



ARAPAHOE COUNTY
COLORADO'S FIRST

BOARD SUMMARY REPORT

Date: March 5, 2020

To: Board of County Commissioners

Through: Bryan Weimer, Director of Public Works and Development

From: Diane Kocis, Energy Specialist

Subject: **Quality of Life Recommendations: Light and Noise Mitigation
Factors to Consider for Oil and Gas Facility Updated Regulations**

Request for Direction and Staff Recommendation

The purpose of this BSR and Study Session is to provide a status update to BoCC regarding the on-going process to develop new oil and gas land use/siting regulations in accordance with SB19-181. This update will discuss public feedback, staff input and rules in other jurisdictions regarding light and noise and will offer some recommendations for mitigating those impacts. BOCC direction is requested on potential mitigation measures related to light and noise impacts from oil and gas operations impacting the quality of life for nearby residents.

Links to Align Arapahoe

This matter links to the Align Arapahoe goal for Quality of Life for Arapahoe County citizens who will be impacted by neighboring oil and gas facilities and to the goal of Fiscal Responsibility for a balanced approach that will allow the industry to operate successfully.

Background

With the enactment of SB19-181, preemption of local government authority over the siting of oil and gas operations was removed. Staff has been directed by the Board of County Commissioners to adopt a balanced approach for new oil and gas rules that considers the interests of both operators and citizens in accordance with the County's authority under SB19-181.

Arapahoe County Public Works and Development's stakeholder input process toward drafting new oil and gas rules will continue through July of 2020, with a goal of adoption of new rules in August of 2020. The adoption process will include public hearings with the Planning Commission and Board of County Commissioners, providing additional opportunity for direct comment on the proposed regulations in a public forum and further opportunity to refine the final regulations.

Staff is currently compiling a spreadsheet of proposed and adopted rules in other jurisdictions. The spreadsheet, summarizing proposed and adopted rules of nine selected Front Range

jurisdictions, is approximately 90% complete at the time of the Board Summary Report. The spreadsheet also includes recent operator agreements adopted in a few jurisdictions in lieu of updating their codes relating to oil and gas development; operator agreements were adopted by some jurisdictions to replace their preexisting MOUs prior to SB19-181 or while the bill was being drafted. Those jurisdictions continue to utilize their operating agreements and are not currently working on new regulations.

Quality of Life Concerns – Light and Noise

Today's study session focuses on aspects of Quality of Life impacts. *Stakeholders have said that light, noise, visual impacts, wildlife concerns, and traffic all have an impact on Quality of Life. This report discusses the light and noise aspects of Quality of Life.* The attached table summarizes the noise and light rules proposed or adopted in other Front Range jurisdictions.

Light and noise affect many aspects of our residents' quality of life, especially light and noise generated by oil and gas operations in rural areas. Based on survey results, survey respondents indicated that both light and noise should be regulated: 66% said regulating light was important/very important and 79% said regulating noise was important/very important. Noise from oil and gas operations has been one of the most frequent resident complaints received since the Niobrara play began in unincorporated Arapahoe County eight years ago (approximately 100 registered complaints with our department).

Current COGCC rules allow industrial noise levels for oil and gas facilities up to 75 dB(A) during the day and 65 db(A) at night, with exceedance of those levels by ten decibels in 15 minute intervals every hour, even when an oil and gas facility meets current minimum setbacks from residential uses. By comparison, the State noise ordinance (not related to oil and gas operations) limits noise within residential areas to 55 db(A) during the day and 50 db(A) at night. The higher levels permitted by COGCC for oil and gas facilities reflect that the oil and gas operation is industrial in nature; however, these are most often located outside of industrial zone districts, and neighboring properties impacted are not industrial in nature and may include residential, agricultural and open space land uses. While more difficult to quantify, Colorado Parks and Wildlife has communicated that wildlife can be significantly impacted by noise and light associated with drilling and fracking activities.

Studies (see **Reference Documents** noted at the end of this Board Summary Report) have shown that constant noise can impact health in otherwise healthy individuals with both short-term and long-term health risks, including stress, sleep disturbance, sleep deprivation, elevated blood pressure and cardiovascular disease. Vulnerable populations such as children, the elderly and people with chronic illnesses may be disproportionately impacted, and health impacts can escalate when the noise persists for several weeks.

Additionally, the irregularity of the greater noise experienced during the intervals when noise is allowed to increase, by ten decibels over fifteen minute intervals, is further disruptive to those who have adjusted to some extent to the semi-industrial or industrial noise levels. Residents sensitive to low-frequency noise (not well addressed through mitigation measures such as sound walls) experience more severe health impacts that include insomnia, headaches, unusual tiredness, irritation and pressure on the eardrum.

