

## Chapter 5 FRONTIER FLARING: SCIENCE & ECONOMICS, POLITICS & REGULATION—THE FUTURE OF FLARING

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### § 5.01 Introduction\*

If pink is the new black in fashion, and 40 is the new 30 in demographics, then flaring is the new fracking<sup>1</sup> in the oil and gas industry. A few short years ago, amateur home video of kitchen sinks with combustible faucets and outraged citizens seemed to be in the news constantly; today's news feeds regularly feature photos from space of the bright lights from flaring in North Dakota. Flaring provides impressive photo opportunities for environmental groups, concerned citizen organizations, and industry regulators alike.

In recent years, the exploration and production industry has made significant improvements to production of oil and gas reserves, resulting in increased production. Perhaps understandably, scrutiny of the industry has kept pace with production. Production in the Bakken Shale formation in North Dakota and Montana is consistently around one million barrels of oil per day. Today, production often outpaces infrastructure and regulation. Historic production levels and technological advancements typically are good problems to have, but solutions proposed by stakeholders from government, industry, and citizen groups often reflect clashing ideologies.

This chapter addresses the primary forces shaping the trajectory of flaring. Government regulators are charged with maximizing production from a minimized footprint. Citizen groups on one end of town have mobilized to demand their share of royalties, while on the opposite end of town other citizens meet to discuss ways to block expansion of operations. Producers scramble to store production, meet new environmental standards and restrictions, and prepare teams in the field for the next series of production challenges. In the context of regulation, revenue, and resource recovery, it can be difficult to keep track of the players and their interests. Producers face angry consumers; regulators face angry producers; and citizen groups alternately press industry and regulators for solutions. Scenarios for

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<sup>1</sup>Fracking is "the injection of fluid into shale beds at high pressure in order to free up petroleum resources (such as oil or natural gas)." "Fracking Definition," *Merriam-Webster.com*, <http://www.merriam-webster.com/dictionary/fracking>.

resolving issues related to flaring are plentiful and widely discussed among stakeholders from industry, regulatory bodies, political actors, and citizen groups. This chapter will address the current state of flaring from each stakeholder group's perspective, and solutions being proposed, in turn.

### [1] What Is Flaring?

Flaring is the controlled burning of natural gas in the course of routine oil and gas production operations. It is more strictly defined as: "The burning of gas in the field as a means of disposal when there is no market for the gas and the operator does not elect (or cannot) use the gas for a nonwasteful purpose."<sup>2</sup> The burning typically occurs at the end of a flare stack or boom. Depending on the design, one or more flares may be necessary at any given production location. In addition to spectacular nighttime images, flaring generates both noise and heat, and emissions released into the environment include water vapor and carbon dioxide (CO<sub>2</sub>), among others.

Flaring is employed for a variety of purposes at various stages of the production process. In hydraulically fractured gas wells, for example, excess gas produced during flowback is typically flared to reduce volatile organic compound (VOC) and greenhouse gas (GHG) emissions.<sup>3</sup> In other cases, the source of the gas may be the production in excess of the amount demanded by commercial customers. It also may be unburned gas from processing facilities, or vapor from the tops of tanks as they are being filled. In some cases, it may result from equipment changes or maintenance, problems in processing, or a complete shutdown that requires temporary flaring to release high pressure that can otherwise have catastrophic results.

Often, flaring has little to do with protection against over-pressuring, but is a result of the natural state of oil and gas prior to production. Oil deposits usually are surrounded by significant amounts of natural gas. When companies extract the oil, options for disposing of natural gas may be limited as a result of many conditions, including inadequate infrastructure, low storage capacity, or economic factors. For instance, in the Bakken, the oil contains significant amounts of natural gas, and because of the geological manner in which the gas is commingled with oil in deposits, operators

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<sup>2</sup>Patrick H. Martin & Bruce M. Kramer, *Williams & Meyers, Manual of Oil and Gas Terms* 385 (15th ed. 2013) (*Manual of Oil and Gas Terms*).

<sup>3</sup>See U.S. Forest Serv., "Emission Reduction Techniques for Oil and Gas Activities," at 22 (2011). In August 2012, the EPA passed new source performance standards (NSPS) that require gas well operators to reduce VOC emissions from drilling and hydraulic fracturing. See 77 Fed. Reg. 49,490 (Aug. 16, 2012). Under these new rules, beginning January 1, 2015, owners and/or operators of fractured or refractured gas wells will be required to use reduced emissions completions (REC), also known as "green completions," in addition to flaring during flowback. See 40 C.F.R. § 60.5375.

cannot produce the oil without releasing the gas simultaneously. Ideally, associated gas would be sold to a customer as a fuel or petrochemical feedstock. Unlike oil, however, gas is not easily transportable, and customers must be in reasonable proximity to the product in order to justify the expense of additional transportation and processing. In new areas of exploration, pipelines and related infrastructure typically are not constructed until after an oil well is completed and a determination is made about the well's productive capability. Even in cases where pipelines already are in place, pipeline capacity may not be available to accommodate additional gas. This chapter will focus primarily on the routine flaring of gas from wells principally producing oil. This type of gas is generally referred to as "casinghead gas." Although the definition of casinghead gas and how to treat it for royalty purposes has been the subject of debate and at times, litigation,<sup>4</sup> for purposes of discussion this chapter relies on the definition used by the U.S. Bureau of Land Management (BLM) in a public outreach presentation dated March 19, 2014: "The natural gas that is produced from an oil well and is either sold, re-injected, used for production purposes, vented (rarely), or flared, depending on whether the well is connected to a gathering line."<sup>5</sup>

## [2] Why Are We Talking About It?

### [a] Public Perception

In recent years, there has been significant, high-profile media attention directed at flaring practices in oil and gas production, particularly in the Bakken Shale formation.<sup>6</sup> These reports often recite astounding figures of lost revenue, ever-growing GHG emissions, and the fact that the flaring activity in the Bakken is visible from space. Some reports estimate that gas worth as much as \$1 million is "wasted" every day in the Bakken.<sup>7</sup> The case being made against flaring has an emotional appeal: flaring is highly visible and appears wasteful on its face. In the same way that citizens concerned about oil and gas development grabbed hold of the fracking debate, they

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<sup>4</sup>See Bruce M. Kramer, "Interpreting the Royalty Obligation by Looking at the Express Language: What a Novel Idea?" 35 *Tex. Tech. L. Rev.* 223, 226–40 (2004).

