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Joseph A. Schremmer
University of New Mexico - School of Law

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Oil, Gas & Energy Law Intelligence

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Regulating Natural Gas Venting and Flaring as Waste: A Review of the New Mexico Approach

Joseph A. Schremmer*

Abstract

This essay interrogates the regulation of routine venting and flaring of natural gas as a source of prohibited “waste,” using New Mexico’s recently adopted Waste Rule as an example. It begins with a survey of both the environmental and economic benefits to be achieved by limiting or eliminating venting and flaring and the direct and indirect costs of doing so, including the forgone opportunity to produce crude oil. Then the essay explains the common law and statutory definitions of “waste” to demonstrate that the concept implicates a balancing of the costs and benefits of any given production practice to determine whether it is justified or wasteful. Finally, the essay applies existing law to routine venting and flaring of associated gas in the Permian Basin, which the Waste Rule has effectively banned. The result of this analysis is that the Waste Rule prohibits some venting and flaring that would not necessarily constitute waste under existing law. In conclusion, the essay argues that waste is the wrong legal rubric for efforts to reduce or eliminate methane emissions from oil and gas operations and that policymakers should instead seek legal means that are better aligned with their true purpose: fighting climate change.

Introduction

As efforts to address concerns about climate change grow, one greenhouse gas in particular is receiving increasing scrutiny: methane. Accordingly, many aspects of the upstream and downstream oil and gas industry—the largest industrial emitter of methane—are coming under new and tightened regulation, and none more so than the routine venting and flaring of natural gas. Regulating this practice, however, is more complex than might meet the eye.

What is so complex about regulating venting and flaring of natural gas that it should warrant a special issue of the *Oil, Gas, and Energy Law Intelligence*? As a policy matter, the difficulty comes, as it often does, in balancing the benefits to be achieved by greater regulation with its costs, both of which may be considerable. As a legal matter, the difficult question is how to achieve any given policy. One tantalizingly straightforward legal mechanism to limit or eliminate routine venting and flaring, which New Mexico’s regulators have embraced, is to prohibit them as a source of “waste” of natural gas. As with the policy question, determining what legally constitutes “waste,” and thus when it may legally be prohibited, turns on an implicit cost–benefit analysis of sorts.¹ Thus, when waste is the rubric for limiting routing venting and flaring, the policy and legal questions converge on the same question: do the benefits of the limitation justify its costs?

* Leon Karelitz Oil & Gas Law Professor and Assistant Professor, University of New Mexico School of Law.

¹ This characterization of legal “waste” is drawn generally from Tara K. Righetti & Joseph A. Schremmer, *Waste and the Governance of Private and Public Property*, 93 U. COLO. L. REV. __ (forthcoming 2022). The concept of “waste” is discussed in depth *infra* in Part III.A.

This essay critically examines New Mexico’s recent effort to virtually eliminate routine natural gas venting and flaring within its borders under the theory that it constitutes prohibited “waste.” New Mexico is a useful subject for examination because of the scale of its oil and gas industry, as well as the enormity of its natural gas industry, which vents and flares about 36 billion cubic feet (worth over \$270 million, in 2018 alone²), and the creativity and ambition of its regulators in addressing the problem.

Part I opens this essay with a survey of the problem of natural gas venting and flaring, focusing on the benefits and costs of regulating the practice in the Permian Basin in New Mexico. Part II then dissects New Mexico’s regulatory response, which approaches the problem of natural gas emissions obliquely from two angles. First by limiting the emission of air pollutants that are regulated by the Clean Air Act and are associated with natural gas production, namely volatile organic compounds and nitrogen oxides. Second, and most importantly for present purposes, by prohibiting venting and flaring in all but a small number of circumstances as a means of preventing “waste” of natural gas resources. Part III evaluates and ultimately questions the use of the legal concept of waste as the rationale for eliminating venting and flaring.

I. The Benefits and Costs of Regulating Venting and Flaring

In discussing the benefits and costs of regulating routine venting and flaring, it must be remembered that the *benefits* of limiting the practices are also the *costs* of not limiting them, and vice versa. The costs to society of methane emissions from oil and gas production and transportation—and thus the benefits of regulating them—fall into two general categories: environmental and economic. The costs of regulating oil and gas emissions from venting and flaring, on the other side of the coin, include both the direct costs of designing, implementing, enforcing, and complying with the regulation and the indirect, opportunity costs associated with limiting the emissions, namely the loss of otherwise producible oil and gas reserves.

A. The Benefits

1. Environmental Benefits

The benefits of limiting natural gas venting and flaring fall into two general categories: environmental and economic.³ On the environmental side, the chief concern about venting and flaring is that they emit methane and carbon dioxide, respectively. Both are greenhouse gases that contribute to climate change, with methane being the more potent, but shorter-lasting of the two.⁴

² See *New Analysis Reveals Persistent Methane Problem, New Mexico Oil & Gas Data*, EDF (Nov. 2020), <https://www.edf.org/nm-oil-gas/>.

³ Kim Talus & Cheri R. Hasz, *Economic Waste and Environmental Problems: Natural Gas Flaring in Texas*, in *DECARBONISATION AND THE ENERGY INDUSTRY: LAW, POLICY AND REGULATION IN LOW-CARBON ENERGY MARKETS* 107 (Tade Oyewunmi, et al., eds. 2020).

⁴ See EPA, *Overview of Greenhouse Gases: Methane Emissions*, <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>; Daniel Raimi, *The Shale Revolution and Climate Change*, *RESOURCES FOR THE FUTURE* (Jan. 31, 2018), <https://media.rff.org/documents/RFF-IB-18-01.pdf>.

