BMC A PAD
LUMA Siting Rationale & Alternatives Analysis

COGCC Rules 305A.a and 305A.b.(2)

COGCC Rule 305A.a. requires a 90-day Notification of Intent (NOI) for a proposed location within a Large UMA (LUMA) oil and gas facility (herein after "location") prior to submitting an oil and gas location (i.e. Form 2A) application to the COGCC. Per COGCC Rule 305A.b.(2), this siting rationale is required as part of the NOI. The notification must be forwarded to (A) the local government with land use authority over the proposed location and (B) the landowner on whose lands the LUMA facility will be located, prior to finalizing the location with the landowner, unless exception criteria under 305A.e.(1) are met.

BACKGROUND

Battlement Mesa (Garfield County, CO), since the late 1970s, was planned as an energy community and initially built to support oil shale and oil and gas development. Following the slow-down of oil shale development in the 1980s, Battlement Mesa continued to be an oil and gas community for the development of the Piceance Basin. Since the 1980s, Battlement Mesa has also been promoted as a retirement community; however as of the 2010 census, the average age of a Battlement Mesa resident is 37.5 and a good portion of its residents support the oil and gas industry. The area surrounding the BM PUD has had historic (since 1949) and considerable oil and gas development, particularly within the past 10 years.

At the time of the county resolution, 14 well pads were proposed within the BM PUD. Under Ursa's predecessor in interest, prior to December 2012, the number of pads and associated infrastructure was reduced to 10. Since that time, Ursa has reduced the number of proposed well pads within the BM PUD to five (5) and potentially four (4) as part of a comprehensive development plan to occur in two phases. Phase I included two locations (the BMC B and the BMC D), which were approved by the COGCC and Garfield County in 2016. Phase II will include the remaining two well pads (the BMC A, BMC L) and a temporary water storage facility (BMC F).

Of the 197 wells Ursa proposes in the vicinity of the BM PUD, only 107 are proposed to be drilled from the four (4) pads within the BM PUD, including the 24 gas wells and 1 injection well planned to be drilled from the BMC A Pad.

All pad locations within the BM PUD are subject to an amended Surface Use Agreement (SUA, 2009) executed between Battlement Mesa Partners, LLC (BM Partners) and Ursa Operating Company LLC (formerly Antero Resources). Said SUA establishes not only the BMC A pad location, but all four (4) of the pad locations for the overall development of the BM PUD. This also meets the intent of the Governor's Task Force and implementing LUMA regulations, as the oil and gas facility is proposed within a site specific development plan (via the SUA) that establishes vested property rights and which expressly governs the location of the wells and production facilities on the surface estate. It should be noted that in working closely with Battlement Mesa Partners over the past several years, the comprehensive development plan considered many complex factors, including long-term community development plans and complex operational considerations.

SITING CRITERIA

Several considerations and criteria weigh significantly in selecting locations to minimize potential impacts to human health, safety, the environment and wildlife. Proposed Best Management Practices (BMPs), developed on a site-specific basis provide an additional level of mitigation in addition to Federal, state, county and local regulations, land use codes, and permit conditions of approval. Potential siting criteria may vary on a site-specific basis and include (but aren't limited to) those listed below: Only those criteria applicable to the proposed location are addressed:

Geology and Bottomhole Considerations

- Number of Bottom holes and approximate depths
- Rationale for selecting this location from a mineral development perspective

Technical and Operational capabilities Issues

- Topography and accessibility of locations
- The ability to reach and develop bottom holes in an economic and technically feasible manner using proven technologies
- Water availability, transportation and management options
- Seasonal and weather constraints, and timeframe to develop (construct, drill, complete, produce)

Existing Mineral Leasing, Surface Owner Contractual Considerations

- Mineral leasing agreement(s)
- Surface owner Surface Use Agreement (SUA) provisions and preferences (w/landowner conflicts)
- Potential local/regional conflicts with future development by a landowner
- Prior existing rights and encumbrances (both public and private)
- State and county land and easement cultural setback requirements (i.e. COGCC exception/buffer zones)

Community Health and Safety Concerns

- Traffic safety including transportation and haul routes
- Proximity to distance of the location from building units, schools, public buildings, etc.
- Community events that may affect scheduling (if known)

Regulatory Considerations Affecting Siting

- Existing Federal, state, county and local regulations and land use codes (and conflicts)
- Minimizing the level of disturbance associated with pads, roads, pipelines, etc.