<sup>5</sup>PowerPoint Presentation, Tim Spisak, BLM, "Venting & Flaring Public Outreach," at 14 (Mar. 19, 2014).

<sup>6</sup>See, e.g., Clifford Krauss, "In North Dakota, Flames of Wasted Natural Gas Light the Prairie," *N.Y. Times* (Sept. 26, 2011); Jeff Brady, "Much of North Dakota's Natural Gas Is Going Up in Flames," *Nat'l Pub. Radio* (Jan. 30, 2014).

<sup>7</sup>See Brady, *supra* note 6. Some estimates are much higher. See, e.g., Ryan Salmon & Andrew Logan, Ceres, "Flaring Up: North Dakota Natural Gas Flaring More Than Doubles in Two Years," at 7 (July 2013) (stating that the revenue lost from flaring gas in May 2013 was about \$3.6 million per day).

now appear to be focusing on flaring as a new way to scrutinize the oil and gas industry. While the magnitude and deleterious effects of flaring in the Bakken and elsewhere are the subject of debate, the potential to influence public perception is apparent. Regardless of whether the reports in the popular media accurately characterize reality in the oil patch, they have raised public awareness of the issues surrounding flaring in oil and gas production. Public perception, in turn, often drives policy.

### **[b] Resource Conservation and Revenue Loss**

Waste of valuable production and the corollary of unrealized economic profits are commonly invoked in the discussion of flaring. From the perspective of mineral owners, flared gas is wasted to the extent it is not subject to royalty payments. Private mineral and royalty owners complain that the value of the mineral estate is diminished without compensation because royalties often are not paid on flared production. Federal and state land management agencies also would like to realize royalty revenue lost when flared gas is not subject to royalty payments. In some cases, the flared gas is not subject to taxation, which taxpayers and state treasuries may perceive as an improper subsidy of the oil and gas industry. From the industry perspective, the decision to flare is not the wanton waste of resources. Rather, it is a business decision based on a cost-benefit analysis that weighs the loss of income from failing to develop the entire quantum or resource, against the expense associated with building infrastructure adequate to collect and use the production otherwise not captured.

### **[c] Environmental Concerns**

In addition to the financial issues discussed above, environmental concerns associated with flaring have garnered considerable attention. When natural gas is produced in association with oil, methane and other pollutants are generated; absent methods for capturing or otherwise preventing their release, those pollutants enter the atmosphere in the form of various emissions.

When vented, natural gas (largely methane) is released directly to the air without being burned. In contrast, when natural gas is flared (burned), the main by-product is carbon dioxide. Flaring is preferred to venting for safety reasons, but also because methane is several times more potent than carbon dioxide as a greenhouse gas (although more short-lived in the atmosphere). Flaring also reduces emissions of ozone-forming pollutants [such as VOCs], compared to venting.<sup>8</sup>

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<sup>8</sup>Michael Ratner & Mary Tiemann, Cong. Research Serv., “An Overview of Unconventional Oil and Natural Gas: Resources and Federal Actions,” at 9 n.22 (CRS Report R43148 Jan. 23, 2014).

However, the total GHG emissions from flaring remain substantial. In 2012, gas flaring in North Dakota produced about 4.5 million metric tons of CO<sub>2</sub>, roughly the equivalent to the annual emissions of a million cars on the road.<sup>9</sup> Additionally, flaring is never 100% efficient, leading to some emissions of VOCs that contribute to smog and are known to be carcinogenic. These concerns and others have prompted many environmental groups and regulators to call for action to reduce the amount of gas flared.

## § 5.02 Economics of Flaring

### [1] Infrastructure

Some argue that the primary cause of flaring is a lack of gas gathering, processing, and transporting infrastructure. “Natural gas occurs in geological formations in different ways: as a gas phase associated with crude oil, dissolved in the crude oil, or as a gas phase not associated with any significant crude oil.”<sup>10</sup> In 2009, an estimated 22% of natural gas came from oil wells.<sup>11</sup> Once an oil well is completed, the various fluids coming out of the well must be separated.<sup>12</sup> When oil and gas do not separate naturally during production, processing is required.<sup>13</sup> Separating the gas and transporting and processing it require infrastructure.<sup>14</sup> Although direct investment in infrastructure has doubled since 2010, drilling and production have outpaced downstream support.<sup>15</sup> Nowhere is this argument more compelling than in the Bakken. According to a recent Associated Press report, “North Dakota drillers currently burn off, or flare, a record 36 percent of the gas because development of pipelines and processing facilities to capture it hasn’t kept pace with oil drilling.”<sup>16</sup>

Oil is the primary economic driver of development in many areas, making investment in gas gathering and distribution a lower priority. So long as there is potential for high-value production from resources that are

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<sup>9</sup>Salmon & Logan, *supra* note 7, at 6.

