CRESTONE PEAK
RESOURCES

OPERATIONS PLAN

FIELDWIDE - WATKINS

Crestone Peak Resources Operating LLC
Watkins Operations Plan—City of Aurora

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Introduction

Crestone Peak Resources Operating LLC, a Delaware company, (Operator) presents this Watkins Operations Plan to the City of Aurora, Colorado, a municipal corporation (City) as a field-wide document to satisfy **10.3 Required Application Contents, #13 Operations Plan** under the Oil and Gas Operator Agreement (OA) between the Operator and the City, effective June 5, 2019, as assigned and recorded in the Arapahoe County Clerk and Recorder's Office at Reception No. E0028448, with an effective date of June 1, 2019.

This Operations Plan is meant to provide a brief overview of the life cycle of an oil and gas well, while also demonstrating how Operator will comply with the Best Management Practices (BMPs) within the OA. A "BMP #" will appear after certain descriptions to help you associate the corresponding BMP with our process.

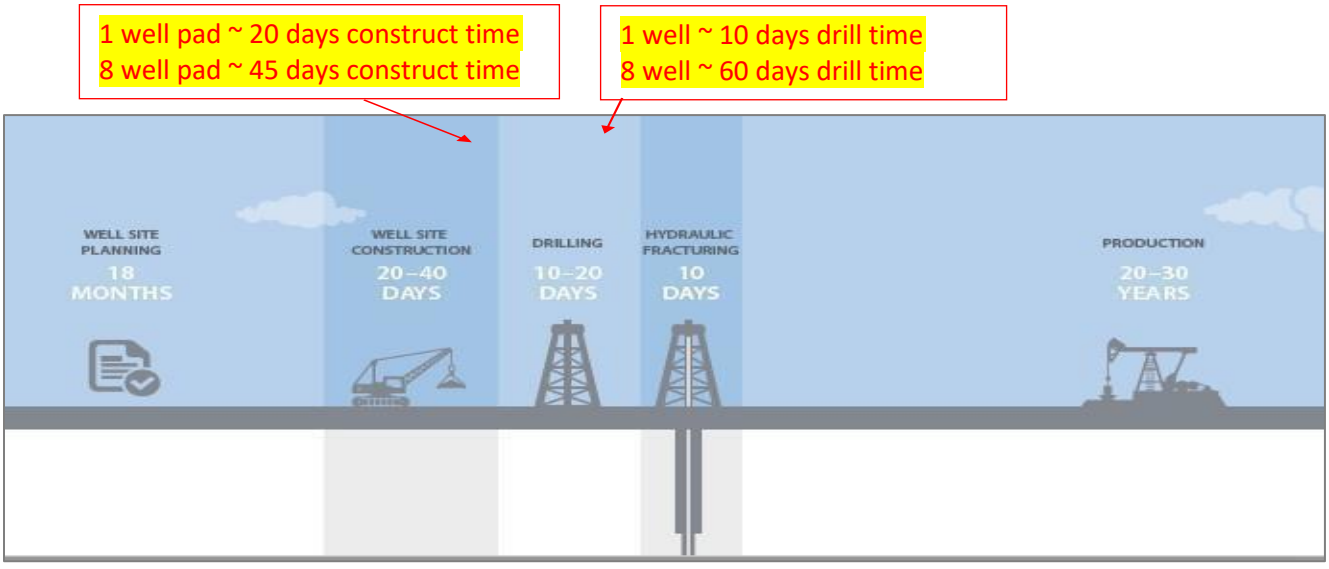
Life Cycle of a Well in the Watkins Asset

The Operator intends to develop Well Sites and drill wells within the City over a period of several years. The timing of individual Well Sites will be dependent on several factors. Pursuant to the OA, the Operator will provide a Project Development Schedule with an Oil and Gas Permit (OGP) Application. The basic development process for a New Well is generally consistent from one site to another. This document describes the life cycle of a typical well, which can be broken down into four basic phases: 1. Planning and Well Site Construction, 2. Drilling and Completion (including Hydraulic Fracturing), 3. Production, and 4. Plugging and Restoration.

The Development Phases of a Well

Each phase of development is characterized by several factors, such as: purpose and objective, duration, intensity of activity, required equipment, number and type of personnel, traffic intensity, local impacts, footprint of operations and more. Various resources are needed to implement each phase and the demand for these resources increases or decreases at various times throughout each phase. The overall process and the duration of each phase for a typical well is depicted in the diagram below.

Pre-Development Planning



There has been a large planning effort underway since 2010 that has led up to the development plans contemplated in the OA. Much of this planning activity will not be described in detail in this Operations Plan, but it was essential work that forms the basis for the development plan and this Operations Plan.

