



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

**Cumulative Impacts Plan**

**DB Farms 40-12HZ Well Pad and Facility  
SE/4 NE/4 Section 12, 3N 67W**

**Weld County, Colorado**

**August 2021**

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## WATER RESOURCES:

### ANTICIPATED IMPACTS:

No anticipated impact to the quality of surface or subsurface water. A mixture of non-potable surface water, groundwater and recycled water will be used for completions operations.

### DETAILS:

KMOG intends to use a total of 3,054,667 BBLs of water during drilling and completions activities on this location. 2,256,748 BBLs will be sourced from non-potable surface water and 782,854 BBLs will be sourced from groundwater. KMOG attempts to use recycled water sourced from produced water from oil and gas operations, 15,045 BBLs will be used at the DB Farms 40-12HZ OGD. The estimated depth to groundwater at this location is 37-feet.

### MITIGATION MEASURES:

KMOG protects water resources by carefully choosing the location and orientation of our pad, utilizing drainage control measures, and proper grading techniques as well as protecting soil resources during the drilling and completions phases by enhancing soil compaction to minimize absorption. Liners are installed under the production facility equipment during the production phase.

Both prior to, and after drilling and completion operations, we contract with a third-party professional to perform water sampling from water wells near the location. The baseline sampling helps establish existing conditions, and the post-development samples verify our operations are safe.

To prevent fluid leaks, temporary produced water storage tanks are designed, constructed, and maintained in accordance with the following portions of the National Fire Protection Association (NFPA) Code 30 (2008 version): 1) Tanks are built to engineering standards using noncombustible materials, with relief device sizing based on API 2000 standards. 2) Tanks are inspected and maintained while in use. 3) The only pipes within the containment are related to the temporary tanks (i.e. no external piping is co-located within the containment), and firefighting equipment is, likewise, not stored within the containment area.

The temporary produced water storage tanks are staged on a geosynthetic liner and surrounded by an earthen berm. The berms enclose an area sufficient to provide secondary containment for 150% of the volume of the largest single tank and are sufficiently impervious to contain spilled or released material. The berms and the liner are inspected at the same time as stormwater inspections. During non-active, but while under construction, site inspections will occur every 14 days.

During completions operations, all fluid containing equipment is inspected daily. When the location is on production, site inspections will occur every 28 days.

Automation technology will be utilized at this facility. This technology includes the use of fluid level monitoring for the tanks and produced water sumps, high-level shut offs, and electronic sensors to monitor the interstitial space of double-walled produced water sumps. All automation is monitored by Kerr-McGee's Integrated Operations Center (IOC), which is manned 24 hours per day, 7 days per week.

KMOG has a plan in place to avoid spills, detect spills if they occur and mitigate them quickly.

**ECOSYSTEM AND WILDLIFE RESOURCES**

**ANTICIPATED IMPACTS:**

KMOG does not anticipate any negative impacts to wildlife resources. KMOG will reclaim 21 acres associated with nearby wells. The DB Farms 40-12HZ location & associated roads will be reclaimed to 3.7 acres. There is no high priority habitat that will be disturbed due to this development.

**DETAILS:**

	<i>Total Acreage Disturbed</i>	<i>Interim Disturbed Amount</i>	<i>HPH</i>	<i>Reclaimed Acreage</i>	<i>Total</i>
<b>Roads</b>	0.35	0.35	0.00	0.00	<b>0.35</b>
<b>Pipeline</b>	0.92	0.00	0.00	0.00	<b>0.00</b>
<b>Utility</b>	0.06	0.00	0.00	0.00	<b>0.00</b>
<b>Pads</b>	14.04	3.39	0.00	21.00	<b>-17.61</b>
<b>Total</b>	<b>15.37</b>	<b>3.74</b>	<b>0.00</b>	<b>21.00</b>	<b>-17.26</b>

The location was surveyed by a third-party biological contractor prior to permit submittal. The location will be surveyed again for nests approximately 2 weeks prior to construction start. Periodic inspections for nests and of avian protection will occur throughout the life of the project.