<sup>10</sup>Staff Report, Fed. Energy Regulatory Comm’n, *Energy Primer: A Handbook of Energy Market Basics* 5 (July 2012).

<sup>11</sup>*Id.* at 16.

<sup>12</sup>“Oil Wells in the Eagle Ford Shale: Description of the Extraction Process,” *Inside Climate News* (Feb. 16, 2014).

<sup>13</sup>See Staff Report, *supra* note 10, at 21.

<sup>14</sup>See IHS Global Inc., Report for the Am. Petroleum Inst., “Oil & Natural Gas Transportation & Storage Infrastructure: Status, Trends, & Economic Benefits,” at 11 (Dec. 2013).

<sup>15</sup>*Id.* at 16–17.

<sup>16</sup>James MacPherson, “Oil Companies Fight ND Plan to Slow Production,” *Associated Press* (Apr. 22, 2014).

easier to access and less expensive to develop, there would seem to be little incentive for operators to invest in gas-related infrastructure. This does not appear to be the case, however, as there is a recent trend toward significant investment in gathering and transportation infrastructure. For example, in 2012, over 2,400 miles of pipelines were built, most of which are used for gas gathering and transmission.<sup>17</sup> Thus, for reasons other than obvious business-oriented incentives, it seems industry players have declared their intention to invest large amounts of money to help the gas infrastructure catch up to the needs created by the rapid expansion of oil development. The North Dakota Petroleum Council (NDPC), an industry group representing hundreds of companies, has reported that companies are planning over \$1.7 billion in new infrastructure projects in North Dakota, including over 1,000 miles of gas gathering pipelines.<sup>18</sup>

Simply being hooked up to a gas gathering pipeline, however, often does not solve the problem. Roughly 29% of gas produced in the Bakken was flared in August 2013.<sup>19</sup> In that month, 16% of North Dakota's gas was flared from wells that were connected to a natural gas sales facility.<sup>20</sup> The North Dakota Pipeline Authority has identified three primary reasons for this: (1) inadequate line pressure caused by low pressure older wells, which do not have enough pressure to overcome the line pressure that exists when newer, high producing wells come online; (2) inadequate pipeline volume; and (3) frequent "pigging" of existing pipelines that is caused by precipitation of the natural gas liquids in the lines, reducing volume.<sup>21</sup> In order to improve gas capture, these issues with existing pipelines must be addressed along with the push to build new lines.

Gas processing capacity presents another area where infrastructure is underdeveloped to accommodate current production. Currently, there are 20 gas processing facilities operating in North Dakota, with a combined total capacity of 1,000 million cubic feet per day (Mmcf).<sup>22</sup> Six new or

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<sup>17</sup>N.D. Pipeline Auth. (NDPA), "North Dakota Natural Gas: A Detailed Look at Natural Gas Gathering," at 6 (Oct. 21, 2013).

<sup>18</sup>See Presentation from NDPC Flaring Task Force, to N.D. Indus. Comm'n (Jan. 29, 2014), [http://www.ndoil.org/image/cache/NDPC\\_Flaring\\_Task\\_Force\\_NDIC\\_1-29-14\\_fnlv1.pdf](http://www.ndoil.org/image/cache/NDPC_Flaring_Task_Force_NDIC_1-29-14_fnlv1.pdf).

<sup>19</sup>NDPA, *supra* note 17, at fig. 4.

<sup>20</sup>*Id.* at 9.

<sup>21</sup>*Id.* at 9–10.

<sup>22</sup>*Id.* at 12.

expanded plants that are in the planning process and set to come on line in the next few years will add additional capacity of about 450 Mmcf.<sup>23</sup>

## [2] Alternatives to Flaring

The planned improvement of existing infrastructure and the build-out of new gathering lines and processing facilities will help reduce the amount of stranded gas that needs to be flared, especially as the number of new oil wells begins to taper off. However, there will always be wells that are too remote or do not produce enough gas to justify the expense of connecting them to gathering pipelines. For this reason other alternatives to flaring are needed. Some alternatives to flaring gas from isolated wells include on-site electrical generation, local trucking to consumers, reinjection of gas underground to maintain reservoir pressure, or small-scale, portable compressed natural gas production.<sup>24</sup> Technological development is needed to make such alternative uses economically feasible, and their implementation depends on the specifics of the well location, but such advancements are necessary to reduce the amount of gas flared.

## [3] Lost Revenue

State and federal agencies may have an interest in capturing revenue from either lost royalties or taxes when gas is flared in the oil field. Imposing taxes or collecting royalties from flared gas can provide additional incentives for producers to find ways to use or sell gas instead of flaring it. Additionally, private mineral owners are interested in receiving royalty payments when gas from their mineral estates is flared. Some aspects of taxation, royalty revenue protection, and fee mineral ownership in the context of gas flaring are discussed below.

### [a] Tax Revenue

In areas where oil is the primary economic driver for development, states may be less inclined to curb flaring in an attempt to increase the tax revenue base. In the short term, states are likely to favor development of high-value oil production. On the other hand, state treasuries may cringe as they watch a valuable, potentially taxable resource literally go up in flames. State governments must carefully balance facilitating development and maintaining revenue generation.

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<sup>23</sup>*Id.*

<sup>24</sup>See Clifford Krauss, "Applying Creativity to a Byproduct of Oil Drilling," *N.Y. Times* (Dec. 17, 2013).