Venting natural gas refers to releasing it directly into the atmosphere. Because natural gas consists primarily of methane, venting emits a large proportion of this greenhouse gas.⁵ Flaring, on the other hand, is the burning of natural gas at the wellhead. Because it combusts natural gas, flaring converts it from methane into carbon dioxide before emitting it into the atmosphere. Flaring also tends to emit carbon monoxide, sulphur dioxide, nitrogen oxides, and other compounds.⁶

The incidence of venting and flaring in New Mexico has risen significantly in recent years along with growth of oil and gas production in the state. According to the New Mexico Governor's office, "oil and gas production growth in New Mexico Permian Basin resulted in an 18% increase in venting and flaring volumes during the first seven months of 2018 compared to 2017."⁷ This growth has occurred primarily in the part of the Permian Basin known as the Delaware Basin, which straddles west Texas and southeastern New Mexico. In recent years, the Delaware Basin has been the premier oil and gas play in the United States, as well as one of the largest sources of vented and flared natural gas in the country.⁸

A recent statewide survey of methane emissions conducted by the Environmental Defense Fund (EDF) estimated that upstream oil and gas sites in New Mexico release more than 1.1 million metric tons of methane per year—significantly greater than EPA had previously estimated.⁹ EDF explains that "this has the same short-term climate impact as 25 coal plants or 21 million automobiles."¹⁰ These releases are from not only venting and flaring, but also equipment leaks and ordinary oil and gas production processes. Consequently, efforts to reduce venting and flaring, as well as emissions of natural gas from other upstream and midstream equipment and processes, are considered to have a significant climate benefit.¹¹

2. *Economic Benefits*

Limiting venting, flaring, and leaking of natural gas is said to produce the economic benefit of conserving the natural gas for beneficial use. This argument is particularly potent in New Mexico, where the state not only collects taxes on sales of natural gas production, but also receives substantial royalties on natural gas produced and sold from its vast land holdings across the state. The Governor's office has estimated that "emissions, venting, flaring, and leaks of natural gas by New Mexico's oil and gas industry results in the waste of an important source of domestic energy to the tune of an estimated \$244 million per year."¹² That amounts to a loss of state tax and royalty revenue of roughly \$43 million annually.¹³ The potential financial benefits to the state of eliminating venting and flaring are apparent.

⁵ Talus & Hasz, *supra* note 3, at 107.

⁶ *Id.*

⁷ N.M. Exec. Order No. 2019-003 (Jan. 29, 2019).

⁸ Ian Palmer, *Profit and Loss from Flaring of Natural Gas in Permian Basin Wells of New Mexico*, FORBES (Jan. 29, 2019), <https://www.forbes.com/sites/ianpalmer/2021/01/29/profit-and-loss-from-flaring-of-natural-gas-in-permian-basin-wells-of-new-mexico/?sh=63f766db78bf>.

⁹ EDF, *supra* note 2.

¹⁰ *Id.*

¹¹ See N.M. Exec. Order No. 2019-003 (Jan. 29, 2019).

¹² *Id.*

¹³ EDF, *supra* note 2. These taxes include on each sale of oil and natural gas a conservation tax of \$0.19, an oil and gas emergency school tax, and an oil and gas ad valorem production tax, and on the processing of natural gas a natural

B. The Costs

1. Direct Costs

Just as there are significant benefits to regulating venting and flaring of natural gas, so too are there many costs. The costs can be distilled into two categories as well: direct costs and indirect, or opportunity costs. The direct costs include the costs to design and administer the regulation itself, including monitoring and enforcing the requirements. These are not insignificant. The ozone-precursor rules drafted by the New Mexico Environment Department¹⁴ alone cost more than 15,000 hours of staff time and \$1 million in contract support from outside scientists and researchers merely to draft.¹⁵

Direct costs also include the compliance costs incurred by the regulated community. While no economic analysis of the costs of compliance with New Mexico's recent regulations has been published, the Environmental Protection Agency recently published a thoroughgoing examination of the costs of complying with the methane emissions standards imposed on upstream and midstream oil and gas operators under Subpart OOOOa of the Clean Air Act.¹⁶ The agency estimated the repeal of the methane emissions standards to save the oil and gas industry, nationwide, \$17 to \$19 million per year in compliance costs.¹⁷

2. Indirect Costs

The indirect, or opportunity costs of limiting methane emissions from oil and gas operations—particularly by prohibiting most venting and flaring—are harder to estimate and potentially much greater than the direct costs. To see why, it is important to understand the reasons venting and flaring have increased so substantially in recent years.

Beginning in the mid-2000s, oil and gas companies developed horizontal drilling and hydraulic fracturing technology capable of exploiting previously unproducible impermeable or “tight” geologic formations. After the technology had been refined in various such “unconventional” plays in Texas and elsewhere, developers’ attention turned to the massive Permian Basin.¹⁸ The Permian had produced from conventional, vertical wells for decades, but the Delaware Basin contained a number of tight formations that had not yet been exploited. In the rush to produce oil from the Delaware Basin using these unconventional techniques, a huge amount of associated natural gas was produced as a byproduct of the oil, which was the developer’s target. The pipeline infrastructure that had been built to transport Permian Basin gas to market from vertical wells

gas processor’s tax. *See* Anne Kolesnikoff & Cassarah Brown, *State Oil and Gas Severance Taxes*, NAT’L CONF. STATE LEGISLATURES (Sept. 6, 2018), <https://www.ncsl.org/research/energy/oil-and-gas-severance-taxes.aspx>.

¹⁴ *See infra* Part II.A.

¹⁵ N.M. ENVIRONMENT DEP’T, OZONE PRECURSOR RULE FACT SHEET (May 2021), <https://www.env.nm.gov/wp-content/uploads/2021/05/2021-05-06-Ozone-precursor-rule-factsheet-FINAL.pdf>.

¹⁶ ENV’T’L PROT. AGENCY, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED OIL AND NATURAL GAS SECTOR: EMISSIONS STANDARDS FOR NEW, RECONSTRUCTED, AND MODIFIED SOURCES REVIEW (Aug. 2019).