Staff also recommends mitigations for light pollution. Operators must light drilling sites 24/7 per OSHA requirements, so their employees can safely work during nighttime activity; however, intense lighting during drilling and fracking has been identified as an impact to nearby residents when operators conduct drilling and completion operations near homes. Residents often experience sleep disruption when drilling lights face their bedroom windows. Sleep disruption has been reported up to one-third of a mile away. Implementing requirements to reduce lighting impacts outside of the pad would still allow safe operations on site. One operator in Arapahoe County has reported success with light mitigation techniques in reducing neighbor complaints.

As we heard from the survey and the public outreach effort for this project, minimizing the disturbance of nearby oil and gas development with noise and light mitigation is important for our residents' quality of life.

Discussion

In response to SB19-181, Staff is proposing to amend the Land Development Code for oil and gas land use applications and is in the process of seeking input and suggestions from citizen and industry stakeholders.

The regulations can include prescriptive standards, performance-based standards, or a combination of both.

- A performance-based standard sets a target (“achieve a sound level of 55 decibels at the nearest residential property line”). Generally, industry prefers performance-based standards, which allow them flexibility in how to address a particular issue.
- A prescriptive standard requires a specific mitigation measure (“electric drilling rigs are mandatory” and/or “noise walls are mandatory”). In some cases, a prescriptive standard may be preferable, such as requiring lights on the drilling rig to be downcast and full cutoff (full cutoff lighting fixtures emit no upward component of light while providing precise, controlled illumination to the work area).
- Other “tools” for mitigation, such as setbacks for the well pad from a residential structure, could be considered in combination with other prescriptive or performance-based measures for impacts related to noise and lighting.

Staff is considering the following noise and light mitigation requirements as part of the new regulations based on rules proposed or already adopted along the Front Range:

- **Noise:**
 - Noise Study
 - Require a baseline noise study over at least three days, one of which must be a weekend day. This helps define the level of background noise in the area and may allow operators to use less mitigation if the background noise levels are higher than is typical for a rural or residential area. Performance-based standards could include exceptions for sites close to railroad or interstate corridors based on higher levels of background noise already occurring.
 - Within a certain distance of residential structures, require noise modeling, monitoring and mitigation to residential levels for residential areas and require the use of sound walls for both drilling and fracking near residential areas. No noise

mitigation would be required if an operator can demonstrate that the noise meets residential limits without sound walls or other mitigation measures. If noise mitigation is required, staff recommends that it be provided during both drilling and fracking.

- Setbacks
 - Require greater setbacks than the current COGCC minimum setback from residential structures. Setbacks are an effective way to reduce low-frequency noise, as well as helping to mitigate health and safety issues. Low-frequency noise cannot be mitigated effectively with sound walls alone. Of the wells drilled in Arapahoe County in the last eight years, approximately 97% had setbacks of 1,000 feet or greater from the closest residence.
 - Setbacks also provide means of mitigating other impacts, as was discussed in a previous study session for Health and Safety mitigation.
 - Staff recommends a 1,000-foot setback from well pads to existing homes to address a range of concerns, including but not limited to impacts from low-frequency noise.
- Other Noise Mitigation
 - If sound walls are required in order to meet residential noise levels, those walls must be erected for both the drilling and completion phases.
 - Require the use of mufflers on diesel engines.
 - Restrict truck traffic, including deliveries, between the hours of 9 PM and 7 AM, except for circumstances outside of the operators' control such as delivery of a drilling rig.
 - Encourage the use of electric drilling rigs and motors in place of noisier rigs typically using natural gas or diesel.
 - Provide covers or insulation for noisy equipment such as the shale shakers.
 - Seek operator input for noise abatement options to meet the standard.
 - The regulations should also have provisions for violations/complaints, so as to ensure timely response to bring the operation back into compliance. Because of the nature of the operation that could be creating the impact, a timely response to violations is critical to resolve before that operation is completed.
- **Light:**
 - If a sound wall is present, lights illuminating the pad shall be mounted below the level of the top of the sound wall.
 - Lights not concealed by a sound wall must be IESNA (Illuminating Engineering Society of North America) full cutoff or must be shielded in some manner (metal shield directing light down or screening material to reduce the amount of light leaving the pad). FAA-mandated lighting would be exempt from this standard.