States have taken differing approaches to taxation of flared gas. Some states provide exemptions from severance taxes for flared gas, including Kansas,<sup>25</sup> Louisiana,<sup>26</sup> Texas,<sup>27</sup> and Wyoming.<sup>28</sup>

Other states (notably, North Dakota), have taxation schemes in place for flared gas, but allow for exceptions. North Dakota permits gas to be flared from an oil well for one year after first production before subjecting the gas to tax.<sup>29</sup> However, if the operator can make a showing of economic infeasibility, the North Dakota Industrial Commission (NDIC) may exempt from taxation gas flared after the expiration of the one-year period.<sup>30</sup> In North Dakota, the exemption seems to be the default, as nearly all applications for exemption are granted,<sup>31</sup> drawing criticism from individuals and groups claiming that the state regulators are not enforcing the laws in a manner consistent with policy objectives.<sup>32</sup>

North Dakota has also shown a willingness to use tax incentives to reduce the amount of flaring in the state. For example, in 2013 the North Dakota legislature passed a bill creating tax incentives to encourage the use of natural gas that would otherwise be flared.<sup>33</sup> This law, which went into effect July 1, 2013, provides for a temporary exemption from gross production taxes for oil and gas wells that employ certain collection systems to avoid flaring. The exemption extends for a period of two years and 30 days from the time of first production.

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<sup>25</sup>See Kan. Stat. Ann. § 79-4217(b) (“The following shall be exempt from the tax imposed under this section: . . . The severance and production of gas which is . . . lawfully vented or flared . . .”).

<sup>26</sup>See La. Rev. Stat. Ann. § 47:633(9)(e) (“[t]he tax shall not accrue on the severance of gas . . . [w]hen produced from oil wells and vented or flared directly into the atmosphere, provided such gas is not otherwise sold”).

<sup>27</sup>See Tex. Tax Code Ann. § 201.053 (“[t]he [severance] tax imposed by this chapter does not apply to gas . . . produced from oil wells with oil and lawfully vented or flared”).

<sup>28</sup>See Wyo. Stat. Ann. § 39-14-205(j) (“[n]atural gas which is vented or flared under the authority of the [WOGCC] . . . is exempt from taxation”).

<sup>29</sup>See N.D. Cent. Code Ann. § 38-08-06.4.

<sup>30</sup>*Id.* § 38-08-06.4(6).

<sup>31</sup>See Salmon & Logan, *supra* note 7, at 6.

<sup>32</sup>*Id.* See also Krauss, *supra* note 6.

<sup>33</sup>See N.D. Cent. Code Ann. § 57-51-02.6. See also Memorandum from N.D. Office of State Tax Comm’r, to Oil & Gas Producers and Purchasers, “2013 Legislative Changes to Gross Production Tax and Oil Extraction Tax” (Aug. 2013).

### [b] State Royalty Revenue

The royalty obligations incurred by producers who flare gas on federal leases are governed by federal law. State requirements for royalty payment for flared gas on state mineral holdings vary. Not surprisingly, the states have adopted differing approaches to assessing royalties on flared gas, and state policies fall somewhere on the continuum between charging royalties for all gas flared on state leases (e.g., Texas) and charging no royalties for gas legally flared (e.g., Utah). Wyoming has recently adopted a flexible approach that falls somewhere in the middle. Under this new framework, the Wyoming Board of Land Commissioners (Board), as trustee for the beneficiaries of Wyoming State Lands production royalties, established new policies and procedures governing flaring (and venting) from state oil and gas lease lands.

Effective March 1, 2014, once the Wyoming Oil and Gas Conservation Commission (WOGCC) approves an application for flaring, “the [state oil and gas supervisor] will forward a copy of the approval to the [Wyoming Office of State Lands and Investments (OSLI)] for review regarding royalty-free disposition of the State’s interest in the vented or flared gas.”<sup>34</sup> The OSLI or the Board may set the matter for a hearing to determine whether it is “appropriate to assess royalty on the vented or flared gas.”<sup>35</sup> Under Wyoming law, “the WOGCC cannot authorize venting or flaring that constitutes waste (as defined in Wyo. Stat. Ann. § 30-5-101(a)(i)).”<sup>36</sup> According to OSLI,

The Board recognizes that although the WOGCC and the Board use the same statutory definition of waste, the determination made by each is intended for different purposes and is mutually exclusive in its application. The WOGCC venting or flaring determination does not preclude the Board’s determination of waste in terms of an Owner/Operator’s State of Wyoming Oil and Gas Lease.<sup>37</sup>

The Board will grant deference to WOGCC’s determination that waste is not occurring; however, it “retains the authority to determine whether royalty should be assessed, and if it should, the appropriate royalty rate on gas being vented or flared.”<sup>38</sup> In assessing royalties, the Board will take into consideration mitigating factors, including among others, the following: “volume and duration of venting or flaring, reasons for venting or flaring, current marketability of gas, efforts being made to bring gas to market,

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<sup>34</sup>OSLI, “Natural Gas Flaring Policy” (Mar. 1, 2014).

<sup>35</sup>*Id.*

<sup>36</sup>*Id.*

<sup>37</sup>*Id.*

<sup>38</sup>*Id.*

development of infrastructure, and value of associated oil production.”<sup>39</sup> Finally,

[i]f the Board determines that assessing royalty on gas being vented or flared is warranted to protect the interest of State beneficiaries, a downward royalty rate adjustment may be made in consideration of the mitigating factors brought before the Board during the hearing. The adjusted rate will be capped at the royalty rate of the underlying lease.<sup>40</sup>

### [c] Royalty Owner Litigation

A number of class action lawsuits have been filed against producers in North Dakota seeking damages for flared gas. The plaintiffs in these cases and the class members they are seeking to represent are mineral owners claiming that gas has been flared from their mineral estates in violation of state law. These cases currently are being litigated and it is not the intent of the authors to comment on the merits of the cases or the likelihood of the plaintiffs’ success. This litigation is mentioned here only to highlight mineral owners as stakeholders in the discussion on gas flaring.