Identifying and testing the Niobrara formation to determine whether it could economically produce hydrocarbons took several years. Once the formation was identified, surface and mineral rights were secured. Permitting for test wells and establishment of drilling and spacing units through the Colorado Oil and Gas Conservation Commission (COGCC) were completed. Exploration drilling collected essential data on reservoir characteristics, geologic hazards, formation tops and tested successful drilling and production strategies. Surveys of topography, sensitive water resources, wildlife and archaeological resources, and formation boundaries all aided in the selection of Well Sites included in the OA (**BMP #10 Tree Mitigation, #47 Cultural and Historical Resource Protection and #48 Water Protection**). Engagement with the surrounding community, including open house events, rig tours, and public hearings all provided a better understanding of local values. This led to the development of compatible strategies to mitigate community concerns with education of our standard safety practices.

Phase 1: Planning and Well Site Construction

Well Site Planning

The location of a Well Site is primarily driven by the underlying geology of the rock and the potential for oil and gas in a specific area. Other factors also include:

- the surface owners desired location of the Well Site
- proximity to homes and buildings
- proximity to water and floodplains
- surrounding wildlife and habitat

A typical multi-well pad may take up to 18 months to plan. Our planning process incorporates site-specific studies on wildlife and natural resources to identify potential impacts from our operations. We use the data to make necessary modifications, such as locating Well Sites and facilities outside nesting habitats, adhering to timing restrictions, and reclaiming land by planting vegetation that provides forage for animals and birds.

Civil Survey

A survey of the specific dimensions of the Well Site aides in the generation of the plat package. The plat package and GIS data also form the basis for the required Site Plan and Storm Water Management Plan (SWMP) used in permitting. The local topography is measured, and the elevation of the Well Site is established during this process. The data collected during civil survey determines earthworks volumes required for construction, and feeds into a viable SWMP. The final access road alignment is typically laid out at this time. The route is based on the surface rights that have been granted, along with the local topography. The access point at the nearest public roadway is determined by sight distances and setbacks from existing intersections. Other data collected includes PLSS Section breakdown to verify the acreage within the drilling and spacing unit as required by the COGCC, in addition to distance to nearest building units, water bodies, drainage, and more.

A survey crew of two to three workers can typically collect the required field data within a few days. It typically takes two to three weeks to prepare the preliminary plat package for review. This can be an iterative process to ensure that the final design is achievable and accounts for site-specific conditions. The crew utilizes survey grade GPS data collectors, ATVs, light pickup trucks, and hand tools to visibly mark the survey location. The plat package is generated on the computer by experienced draftsmen. Traffic associated with the activity is minimal, typically consisting of a few light passenger vehicles.

Permitting

Once a plat package and civil engineering drawings are completed, permits are filed with the City and the COGCC. While these permit packages represent the same project, they can differ due to the specific regulations, rules and guidance issued by the agencies. Under the OA, the City permits are expected to take approximately 13 weeks to complete for new projects and eight weeks for Schedule 2 projects. COGCC permits will be processed concurrently with City permits, but approval will not be granted until the City permit has been issued.

The Operator is not permitted to begin construction on the Well Site until the City has issued a Stormwater Water Management Permit (SWMP) (**BMP #30 Stormwater Management**) and the COGCC has issued the Form 2A.

Groundwater Quality Monitoring Plan

As part of the permitting process in the City, the Operator is committed to conducting its Operations in a manner to avoid causing degradation to surface or ground waters within the City and to wetlands within the City. In order to achieve this, a third-party environmental contractor provides groundwater sampling and monitoring to meet the requirements set forth in the OA, the COGCC Statewide Groundwater Sampling and Monitoring Program Rule 609 (Rule 609). This Groundwater Quality Monitoring Plan presents the actions which the contractor will provide on behalf of Operator to ensure all groundwater monitoring requirements are met for proposed Well Sites within the City. More information can be found in the fieldwide Groundwater Quality Monitoring Plan submitted with this Application **(BMP #46 Water Quality Monitoring Plan).**

Well Site Construction

Once all required permits have been issued, Well Site construction may begin. On average, Well Site construction takes approximately 45 days. This work is normally done during daylight hours and scheduled far enough in advance that construction of the Well Site is completed ahead of bringing a drilling rig to the Well Site. This process uses construction equipment such as bulldozers, scrapers, loaders, backhoes, water wagons, rollers, graders, and gravel trucks to construct the pad and haul in the surface gravel to the location. There are between two and 10 people on-site during this phase of work.

The first step in Well Site construction involves installation of perimeter stormwater BMPs pursuant to the approved SWMP, COGCC and CDPHE Stormwater requirements. Once these protections are in place, earthworks may begin. The existing vegetation is cleared, and the topsoil is stripped. No burning of debris occurs (**BMP #6 Burning**). Topsoil and spoil piles are clearly separated to ensure preservation of the topsoil for final site reclamation.

During the construction of the Well Site there may be a temporary trailer on the location, but no personnel stay overnight on-site (**BMP #26 Trailers**). The Well Site is constructed to match the approved permits to the best of our ability. At times, new information is learned during construction that requires deviations from the plans. The Operator works with COGCC and City representatives to make any required modification to plans as needed, which is often done in the field. Once the basic grading is complete to level the well pad, establish drainage ditches, and spoils and topsoil stockpiles separated, gravel is hauled in to provide a stable surface for oil and gas operations. Gravel hauling generates heavy traffic, but generally only lasts a few days. Specific traffic estimates have been provided in the Traffic Letter for the OGP (**OGP Submittal Item #15 and BMP #27 Transportation**).