**MITIGATION MEASURES:**

KMOG anticipates minimal to no impacts to ecosystem and wildlife resources. Although the pad has been carefully planned to have the smallest footprint possible and be in a place that is as far away from critical habitat as possible, the pad will create some surface disturbance. KMOG will compensate the surface owner for surface damages per the signed and executed Surface Use Agreement.

KMOG will plug and abandon 25 wells associated with 3 locations and reclaim 21 acres of previously created pads. The DB Farms location will disturb 14 acres for pre-production activities and be reclaimed to approximately 3.7 acres. The net reclamation of this pad exceeds the disturbance created. This will also eliminate fragmentation of habitat. The pad is not located in any high priority habitat and the area will be surveyed on multiple occasions to ensure that animals or their nests are not present. If animals are discovered the proper actions will be followed to ensure the safety of the animal and their habitat.

KMOG maintains a Standard Operating Procedure (SOP) for water suction hoses and transportation Tanks that meets 1202.a.(2).A requirements with our 3rd party contractors when moving equipment from locations. The contractor will use a CPW-approved disinfectant solution capable of killing whirling disease spores and other aquatic nuisance species defined by CPW.

KMOG does not use Drilling Pits, Production Pits or any other Pits at Oil and Gas Locations in the Denver-Julesburg Basin. During construction of Pipelines regulated pursuant to the Commission’s 1100 Series rules, KMOG will install wildlife exit ramps every ¼ mile for any trenches that are left open for more than 5 consecutive days. Avian protection for openings larger than 2” is utilized throughout all operations.

## AIR RESOURCES

### ANTICIPATED IMPACTS:

Short-term impacts: During pre-production activities KMOG anticipates the release of 3,601 tons of emissions.

Long-term Impacts: During one year of production KMOG anticipates the release of 6,186 tons of emissions.

### DETAILS:

To ensure the wellbeing of those working and living near our operations, we contract with a third-party environmental air quality expert to perform continuous air monitoring during drilling and completions.

	<i>NOx</i>	<i>CO</i>	<i>VOCs</i>	<i>Methane</i>	<i>Ethane</i>	<i>CO2</i>	<i>N2O</i>	<i>TOTAL</i>
<b><i>Pre-Production Emissions</i></b>	<b>19.66</b>	<b>45.98</b>	<b>2.55</b>	<b>1.84</b>	<b>0.36</b>	<b>3,530.81</b>	<b>0.03</b>	<b>3,601.23</b>
<b><i>Production Emissions (One Year)</i></b>	<b>5.13</b>	<b>5.02</b>	<b>2.23</b>	<b>2.53</b>	<b>1.02</b>	<b>6,170.66</b>	<b>0.11</b>	<b>6,186.70</b>

<i>Equipment</i>	<i>Removed</i>	<i>Installed</i>	<i>Total</i>
<b><i>Oil Tanks</i></b>	5	1	-4
<b><i>Water Pit</i></b>	0	0	0
<b><i>Water Tanks</i></b>	4	4	0
<b><i>Separators</i></b>	6	7	1
<b><i>ECD</i></b>	4	0	-4

### MITIGATION MEASURES:

KMOG anticipates minimal impact to air resources from its operations.

During drilling: KMOG uses natural gas engines instead of tier II diesel generators. This change produces 30% less CO<sub>2</sub>, 75% less Nitrogen Oxide, particulate matter is reduced by 90% and sulfur oxides are reduced by 50%.

During Completions: KMOG uses a green completions fleet and a closed loop system.

During flowback: Fluids will flow through separation equipment where the gas will be collected through a gas gathering line instead of vented or burned.

