. All waste generated from the cleanup process will be profiled, as required by local, state, and federal regulations, for recycling or disposal. Manifests will be used to track all waste generated.

3. Waste Characterization and Volumes

Wastes will be characterized in accordance with local, state, and federal requirements. Different types of wastes will be characterized via process knowledge, safety data sheets, or laboratory analysis in accordance with regulations and the requirements of the permitted facility to which they will be taken for ultimate disposition. Different types of wastes have different classifications such as hazardous, non-hazardous, and E&P exempt. The majority of wastes generated at this well pad will be E&P exempt. Volumes of wastes will be highly variable with some potential wastes never being generated and can vary greatly throughout the life of the well. Wastes such as drill cuttings and produced fluids will certainly be generated with volumes ranging from approximately 350-700 cubic yards per well and 50-1,500 barrels per day, respectively. Flowback water and produced water are considered one and the same by KMOG.

4. Waste Transportation and Disposal

Wastes will be transported to facilities authorized by the ECMC Director, to permitted commercial waste disposal facilities, permitted commercial waste facilities, or permitted beneficial use sites.

All E&P wastes transported offsite will be ticketed, signed by the transporter, and maintained to be provided upon request for a minimum of five years. Each ticket will include the information listed below:

- a. The date of the transport.
- b. The identity of the waste generator.
- c. The identity of the waste transporter.
- d. The location of the waste pickup site.
- e. The type and volume of waste.
- f. The name and location of the treatment or disposal site.

5. Reuse and Recycling

Per 905.a(3) KMOG is submitting this plan for treating and re- using flowback and produced water (water) waste in order to reduce the volume of freshwater at the Fern Location These operations will be conducted during 2027. KMOG will contract a third-party vendor to manage a recycling system that will treat the water. Once the water has been treated, KMOG plans to re-use the treated water as hydraulic fracturing feed water. This water recycling system will be utilized for only KMOG operations in the Denver-Julesburg Basin and will not accept water from third parties.

The mobile recycling system will remove oil, grease, break and remove emulsions, settle solids, remove bacteria and adjust chemical parameters such as pH through four stages of treatment. The four stages of treatment include:

- 1) Oxidation and hardness reduction in order to reduce organics/microorganisms and boost the pH if needed.
- 2) Settling and dissolved air flotation via flocculation/coagulation.
- 3) Filtration and polishing.
- 4) Solids control and disposal.

The following bullet points provide additional information about the third-party mobile recycling system that will provide treated water to KMOG operations.

- a. The mobile recycling system will be placed on the Fern location for approximately 2 months.
- b. The mobile recycling system can treat approximately 10,000 barrels per day. KMOG will utilize trucks to bring in the water.

- c. The sludge generated from the treatment will be collected in tanks and transported offsite for disposal at a permitted landfill or KMOG Aggregate Recycle Facility. The resulting water from the dewatering process will be recirculated back through the mobile recycling system. Attached is a table of Site-Specific potential wastes.
- d. The mobile recycling system will treat an estimated 95% of inlet water. An estimated 5% of inlet water will be rejected from the mobile recycling system and transported off site to a commercial disposal facility.
- e. Water and treated water will be stored in closed top frac tanks. Water and treated water will not be stored in pits or modular large volume storage tanks.
- f. Best management practices will be incorporated for above ground piping carrying treated water to the hydraulic fracturing operations. Piping will be above ground where it can be easily evaluated for leaks. Additionally, fused high density polyethylene pipe will be utilized to carry treated water as this is considered to be best industry practice for minimizing leaks around joints.
- g. The untreated water storage tanks will be placed within a lined secondary containment.
- h. All tanks and vessels will be inspected daily, and the facility will have operators 24 hours a day, seven days a week.
- i. KMOG will maintain waste tracking for the mobile recycling system as noted below.

Quality assurance will be maintained through sampling and analysis at various stages of the treatment process. KMOG will be regularly testing and documenting soluble iron, bacterial control, dissolved H₂S, pH, and oxidation reduction potential.

