U.S. DEPARTMENT OF ENERGY | Fossil Energy and Carbon Management

Colorado Natural Gas Flaring and Venting Regulations

The U.S. Department of Energy's Office of Fossil Energy and Carbon Management (FECM) supports research and development of technologies that can reduce the volume of natural gas (e.g., methane) flared or vented (released) into the atmosphere during crude oil and natural gas production, processing, transportation, and storage operations. Methane is a potent greenhouse gas (GHG) and minimizing its release across the oil and natural gas supply chain is critical to the realization of a net GHG benefit and reducing climate and environmental impacts of carbon-based fuels. This fact sheet was created by FECM to inform stakeholders on state-level production and regulatory activities, as they relate to natural gas flaring and venting. FECM's research portfolio includes efforts to reduce natural gas flaring through the application of improved technologies to capture and utilize small volumes of natural gas at remote locations, as well as technologies to reduce methane release during upstream production operations, as well as midstream natural gas processing and transportation. While flaring activities in the prolific unconventional shale plays have steadily increased between 2011-2019 due to higher oil production levels and natural gas pipeline takeaway capacity constraints, this trend took a sharp downturn since 2020 as a result of significant decline in demand for oil. Other factors include federal and state regulatory efforts to reduce methane emissions, companies taking voluntary actions and measures to minimize flaring of associated natural gas, and additional pipeline projects connecting sources of supply and consumption.

Colorado Producing Basins and Plays

Colorado oil- and gas-producing basins include portions of the Denver-Julesburg (DJ), Uinta, Greater Green River, Piceance, Paradox, San Juan, Raton, and Park Basins (Figure 1). The Niobrara "Shale" play is a crude oil and liquids-rich gas play that spreads across the DJ, Piceance, and Park Basins. The Niobrara production comes from a brittle, tight limestone that's adjacent to oil-prone sources of rock shales. However, the Paradox Basin in southwestern Colorado is known more for its conventional oil and gas production, while the Piceance Basin is home to tight gas sands that include some liquids-rich natural gas.

Figure 1: Colorado producing basins with major unconventional oil and gas plays outlined. *Source: EIA*

By comparison, the Pierre Shale in the northern Raton Basin has seen limited development activity. The 2016 Potential Gas Committee (PGC) report identifies nearly 80 trillion cubic feet (Tcf) of recoverable natural gas resources in the Piceance/Park Basins, about half of which is in unconventional formations. The PGC estimates the most likely DJ Basin conventional gas resource to be about 8 Tcf. The U.S. Geological Survey has estimated the mean undiscovered oil resource for the entire DJ Basin (including portions beyond Colorado) at 104 million barrels—of which, about 40 million barrels are associated with the Niobrara. According to the U.S. Energy Information Administration (EIA), Colorado's proved reserves are 1.17 billion barrels of oil and 20.4 Tcf of natural gas (2020).

Colorado Oil and Natural Gas Statistics (EIA)

	2015	2016	2017	2018	2019	2020	2021
Crude Oil Production (Average Thousand Barrels/Day)	336	318	358	459	527	459	369
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	4,627	4,613	4,687	5,077	5,455	5,449	5,151
Natural Gas Gross Withdrawals and Production (Flared) (MMcf/Day)	N/A	7.2	11.7	16.4	11.7	10.7	N/A
Natural Gas Gross Withdrawals and Production (Oil Wells) (MMcf/Day)	647	559	618	69	73	49	N/A
Natural Gas and Gas Producing Oil Wells (Thousands)	53.9	52.8	52.0	44.4	38.6	38	N/A

MMcf – million cubic feet

2021 ranking among 32 U.S. oil and natural gas producing states — Oil: 5 Natural Gas: 9

Colorado Key Regulations Associated with Flaring and Venting

The Colorado Oil and Gas Conservation Commission (COGCC) regulates the state's oil and gas development according to rules outlined in the Colorado Code of Regulations. Rule 912 of the Oil and Gas Conservation Act (see page 183) to read: Rule 912 of the Oil and Gas Conservation Act addresses natural gas flaring and venting, prohibiting unnecessary or excessive venting or flaring from a well. The rule also defines acceptable flaring as that which is necessary to protect public health, safety, and welfare. Additionally, this rule requires that a facility operator notify the appropriate local point of contact when it plans to conduct flaring activities.

The Oil and Gas Conservation Act also outlines regulations relevant to venting and flaring, with relevant provisions iprovisions in Rule 604 (see page 138). In 2016, the COGCC approved the provisions as part of a set of rules related to planning large-scale oil and gas facilities located near residential Urban Mitigation Areas (comprising 22 or more homes). This rule requires the planned facility to identify satisfactory mitigation measures and best management practices. The proposed facility must account for emergency events, fluid management and leak detection, flaring and venting, automated shut-in control measures, and storage tanks.

In 2019, the Colorado General Assembly passed SB 19-181. The bill requires reform of Colorado Oil and Gas Commission's role from economic development of the oil and gas industry to a regulatory role which is tasked with protecting public health, safety, welfare, the environment, and wildlife resources. This legislation also requires the Colorado Department of Public Health and Environment Air Quality Control Commission (AQCC) to obtain emissions data from operators and to minimize emissions in the oil and gas sector. In September 2020, the AQCC required that all new wells be monitored and emission requirements be tightened for pre-production activities.

In November 2020, the Colorado Oil and Gas Conservation Commission approved rules that would ban routine flaring and venting and the release of raw gas. Flaring would be permitted only if conditions at the well are disrupted, during maintenance (with written permission), or production evaluation or as part of an approved gas capture plan. It would also be permitted, if necessary, for a well completion or if the operator can show it will minimize adverse impacts to public health, safety, welfare, and the environment.

Colorado State Points of Contact

Colorado Oil and Gas Conservation Commission

Contact the COGCC for information about Colorado oil and gas enforcement, forms, hearings, operator guidance, orders, policies, and rules.

Website: https://cogcc.state.co.us

Email: julie.murphy@state.co.us

Phone: 303-598-7022

Colorado Department of Public Health & Environment: Air Pollution Control Division

Contact the Air Pollution Control Division for information on permits and emissions from business and industry.

Website: https://www.colorado.gov/pacific/cdphe/apcd

Email: christopher.laplante@state.co.us

Phone: 303-692-3216

Visit https://www.energy.gov/fecm/findyourstate-natural-gas-flaring-and-venting-regulations-fact-sheets-state for a digital version of this fact sheet that includes hyperlinks to information sources.