Environmental

- Potential natural resource impacts to sensitive areas, public water supplies, wetlands, floodplains
- Potential for nuisances including traffic, odors, noise, air emissions, etc.
- Sensitive area, natural resource, environmental and wildlife concerns
- Potential environmental and wildlife concerns

PROPOSED LOCATION

Geological, Technical & Operational Considerations

Consideration was given to the location most likely available to reach all bottomholes from a single well pad vs. multiple pads to reach all bottomholes. The proposed oil and gas location is planned to accommodate 24 bottom holes in addition to an injection well to help manage water and lessen community impact through reduction in truck traffic. The farthest reach to a bottom hole from this location is approximately 2,463'.

The construction of the well pad location will have significant cuts and fills. A 750ft +/- access road will have to be built as depicted in our construction drawings. Access to existing Phase I pipeline infrastructure is in close proximity and would not interfere with existing land uses and will be in close proximity to the well pad and access road.

Based on the bottomhole locations in relationship to the location of the well pad, Ursa has determined that it is economically and technically feasible using proven existing technologies to reach all bottomholes, and that the maximum drilling reach of 2,463' is reasonable and practical.

Existing Mineral Leasing, Surface Owner Contractual Considerations

Ursa has valid existing lease(s) to reach bottomholes from the proposed location. Communication with the surface owner has been in progress for the past several years, and an agreement has been reached with the landowner. The well pad is not anticipated to affect any prior existing rights, easements or encumbrances. There are 7 building units (6 of which are currently occupied) are within exception zone (0 – 500') and 44 building units located within the buffer zone (500 – 1000'). A total of 51 building units within a 1000'.

Community Health, Safety and Nuisance Concerns

Ursa's traffic and transportation (aka haul route) plans consider potential community and residential safety concerns. The proposed location doesn't appear to present any traffic or safety concerns that would adversely affect this location, nor present any greater concerns that other locations in similar settings. In addition, Ursa works with Community Counts, the Garfield Energy Advisory Board, and periodic community meetings to address upcoming rig moves, operations actions, etc. that would potentially affect the community. Haul routes were established by Garfield County to serve as primary routes for oil and gas development in the vicinity of this location.

There is a potential for short-term noise and lighting nuisances associated with construction, drilling and completions for the 51 building units proximate to the well pad location. However, Ursa will work with the permitting agencies and the community to mitigate or eliminate potential nuisances through compliance with regulations, BMPs, and state and county permit conditions of approval (COAs).

The BMC A location has been engineered to allow for the pad to be cut into the side of the hill to the east of the pad location. This cut will allow for the natural shielding of a portion of the well pad, access road and production and injection facilities. Topography and engineered pad design will also help minimize community impact and nuisance conditions (i.e. noise, light and visual mitigation) during construction, drilling, completion and production phases of development.

Regulatory & Environmental Considerations

Ursa has conducted site reviews, onsites, and land assessments to ensure that the location will comply with existing Federal, state, county and local regulations and land use codes; including both cultural and environmental setbacks. No conflicts with laws and regulations have been initially identified in the assessments and onsites conducted by Ursa.

Ursa and its third party consultants have conducted site environmental assessments including ecological surveys (e.g. noxious weeds, wildlife, waters of the state, etc.) for the BMC A Pad. The proposed location was evaluated for potential natural resource impacts to include (but not limited to) sensitive areas, public water supplies, wetlands, watersheds and floodplains. The proposed location is not located within the 100-year floodplain, the Parachute Watershed District or a designated 317B Public Water Supply Area. This location is located within key wildlife habitats, for which a Wildlife Mitigation Plan exists, so there are no issues affecting wildlife, which is primarily big game. Otherwise no potential environmental conflicts were identified during the site reviews and onsite.