¹⁷ *See generally id.*; 84 Fed. Reg. 50,244, 50,278 (Sept. 24, 2019).

¹⁸ 2 ERNEST E. SMITH & JACQUELINE LANG WEAVER, TEXAS LAW OF OIL AND GAS § 10.6(A)(3) (2021).

could not accommodate this associated gas flowing in massive volumes from new horizontal wells.¹⁹ There are simply not enough gas pipelines in the Permian Basin to take all of the associated gas.

The dearth of pipeline capacity has coincided with a period of historically low natural gas prices, which also resulted from the enormous amount of natural gas brought online by horizontal wells in the United States. Spot prices for natural gas in the Permian Basin have been especially low and have often turned negative, such that producers are sometimes required under their contracts to *pay* to “sell” their gas.²⁰ Because most of the gas produced in the basin comes intermingled with oil production, it is not possible to produce one without the other. Thus, the combination of too few pipeline connections and low-to-negative spot prices has forced large numbers of producers in the Delaware Basin to a choice. For those fortunate to have a pipeline connection, they may vent or flare their associated gas, sell it (maybe at a loss), or shut-in their oil wells. For those without a pipeline connection the choice is even simpler; they must vent or flare their associated gas or shut-in their oil wells.

For these reasons, forbidding venting and flaring of natural gas in New Mexico may come at the dear cost of foregoing oil production. Viewed from a climate-change perspective, this result may not be troubling. However, the economic costs to the state of lost oil production may be high, as the market price for oil is considerably higher than for natural gas,²¹ and could, conceivably, even outstrip the revenues lost from venting and flaring. Certainly, a venting and flaring prohibition may incentivize construction of new pipeline capacity in the region, ameliorating or even eliminating the potential for lost production.

Whether any of these offsetting costs and benefits will come to fruition in practice will be an empirical question; but the potential remains that tight control of venting and flaring could curtail not only of emissions of methane, but also production of oil.

II. New Mexico’s Approach to Eliminating Routine Venting and Flaring

In January 2019, New Mexico Governor Michelle Lujan Grisham issued Executive Order 2019-003 to require the state’s Energy, Minerals and Natural Resources Department (EMNRD), which houses the Oil Conservation Division (OCD) and Oil Conservation Commission (OCC), and the New Mexico Environment Department (NMED) to “jointly develop a statewide, enforceable regulatory framework to secure reductions in oil and gas sector methane emissions and to prevent waste from new and existing sources and enact such rules as soon as practicable.”²² The four-page order focuses extensively on the harms of climate change and methane and carbon dioxide’s contribution to it, and notes that “efforts to reduce methane emissions throughout New Mexico will have a significant climate benefit as well as prevent the waste of energy resources.”²³

¹⁹ *Id.*

²⁰ See *Texas Waha Natgas Prices Drop to Negative on Weak Demand*, REUTERS (Oct. 19, 2020), <https://www.reuters.com/article/us-usa-natgas-texas/texas-waha-natgas-prices-drop-to-negative-on-weak-demand-idUSKBN2741L2>.

²¹ See *Crude Oil vs Natural Gas—10 Year Daily Chart*, MACROTRENDS (last visited June 2, 2021), <https://www.macrotrends.net/2500/crude-oil-vs-natural-gas-chart>.

²² N.M. Exec. Order No. 2019-003 (Jan. 29, 2019).

²³ *Id.*

Accordingly, NMED has drafted regulations to limit the emissions of ozone-precursor compounds from upstream and midstream natural gas operations and OCD has adopted final regulations limiting venting and flaring of natural gas at wells and from natural gas gathering systems. These regulations do not target methane or carbon dioxide directly. Rather, they limit the emission of substances produced in conjunction with methane. NMED's draft ozone-precursor rule is projected to reduce methane emissions by 851 pounds annually,²⁴ and OCD has promoted its venting and flaring regulations as providing the "co-benefit of reducing methane emissions in the oil and gas sector."²⁵ The regulations justify these limitations on the basis of protecting air quality from oil and gas contamination and preventing waste of natural gas, respectively, rather than on the basis of preventing or mitigating climate change.

The following sections outline the NMED and OCD regulations in turn to demonstrate New Mexico's two-pronged approach to limiting methane emissions.

A. Regulating Methane Emissions as a Source of Ground-Level Ozone Pollution

Under the New Mexico Air Quality Control Act, the Environmental Improvement Board (EIB) is authorized and obligated "to adopt a plan, including regulations, to control emissions of oxides of nitrogen [NO_x] and volatile organic compounds [VOCs] to provide for attainment and maintenance of" the National Ambient Air Quality Standards (NAAQS) established by the United States Environmental Protection Agency under the federal Clean Air Act for ground-level ozone. EIB's authority to do so extends only to those areas of the state where ozone concentrations exceed 95% of the NAAQS.²⁶ The EIB may adopt standards of performance for sources of emissions for which no federal performance standard has been adopted, as well as performance standards that are more stringent than federal standards.²⁷

Pursuant to this statutory authority, NMED has drafted proposed regulations to establish emissions standards for VOCs and NO_x for oil and gas production, processing, and transportation sources.²⁸ As of this writing, EIB has not yet voted to adopt the emissions standards, but that vote is expected imminently.²⁹ In general, the proposed ozone-precursor rules are similar to the new source performance standards adopted by EPA under the Clean Air Act for newly constructed and modified natural gas wells at Subpart OOOO.³⁰ NMED's rules would apply only in areas that exceed 95% of the NAAQs for ozone,³¹ which would include oil and gas operations in New

²⁴ Hannah Grover, *NMED Releases Ozone Precursor Rules*, N.M. POLITICAL REP'T (May 7, 2021), <https://nmpoliticalreport.com/2021/05/07/nmed-releases-ozone-precursor-rules/>.