### [d] Industry Initiatives

Although often portrayed as the villains in the flaring drama, the oil and gas industry is taking an active role in the effort to reduce flaring, especially in areas like the Bakken, where oil development is occurring at a rapid rate and a high percentage of gas is being flared. Recently, an industry task force representing 500 companies developed a comprehensive plan to increase natural gas capture in the Bakken from 70% to 85% within two years, and to 90% in six years.<sup>41</sup> The group also concluded that as much as 95% of gas could be captured with the full engagement of state agencies, Indian tribes, and landowners. These improvements in gas capture are to be accomplished through self-prescribed practices to be implemented by the industry, primarily increased construction of gathering pipelines and processing plants along with implementation of operational recommendations.

## § 5.03 Flaring Regulation

### [1] Federal Regulation

Although regulating oil and gas production is primarily the responsibility of the states, the federal government regulates many activities on federal lands that affect oil and gas development. The federal government, as a

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<sup>39</sup>*Id.*

<sup>40</sup>*Id.*

<sup>41</sup>Press Release, N.D. Petroleum Council, “Industry to increase natural gas capture to 85 percent within two years and 90 percent in six years” (Jan. 29, 2014).

major force affecting the industry, plays an important role in the conversation about flaring.

### [a] Protecting Federal Revenue

The U.S. Department of the Interior administers minerals on over 700 million acres of federal lands and 1.8 billion acres below offshore waters.<sup>42</sup> Over 15% of the United States' oil and gas is produced from lands managed by the federal government.<sup>43</sup> Revenue from production on federal lands accounts for one of the largest nontax sources of federal revenue.<sup>44</sup> Under the Mineral Leasing Act of 1920,<sup>45</sup> BLM is charged with protecting federal mineral interests from waste. Like producers on state and fee lands, oil producers on federal lands will flare associated gas when there is no economical way to put the gas to beneficial use or get the gas to market.<sup>46</sup> Given the amount of gas produced on federal lands, BLM is understandably interested in avoiding unnecessary losses of revenue due to gas flared that would otherwise be subject to royalty payments.<sup>47</sup>

The amount of revenue lost by the federal government due to routine flaring of associated gas on federal leases is not known. A 2010 U.S. Government Accountability Office (GAO) report estimated that reducing vented or flared gas on onshore federal leases by 40% could increase federal royalty payments by about \$23 million annually.<sup>48</sup> While this figure has been used in the debate over oil field flaring, the study was actually much broader and included EPA estimates of flared and vented gas from a number of sources including gas well completions, pneumatic devices, condensate storage tanks, and dehydrators. Regardless of the actual amount of lost revenue due to flaring from oil wells, there is a perception that BLM could be doing more to fulfill its charge to minimize waste of natural resources.

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<sup>42</sup>U.S. Gov't Accountability Office (GAO), "Mineral Resources: Mineral Volume, Value, and Revenue" (GAO-13-45R Nov. 15, 2012).

<sup>43</sup>Marc Humphries, Cong. Research Serv., "U.S. Crude Oil and Natural Gas Production in Federal and Non-Federal Areas," at tbl. 2 (CRS Report R42432 Apr. 10, 2014).

<sup>44</sup>See GAO, *supra* note 42, at 6.

<sup>45</sup>30 U.S.C. §§ 181–263.

<sup>46</sup>See Rife Oil Props., Inc., 131 IBLA 357, GFS(O&G) 4(1995) ("regulations provide that the operator shall put into marketable condition 'if economically feasible' all oil, gas, and other hydrocarbon substances produced from the lease" (quoting 43 C.F.R. § 3162.7-1(a))).

<sup>47</sup>See Erika Z. Enger, "Current Issues in Oil & Gas Exploration and Production on Public Lands," *Public Land Law, Regulation, and Management* 6-1, 6-5 (Rocky Mt. Min. L. Fdn. 2014).

<sup>48</sup>GAO, "Federal Oil and Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases," at 24–25 (GAO-11-34 Oct. 29, 2010).

Under the current regulations, lessees or operators on federal leases are allowed to vent or flare gas without paying royalties in temporary emergency situations; during well purging and evaluation tests (for up to 24 hours); and during initial well production tests (not exceeding 30 days or the production of 50 Mmcf, whichever occurs first).<sup>49</sup> Additionally, no royalty obligation accrues for gas that is vented or flared from an oil well with prior BLM approval.<sup>50</sup> In order to obtain such approval, the producer or lessee must submit an application showing that the flaring or venting is justified. Such application must be supported by either:

- (1) an evaluation report supported by engineering, geologic, and economic data which demonstrates . . . that the expenditures necessary to market or beneficially use such gas are not economically justified and that conservation of the gas, if required, would lead to the premature abandonment of recoverable oil reserves and ultimately to a greater loss of equivalent energy than would be recovered if the venting or flaring were permitted to continue or (2) an action plan that will eliminate venting or flaring of the gas within 1 year from the date of application.<sup>51</sup>

BLM currently is in the process of developing a new Onshore Oil and Gas Order to set standards to reduce the waste of flared gas and to designate appropriate beneficial uses.<sup>52</sup> The rulemaking is expected to focus on methods and means to limit waste from the venting and flaring of gas on federal and Indian lands. While it is too early to predict what the new rule, if any is promulgated, would look like, BLM has clearly indicated that reduction of flaring and venting is a priority.