Injection Well Considerations

Ursa's comprehensive development plan of the Battlement Mesa area requires the use of a total of 4 injection wells in order to effectively manage produced water once Phase I and Phase II are in full production mode. Ursa always strives to reduce water usage through the application of green completions and water recycling. Once the Phase II wells are completed, available locations requiring recycled water for completions within the BM PUD are anticipated to diminish greatly. Conversely, the largest anticipated amount of flowback / produced water from the pads within the BM PUD will be at this same time the demand lessens. During this peak flowback period, necessary injection rates are anticipated to exceed daily and cumulative injection volume limits (established through the COGCC UIC permitting process) for 3 injection wells (2 existing – Speakman A, Watson Ranch B and 1 pending application – Tompkins). If an injection well is not approved within the BM PUD, any excess volumes of produced water will be required to be trucked to locations outside of the Battlement Mesa area. Approval of a 4th injection well will allow for an effective water management program and will reduce overall impact to the community through a significant reduction in daily truck traffic.

Existing Phase I and proposed Phase II infrastructure is planned to accommodate all water recycling and disposal within the BM PUD. No additional surface disturbance is required for the injection well and associated facilities as they will be located within the pad boundaries of the BMC A pad.

ALTERNATIVE LOCATIONS CONSIDERED

Well Pad

Geological, Technical & Operational Considerations

Alternative locations were considered and evaluated over the past several years to meet lease commitments, without requiring two locations or more to reach bottomholes. Phase I pads (BMC B & BMC D) were maxed out for the number of bottom hole locations able to be drilled from the pads due to pad size constraints pursuant to the SUA. The BMC L pad as expanded through a recent SUA amendment to allow for a larger pad size to accommodate additional bottom hole locations. However, the BMC L pad is located at the opposite end of the BM PUD and would not allow for reaches to the planned BMC A bottom holes. As discussed below in the

Community Health & Safety Concerns section, the other 2 pads within the PUD (BMC M and Parks & Rec) are anticipated to be eliminated from Ursa's development plan completely. All existing pads in the Battlement Mesa Area but located outside of the BM PUD (Speakman A, Monument Ridge, Monument Ridge B, Watson Ranch, Watson Ranch B, Yater, Tompkins and B&V) have been drilled out. Whether from a surface constraint perspective or a bottom hole reach perspective, these pads are not able to accommodate additional wells. Future proposed pad locations Speakman B and Lacy Park were also considered. Speakman B is located outside of the BM PUD but is located too far south to access the BMC A bottom holes. The Lacy Park pad was initially planned to accommodate up to 21 wells. However, upon initiation of the LUMA process, Ursa decided to shuffle the Lacy Park bottom hole locations and re-plan them from the BMC B, D and A pads due to proximity to Grand Valley High School, nearby residences, the Colorado River, pad size limitations and community concern.

Existing Mineral Leasing, Surface Owner Contractual Considerations

From both a mineral and the SUA with the surface owner, no other feasible alternatives exist. The well pad isn't anticipated to affect any prior existing rights, easements or encumbrances.

Community Health and Safety Concerns

Two additional well pads proximate to the BMC A pad location were planned per the 1982 Resolution: BMC Parks & Rec pad and BMC M pad. From a geologic perspective, the BMC Parks & Rec and BMC M pads were planned to accommodate several of the bottom hole locations now planned to be drilled from the BMC A pad. By shifting the bottom holes to be drilled from the Phase I and Phase II pads, Ursa will reduce the total amount of surface disturbance within the BM PUD. Both the Parks & Rec pad and the BMC M pad locations would be located nearer to residences and in areas that are highly visible to the surrounding community.

Alternative location to the north would not be feasible due to the water treatment facility. Alternative location to the east would not be feasible due to the terrain, existing road and would still be within a Large Urban Mitigation Area. Alternative location to the south would place the location in closer proximity to homes and building units and would likely result in a higher potential for short-term noise and lighting nuisances associated with construction and drilling in close proximity to the well pad location.

