



The U.S. Department of Energy's Office of Fossil Energy (FE) 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 exploration, production, processing, transportation, and storage operations. This fact sheet was created by FE to inform stakeholders on state-level production and regulatory activity regarding natural gas flaring and venting. FE's research portfolio includes efforts to reduce methane (and other hydrocarbon) 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 (primarily) methane release during midstream gas processing and transportation. Intermittent flaring that occurs as a result of routine well testing, production facility process shutdowns, or facility and pipeline infrastructure maintenance, are normal aspects of safe oil and natural gas production. Increases in domestic oil and natural gas production have resulted in significant infrastructure buildouts, however, natural gas pipeline capacity constraints have led to regional increases in the flaring of associated gas in some unconventional plays (e.g., Permian Basin in Texas and New Mexico and Bakken Shale in North Dakota) in order to enable oil production.

Montana Producing Plays and Basins

Montana's historical oil and gas producing areas include the Williston and Powder River Basins in the eastern and southeastern portions of the state and a small part of the Big Horn Basin in south central Montana ([Figure 1](#)). According to the [Montana Board of Oil and Gas](#), the Sweetgrass Arch, just east of the Montana Thrust Belt, and other central and north central Montana areas also have contributed to the state's production. According to a 2012 report by the [University of Montana](#), since the late 1950s, the majority of oil production has come from the Williston Basin, and since 2000, the large majority has come from development of the unconventional



Figure 1: Montana basins and major unconventional oil and gas plays outlined.
Source: EIA

Bakken-Three Forks Shale play. According to the U.S. Energy Information Administration (EIA), Montana's proved reserves are [302 million barrels of oil](#) and [0.63 trillion cubic feet \(Tcf\) of natural gas](#) (2017).

In addition to the Bakken, there are several other emerging unconventional

plays in Montana that have seen limited prospecting. The oil-prone Heath play is a mixture of shale and limestone. The Upper Cretaceous Cody Shale is a gas play with complex geology. The Upper Cretaceous Niobrara Shale also has some gas potential. However, there are other unconventional formations with production potential within all of the basins mentioned. The U.S. Geological Survey (USGS) has prepared a number of resource assessments for basins that extend into Montana. In 2013, the [USGS](#) estimated mean undiscovered volumes of 7.4 billion barrels of oil, 6.7 Tcf of associated/dissolved natural gas, and 0.53 billion barrels of natural gas liquids in the Bakken and Three Forks Formations in the Williston Basin Province of Montana,

Montana [Oil](#) and [Natural Gas](#) Statistics (EIA)

	2013	2014	2015	2016	2017	2018
Crude Oil Production (Average Thousand Barrels/Day)	80	82	78	63	57	59
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	173	162	160	143	135	127
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day) *	13.4	14.4	18.9	11.5	8.6	N/A
Natural Gas Gross Withdrawals and Production (Oil Wells) (MMcf/Day)	63.4	62.3	68.8	60.4	57.8	N/A
Natural Gas and Gas Producing Oil Wells (Thousands)	8.1	8.0	7.9	7.7	7.6	N/A

MMcf - million cubic feet

*Data provided by the Montana Department of Natural Resources and Conservation.

2017 ranking among 32 U.S. oil and natural gas producing states — [Oil](#): 12 [Natural Gas](#): 20

North Dakota, and South Dakota. A 2002 [USGS](#) assessment estimated a mean of 8.6 Tcf of undiscovered natural gas, 109 million barrels of undiscovered oil, and 240 million barrels of natural gas liquids in the Montana Thrust Belt.

In 2008, the [USGS](#) prepared a similar assessment for the Bighorn Basin that estimated a mean of 989 billion cubic feet (Bcf) of undiscovered natural gas, 72 million barrels of undiscovered oil, and 13 million barrels of undiscovered natural gas liquids—although only a small portion of that assessment area extends into Montana. And in 2017, the [USGS](#) assessed the mean undiscovered, technically recoverable resources in north central Montana at 55 million barrels of oil and 846 Bcf of gas. The [Potential Gas Committee’s 2016 report](#) estimated “most likely” technically recoverable resources of 2.4 Tcf for the Sweetgrass Arch and Central Montana; 12.55 Tcf for the Montana Thrust Belt; as well as 5.6 Tcf for the Powder River Basin; and 3 Tcf for the Williston Basin—each of which extends only partially into Montana.

Montana Key Regulations Associated with Flaring and Venting

The [Montana Department of Environmental Quality](#) (MDEQ) administers the major environmental protection laws, and the [Montana Board of Environmental Review](#) (MBER) has the rulemaking authority under various environmental regulatory statutes. MDEQ staff monitor environmental regulations

at oil and gas operations throughout Montana. The [Montana Board of Oil and Gas Conservation](#) (MBOGC) administers the state’s oil and gas conservation laws, promotes conservation, prevents waste in the recovery of resources, and regulates oil and gas exploration and production. MBOGC staff monitor conservation regulations at oil and gas operations throughout Montana.

Natural gas flaring and venting in Montana is governed primarily by state statute, federal law, and the Administrative Rules of Montana (ARM). These laws include: [ARM 17.8.1603](#), *Emission Control Requirements* (prior to permit/registration); [ARM 17.8.1711](#), *Oil or Gas Well Facilities Emission Control Requirements*; and [ARM 36.22.1220](#), *Associated Gas Flaring Limitation – Application to Exceed – Board Review and Action*. Per ARM 17.8.1603 and/or ARM 17.8.1711, oil or gas well operators must use air pollution control equipment. As part of this requirement, volatile organic compound emissions equal to or greater than 200 British thermal units per standard cubic foot, with a potential to emit greater than 15 tons per year, must be captured and routed to a gas pipeline, a smokeless combustion device, or a continuous burning pilot system. Or they must be routed to air pollution control equipment with equal or greater control efficiency than a smokeless combustion device.

According to ARM 36.22.1220, an operation may be subject to production limitations if it flares or wastes the associated gas. If the average daily gas

production is greater than 100 thousand cubic feet (Mcf), then the well may not produce more than an average of 100 Mcf of gas per day each month (following the required 60-day test). In order to surpass this limit, an operator must submit a justification with detailed analysis and review the statement with the MBOGC at its next regularly scheduled meeting.

Montana State Points of Contact

Montana Department of Natural Resources and Conservation; Board of Oil and Gas Conservation

Contact MBOGC regarding venting and flaring regulations and data.

Website: <http://dnrc.mt.gov/divisions/board-of-oil-and-gas-conservation>

Email: jhalvorson@mt.gov

Phone numbers: 406-656-0040

Montana Department of Environmental Quality; Air, Energy & Mining Division

Contact MDEQ regarding venting and flaring permit and license applications.

Website: <http://deq.mt.gov/DEQAdmin/AEM>

Email: laura.rennick@mt.gov

Phone: 406-444-4323

Visit energy.gov/fe/state-natural-gas-flaring-and-venting-regulations for a digital version of this fact sheet that includes hyperlinks to information sources.