When treated water is used as hydraulic fracturing feed water, the information will be provided to the ECOM on a Form 5A Completed Interval Report.

All incoming water and outgoing waste will be documented with the following:

- a. The date of the transport.
- b. The identity of the waste/water generator.
- c. The identity of the waste/water transporter.
- d. The location of the waste pickup site.
- e. Volume of water/waste.
- f. The name and location of the treatment or disposal site.

6. Site Information

The attached Table 1 lists the Potential Waste Management Options and BMPs for this Location. For each waste type a variety of options are identified due to factors that change during normal operation and life of the facility such as waste volumes, disposal facility hours of operation, facility capacities, etc.

Table 1 – Potential Waste Management Options & BMPs

Waste Type	Storage Container	Waste Disposal or Centralized E&P Management Facility	Potential Volume per Well	Frequency of transport per Well	Waste Characterization	Potential Hazard	E&P Exempt	Narrative/Phase of Generation
Water-based drilling fluids and associated drill cuttings	Steel bins, roll-offs, or tanks	Drilling Fluid Management Facility #3 (ECMC Facility ID 439305)	300-700 cubic yards	Daily-weekly	DFMF 3 ECMC permit requirements	None	Yes	Drilling, Plugging and Abandonment
		Aggregate State Fluid Recycling Facility (ECMC Facility ID 456644)			Aggregate State Fluid Recycling Facility Waste Management Plan requirements			
		Waste Connections, Erie, Colorado			Landfill requirements			
		Buffalo Ridge, Keenesburg, Colorado						
Oil-based drilling fluids and associated drill cuttings	Steel bins, roll-offs, or tanks	Aggregate State Fluid Recycling Facility (ECMC Facility ID 456644)	300-700 cubic yards	Daily-weekly	Aggregate State Fluid Recycling Facility Waste Management Plan requirements	Ignitable/Combustible, Toxic	Yes	Drilling, Plugging and Abandonment, Spill Response and Remediation
		Waste Connections, Erie, Colorado			Landfill requirements			
		Buffalo Ridge, Keenesburg, Colorado						
Flowback sand	Steel bins, roll-offs, or tanks	Aggregate State Fluid Recycling Facility (ECMC Facility ID 456644)	100-300 cubic yards	Daily-weekly	Aggregate State Fluid Recycling Facility Waste Management Plan requirements	Ignitable/Combustible, Toxic	Yes	Drilling, Plugging and Abandonment, Spill Response and Remediation
		Waste Connections, Erie, Colorado			Landfill requirements			
		Buffalo Ridge, Keenesburg, Colorado						
Flowback and Produced Water (Trucked off Location)	Steel tanks and fiberglass tanks	KMOG 16-24i and 19-3i SWDs	50-1,500 bbls per day	Daily-weekly	ECMC UIC permit requirements	Ignitable/Combustible, Toxic	Yes	Completions, Flowback, Production, Facility Decommissioning, Plugging and Abandonment
		EWS #3, #4, and #5 SWDs						
		Lonestar Select SWD						
Flowback and Produced Water (Piped off location)	Not stored on Location	KMOG 16-24i and 19-3i SWDs	50-1,500 bbls per day	Continuous	ECMC UIC permit requirements	Ignitable/Combustible, Toxic	Yes	Completions, Flowback, Production, Facility Decommissioning, Plugging and Abandonment
		EWS #3, #4, and #5 SWDs						
		Lonestar Select SWD						
Oil and produced fluid impacted soil	Containment, steel roll-offs, or loaded directly into transportation	KMOG Land Treatment Facility (ECMC Facility ID 149007)	Highly Variable	Daily-Never	Land Treatment Facility Waste Management Plan requirements	Ignitable/Combustible, Toxic	Yes	Spill Response and Remediation
		Aggregate State Fluid Recycling Facility (ECMC Facility ID 456644)			Aggregate State Fluid Recycling Facility Waste Management Plan requirements			