During Production: KMOG uses production facilities that have been designed to eliminate most emission sources. Oil will be gathered and sent via pipeline to a stabilization facility, rather than stored on location where it could cause emissions. This gathering system also reduces the number of vehicles

visiting the location. Additionally, KMOG uses air actuated pneumatic devices rather than natural gas actuated devices. There will be no flaring of associated sales gas. There will be no compressor engines on location. Produced water can contain entrained gas, KMOG equips water storage tanks with combustion devices with a 98% destruction efficiency. If the pilot for the combustor goes out the location will be remotely shut in.

The in-house emissions team will conduct inspections, repairs, and preventative maintenance. Members of the emissions team will perform Audio, Visual, Olfactory (AVO) inspections at production facilities at least weekly. The entire facility will be inspected to ensure that there are not any leaks that can be detected using hearing, sight, or smell. Facilities will also be inspected for gas leaks at least monthly using an infrared camera.

KMOG maintains an Integrated Operations Center (IOC) where facilities are monitored and can be shut in remotely if a leak is suspected. This allows KMOG to quickly respond without creating any additional traffic.

The reduction of 25 wells and 3 facility locations will remove the following potential sources of emissions: 4 water pits, 5 oil tanks, and 6 separators. The omission of 1080 truck trips to visit those locations will also reduce emissions.

## **PUBLIC HEALTH RESOURCES**

### **ANTICIPATED IMPACTS:**

KMOG does not anticipate any negative impacts to public health.

### **MITIGATION MEASURES:**

KMOG does not anticipate any impact to public health by its operations at this location. As a part of the CPRN (Colorado Preparedness Response Network) KMOG will work alongside other operators to facilitate training drills. These drills and the presence of oil and gas operations in the area has the potential to enhance the capabilities and the watchfulness of the emergency responders.

Our Integrated Operations Center (IOC), staffed 24 hours per day, seven days per week, will remotely monitor the wells and facility. This enables us to deploy appropriate resources quickly, efficiently, and to collaborate with local emergency response agencies as necessary. This system also helps reduce traffic.

## **PUBLIC WELFARE: NOISE, LIGHT, DUST, ODOR, VIEW**

### **ANTICIPATED IMPACTS:**

During the short-term pre-production activities KMOG anticipates an increase in noise, light, and truck traffic. There are no anticipated odor impacts. As a result of plugging and reclaiming multiple wells nearby and creating a more consolidated location the scenery in the area will be changed during pre-production and production phases.

### **DETAILS:**

Noise: KMOG contracted Behrens and Associates to measure the ambient noise near the location and build site-specific noise models to predict the future noise impact of the proposed operations and

determine what noise mitigation measures, if any, would be required to demonstrate compliance with the COGCC maximum permissible noise levels. The noise modeling results were calculated utilizing the ISO 9613-2 standard and include the effects of local topography, buildings, barriers, and ground cover. Both A-weighted (dBA) and C-weighted (dBC) noise levels were measured during the ambient survey performed between February 26 and March 1, 2021 at an approximate height of 5 feet and considered during the noise modeling assessment. The models use the site-specific anticipated drilling rig, quiet completions fleet and production equipment. The results of the noise modeling can be found in the Noise Mitigation and Monitoring Plan.

Light: Site specific three-dimensional lighting models were developed for each of the phases of this development to determine their associated lighting impacts. The lighting fixtures used in the models were selected based on currently operated representative sites and research conducted into available vendor lighting systems. All calculated values fall within the prescribed regulatory limits.

<b>Calculated Lighting Values and Regulatory Limits Summary</b>			
	<b>Calculated Value</b>	<b>Regulatory Limit</b>	<b>Code Reference</b>
Max. Light Impact on Surrounding Building	0.31 lux	≤ 4.0 lux	<i>COGCC 424.f</i>
Pre-Production – Drilling Phase (Lumens / Hardscape)	9.8 lm/ft <sup>2</sup>	≤ 12 lm/ft <sup>2</sup>	<i>Weld County Ordinance ORD2020-12 Table 405 B.1</i>
Pre-Production – Completions Phase (Lumens / Hardscape)	10.0 lm/ft <sup>2</sup>	≤ 12 lm/ft <sup>2</sup>	<i>Weld County Ordinance ORD2020-12 Table 405 B.1</i>
Production (Lumens / Hardscape)	0.1 lm/ft <sup>2</sup>	≤ 2.5 lm/ ft <sup>2</sup>	<i>Weld County Sec 21-5-405 Table 405.C.1 for land use LZ-2 and COGCC Rule 424.d.(2) for Agricultural/Commercial</i>