Criteria for Evaluation

Staff will continue to use the evaluation criteria already presented at previous study sessions for any draft rules:

- Impact on the Public
- Alignment with State Rules
- Best Management Practices
- Industry Impact
- Impact to County Resources

Steps taken since last Study Session

Staff assessed the results of the online Oil & Gas Survey, compiled a table of adopted and proposed rules in other jurisdictions, and is still working toward a goal of completing the Land Development Code revision process in August of 2020 with BOCC adoption of updated codes. Staff continues to review and summarize regulations drafted and adopted in other jurisdictions and to evaluate BMPs and mitigations used in other jurisdictions.

Steps to be taken after this Study Session

At the March 27 and April 7, 2020, study sessions, staff will cover the remaining Quality of Life topics under consideration for new rules. On April 21, staff will summarize the information provided in the January, February, March and April study sessions and seek Board feedback on specific items to incorporate in the Land Development Code revisions.

Alternatives: Quality of Life Measures to Address Impacts from Noise and Light

Staff is requesting general feedback from the Board on the information presented and specific direction on the following:

Noise: Staff expects future regulations will include a combination of performance-based and prescriptive measures; however, we are requesting feedback from the Board on specific measures that that may weigh into how the regulations are drafted. Draft regulations will be further reviewed through referrals, public review, and hearings.

Options for the questions below could be, for example:

Yesdefinitely require as part of regulations

No.....definitely do not require as part of regulations

Toolbox.....prefer performance-based measures; use *this* prescriptive measure as part of a package of options for the operator

1. Should the County require a baseline noise study over at least 3 days, one of which would be a weekend day?
2. Should the County require the operator to post 24/7 contact information for noise complaints? *Note: This is a requirement of the MOU currently in use.*
3. Should the County include provisions in noise regulations to verify and resolve complaints in a timely manner?
4. Should the County require a noise mitigation plan?
5. Should the County require the operator to minimize engine idling?
6. Should the regulations include provisions encouraging the use of electric equipment and other noise-mitigating technology, such as mufflers on engines, to minimize engine noise?
7. Should the County require noise walls as a mitigation effort if performance-based noise limits will be exceeded, and if so, should we require noise walls for both drilling and fracking?

8. Should the County require the placement of temporary noise mitigations, if contacted by nearby residents about excessive noise, in the form of hay bales or other operator-engineered solutions?
9. Should the County restrict heavy truck traffic to and from well pads between the hours of 9 PM and 7 AM, except for circumstances outside of the operator's control such as the delivery of drilling rigs?
10. Should the County restrict the hours of operation for noise-intensive activities such as flaring, blowdowns (pressure releases) and unloading of tubular materials between the hours of 9 PM and 7 AM?
11. Should the County consider setbacks as a method to mitigate noise (such as low-frequency noise poorly controlled by noise walls) and other impacts?
12. Should the County use residential noise limits for drilling and fracking near residential structures? *Current COGCC limits are based on industrial and semi-industrial use.*
13. Should there be exceptions to mitigation requirements where background noise levels are determined to exceed typical residential or agricultural levels? *Examples may be areas in proximity to a railroad or interstate highway corridor based on a noise study.*
14. Should the County include a provision to also address potential noise mitigations in conditions of approval, on a permit-specific basis, where unusual circumstances warrant additional mitigation?

Light:

1. Should the County require light pollution mitigations (mounting lights to be placed on sound walls when sound walls are in use, full cutoff lights, or the use of shielded lights) when operations are within 1,320 feet (one-quarter of a mile) of residential structures?
2. Should the County require light pollution mitigations such as shielded lighting regardless of distance from a residential structure?

Reference Documents

Guy, Ann B. (2017) "Noise Pollution from Oil and Gas Development May Harm Human Health," *Physicians, Scientists and Engineers for Healthy Energy*.

Hayes, J., McCawley, M. and Shonkoff, S. (2016) "Public Health Implications of Environmental Noise Associated with Unconventional Oil and Gas Development," *Science of the Total Environment*, Elsevier publications.

Radtke, C. (2016) "Noise Characterization of Oil and Gas Operations," Master's Thesis, Colorado State University.

Fiscal Impact

Depending on the specific changes adopted, it is likely a minimal financial impact will occur for the County due to additional plan review that would be required from approved or pending land development for new oil and gas facility applications. Ability to enforce any new regulations and impacts to staffing for ongoing implementation and enforcement of regulations are being taken into consideration by staff in making recommendations to the Board of County Commissioners.

Concurrence

PWD Staff is in support of continuing this process with additional study sessions and continued public outreach with the goal of drafting updated regulations for consideration through the public process. The County Attorney's Office has reviewed this BSR and the staff evaluation.

Attachment

Summary Table of Noise and Light Rules in Other Jurisdictions

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