

Objective Criteria Review Memo *Great Western Operating Company, LLC, Kortum, Form 2A 401765139*

This summary explains how COGCC staff conducted its technical review of the Great Western Oil and Gas (GWOC), Kortum, Form 2A, document #401765139 within the context of SB 19-181 and for the required Objective Criteria. This proposed Location includes 44 wells, 17 separators, 12 oil tanks, six water tanks, three vapor recovery units (VRU), four emissions control devices, seven vapor recovery towers, three heater treaters, four lease automatic custody transfer (LACT) units, two modular large volume tanks and met the following Objective Criteria:

1. (Criteria #1) The proposed Location lies within 1,500 feet of a Building Unit or High Occupancy Building, which include Urban Mitigation Area (UMA) and Large UMA Facility (LUMAF) location. The closest Building Unit is an estimated 740 feet from the Oil and Gas Location.
2. (Criteria #3) Locations within 1500' of a municipal boundary, platted subdivision, or county boundary.
3. (Criteria #5.c) Oil and Gas Locations within a Sensitive Area for water resources. The closest surface water feature is an estimated 330 feet from the Oil and Gas Location.
4. (Criteria #8) The proposed Location with storage of hydrocarbon or produced liquid in more than 18 tanks or in excess of 5,200 barrels.
5. (Criteria #10) The Relevant Local Government provided comment on this Form 2A regarding additional requirements.

COGCC staff met with the Director to discuss the Objective Criteria for the Form 2A with the proposed Best Management Practices (BMPs) and applied Conditions of Approval (COAs). The following sections provide details regarding the evaluation of each criterion.

Criteria 1: Oil and Gas Locations within 1,500 feet of a Building Unit or High Occupancy Building, which include Urban Mitigation Area ("UMA") and Large UMA Facility ("LUMAF") locations.

Site Specific Description of Applicability of Criteria 1: Based on the technical review and desktop evaluation, staff identified approximately 29 Building Units within 1,500 feet of the Oil and Gas Location. The nearest residential Building Unit (BU) is located approximately 740 feet northeast of the proposed Location. The nearest planned well is 908 feet and nearest planned production facility is 1049 feet from a BU. The proposed Oil and Gas Location is a Buffer Zone location due to the distance from the nearest well to a BU. Approximately 9 BUs lie within 1,000 feet of the Oil and Gas Location with an additional 19 BUs located between 1,000 feet and 1,500 feet of the Oil and Gas Location. Approximately 24 additional BUs are located between 1,500 feet and 2,000 feet of the proposed Oil and Gas Location with a total of approximately 52 BUs within 2,000 feet of the Oil and Gas Location. There are no BUs located within 500 feet of the Oil and Gas Location.

Site Specific Measures to Address Criteria 1: Adams County approved the proposed Location on April 24, 2019, subsequent to the enactment of SB 19-181. As this proposed Location is a Buffer Zone location, it is subject to all BMPs and mitigation measures specified in Rule 604.c.(2). GWOC has committed to constructing 32-foot sound walls along the north, south and east sides of the proposed Location to minimize noise impacts and shield lights. GWOC will minimize dust on the access road with speed restrictions, surface stabilization, or dust control with appropriate chemical or water applications. GWOC has committed to an oil pipeline to reduce truck traffic and emissions from the Location during regular production. In the event that the pipeline is shut down for maintenance or upset conditions, the remaining tanks will use a LACT unit which allows for unloading of tanks without opening hatches, minimizing vapors. To reduce odors associated with oil and gas operations, GWOC will use an oil-based mud that meets the requirement for Group III classification. Lights on permanent equipment will be shielded and pointed down. Furthermore, GWOC has committed to conducting air monitoring and will submit the results to the COGCC on a monthly basis. In the event elevated readings are observed, GWOC will verify and QAQC the data to determine appropriate contingency actions. All contingency actions will be submitted to the COGCC for review and approval upon request. The air monitoring scope includes a two-week baseline test conducted prior to the start of drilling. Air monitoring will be conducted along the perimeters of the production facility within the proposed Oil and Gas Location and will remain in place from the beginning of drilling through six months of production. In addition to the information provided by GWOC, staff applied a Condition of Approval (COA) requesting the submittal and subsequent approval of the air monitoring plan prior to commencing drilling operations. The COA included a contingency to lengthen the duration of the air monitoring if deemed appropriate by the Director.

Because the proposed location is in Adams County, the operator was required to notice residents within ½ mile and hold a public meeting to disseminate information; 362 residents were noticed. The meeting notice was mailed out on April 20, 2017. GWOC received 6 RSVPs to the meeting. Various operations questions were asked with the main areas of concern being emissions, safety and nuisance issues such as noise, light, truck traffic and visual mitigation for homeowners within proximity to the location. GWOC addressed one site specific concern from the neighbors to the northeast. Attendees from the neighborhood to the northeast of the location expressed concern that they would be overlooking the location because the neighborhood is at a higher elevation than the pad. GWOC addressed these concerns by providing information on GWOC's light and noise mitigation sound walls, low profile tanks as well as Adams County's landscaping requirements. In addition, GWOC provided BMPs addressing these concerns which includes the commitment to use sound walls along the perimeter of the Location, the use of low-profile tanks and the installation of vegetative landscaping around the north and east perimeters of the proposed Location for the lifetime of the wells. Additional questions have not been received by GWOC to date. Adams County granted an Administrative Use by Special Review (AUSR) on April 24, 2019 subsequent to the enactment of SB 19-181.