²⁵ N.M. ENERGY, MINERALS & NATURAL RESOURCES DEP'T, SUMMARY AND FAQs OF OCD'S NATURAL GAS WASTE RULE (last visited June 1, 2021), <http://www.emnrd.state.nm.us/ADMIN/documents/FinalMethaneRuleOneSheeter.pdf>

²⁶ N.M. STAT. ANN. § 74-2-5.3(A).

²⁷ *Id.* § 74-2-5.3(B).

²⁸ N.M. ADMIN. CODE § 20.2.50 (proposed May 6, 2021).

²⁹ Grover, *supra* note 23.

³⁰ See 40 C.F.R. Part 60; see also Colin G. Harris & Ivan L. London, *There's Something in the Air: New and Evolving Air Quality Regulations Impacting Oil and Gas Development*, 58 ROCKY MTN. MIN. L. INST. 6-1, § 6.04[1] (2012).

³¹ N.M. ADMIN. CODE §§ 20.2.50.2, .111(A) (proposed).

Mexico’s largest producing counties, including Eddy and Lea (in the Delaware Basin) and San Juan (in the San Juan Basin).

The rules are technical and extensive. As the focus of this essay is on the regulation of venting and flaring as a source of waste, rather than as a source of air pollution, this summary of the rule’s contents will be short. In general, the rules cover 13 categories components and processes: engines and turbines, control devices, equipment leaks and fugitive emissions, natural gas well liquid unloading, glycol dehydrators, heaters, hydrocarbon liquid transfers, pre-launching and receiving, pneumatic controllers and pumps, storage vessels, well workovers, and produced water management units. For each source category, the rules impose performance standards for controlling emissions from the source. Most of the rules do not require any particular means or technology to achieve the standards. Additionally, the rules impose monitoring, recordkeeping, and reporting requirements for each source, as well as repair requirements for equipment leaks and fugitive emissions. Relaxed rules apply to defined Small Business Facilities, which are those facilities operated by companies employing fewer than ten individuals and generating less than \$250,000 in gross annual revenues.³²

B. Regulating Venting and Flaring as Waste of Natural Gas

To complement the indirect methane-reducing effects of the ozone-precursor rules, OCD has adopted final regulations limiting venting and flaring of natural gas. Under the New Mexico Oil and Gas Act, “The production or handling of crude petroleum oil or natural gas of any type or in any form . . . in such manner or under such conditions or in such amounts as to constitute or result in *waste* is each hereby prohibited.”³³ The Act empowers OCD and OCC “to make and enforce rules, regulations, and orders, and do whatever may be reasonably necessary to carry out the purpose of this act,” including to prevent waste.³⁴ In addition to preventing waste, OCD is duty-bound to protect oil and gas owners and operators’ correlative rights.³⁵

Exercising this authority, effective May 25, 2021, the OCC adopted final regulations—dubbed the “Waste Rule”—stringently limiting routine venting and flaring natural gas.³⁶ The Waste Rule consists of five principal parts: (1) a venting and flaring prohibition with exemptions; (2) performance and inspection standards; (3) obligations to quantify and report venting and flaring; (4) statewide natural gas capture requirements; and (5) a natural gas management plan requirement for new and recompleted wells. Each will be discussed briefly in turn.

1. The Venting and Flaring Prohibition and Exemptions

The heart of the Waste Rule is its prohibition on “[v]enting or flaring of natural gas during drilling, completion, or production operations that constitutes waste”³⁷ Virtually identical terms apply to

³² *Id.* §§ 20.2.50.125, .7(OO) (proposed).

³³ N.M. STAT. ANN. § 70-2-2 (emphasis added).

³⁴ *Id.* § 70-2-11.

³⁵ *Id.*

³⁶ N.M. ADMIN. CODE §§ 19.15.7, .18–.19, .27–.28

³⁷ *Id.* § 19.15.27.8(A).

the operation of natural gas gathering systems.³⁸ The rule also requires operators to flare rather than vent wherever safe and feasible.

This blanket prohibition contains certain exemptions.³⁹ First, during drilling operations an operator may flare natural gas if it is technically feasible in lieu of capturing it and may vent natural gas “to avoid a risk of an immediate and substantial adverse impact on safety, public health, or the environment.”⁴⁰ Second, during completion or recompletion operations an operator may flare during the initial flowback stage, as well as during separation flowback if capturing and routing the natural gas to a beneficial use would “pose a risk to safe operation or personnel safety.”⁴¹ Following completion, an operator may flare for up to 60 days if the natural gas does not meet pipeline quality specifications, conditioned on the operator’s providing the pipeline specifications and periodic gas analyses to OCD upon request.⁴²

And third, during production operations an operator may vent or flare in a variety of narrow situations, including (1) during emergencies and malfunctions; (2) to unload or clean-up liquid holdup in a well to atmospheric pressure (under certain conditions); (3) during the first 12 months of production from an exploratory well under certain conditions (which may be extended by OCD for good cause shown); and (4) during certain routine operations such as tank gauging and sampling, liquids loading, repair and maintenance activities, equipment testing, production testing lasting less than 24 hours, commissioning of pipelines and equipment, and during the normal operation of various components such as storage tanks, dehydration units and amine treatment units, compressors and compressor engines and turbines, and connectors like valves and flanges; and (5) when natural gas does not meet gathering pipeline specifications provided the operator analyzes gas samples twice weekly and routes the gas to a pipeline as soon as it meets specifications.⁴³ The exemptions do not appear to include venting or flaring due to the lack of a pipeline connection or a market for the gas.

The rationale for certain of these exemptions is clear. For example, it is obviously not worth the costs to life and limb to forbid venting and flaring even when it would risk causing or exacerbating an emergency. While the rationale for most of the other exemptions may not be so clear, they nonetheless evince a tacit cost–benefit analysis. For instance, it is not prohibited waste to operate the many essential components that tend to emit small amounts of natural gas, like compressors, or to undertake certain necessary actions, like opening the thief hatch of a tank to gauge it, that emit small amounts of natural gas in the process. These emissions are generally small and unavoidable in the normal course of gas production, and hence their elimination is not cost justified.