The Operator will not carry out any construction, alteration, removal, or demolition of a building or feature or make any changes that would impair the historic association of the landmark building, landmark site, or historic district to comply with City of Aurora Municipal Code, without first obtaining approval from the City. If there is a discovery of historic artifacts, Operator will notify the City (**BMP #47 Cultural and Historical Resource Protection)**.

A portion of the Well Site is constructed with the permanent production facilities in mind. This area is located away from the planned wellheads to abide by numerous safety standards set by the Operator, the COGCC and the American Petroleum Institute. All disturbed ground not needed for subsequent operations, including stockpiles and cut and fill slopes, are seeded and mulched in accordance with the permits. Approved weed-free seed mix is used, and these areas are monitored and maintained for re- growth establishment and elimination of weed establishment for the life of the well (**BMP #33 Noxious Weed Control**).

A perimeter fence is constructed to establish the Well Site boundary, turn livestock and deter the public from entering the Well Site. Cattle guards may be installed at the Well Site entrance, in addition to a locking gate. This perimeter fence will generally remain in place until after interim reclamation (as defined by the COGCC) has been performed, and all disturbed areas have re-established vegetation. Any additional fencing requirements under the OA will be installed after interim reclamation occurs (described below) (**BMP #17 Fencing**).

The Well Site is left in a stable condition, ready for the rig. Specific project schedules will be communicated to the City through the OGP process (**OGP Submittal Item #14**). Operator will also communicate the schedule of these activities to the City pursuant to the OA (**BMP #4 Notifications to the City**).

Phase 2: Drilling and Completion

Drilling

Multiple drilling rigs may be brought to the Well Site and begin drilling each of the New Wells. Drilling rig operations are 24 hours per day. The drilling crews work in shifts, with some personnel living on-site during the entire operation. The crew size is about 25 to 40 people. There can be up to 40 people on-site at any time. The Operator will conduct drilling operations in compliance with all COGCC rules and regulations, as well as all applicable local rules and regulations. Drilling a single well takes approximately 10 days.

The drilling rig will be on location for a total of 60 to 70 days for a Well Site with eight New Wells. Multi- well Sites take longer to drill than a single-well Well Site but yield a smaller overall disturbance than drilling multiple single-well Well Sites. There will be a period of increased traffic prior to the rig arriving and while the rig moves off to the next location (**BMP #27 Transportation and Circulation and BMP #29 Road Repairs**).

Standard operations on the Well Site consist of a drilling rig at the center of the pad along with water storage to be used in the drilling operations, pipe racks for temporarily storing drill piping, pumps, power generators, tool storage, fuel storage for said generators and pumps, and an enclosure to protect workers from inclement weather.

All secondary containment, tank farms and diesel storage tanks are surrounded by mechanical (muscle) walls which have a thick, impervious liner installed within. All areas underneath the drilling rig, mud pumps, and mud circulation equipment have a liner installed. This liner holds small spills until the spill can be vacuumed out and disposed of. In addition, all drilling rigs contracted by Operator will have their own SPCC program (**BMP #5 Closed-Loop Pitless Systems for the Containment and/or Recycling of Drilling Fluids**).

Construction trailers, portable toilets, garbage storage and extra fuel storage will be located near the edge of the Well Site (**BMP #26 Trailers**). All trailers are temporarily used for office, residential and security purposes. The Operator utilizes a "closed loop system" during drilling operations. Water used to support drilling operations may be trucked in or piped in and temporarily stored on-site (**BMP #5 Closed-Loop Pitless Systems for the Containment and/or Recycling of Drilling Fluids**). The Operator properly handles all drilling fluid in accordance with federal regulations. No fluid will be discharged on-site (**BMP #31 Wastewater Management**). Drilling fluid will be disposed of offsite, in a manner approved by the COGCC (**BMP #3 Transportation and Storage of Fluids**).

The Operator plans to use an electric drilling rig to reduce emissions where it is possible to do so and that power is available 6 months prior to the date that Operator commences drilling operations. The Operator will use generator power for production equipment until the Operator acquires the required Building Permit and can safely tie into the existing power at the Well Site (**BMP #13 Electrical Equipment**).

Noise mitigation may be required during the Drilling Phase based on its proximity to residences or zoning. In this case, the Operator has agreed to use sound walls, berming, bales, or other appropriate measures to mitigate sound **(BMP #2 Noise Mitigation)**.