Truck Traffic: KMOG anticipates at total of 29,616 truck trips during pre-production. When the location reaches production phase the truck traffic will be drastically reduced to 623 trips throughout the anticipated 25-year life of the facility.

**MITIGATION MEASURES:**

KMOG anticipates minimal impacts to public welfare, however there will be increased noise, light, and dust during the pre-production phases of the development.

Noise: Sound walls will be installed on all four sides of the location during drilling, completions. Although operations are conducted 24/7, at night we aim to minimize all non-essential work. Noise limits will be within 65 dBA during daytime operations and 60 dBA during night operations per Weld County ruling of NL-3 dBA noise compliance. Continuous noise monitoring at 3 locations will allow KMOG to analyze real time noise data and take appropriate operational actions to address noise should the situation arise. To reduce noise during drilling and hydraulic fracturing, KMOG uses a tier 4 engine on the drilling rig and a quiet completions fleet. Testing has shown that this equipment is substantially quieter than traditional models. KMOG has gone to considerable lengths to modify the rigs available to significantly reduce noise by not only using the quietest shale shaker model available, but also installing vibrating pads below shaker mounts. Extreme grade exhaust silencers are used on engines and drawworks traction motor. The generator house is fully enclosed with sound dampening louver boxes. KMOG utilizes quiet frac fleets whose engines are boxed to reduce noise pollution.

Light: To safely operate lights must be used, to the extent possible, KMOG uses Light-emitting diode (LED) fixtures that are angled downward and inward toward the location and away from homes and

businesses to reduce skyglow. LED lights not only use less energy and last longer, they emit light in a specific direction unlike incandescent and CFL bulbs which emit light in all directions. Lights are directed to task areas only and switched off when not needed. Light masts are automatically switched off/on based on lighting sensors. Low power (63W) LED lights are used for the drill rig. Sound barriers are positioned to reduce lighting trespass to surrounding off-site buildings. Lighting within the Production area has been reduced to provide a minimum acceptable value for safe operations.

**Truck Traffic:** KMOG utilizes a tankless design that reduces the footprint of the pad and the number of truck trips to location. The condensate produced from this location will flow off-site through a pipeline, eliminating the need for trucks to transport oil. KMOG transports the water used in hydraulic fracturing through our Water-On-Demand pipeline system. Since its inception in 2012, this technology has enabled us to eliminate more than 25 million miles of truck traffic in Weld County. During production, trucks will only visit one location instead of multiple locations within the area, thereby reducing associated emissions, odors, dust, and noise.

**Dust:** Sand boxes are used during hydraulic stimulation to reduce the risk of silica dust. Road dust will be controlled by implementing a strict 10 mph speed limit on the unpaved lease road and 5 mph speed limit on location. If necessary KMOG will spray down the lease road with water. KMOG will attempt to minimize the tracking of mud onto Weld County roads. Street sweepers will be utilized if mud tracking becomes an issue. Access roads and Vehicle Tracking Control will receive maintenance as needed throughout operations. KMOG will respond quickly and work with Weld County to address any concerns related to county road damages.

**Odor:** Although no odor impacts are anticipated, KMOG will use closed loop systems, remove drilling cuttings from location within approximately 24 hours, and use natural additives in our drilling fluid to ensure odors are controlled.

**View:** The scenery in the area will be changed both during pre-production and production phases. The plugging of 25 older wells will eliminate 3 facilities locations in the area, older equipment will be removed from those locations.