Ursa's initial review of traffic and transportation haul routes found that no other options exist based on current infrastructure. No alternative location was identified that would create less traffic and safety concerns.

Regulatory & Environmental Considerations

Alternate locations were considered as part of site environmental assessment, onsites, and land assessments to ensure that the location would comply with existing Federal, state, county and local regulations and land use codes. While other locations could potentially comply, those options were eliminated due to both cultural and environmental setbacks, and other reasons included in this siting analysis.

Alternate locations were considered in evaluating potential natural resource impacts to include (but not limited to) sensitive areas, public water supplies, wetlands, floodplains and wildlife. Locating the site to the west or northwest would fall within a wildlife mitigation area agreed to with Colorado Parks and Wildlife, and possibly within the 100 year floodplain, wetlands, and in closer proximity to a potential public water supply area.

Injection Well

Community Health and Safety Concerns

Per the 2009 SUA, an injection well has been planned within the BM PUD boundary from the BMC G pad. In response to community concern, Ursa eliminated the BMC G pad from the BM PUD development plan and was successful in constructing adjacent well pads (Yater and Watson Ranch B) outside of the BM OUD boundary. The injection well within the BM PUD was re-planned at the BMC B pad location. Due to community and CDPHE concerns regarding the proximate location to the Colorado River, PUD drinking water intake and 317B public water supply internal buffer, Ursa has worked with the surface owner and Garfield County staff and commissioners to move the surface location for the planned injection well to the BMC A pad location. The proposed BMC A location is outside of the 317B public water supply area, outside of the floodplain and is located nearly 2000 feet from the Colorado River.

Geological, Technical & Operational Considerations

Ursa currently has 2 existing injection wells and 1 pending injection well application in process:
Speakman A BAT 23CWI-24-07-96 located at the south end of the BM PUD
Watson Ranch B 24AWI-17-07-95 located on the south east side of the BM PUD
Tompkins 41AWI-08-07-95 located at the north end of the BM PUD

Existing / future planned pad locations proximate to but outside of the BM PUD were all considered as possible locations for injection wells. Due to topography, the Colorado River and planned and existing infrastructure including the additional injection wells discussed above, the preferred location for the 4th injection well is along the western side of the BM PUD.

Due to adjacent land uses surrounding the proposed BMC A pad, we feel this site is best suited for our injection needs for our development. The Battlement Mesa Metro District sewer treatment plant is immediately adjoining to the N/NE along with the Battlement Mesa Company maintenance shop and an RV storage lot. All other pads that Ursa operates are surrounded by residential areas other than the Proposed BMC M pad which is located along the Golf Course area in the middle of Battlement Mesa. To locate this injection well on the BMC M pad would create a large amount of additional disturbance to build the pad, access road and pipeline connections through the Battlement Mesa community. We feel it is best to try and utilize an already planned producing pad to continue our efforts in overall reduction of disturbance in the area. If we are able to place this injection facility at the proposed BMC A pad, we are one more step closer to eliminating yet another pad from the overall development, which started as 14 well pads, and this plan would help us reduce our planned well pads down to 4.

SUMMARY

Ursa has evaluated the proposed location and potential alternative locations to assess compliance with Federal, state and local regulations and land use codes, and the landowner's preference as documented in the SUA. In conducting the siting analysis, potential conflicting land uses and concerns were identified. The analysis included mineral lease obligations, SUA contractual obligations, existing and reasonably foreseeable land development uses, regulatory setbacks, community concerns, and potential impacts to natural resources, the

environment, and wildlife. Based on the information provided in this siting rationale, alternative sites to the east, north, northwest, south and west aren't considered feasible for the location for reasons provided herein, and still have the ability to reach bottom holes. Ursa already has a location to the east and northeast approved by COGCC and Garfield County. Therefore, Ursa believes that the proposed location is the best option to locate the proposed well pad with appropriate BMPs and permit COAs.