³⁸ *Id.* § 19.15.28.8(A).

³⁹ In the case of natural gas gathering systems, venting or flaring is exempt from the Waste Rule’s prohibition during emergencies and malfunctions, pigging and purging, commissioning of pipelines and equipment, repair and maintenance, gauging and sampling tanks, liquids loading, and during the normal operation of typical pipeline components, including pneumatic controllers and pumps, dehydration and amine treatment units, compressors, valves and flanges, and storage tanks. *Id.* § 19.15.27.8(D)(4).

⁴⁰ *Id.* § 19.15.28.8(B)(1), (2).

⁴¹ *Id.* § 19.15.27.8(C)(1)–(2).

⁴² *Id.* § 19.15.27.8(C)(3).

⁴³ *Id.* § 19.15.27.8(D)(4).

Moreover, flaring is permitted for a year or more when an operator completes an “exploratory” well. This exemption seems to acknowledge that exploring for new pools of oil and gas would be impossible under an absolute prohibition on venting and flaring and that the benefits of eliminating venting and flaring from such wells do not justify the costs in terms of lost opportunities for exploration.⁴⁴ The presence of these exemptions demonstrates that the question of when venting and flaring constitutes prohibited waste depends, at least implicitly, on a weighing of the venting or flaring’s benefits with its costs.

2. Performance and Inspection Standards

The Waste Rule further imposes what it labels as “performance standards.” The performance standards obligate operators to “design completion and production separation equipment and storage tanks for maximum anticipated throughput and pressure to minimize waste,” to “take all reasonable actions to prevent and minimize leaks and releases of natural gas from a natural gas gathering system and . . . implement an operations plan to minimize the waste of natural gas for each non-contiguous natural gas gathering system,” and generally to design new facilities to minimize waste.⁴⁵ The standards also require operators to conduct periodic “AVO,” or audio, visual, olfactory, inspections of all components at a wellsite or of a gathering system for natural gas leaks.⁴⁶ Operators are to maintain records of each AVO inspection for at least five years, which are subject to OCD inspection.

3. Quantifying and Reporting Venting and Flaring

The next two parts of the Waste Rule are closely related to one another. The rule requires operators to measure (for wells drilled after the effective date of the rule) or estimate using a method that is independently verifiable (for existing wells) the volume of natural gas that it vents, flares, or beneficially uses (*e.g.*, sells or re-routes to use as fuel gas on the lease) from its wells during drilling, completion, and production operations and from its natural gas systems.⁴⁷ Operators must then report all volumes of natural gas that were vented or flared at each well on a monthly basis,⁴⁸ which OCD will compile and publish on its website.⁴⁹

4. Statewide Natural Gas Capture Requirements

Using the venting and flaring data submitted by operators during the fourth quarter of 2021 and the first quarter of 2022, OCD will calculate and publish on its website each operator’s “baseline natural gas capture rate” for all of its wells and gathering systems in New Mexico.⁵⁰ Each year, starting on April 1, 2022, operators must increase the percentage of natural gas captured at their facilities across the state from this baseline rate by an amount sufficient to reach a capture rate of

⁴⁴ In fact, it may well constitute “underground waste” under the Oil and Gas Act’s existing statutory definition to make it economically infeasible to produce new pools. *See infra* Part III.

⁴⁵ *Id.* §§ 19.15.27.8(E)(1)–(4), (7) (pertaining to wells), 19.15.28.8(C)(1), (6) (pertaining to gathering systems).

⁴⁶ *Id.* §§ 19.15.27.8(E)(5) (pertaining to wells), 19.15.28.8(C)(4) (pertaining to gather systems).

⁴⁷ *Id.* §§ 19.15.27.8(F) (pertaining to wells), 19.15.28.8(E) (pertaining to gathering systems).

⁴⁸ *Id.* §§ 19.15.27.8(G)(2) (pertaining to wells), 19.15.28.8(F)(2) (pertaining to gathering systems).

⁴⁹ *Id.* §§ 19.15.27.8(G)(3) (pertaining to wells), 19.15.28.8(F)(3) (pertaining to gathering systems).

⁵⁰ *Id.*

at least 98% by December 31, 2026.⁵¹ Put differently, operators must reduce the annual volume of vented and flared natural gas at their facilities to the point where they lose no more than 2% of the gas they produce across the state by the end of 2026. The amount of annual progress an operator must make to achieve 98% capture by 2026 depends on its baseline rate of capture. Operators whose baseline capture rates are less than 60% must submit a plan to OCD to meet the minimum required annual capture percentage increase.⁵²

Operators are required to submit reports certifying their compliance with the statewide capture requirement by February 28 of each year beginning in 2023.⁵³ In determining its compliance with the required annual increases in its capture rate, an operator may deduct from its volumes of vented or flared gas any leaks that it detected and repaired using approved advanced leak and repair monitoring (ALARM) technology that the operator voluntarily adopted.⁵⁴

The statewide natural gas capture requirement is the most ambitious element of New Mexico's Waste Rule. No other jurisdiction in the United States limits natural gas emissions to 2% of production. While setting an extremely high standard for performance, the Waste Rule does not prescribe the means of achieving the standard. Operators are free to increase their natural gas capture rates from their current baselines using any effective means they can contrive. OCD touts this feature as providing flexibility and incentivizing innovation.⁵⁵