Though not required by COGCC rule, GWOC also provided a detailed rationale for siting the multi-well production facilities and included a discussion of 5 potential alternative locations and

why they were not chosen, see Attachment Documents #1010837 and 1010838 as well as a written summary (Final Written Explanation), which addressed outreach and local government coordination, Attachment Document #1010839.

Summary: During the technical review process, COGCC staff requested additional information and clarification regarding GWOC's proposal and BMPs for dust, odors, noise and lighting. The information received has been added to the application materials. Staff also placed a COA regarding air monitoring on the Form 2A during the technical review process.

Criteria 3: Oil and Gas Locations within 1,500' feet of a municipal boundary, platted subdivision, or county boundary.

Site Specific Description of Applicability of Criteria 3: The proposed Location lies within 1500 feet of a municipal boundary (Thornton).

Site Specific Measures to Address Criteria 3: GWOC provided a description of the outreach and coordination with the Adams County LGD as well as Thornton for the Form 2A. GWOC has entered into agreements with Adams County and the City of Thornton regarding the use of Thornton roads.

Summary: During the technical review, COGCC staff requested additional information regarding GWOC's communications with the City of Thornton. GWOC provided a description of the outreach and coordination with the Adams County LGD as well as Thornton.

Criteria 5.c: Oil and Gas Locations within a Sensitive Area for water resources.

Site Specific Description of Applicability of Criteria 5.c: The Location lies within a sensitive area due to the proximity to surface water. An ephemeral drainage is located approximately 330 feet to the south of the Location.

Site Specific Measures to Address Criteria 5.c: GWOC has placed BMPs on the Form 2A for protection of the sensitive water resources. BMPs include the installation of perimeter stormwater controls to prevent off site migration of sediment/contaminant, construction of the production facilities within lined secondary containment, remote shut in capabilities, installation of leak detection, daily inspections of all tanks, visible pipelines and valves and documentation of annual inspections and formal site specific and random audits. GWOC will submit all documented inspection records to the COGCC, within 30 days, upon request.

In addition to the BMPs provided by the Operator, staff applied a COA to the Form 2A regarding notification of a potentially impactful spill or release to the downgradient Public Water Supply, the COGCC and the Environmental Release/Incident Report Hotline as the Oil and Gas Location lies upgradient of the Brighton Public Water Supply.

Summary: During the technical review, COGCC staff requested additional information and clarification regarding GWOC's BMPs for stormwater and leak detection. GWOC provided BMPs that address surface water protection. The BMPs include engineering controls (construction and containment) and administrative controls (inspections and a leak detection plan).

Criteria 8: The proposed Location with storage of hydrocarbon or produced liquid in more than 18 tanks or in excess of 5,200 barrels.

Site Specific Description of Applicability of Criteria 8: The proposed Location is being permitted for a total of 12, 500-bbl oil tanks and two buried produced water vaults.

Site Specific Measures to Address Criteria 8: This proposed Location will require an Adams County Administrative Use by Special Review (AUSR). The AUSR requires operators to coordinate with local emergency responders in case of a fire or explosion at the location. The proposed total tank count for the location is 12 oil tanks and six water tanks. Based on the technical review of the Form 2A, the location lies within an area of unincorporated Adams County with closest residential communities located to the north of Highway 470, which provides a barrier between the residential communities and the Oil and Gas Location.

Though not required by COGCC rule, GWOC provided a written summary (Final Written Explanation), which addressed outreach and local government coordination including coordination with the local emergency response team, see Attachment Document #1010839.

Summary: During the technical review, COGCC staff requested additional information regarding communication with the local responders. GWOC provided additional information regarding communication with Brighton Fire on June 27, 2019 to discuss all locations in their district including Kortum.

Criteria 10: Oil and Gas Locations where the Relevant Local Government, or state or federal agency requests additional consultation

Site Specific Description of Applicability of Criteria 10: The Adams County Local Government Oil and Gas Liaison (LGD) provided comments on this Form 2A regarding additional requirements.

Site Specific Measures to Address Criteria 10: COGCC staff reviewed the comments placed on the Form 2A by the local jurisdictional authority, Adams County. GWOC has worked with Adams County to address comments regarding the development of the Kortum Location including consultation with CDPHE through the Adams County permitting process. GWOC provided a summary of the Adams County permitting process and CDPHE consultation included on the correspondence document (Document #1010839). Adams County granted an AUSR on April 24, 2019 subsequent to the enactment of SB 19-181.

Summary: During the technical review, COGCC staff requested additional information regarding communication and coordination with the local government. GWOC provided a list of BMPs that GWOC has committed to with the County.

Director Determination: Based on the Objective Criteria review and approval of the Adams County AUSR subsequent to the enactment of SB 19-181, The Director has determined that this permit application meets the standard for protection of public health, safety, welfare, the environment and wildlife resources set by SB 19-181.