### [b] Reducing Regulatory Hurdles

Another federal approach to reducing flaring that is being considered is to reduce the regulatory obstacles that impede development of gas gathering and transmission infrastructure. This approach is being explored in both the legislative and regulatory contexts. The Natural Gas Gathering Enhancement Act (NGGEA) has been introduced in the U.S. Senate,<sup>53</sup> and a companion bill has been introduced in the House.<sup>54</sup> Among other things,

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<sup>49</sup>See NTL-4A, “Royalty or Compensation for Oil and Gas Lost,” at § III.C (Jan. 1, 1980).

<sup>50</sup>*Id.* § I.

<sup>51</sup>*Id.* § IV.B.

<sup>52</sup>See Bicameral Task Force on Climate Change, U.S. Cong., “Implementing the President’s Climate Action Plan: U.S. Department of the Interior,” at 9 (Dec. 19, 2013). See also Unified Agenda 1004-AE14, “Onshore Oil and Gas Order 9: Waste Prevention and Use of Produced Oil and Gas for Beneficial Purposes,” <http://federalregister.gov/r/1004-AE14>.

<sup>53</sup>NGGEA, S. 2112, 113th Cong. (2014).

<sup>54</sup>NGGEA, H.R. 4293, 113th Cong. (2014).

NGGEA would amend the Energy Policy Act of 2005<sup>55</sup> by adding a new section to categorically exclude from the National Environmental Policy Act of 1969<sup>56</sup> rights-of-way issued for gas gathering lines on certain federal lands.<sup>57</sup> NGGEA would also expedite the process of obtaining rights-of-way for such pipelines.<sup>58</sup> According to a sponsor of the Senate bill, “[the] bill will reduce unnecessary flaring and help energy companies safely capture and sell more natural gas. It’s a win for state and federal budgets and our environment.”<sup>59</sup> According to another sponsor, the bill would help North Dakota achieve its goal of reducing flaring by over 60% in the next six years.<sup>60</sup>

On the executive side, the President’s Climate Action Plan discusses the need to improve federal permitting for infrastructure, which would reduce venting and flaring of natural gas.<sup>61</sup> As part of this initiative, the interagency Bakken Federal Executive Group, representing a dozen federal agencies, has been given the task of finding ways to address some of the obstacles facing infrastructure development in the Bakken.<sup>62</sup>

## [2] State Regulation

As with taxation of flared gas, states have adopted differing approaches to regulating flaring within their respective jurisdictions. Included here are summaries of some states’ regulations with regard to flaring. These states, while focused on the Rocky Mountain region and adjacent areas, represent a sampling of policy and regulatory approaches ranging from more permissive to more restrictive. The regulation of flaring is currently being reevaluated in a number of jurisdictions and the summaries below include some discussion about proposed, as well as current regulatory frameworks.

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<sup>55</sup>Pub. L. No. 109-58, 119 Stat. 594.

<sup>56</sup>42 U.S.C. §§ 4321–4347.

<sup>57</sup>See NGGEA § 4.

<sup>58</sup>See NGGEA §§ 5–6.

<sup>59</sup>News Release, Press Office for U.S. Senator John Barrasso, “Senators Introduce Bill to Reduce Natural Gas Flaring” (Mar. 12, 2014).

<sup>60</sup>*Id.*

<sup>61</sup>See Exec. Office of the President, “The President’s Climate Action Plan” (June 2013). See also Exec. Order No. 13604, 77 Fed. Reg. 18,887 (Mar. 22, 2012).

<sup>62</sup>See Press Release, DOI, “Interagency Team on Bakken Continues Progress to Advance Oil and Gas Permitting and Production” (June 6, 2013).

**[a] Colorado**

Colorado has taken one of the more restrictive approaches to flaring. Under regulations promulgated by the Colorado Oil and Gas Conservation Commission (COGCC), unnecessary or excessive flaring of gas is prohibited.<sup>63</sup> Under this rule, gas may only be flared after notice has been given and approval obtained from the COGCC Director, except during an upset condition, well maintenance, well stimulation flowback, purging operation, or productivity test.<sup>64</sup> Additionally, notice to local emergency dispatch or the local governmental designee is required prior to, or in no event more than two hours after the flaring occurs.<sup>65</sup>

**[b] North Dakota**

North Dakota currently allows gas produced with crude oil from an oil well to be flared for one year from the date of first production.<sup>66</sup> After this one-year period, the flaring must cease and the well must be either: (1) capped; (2) connected to a gas gathering pipeline; (3) equipped with an electrical generator that uses at least 75% of the gas from the well; (4) equipped with a system to compress the gas to liquid for various beneficial uses; or (5) equipped with other approved value-added processes that reduce the volume or intensity of the flare by more than 60%.<sup>67</sup>

For wells operated in violation of the statute, the producer is required to pay royalties to the mineral owner and gross production tax on the flared gas to the state.<sup>68</sup> However, producers may obtain an exemption from these restrictions by showing to the satisfaction of the NDIC that connecting the well to a natural gas gathering pipeline or equipping the well with other equipment as required by the statute is economically infeasible.<sup>69</sup> For purposes of the statute, connecting a well to a gathering pipeline is economically infeasible if the costs of connecting the well to the line and operating the connecting facilities during the life of the well “are greater than the amount of money the operator is likely to receive for the gas, less production taxes and royalties . . . .”<sup>70</sup>

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<sup>63</sup>2 Colo. Code Regs. § 404-1:912(a).

<sup>64</sup>*Id.* § 404-1:912(b).

<sup>65</sup>*Id.* § 404-1:912(e).

<sup>66</sup>N.D. Cent. Code Ann. § 38-08-06.4(1).