5. Natural Gas Management Plans

The final component of the Waste Rule requires operators to file a natural gas management plan with each application for a permit to drill (APD) for a new or recompleted well after May 25, 2021. The plan is supposed to “describe the actions that the operator will take at each proposed well to meet its statewide natural gas capture requirements and to comply with” the Waste Rule.⁵⁶ Each plan must describe the “operational best practices that will be used to minimize venting and flaring during active and planned maintenance,” as well as certify whether or not the operator will be able to connect the well to a natural gas gathering system in the general area with sufficient capacity to transport all of the gas the operator anticipates the well will produce.⁵⁷ If the operator determines it will not be able to connect to a gathering system by the commencement of production, it must either shut in the well until it obtains a market or submits a plan to OCD to store the natural gas or use it for a beneficial purpose on the lease.⁵⁸ OCD may deny any APD for which the operator fails to either certify that it will have a market for the gas or propose an adequate alternative use for the gas.⁵⁹

Operators that are out of compliance with the statewide natural gas capture requirement must include additional information in its natural gas management plans. Specifically, such an operator

⁵¹ *Id.* §§ 19.15.27.9(A) (pertaining to wells), 19.15.28.10(A) (pertaining to gathering systems).

⁵² *Id.* §§ 19.15.27.9(A)(2) (pertaining to wells), 19.15.28.10(A)(2) (pertaining to gathering systems).

⁵³ *Id.* §§ 19.15.27.9(B) (pertaining to wells), 19.15.28.10(B) (pertaining to gathering systems).

⁵⁴ *Id.*; *Id.* §§ 19.15.27.7(A), 19.15.28.7(A) (defining “ALARM”).

⁵⁵ *See, e.g.*, N.M. ENERGY, MINERALS & NATURAL RESOURCES DEP'T, *supra* note 24.

⁵⁶ N.M. ADMIN. CODE § 19.15.27.9(D)(1).

⁵⁷ *Id.* § 19.15.27.9(D)(1), (4).

⁵⁸ *Id.* § 19.15.27.9(D)(5).

⁵⁹ *Id.* § 19.15.27.9(D)(7).

must include the contact information for “the existing natural gas gathering system the operator has contracted or anticipates contracting with to gather the natural gas,” as well as describe “the operator’s plans for connecting the well to the natural gas gathering system.”⁶⁰

To summarize, the natural gas management plan requirement means that no new oil or gas well may be spud in New Mexico unless the operator certifies to OCD that it will be able to connect and sell all of the gas produced from such well to a natural gas gathering system in the general area or, instead, will put the gas to a suitable alternative beneficial use until a gas gathering system is available. Together with the other parts of the Waste Rule, this new requirement poses a potentially significant obstacle to oil production in the state. Under the rule, an operator must have a market or an alternative beneficial use for all gas associated with its oil production to continue producing the oil, which, as previously noted, is often impossible or cost-prohibitive in the Delaware Basin. Whether and when the elimination even of necessary venting and flaring is justified under New Mexico law as “waste” is the subject of Part III.

III. Evaluating the Waste Rationale

As explained, OCD is authorized by the New Mexico Oil and Gas Act to promulgate regulations to prevent “waste.”⁶¹ The precise definition of waste, and thus the extent of OCD’s jurisdiction under the Act’s waste-prevention mandate, can be elusive. The Act contains a specific statutory definition, as set forth in the below sections. Yet the legal concept of waste predates adoption of this or any other oil and gas conservation act. Waste of oil and gas resources was tortious at common law, and a brief review of the common law history of waste illuminates that implicit in the concept’s definition is a sort of cost–benefit analysis. This Part reviews the concept of waste at common law and under the Oil and Gas Act and then attempts to apply the concept to determine whether and under what circumstances the routine venting and flaring prohibited under the Waste Rule truly constitutes “waste.”

A. What Is “Waste”?

1. Waste at Common Law

As Tara Righetti and I have detailed elsewhere,⁶² the prohibition against waste of commonly owned natural resources, such as oil and gas resources, originates at common law. Oil and gas reservoirs are semicommons, in which all owners whose land holdings overlay a portion of the reservoir have a co-equal, nonexcludable opportunity to produce a proportional amount of the oil or gas using a proportional amount of the reservoir energy to do so.⁶³ Reservoirs are inherently interconnected such that each owner’s extractions from the reservoir affect the energy and reserves available to all other owners. As the United States Supreme Court acknowledged in the seminal 1900 waste case of *Ohio Oil Co. v. Indiana*, this physical reality gives rise to the potential that any

⁶⁰ *Id.* § 19.15.27.9(D)(2)(b).

⁶¹ *See supra* Part II.B.

⁶² Righetti & Schremmer, *supra* note 1.

⁶³ The classic statement of the fair opportunity principle is from Robert E. Hardwicke & M.K. Woodward, *Fair Share and the Small Tract in Texas*, 41 TEX. L. REV. 75, 93 (1962).

one of the owners could destroy all of the reservoir's energy and oil or gas contents and deprive all of the other owners of their chance to produce the reserves.⁶⁴

The fair opportunity of every owner to produce a pro rata share of the reserves that the *Ohio Oil* court acknowledged has become known as the doctrine of correlative rights.⁶⁵ Each reservoir owner's property interest is relative (or correlative) and dependent on the other owners not to destroy or damage the reservoir or waste its energy or contents. What does it mean to "waste" a reservoir's energy or contents? It refers to the use of or extraction from a reservoir that fails to generate any benefits to offset the losses of energy and production caused by the activity; stated another way, waste is the reduction of the total net value of a reservoir to all its owners.⁶⁶

Consider, for example, the famous waste case of *Elliff v. Texon Drilling Co.*, where Texon's well blew out and destroyed huge amounts of oil, gas, and distillate underneath Elliff's neighboring property.⁶⁷ The Supreme Court of Texas denied Texon's defense that under the rule of capture it would be entitled to capture the hydrocarbons under Elliff's property, so it should not be liable for destroying them. On the contrary, the court held that the "negligent waste and destruction of gas and distillate was neither a legitimate drainage of the minerals . . . nor a lawful or reasonable appropriation of them."⁶⁸

Similarly, in another well-known case, *Louisville Gas Co. v. Kentucky Heating Co.*, the court enjoined a defendant from producing natural gas from a reservoir it shared with the plaintiff for the purpose of dissipating it into the air to spite the plaintiff, but under the pretense of manufacturing carbon black.⁶⁹ While the rule of capture would have privileged the defendant in producing the same quantity natural gas reserves,⁷⁰ the doctrine of waste prevented it from squandering them for no beneficial purpose (other than spite).