The larger drilling rig drills vertically down to a specified depth and then horizontally to a specified distance. This target depth ranges from 7500'-8500' of feet below the surface. The deepest freshwater source is approximately 5500' shallower than the target depth. The hole (wellbore) is drilled in successive sections through the rock layers. Once the desired length of each wellbore section has been drilled, the drilling assembly is removed, and steel casing is inserted into the wellbore and cemented in place. A typical wellbore contains surface casing and production casing strings designed to provide a barrier that protects groundwater resources from the contents that will later flow inside the wellbore **(BMP #46 Water Quality Monitoring Plan**). The Applicant's standard surface casing design consists of 9 5/8" 36 lb/ft graded steel casing. The Applicant's standard production casing design consists of 5 ½" 23 lb/ft graded steel pipe. The Operator will follow the COGCC regulations (Rule 317) regarding wellbore integrity and testing to ensure water aquifer protection (**BMP #46.7 Wellbore Integrity and Aquifer Protection**).

The well construction is designed so that Operator will protect freshwater producing zones from the intrusion of hydrocarbons or water from other formations that are penetrated by the New Well. Operator will comply with applicable COGCC regulations regarding wellbore integrity and testing. The casing and cement for each New Well will prevent oil, gas, and water from migrating from one formation to another behind the casing. Where the depth of water producing formations is clearly established, the Operator will set and cement casing in a manner sufficient to protect freshwater aquifers.

Following construction of the pad, a smaller drilling rig is used to drill and set the surface casing strings. Once completed, a larger drilling rig will then be brought to the location to finish drilling the remaining wellbores. The time between the two drilling rig operations is several weeks to months and allows the surface cement to sufficiently cure. The smaller drilling rig equipment will be brought onto the Well Site and rigged up. Drilling operations, which run twenty-four (24) hours a day until completed, will commence after the rig is "rigged up". The first Watkins well is anticipated to be spud Q1 2021. The surface holes will be drilled to approximately 2,200 feet using fresh water. Surface casing will then be run and cemented to surface to protect any freshwater zones. Surface casing setting depth is determined from subsurface ground water maps prepared by the State Engineer and supplemented by the latest data available from offsetting wells. Prior to drilling activities, a baseline water sample will be obtained from water wells within ½ mile of the proposed location to ensure water quality.

The COGCC sets forth specific requirements for casing setting depths necessary to protect ground water sources, and all drilling permits ensure that those setting depths are achieved. To ensure the protection of all freshwater resources, 9-⅝" steel surface casing will be set to a depth at least fifty (50) feet below the base of the deepest aquifer in water wells located within one mile of the surface location as required by the COGCC. The casing will be cemented from the bottom of the pipe up to surface. The COGCC reviews all drilling permits for adequate surface casing setting depths and cementing programs based on subsurface ground water maps prepared by the State Water Engineer and offset well data.

For each well drilled from the Well Site, cement is installed between the wellbore and casing pipe and will be allowed to set. While the cement is setting, well control equipment is installed and tested. After the cement is set and installation of well control equipment is complete, a drill bit is run into the hole to drill the intermediate portion of the well into the potential oil and gas bearing formations. The well will be drilled horizontally and will be turned or steered such that a curve is achieved to approximately 90 degrees or parallel to the surface of the ground. The proposed vertical depth for the each well drilled from the Well Site is approximately 8,000 feet below ground level and the length of the horizontal leg being approximately two (2) to three (3) miles long. The total Measured Depth (MD) for each of the proposed wells will be approximately 18,000 feet.

Once the horizontal section of the wellbore is drilled, a string of production casing will be run into the wellbore. This casing will be 5½ inches in outer diameter and weigh 20 pounds per linear foot. The grade will be P110, which has a collapse rating of 11,080 psi and a burst rating of 12,640 psi. This casing will be cemented into place to isolate the productive zones of the reservoir.

During the Drilling Phase, if surface casing cement is not circulated to the surface, Operator will run temperature or cement logs in order to ensure integrity. Operator will test the production casing to simulate conditions anticipated during the completion operations by pressuring up production casing to 9800 psi before opening the toe sleeve or perforating the toe. If the pressure test is unsuccessful (i.e. the toe valve leaks) a plug is deployed as deep as the plug will go on wireline to test to 9800 psi. Operator will install

pressure transmitters on surface and production casing and Operator will monitor casing pressures during the Production Phase.

Operator performs Bradenhead tests on all New Wells at all Well Sites during the Drilling Phase and then annually during the Production Phase of the well. Each test is witnessed by a COGCC inspector (**BMP #46.7 Wellbore Integrity and Aquifer Protection**).

During drilling operations and other operations on the Well Site, the Operator will use various measures to manage dust from trucks and traffic (**BMP #12 Fugitive Dust Suppression**). Also, odor can result from drilling operations. If the Operator receives complaints from a Residential Building Unit within 1,320 feet from the Well Site, Operator will take measures to mitigate the odor, based on the specific circumstances (**BMP #36 Odor**).

Once drilling operations are complete, the drilling rig is disassembled and moved offsite. At this stage, activity stops until the "completion" (or hydraulic fracturing) of the well occurs. This period of no activity can be as short as a few days or up to several months.