<sup>67</sup>*Id.* § 38-08-06.4(2).

<sup>68</sup>*Id.* § 38-08-06.4(4).

<sup>69</sup>*Id.* § 38-08-06.4(6).

<sup>70</sup>N.D. Admin. Code § 43-02-03-60.2.

**[c] Texas**

The Texas Natural Resources Code defines waste to include, inter alia, operation of any oil well with inefficient gas to oil ratio; allowing any natural gas well to burn wastefully; and allowing escape of gas into the open air.<sup>71</sup> The Texas Railroad Commission (RRC), through authority granted by the Texas legislature, administers and enforces rules promulgated to regulate the oil and gas industry.<sup>72</sup> The RRC allows operators to flare gas for up to 10 days before a well is completed.<sup>73</sup> The RRC also “may administratively grant or renew an exception to . . . allow additional releases of gas if the operator of a well or production facility presents information to show the necessity for the release.”<sup>74</sup>

The following circumstances may meet the requirement for establishing necessity under the regulations: workover operations (including perforating, stimulating, well maintenance, and repair); unloading excess formation fluid buildup; release of low-pressure gas that would not otherwise be used or sold due to mechanical, physical, or economic impracticability; lack of a pipeline or market; or avoiding reduced ultimate recovery.<sup>75</sup>

Finally, the RRC may administratively grant an exception permit to flare gas for a period of 180 days.<sup>76</sup> In such instances, the request for exception must be accompanied by the requisite fee imposed elsewhere in the regulations;<sup>77</sup> the period of exception may not exceed 180 days;<sup>78</sup> the exception cannot be applied to volumes of gas less than or equal to 50 thousand cubic feet (mcf) of hydrocarbon gas per day;<sup>79</sup> requests for exceptions in excess of 180 days or for volumes of gas in excess of 50 mcf per day will be granted only pursuant to a final order from the RRC;<sup>80</sup> facsimile requests may be submitted only to cover cases of an operating

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<sup>71</sup>Tex. Nat. Res. Code Ann. § 85.046(a)(1), (4), (9).

<sup>72</sup>The Texas Supreme Court has consistently upheld RRC’s authority to prevent waste by regulating flaring. See *Railroad Comm’n v. Shell Oil Co.*, 206 S.W.2d 235, 241 (Tex. 1947); *Railroad Comm’n v. Sterling Oil & Refining Co.*, 218 S.W.2d 415, 418 (Tex. 1949).

<sup>73</sup>16 Tex. Admin. Code § 3.32(f)(1)(A).

<sup>74</sup>*Id.* § 3.32(f)(2).

<sup>75</sup>*Id.* § 3.32(f)(2)(A)–(E).

<sup>76</sup>*Id.* § 3.32(h).

<sup>77</sup>*Id.* § 3.32(h)(1) (citing *id.* § 3.78(b)(5)).

<sup>78</sup>*Id.* § 3.32(h)(2).

<sup>79</sup>*Id.* § 3.32(h)(3).

<sup>80</sup>*Id.* § 3.32(h)(4).

emergency or other unplanned condition, provided the original signed request is submitted along with the required fee within three working days of the initial facsimile request;<sup>81</sup> and exceptions are granted to the operator, and are not transferable upon change of operator.<sup>82</sup>

### [d] Utah

Utah's Oil and Gas Conservation Act<sup>83</sup> governs oil and gas development in the state. According to legislative authority granted to it by the Act, the Board of Oil, Gas and Mining (Board) acts as the adjudicative and rulemaking body and delegates oversight responsibility for operations related to the production of oil and gas, including flaring, to the Division of Oil, Gas and Mining (Division).<sup>84</sup> Pursuant to rules and regulations so promulgated and enforced, operators in Utah may flare produced gas without approval, under certain circumstances.<sup>85</sup> No approval is required to flare up to 1,800 mcf of oil well gas from an individual well, on a monthly basis.<sup>86</sup> While conducting certain testing as required elsewhere in the regulations, an operator also may flare all produced oil well gas necessary to conduct the test,<sup>87</sup> so long as no gas is flared that is not necessary to conduct the test, and flaring does not continue beyond the time allowed for testing.<sup>88</sup> Subsequent to the first calendar month immediately following the time allowed for the initial test described above, an operator may flare up to 3,000 mcf of oil well gas without approval.<sup>89</sup>

Unavoidable or short-term flaring may occur, without approval, for wells prior to testing and completion,<sup>90</sup> but such flaring is permitted only under the same conditions as those imposed once a well is completed and gas is being transported or marketed.<sup>91</sup> These conditions include flaring from a well during line failures, equipment malfunctions, and other emergencies

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<sup>81</sup>*Id.* § 3.32(h)(5).

<sup>82</sup>*Id.* § 3.32(h)(6)–(7). New operators may apply for new exceptions during a 90-day review period. *Id.* § 3.32(h)(7).

<sup>83</sup>Utah Code Ann. §§ 40-6-1 to -19.

<sup>84</sup>*See id.* *See also* Utah Admin. Code r. 649-3-20.

<sup>85</sup>Utah Admin. Code r. 649-3-20(1).

<sup>86</sup>*Id.* r. 649-3-20(1.1).

<sup>87</sup>*Id.* r. 649-3-20(1.2)–(1.2.1).

<sup>88</sup>*Id.*

<sup>89</sup>*Id.* r. 649-3-20(1.3).

<sup>90</sup>*Id.* r. 649-3-20(1.4).