Contrast *Elliff* and *Louisville Gas Co.* with *Corzelius v. Harrell*.⁷¹ There the plaintiff sued defendant for waste because the defendant failed to extract valuable liquids from the natural gas it produced from a common reservoir before selling the gas. Although the court acknowledged that the defendant may have been leaving money on the table by not maximizing the value of its natural gas, it declined to find waste since the defendant was putting the gas to beneficial—albeit relatively low-value—use.⁷²

Distilling these cases, waste at common law prohibits extractions from a reservoir that serve no useful purpose, such as the negligent destruction of reserves as in *Elliff* or the spiteful dissipation of natural gas as in *Louisville Gas Co.*, but does not require a producer to maximize the economic value of its production or the contents of the common reservoir. The doctrine considers both the

⁶⁴ 177 U.S. 190, 201 (1900).

⁶⁵ See *Cowling v. Dept. of Nat. Resources*, 830 P.2d 220, 225 (Utah 1991).

⁶⁶ *Righetti & Schremmer*, *supra* note 1.

⁶⁷ 210 S.W.2d 558 (Tex. 1948).

⁶⁸ *Id.* at 560.

⁶⁹ 77 S.W. 368 (Ky. 1903).

⁷⁰ See *Kelly v. Ohio Oil Co.*, 49 NE 399, 401 (Ohio 1897) (holding that the rule of capture privileged the defendant to maliciously drain the oil from underneath the plaintiff's property).

⁷¹ 179 S.W.2d 419 (Tex. App. 1944).

⁷² *Id.* at 422.

costs of a defendant's extraction from the reservoir, *i.e.*, what it removes from the other owners' fair opportunity to produce the same reservoir, and the tangible benefits. Where the costs are offset by some benefit, such as where the defendant sells the production or uses it for on-lease operations like running an engine or compressor, the rule of capture privileges the defendant's extraction. Under the common law definition of waste, it does not matter how great the tangible benefit is or whether the defendant took steps to maximize its economic impact. All that matters is that the costs of the defendant's extraction from the common reservoir are not for nothing.

2. Waste Under the Oil and Gas Act

As in all oil and gas producing states, the common law of waste is largely displaced in New Mexico by the statutory definition. For present purposes, the relevant portions of the multi-faceted statutory definition pertain to "surface waste" and "underground waste." The New Mexico Oil and Gas Act defines "surface waste"

as those words are generally understood in the oil and gas business, and in any event to embrace the *unnecessary or excessive surface loss or destruction without beneficial use, however caused, of natural gas* of any type or in any form or crude petroleum oil, or any product thereof, but including the loss or destruction, without beneficial use, resulting from evaporation, seepage, leakage or fire, especially such loss or destruction incident to or resulting from the manner of spacing, equipping, operating or producing, well or wells, or incident to or resulting from the use of inefficient storage or from the production of crude petroleum oil or natural gas in excess of the reasonable market demand[.]⁷³

The emphasized portion of the definition is entirely consistent with the concept of waste at common law. The needless destruction of natural gas at the surface of the earth for no beneficial use would, by definition, fail to generate any benefit or gain to offset the loss of the reserves to the other reservoir owners; this would constitute waste at common law as well as under the statutory definition.

At first blush, flaring natural gas appears to fit this definition, as it involves the destruction by burning of natural gas at the surface of the earth. Examined closely, however, it is not clear that flaring (or venting) would be *unnecessary or excessive* in every case. When, other than in emergencies, might venting or flaring of natural gas at the surface be necessary?

In addressing this question, consider the statutory definition of "underground waste"

as those words are generally understood in the oil and gas business, and in any event to embrace *the inefficient, excessive or improper, use or dissipation of the reservoir energy, including gas energy* and water drive, of any pool, and the locating, spacing, drilling, equipping, operating or producing, of any well or wells *in a manner to reduce or tend to reduce the total quantity of crude petroleum oil or natural gas ultimately recovered from any pool*, and the use of inefficient underground storage of natural gas[.]⁷⁴

⁷³ *Id.* § 70-2-3(B) (emphasis added).

⁷⁴ N.M. STAT. ANN. § 70-2-3(A) (emphasis added).

Focusing on the emphasized portions of the definition, misuse of reservoir energy, which can include energy from associated natural gas, constitutes waste if it would tend to reduce the total quantity of crude oil ultimately recovered from the pool. Reading the definitions of surface and underground waste together reveals that the surface destruction of natural gas may, in some circumstances, be necessary—and thus not constitute surface waste—in order to avoid the commission of underground waste by stranding crude oil reserves.

This interpretation is fully consistent with the common law concept of waste. Where an operator flares associated natural gas as a means of producing oil reserves at efficient, not-excessive rates, the flaring is not purposeless. Rather, it serves the purpose of enabling oil production, which generates a benefit to offset the loss of natural gas and reservoir energy to the other owners. Thus, both at common law and under New Mexico’s statutory definition, the benefits of producing otherwise unrecoverable oil reserves through venting or flaring natural gas (discussed earlier as the indirect *costs* of regulating venting and flaring⁷⁵) may render the practice non-wasteful. The following section will further analyze under what circumstances this proposition may be true.