Completions (Hydraulic Fracturing)

Prior to and following the Completion Phase of any New Well, Operator will assess the integrity of plugged and decommissioned wells, wells removed from use, and dry holes ("Previously Abandoned Wells") which are located within 1,500 feet of the proposed New Well borehole (**BMP #43 Plugged and Decommissioned Well Testing)**.

To "complete" a well means performing various tasks for a well to produce oil through the wellhead. Hydraulic Fracturing is just one portion of the completions process. There are also other minor activities that take place on the pad before and after fracturing, such as preparing the New Well for fracturing and cleaning the sand out afterwards. Hydraulic fracturing is a completion method that has been used since the late 1940s.

On average, it takes less than 10 days to complete a New Well and 50–60 days to complete an eight-well Well Site. Completion operations occur 24-hours per day on the Well Site. The completions crews work in shifts, with some personnel living on-site during the entire operation. Crew size can vary but is typically made up of about 20 people, although up to 60 people may be on-site at anytime.

During hydraulic fracturing, fracturing materials, mainly sand, are brought in by truck and mixed on-site with water and other fracturing fluids. Pursuant to the terms of the OA, and to the maximum extent possible, the Operator will transport water onto the Well Site through temporary, above-ground water supply line (not trucks) for this work (**BMP #3 Transportation and Storage of Fluids**).

Operator has a site-specific Water Delivery Plan and Method that has been provided to the City with this application. These temporary, above-ground water supply lines ("Lay Flat Lines") are typically 12" in diameter and typically made of synthetic rubber or similar "hose" material. They are used for the transfer of water from an identified water source to support company's hydraulic fracturing operations.

“Facilities” associated with use of Lay Flat Lines include the following:

- In-line pumps
- Spools
- Secondary containment equipment
- Ramps

Equipment used for installation may include pick-up trucks, flatbed trailers, skid steer, and skid steer mounted reel winder.

Lay Flat Lines are laid on the surface, at grade and do not require excavation. They do not require staking in order to secure them from movement and are placed at least 10’ from the edge of the roadway.

Deployment and retrieval of a Lay Flat Line involves a truck carrying spools of hose following along-side a skid steer tractor. The skid steer carries and straddles the spool of Lay Flat Line and releases the hose by the reel rolling forward. Victaulic couplings are used to assemble segments of Lay Flat Lines. The process of retrieving the Lay Flat Lines involves the same equipment and process in reverse (reel rolling backward). When Lay Flat Lines run alongside road right of way, traffic control plans are implemented to manage and mandate safety procedures.

There are no permanent tanks associated with Lay Flat Lines. All flowback water is routed to temporary frac tanks which are mobile units and trucked off-site. These frac tanks also have secondary containment (temporary liner constructed 30-40 ml polyurethanes and the portable containment is installed with interlocking high-density plastic panels).

There are seven permanent tanks (five oil tanks and two produced water tanks) with the exception of nine (9) allowable low-profile tanks as outlined in Exhibit B to the OA. These are shown on the Site Plan and each tank is equipped with automatic shut-down devices that can accessed remotely or on- site.

All tanks have an automated high-level shutdown device installed to shut-in the well to prevent over- filling of any tank.

All valves associated with filling and offload of tanks will be installed inside containment berms and the operation of such valves will be controlled through a security seal process per Operator's site security procedure.

Environmental drip buckets will be used in addition to containment berms to minimize small spills during connection and disconnection of transfer equipment.

Vapor from tanks on Well Sites with multiple wells will be directed to a vapor recovery compressor unit ("VRU") as needed to meet CDPHE air permit requirements. All associated piping and tank connections will be subject to LDAR inspections.

As secondary containment for completions, any tank 55 bbls or larger not filled with fresh water will be surrounded by a mechanical (muscle) wall with a thick, impervious liner installed within. All stimulation equipment, coiled tubing, and workover rig circulating equipment will have a liner installed underneath. This liner contains small spills until the spill can be vacuumed out and disposed of under as described in the waste management plan (**BMP #31 Wastewater and WasteManagement**).

The actual fracturing process uses machinery capable of driving fracturing fluid down the length of the entire wellbore (potentially more than 17,000 feet). The fracturing fluid consists of water, proppant (typically sand), and some chemical additives. This fracturing fluid is pumped into the well at high pressures to crack the rock in different stages in the targeted geologic horizon.

Fracturing fluid is comprised of up to 99.5% water and sand. Small amounts of chemical additives are necessary to reduce fluid friction, kill bacteria that are present in the water source and enhance the fluid's ability to transport the propping agent. Many of these chemical additives are commonly used in everyday consumer products, such as toothpaste, ice cream, cosmetics, household cleaners, table salt substitutes and antiperspirant. Operator supports disclosure of the chemical ingredients used in fracturing fluids in a way that informs the public and protects proprietary company information. Disclosure of these chemicals is required under the terms of the OA (**BMP #7 Chemical Disclosure andStorage**).