<sup>91</sup>*Id.* r. 649-3-20(4).

when shutting in or restricting production would cause waste or adversely impact the well or reservoir.<sup>92</sup> If flaring occurs in such cases, the operator must immediately notify the Division in the manner provided elsewhere in the regulations,<sup>93</sup> and the Division will determine whether the flaring is justified, and specify conditions of approval, if necessary.<sup>94</sup> Gas also may be flared after a well is completed, during well purging or evaluation tests that do not exceed a period of 24 hours or a maximum of 144 hours per month; subsequent written notice must be provided to the Division in all such cases.<sup>95</sup>

Should an operator require flaring an amount of produced gas greater than permitted by the foregoing rules, the operator must submit a request for agency action (Request) to the Board for consideration as a formal matter on the Board docket.<sup>96</sup> The Request made under these regulations should include the following: a statement of reasons justifying the flaring; a description of production test results; chemical analysis of the produced gas; estimated oil and gas reserves; description of the reinjection potential or alternative for disposing of produced gas; a description of the amount of gas used in lease operations; economic evaluation that supports the operator's conclusion that conservation is not economically feasible, including engineering and/or geological data pertaining to all well production, not only limited to gas production; and any information otherwise relevant to determining whether marketing or conserving the produced gas is economically practical.<sup>97</sup>

Upon review of a Request to approve flaring, the Board may grant the request, restrict production until the gas may be beneficially used, or take such other action the Board deems appropriate.<sup>98</sup> The Board may exercise discretion in implementing additional enforcement measures in circumstances of flaring not otherwise addressed by the regulations.<sup>99</sup>

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<sup>92</sup>*Id.* r. 649-3-20(4.2).

<sup>93</sup>*Id.* r. 649-3-20(4.3).

<sup>94</sup>*Id.* r. 649-3-20(4.4).

<sup>95</sup>*Id.* r. 649-3-20(4.5)–(4.6).

<sup>96</sup>*Id.* r. 649-3-20(5).

<sup>97</sup>*Id.* r. 649-3-20(5.1)–(5.8).

<sup>98</sup>*Id.* r. 649-3-20(6)–(6.3).

<sup>99</sup>*Id.* r. 649-3-20(6.3)–(7).

### [e] Wyoming

Wyoming state law governing oil and gas operations and development regulates flaring by defining it as “waste,” except when “necessary for the drilling, completing or testing of the well.”<sup>100</sup> Under Wyoming law, burning or escape of natural gas is deemed waste,<sup>101</sup> and it is prohibited.<sup>102</sup> The WOGCC rules, however, limit the application of statutory requirements by acknowledging that not all flaring constitutes waste.<sup>103</sup> Emergencies, such as equipment failures, abnormal pressures and other circumstances that create “unavoidable short-term” flaring, do not constitute waste.<sup>104</sup>

Similarly, well purging and evaluation tests “[d]uring the unloading or cleaning up of a well during routine purging or drill stem, producing, or evaluation tests” and production tests “[d]uring initial or recompletion evaluation tests not exceeding a period of fifteen (15) days” do not constitute waste.<sup>105</sup> If flaring occurs, or is anticipated to occur under circumstances not addressed by the foregoing, an operator may apply for retroactive or prospective authorization to flare.<sup>106</sup> So long as the application for authority to flare sufficiently establishes that the flaring does not constitute waste, authorization may be granted upon review of the application.<sup>107</sup> The application must contain, at a minimum, the following: statement of reasons for flaring; estimated duration of flaring; estimated daily volume of flared gas; compositional analysis for gas containing hydrogen sulfide or a low Btu content; legal description of the well, plant, or facility and the distance to the nearest point of sale or pipeline; and an explanation of safety factors, plans, and emergency procedures.<sup>108</sup>

### § 5.04 Conclusion

Statistics regarding various aspects of flaring may be found to support just about any perspective on the current state of, and anticipated trends in flaring. From the number of permits issued, to the billions of dollars lost in production and revenue, the potential for mishandling the issues

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<sup>100</sup>Wyo. Stat. Ann. § 30-5-101(a)(G).

<sup>101</sup>*Id.* § 30-5-121.

<sup>102</sup>*Id.* § 30-5-102(a).

<sup>103</sup>Wyo. Admin. Code OIL GEN ch. 3, § 39(a).

<sup>104</sup>*Id.* § 39(a)(i).

<sup>105</sup>*Id.* § 39(a)(ii), (iii).

<sup>106</sup>*Id.* § 39(c).

<sup>107</sup>*Id.*

<sup>108</sup>*Id.* § 39(c)(i)–(vii).

raised by flaring looms large over the oil patch. Until now, despite the loss in potential revenue, flaring has been the most economical alternative for disposing of casinghead gas. As the literal visibility of flaring increases and the additional non-economic costs of flaring are added to the equation, this reality may shift.

Domestic production of natural gas plays a vital role in shaping the nation's future. Members of the House Committee on Energy and Commerce have stressed that recognizing this unmistakable opportunity to create a positive future is ample motivation for them not only to work together, but also to gather all the stakeholders necessary to implement a system that will reduce harm to the environment and reduce equally harmful waste of precious and finite resources.<sup>109</sup> The means for utilizing science and political will are at our disposal if motivated and interested parties can agree on the method of implementation. Achieving a cooperative resolution to a problem of concern to so many would be an accomplishment far beyond producing enough expendable energy to make North Dakota visible from space.

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<sup>109</sup>See Letter from Henry A. Waxman, Bobby L. Rush & Diana DeGette, Ranking Members, U.S. House of Representatives, to The Honorable Fred Upton, Chairman, U.S. House of Representatives Comm. on Energy and Commerce (May 14, 2012) (requesting a hearing on the practice of natural gas flaring at oil production facilities in North Dakota).