		Waste Connections, Erie, Colorado			Landfill requirements			
		Buffalo Ridge, Keenesburg, Colorado						
Tank bottoms, oily waste, and workover fluids	Steel bins, roll-offs, tanks, containment, or loaded directly into transportation	KMOG Landfarm (ECMC Facility ID 149007)	Highly Variable	Weekly-Never Generated	Land Treatment Facility Waste Management Plan requirements	Ignitable/Combustible, Toxic	Yes	Drilling, Completions, Flowback, Production, Spill Response and remediation, Facility Decommissioning, Plugging and Abandonment (P&A)
		Aggregate State Fluid Recycling Facility (ECMC Facility ID 456644)			Aggregate State Fluid Recycling Facility Waste Management Plan requirements			
		Waste Connections, Erie, Colorado			Landfill requirements			
		Buffalo Ridge, Keenesburg, Colorado						
		Tower Road Landfill, Denver, Colorado						
		Foothills Landfill, Golden, Colorado						
		Clean Harbors, Deer Trail, Colorado						
Hazardous materials	Steel bins, roll-offs, tanks, totes, drums, clean packs	Clean Harbors, Kimble, Nebraska	Highly Variable	Yearly-Never Generated	Resource, Conservation, and Recovery ACT (RCRA) and Landfill requirements	Ignitable/Combustible, Corrosive, Reactive, Toxic	No	Drilling, Completions, Production
		Clean Harbors, Deer Trail, Colorado						
Human Waste	Steel Septic Tanks or Port-a-lets	McDonald Farms, Longmont, Colorado	Highly Variable	Weekly-Monthly	No characterization required	Biological	No	Construction, Drilling, Completions, Flowback, Production, Spill Response and Remediation, Facility Decommissioning, P&A
		Columbia Sanitation, Golden, Colorado						
Technologically Enhanced Natural Occurring Radioactive Material (TENORM) Waste	Steel bins, tanks, clean packs, or roll-offs	Clean Harbors, Deer Trail, Colorado	Highly Variable	Weekly - Never Generated	Characterized for Radium 226 and Radium 228 (produced water granted a conditional exemption from Colorado Department of Public Health and Environment)	Radioactivity	No	Construction, Drilling, Completions, Flowback, Production, Spill Response and Remediation, Facility Decommissioning, P&A
		Foothills Landfill, Golden, Colorado						
General trash and non-hazardous municipal solid waste	Steel bins or roll-offs	Waste Connections, Erie, Colorado	Highly Variable	Weekly-Never Generated	No characterization required	None	No	Construction, Drilling, Completions, Flowback, Production, Spill Response and Remediation, Facility Decommissioning, P&A
		Buffalo Ridge, Keenesburg, Colorado						



Water treatment sludge	Tanks or loaded directly into transportation	KMOG Landfarm (ECMC Facility ID 149007)	Highly Variable	Weekly- Never Generated	Land Treatment Facility Waste Management Plan requirements	Ignitable/Combustible, Toxic	Yes	Completions, Flowback, Spill Response and Remediation
		Aggregate State Fluid Recycling Facility (ECMC Facility ID 456644)			Aggregate State Fluid Recycling Facility Waste Management Plan requirements			
		Waste Connections, Erie, Colorado			Landfill requirements			
		Buffalo Ridge, Keenesburg, Colorado						
		Tower Road Landfill, Denver, Colorado						
		Foothills Landfill, Golden, Colorado						
Clean Harbors, Deer Trail, Colorado								
Non-hazardous industrial waste	Steel bins, roll-offs, tanks, containment, or loaded directly into transportation	Waste Connections, Erie, Colorado	Highly Variable	Weekly- Never Generated	Landfill requirements	Ignitable/Combustible, Toxic	No	Completions, Flowback, Spill Response and Remediation
		Buffalo Ridge, Keenesburg, Colorado						
		Tower Road Landfill, Denver, Colorado						
		Foothills Landfill, Golden, Colorado						
		Clean Harbors, Deer Trail, Colorado						