To start the fracturing process, the well casing must first be perforated. At predetermined and specific intervals (stages) in the well, small perforations are made in the wellbore that allow the fracturing fluid to pass through the steel casing and exert pressure against the rock. The force of the fluid creates tiny cracks, or fractures, in the underground reservoir. Once fluid injection stops, pressure begins to dissipate, and the fractures previously held open by the fluid pressure begin to close. The proppant acts as a tiny wedge to hold these narrow fractures open, creating pathways for oil, natural gas and fracturing fluids to flow more easily to the well.

After a stage has been hydraulically fractured, a plug is set inside the casing to isolate the stimulated section of the wellbore. The next stage is then perforated, fractured and isolated by a plug. The entire perforate-fracture-plug cycle is repeated at regular intervals along the targeted section of the reservoir. A 10,000 ft. lateral in the Niobrara formation may have 40 or more discrete stages associated with a frac job. Once all stages have been fractured, the plugs are drilled out by a coil tubing rig, or workover rig, allowing the oil, natural gas, and fluids to flow into the well casing and up to the surface.

Operator complies with “green completions” standards set by the COGCC and the EPA under 40 CFR 60 Subpart OOOO and OOOOa (**BMP #16 Reduced Emissions Completions**). Based on zoning and prescribed distances, Operator has agreed to mitigate the sound created by hydraulic fracturing through appropriate means as described in the OA (**BMP #2 Noise Mitigation**).

The last stage of the completions process is known as “flowback”. Flowback describes the first few days of production from the well, after the plugs have been drilled out by a coil tubing rig or workover rig. The well produces an emulsion of hydrocarbon, formation water and produced water from the fracturing fluid. This emulsion flows through various pieces of temporary equipment on the surface to separate it out into various components. The flowback water is collected in tanks and may be recycled and blended with other water to be used at another fracturing site, or disposed of in accordance with all applicable rules, including

COGCC's. This typically means the water is transported by truck to a state-approved injection well located outside of the City (**BMP #3 Transportation and Storage of Fluids and BMP #34 Class II Underground Injection Control Wells**).

At the end of this stage of development, all temporary equipment is removed from the Well Site, leaving only the wellhead and the permanent production facilities, including, separators, storage tanks and emissions control equipment **(BMP #25 Removal of Equipment**). New well equipment and all existing equipment at the Well Sites will be anchored to the extent necessary to prevent flotation, collapse, lateral movement, or subsidence in compliance with applicable Federal Emergency Management Agency ("FEMA") (as administered by the City) and COGCC rules and regulations. Operator's wells do not leave any anchors buried for future use. All anchoring is done through surface anchors or removable anchoring systems during Drilling and Completion Phases. **(BMP #41 Anchoring)**.

Phase 3: Production Phase

After drilling and completion operations conclude, the well is "put on production" and may produce for 20+ years. Operator's commitment to safe and environmentally responsible operations continues through the entire life of each well.

Wells produce an emulsion of oil, gas and naturally occurring water. Certain equipment is needed on the Well Site to separate the gas from the oil, and the oil from the water. The oil and gas are measured, metered, and sold as they leave the Well Site. The separated water, or "produced water", must be disposed of according to state and federal regulations. A list of the production equipment used at this stage is provided with the OGP submittal.

The plan is for oil to be primarily transported from the Well Site via pipeline in order to minimize the truck traffic associated with production operations. Oil storage tanks are included on the Well Site to provide for efficient production of oil during the life of the well (**BMP #3 Permanent Tanks and BMP #9 Low Profile Tanks**). There may be periods where pipeline is not available, and the OA allows for use of tanks and transportation of oil and produced water. ***Primarily*** is used in this instance for those occasions where wells were drilled before January 1, 2020 and do not yet have pipeline infrastructure in place, and also in instances where economic, physical, or other factors may prevent or delay the installation of oil pipeline. The industry recognized alternatives would be to truck oil instead of pipeline.

Numerous engineering controls are in place to prevent or minimize the impact of unplanned events such as spills or leaks (**BMP #40 Containment Berms, BMP #38 Spills, BMP #45 Automatic Safety Protective Systems**).

Until a water gathering system is constructed, produced water is trucked offsite. Produced water will be disposed of offsite to a state-approved injection well located outside of the City, as approved by the COGCC. Operator will not dispose of produced water within the City or within four miles of the City except as described in the OA (**BMP #34 Underground Injection Wells**).

Natural gas is sold through the meter and transported offsite through a gas gathering pipeline system in accordance with COGCC regulations.
The physical dimensions of the production facilities may vary based on several factors, all of which are covered by the OA or in OGP Process. Operator will use electricity to power most equipment on-site (**BMP #13**

Electric Equipment). Above ground structures are painted a tan or brown matte finish to reduce the visual impact of the production facilities from visibility corridors (**BMP #8 Paint Color**). No permanent facilities will be placed outside of the designated pad.

Well Site facilities must meet internal engineering standards, as well as operating and process integrity requirements. The facility plans go through a PHA-Hazard Operability Study by a certified facilitator. Any recommendations are incorporated into the design (**BMP #44 PHA-Haz Op Study**). Alarms and relief systems are regularly tested (**BMP #45 Automatic Safety Protective Systems**), and personnel are trained to operate facilities responsibly. During Production Phase, tanks and separation equipment are secured to the ground using anchors engineered to resist floatation, collapse, lateral movement, or subsidence.

To the extent flares, thermal oxidizers, or combustion devices are utilized, all such flares shall be designed and operated in accordance with the state and federal regulations, as well as the OA requirements as follows:

- A combustion device must be available at each Well Site during the entire Production Phase for maintenance or emergencies only.

- The combustion device must be fired with natural gas and designed to operate with a 98% or higher hydrocarbon destruction efficiency.

- The combustion device must be designed and operated in a manner that will ensure no visible emissions during normal operation. Visible emissions mean observations of smoke for any period or periods of duration greater than or equal to one minute in any 15-minute period during normal operation, pursuant to EPA Method 22. Visible emissions do not include radiant energy or water vapor.

- The combustion device must always be operated with a flame present when emissions may be vented to it, or other mechanism that does not allow uncontrolled emissions.

- All combustion devices must be equipped with an auto-igniter unless manned while in use. (**BMP #19 Combustion Devices**).

Operator will maintain all equipment and machinery in a safe manner, and maintenance will not be performed within 500 feet of a navigable waterway (**BMP #35 General Maintenance and BMP #22 Maintenance of Machinery**). Operator will provide a safe and secure work environment to protect workers, our contractors and the community. Critical equipment will be secured by lock or with a security seal to prevent unauthorized tampering with equipment (**BMP #3.1 Permanent Tanks**).

Containment Berms. Operator will use hard-rimmed rings at the Well Sites with sufficient capacity to contain 1.5 times the maximum volume of the largest tank on location that such facility will contain at any given time plus sufficient freeboard to prevent overflow around all permanent tanks. All berms and containment devices will be inspected quarterly by Operator and maintained in good condition. No potential ignition sources will be installed inside the secondary containment area unless the containment area encloses a fired vessel or such sources are rated in accordance with industry codes and standards. Secondary containment such as duck ponds or lined earthen berms for temporary tanks may also be used. Containment berms will be constructed of hard-rimmed rings, designed and installed to prevent leakage and resist degradation from erosion or routine operation. Secondary containment for tanks will be constructed with a synthetic or

engineered liner that contains all primary containment vessels and is mechanically connected to the steel ring to prevent leakage. Well Sites will comply with the City's stormwater management requirements, including the use of stormwater best management practices to minimize water runoff from collecting in local waterways.

Automatic Safety Protective Systems and Surface Safety Valve. An automated safety system, governed by safety devices and a programmable logic computer, will be installed at the Well Sites. The automated safety system will include the installation, monitoring and remote control of a Surface Safety Valve ("SSV") among other engineered measures and devices that are implemented to reduce or eliminate the potential for a well event. The SSV is minimally complex and has relatively low pressure or risk. All New Wells will have an SSV installed prior to the commencement of the Production Phase connected to the production tubing at the surface. The SSV will be equipped to operate remotely via the automated safety protective system, which monitors flowing pressures and other operating parameters which have predetermined threshold values programmed and will remotely shut the well in should certain upset conditions be detected. Additionally, the automated safety system provides the ability to remotely shut-in wells on demand through operator remote intervention. The SSV will have documented annual testing to ensure functionality. The practice of utilizing automated safety protective systems, including SSVs, exceeds the current state regulations and requirements for wells operated within Colorado.

Interim reclamation will occur within three months of the first production on Well Sites surrounded by crop lands, and within six months of first production for Well Sites surrounded by grass lands unless a timeline exception is granted by the surface owner and COGCC Interim reclamation is performed in accordance with the approved City SWMP plans and the COGCC Rules (**BMP #39 Reclamation**). During this phase, portions of the Well Site that are no longer needed for production operations are reclaimed back to their original contours and reseeded with appropriate vegetative cover. Operator will monitor the condition of these reclaimed areas until sufficient vegetative cover is established. The final fencing is typically installed at this time to enclose the pad area and establish the site perimeter. A gate to allow for vehicle access will be installed and locked at all times, unless there are personnel on-site. The fence can serve multiple purposes including: visually screening the site from view, acting as a security measure to deter unauthorized access by members of the public and preventing livestock from entering the site.

During the Production Phase, Operator will maintain the Well Site. Debris and flammable material will be removed from the Well Site (**BMP #18 Flammable Material and BMP #24 Removal of Debris**) and any mud tracked from the Well Site to public roads will be addressed (**BMP #23 Mud Tracking**).

Phase 4: Plugging and Restoration

At the end of a well's productive life (generally 20+ years), the Operator submits a Notice of Abandonment to the COGCC and will concurrently submit a final reclamation plan to the City. The "Final Reclamation" of the Well Site is dictated by multiple documents, including COGCC Regulations, any conditions of approval associated with the City permits, the Surface Use Agreement, and/or Oil and Gas Lease or Leases.

Final reclamation plans will include the appropriate surface reclamation necessary for approval from the COGCC (**BMP# 39.3 Final Reclamation**). All wellbores are plugged and abandoned in accordance with COGCC regulations and other applicable laws. At the time of final plugging and abandonment, all surface equipment is removed, and the Well Site is graded back to approximate natural contours. Backfilling, leveling and

recontouring is performed as soon as possible after plugging or cessation of production and removal of production equipment and facilities. Stockpiled topsoil is redistributed evenly over the re-contoured surface.

The area is treated to eliminate any compaction that may have occurred during final grading. The access road is reclaimed in a similar manner. If necessary, water bars and physical barricades may be implemented as necessary to promote reclamation efforts. Pipelines and subsurface power lines are typically abandoned in place.

The reclaimed area is reseeded with the approved seed mixture specifically designed to simulate adjacent undisturbed vegetation while maximizing utilization by both wildlife and domestic stock. Final reclamation of the access road is done in accordance with the terms and conditions of the right-of-way grant.

Operator must meet stringent site-closure requirements and file appropriate documentation with the COGCC and other government authorities to preserve the location and details of the well closure for future reference.

Operator has agreed to conduct its air, ground water, and plugged and decommissioned well monitoring programs at its own cost. The City may access the Well Site to inspect and ensure compliance provided they provide 48-hour notice, wear PPE, comply with Operator's safety standards and rules, and be accompanied by Operator's representative.

For each previously abandoned well for which access and permission to test is granted by the surface owner and the operator of record, a soil gas survey to test the soil within a 10-foot radius of the previously abandoned well shall be completed prior to production from the proposed New Well and again one year after production has commenced on the New Well. Notification of the results of the soil gas survey to the City and the COGCC within three months of conducting the survey will be provided. If access to the previously abandoned well could not be obtained from the surface owner, Operator will notify the City.

OA, Exhibit C, Additional BMPs

BMP #4 Notifications to the City – Operator will provide all required notifications under the OA to the City by notifying Daniel Brotzman by e-mail at dbrotzman@auroragov.org, and Jeffrey S. Moore, Local Government Designee.

BMP #6 Burning – Operator will not allow open burning of debris to occur on the site of any oil and gas operation, as per City code. This provision does not include emergency flares.

BMP #9 Low Profile Tanks – Operator will use 16' tall tanks ("Low Profile Tanks") for New Wells on Well Sites where technically feasible and where oil pipeline exists. Operator will not be required to use Low Profile Tanks for New Wells on Well Sites that existed as of the Effective Date if no additional tanks are required on that Well Site for those New Wells. Please refer to site-specific Oil and Gas Well Permit plans for more listings of the number of tanks and their dimensions.

BMP #10 Tree Mitigation - The oil and gas location and/ or Well Site will be constructed by the Operator in a manner that minimizes the removal of and damage to existing trees in accordance with the City's tree mitigation ordinance.

BMP #11 Discharge Valves – The Operator will ensure that open-ended discharge valves on all storage tanks and other containers within the Well Site are secured, capped, or blind-flanged, and that they will not be accessible to the general public. The Operator will ensure that all open-ended discharge valves within the Well Site are be placed within the interior of the secondary containment area.

BMP #22 Maintenance of Machinery – Operator will ensure that routine field maintenance of vehicles or mobile machinery will not be performed within 500 feet of any navigable waters of the United States. Operator will ensure that all fueling occurs over impervious material.

BMP #23 Mud Tracking – Operator will, in accordance with the stormwater management plan submitted with all New Well permit applications, take all practicable measures to ensure that vehicles do not track mud or debris onto City streets. If mud or debris is nonetheless deposited on City streets, in excess of de minimus levels, the streets shall be cleaned in a reasonable time by the Operator or within 24 hours of notice by the City. If for some reason this cannot be done, or needs to be postponed, Operator shall notify the City of the Operator's plan for mud removal.

BMP #24 Removal of Debris – Operator will ensure that all construction-related debris is removed from the Well Site for proper disposal in a timely manner. The Operator will ensure that the Well Site is reasonably free of debris and excess materials during all Phases of Operations. Operator shall not stockpile debris at the Well Sites.

BMP #25 Removal of Equipment - All equipment used for drilling, re-completion and maintenance of the facility will be removed from the site within 30 days of completion of the Operations, weather conditions permitting, unless otherwise agreed to by the surface owner. No permanent storage of removable equipment on Well Sites will occur.

BMP #36 Odor - Operator will mitigate odors by routing to closed loop systems to the maximum extent practicable. Odor emitting from Well Sites will be controlled safely and within a reasonable time. If a person living in a Residential Building Unit within 1,320 feet of a Well Site complains of odor, Operator will determine whether the odor is caused by Operator's Operations. If the odor is caused by Operator's Operations, Operator will resolve the odor concern to the maximum extent practical within 24 hours. Operator will wipe down drill pipe each time the drilling operation "trips" out of hole. Operator will comply with COGCC Rule 805 and CDPHE Regulation 2.