B. When Is Routine Venting and Flaring Waste (and When Is it Not)?

Consider how the Waste Rule interacts with the existing statutory and common law definitions of waste in three highly simplified paradigm cases: (1) where an operator produces oil and associated gas from a non-exploratory well and has a pipeline connection through which to market all the gas at sufficient prices to at least break even on the gas; (2) where an operator produces oil and associated gas from a non-exploratory well but lacks a pipeline connection or other market for the gas; and (3) where an operator produces oil and associated gas from a non-exploratory well and has a pipeline connection through which to market only part of the gas or has a market for all the gas at prices so low as to generate a loss by selling it. The Waste Rule would prohibit routine venting and flaring in each case; but would venting and flaring in each case necessarily constitute waste under the statutory and common law predating the Waste Rule?

In case 1, where the operator has a full and quality market for the associated gas, routine venting and flaring would clearly constitute surface waste under existing law, as it would serve no beneficial purpose to counterbalance the loss of gas from the reservoir. The Waste Rule’s prohibition is entirely consistent with existing law in this case.

Case 2, where the operator lacks a market for the associated gas, presents the operator with a dilemma: produce the oil and vent or flare the gas, or do not produce the oil. The Waste Rule would prohibit the venting or flaring, forcing the operator to choose not to produce the oil. Yet, under the existing statutory waste definitions, venting or flaring in this situation may be necessary to avoid the underground waste of oil. This would be especially so if, as is the case presently, the oil is significantly more valuable than the associated gas. The Waste Rule would require the operator to be penny wise and pound foolish, contrary to preexisting definitions of waste.

⁷⁵ See *supra* Part I.B.2.

Case 3 presents the most complex situation. Two subcases must be distinguished. In subcase 3.A, where the operator has a partial market for the associated gas and at prices that do not render a loss from selling the gas, the operator may need to either vent or flare periodically or shut in periodically. Because it would be possible to shut in periodically while still producing and selling the oil and gas, albeit at curtailed rates, venting or flaring would not be necessary to avoid underground waste of oil and would likely constitute surface waste under existing law. The Waste Rule's prohibition would not change this result.

The analysis differs in subcase 3.B, where the operator's market (whether full or partial) is of such low quality that it would render a loss to the operator to sell the gas. If the magnitude of the loss is small and producing the oil is sufficiently profitable to make the well overall economic, venting or flaring would not be necessary to avoid underground waste of oil because the operator could sell the gas at a loss and still produce the oil economically. If, however, the magnitude of the loss on the gas is so great that it would render the well uneconomic even considering profits from the sale of oil, venting or flaring may be necessary to avoid the underground waste of oil. This venting or flaring would violate the Waste Rule, putting the Waste Rule at odds with the existing definitions of waste (as in case 2).

Thus, in situations resembling case 2 and subcase 3.A, the Waste Rule's categorical prohibition on routine venting and flaring as "waste" may exceed OCD's statutory authority to prevent waste as defined in the Oil and Gas Act. Moreover, the Waste Rule's application in these cases runs counter to the understanding of waste at common law, namely as an entirely purposeless dissipation of reservoir contents or energy.

Likewise, the Waste Rule's statewide capture requirement⁷⁶ and natural gas management plan requirement⁷⁷ may impose limitations on releases of natural gas that exceed OCD's authority to prevent waste under the Oil and Gas Act. The statewide capture requirement mandates annual reductions in releases of natural gas (through venting and flaring and otherwise), whether or not these releases constitute waste under existing law. Moreover, the natural gas management plan provisions could deny drilling permits to operators seeking to spud for oil without a natural gas market in hand, stranding oil reserves that cannot be produced without associated gas.

Such de facto bans on oil and gas extraction are "antagonistic" to the New Mexico Oil and Gas Act. In *Sweepi, Ltd. P'ship v. Mora Cnty.*, the court held a county ordinance prohibiting the use of hydraulic fracturing void as against state law because it effectively banned new oil and gas production from tight formations and threatened to cause waste under the Oil and Gas Act.⁷⁸ Quoting extensively from Professor Alex Ritchie's argument in *On Local Fracking Bans: Policy and Preemption in New Mexico*,⁷⁹ the court found that (1) the Oil and Gas Act's regulation of waste necessarily implied that efficient production of oil and gas reserves is permitted under New Mexico law, and (2) that the ordinance's prohibition on hydraulic fracturing acted as a de facto

⁷⁶ See *supra* Part II.B.4.

⁷⁷ See *supra* Part II.B.5.

⁷⁸ 81 F. Supp. 3d. 1075, 1199–1201 (D.N.M. 2015).

⁷⁹ 54 NAT. RES. J. 255, 310–11 (2015).

ban on new production, which constituted waste by precluding the efficient production of reserves and additionally deprived affected owners of their correlative rights.⁸⁰

As in *Swepi*, where the Waste Rule effectively prohibits oil production by banning a technique that is necessary to accomplish it, it would be contrary to the provisions of the Oil and Gas Act. By precluding the efficient production of oil reserves, the Rule may actually cause waste of those resources, rather than preventing it, and simultaneously destroy the correlative rights of the reservoir owners who are effectively denied the ability to extract the underlying oil.

Before completely condemning the Waste Rule, however, one would be wise to recall the Supreme Court case that recognized the existence at common law of waste and correlative rights. *Ohio Oil Co. v. Indiana* upheld against constitutional attack an Indiana statute categorically prohibiting the venting of natural gas from common reservoirs.⁸¹ The case arose when the Indiana attorney general sued the defendant for violating the statute by venting associated gas from several producing oil wells in a common reservoir. The defendant asserted that the venting prohibition constituted a taking of its mineral property, alleging that the venting was necessary to produce its oil reserves. The Court found no taking of the plaintiff's mineral rights, holding that Indiana had the power to adopt the statute to protect correlative rights and prevent a common pool "from being taken by one of the common owners without regard to the enjoyment of the others."⁸²

Ohio Oil Co. may be useful precedent for OCD in any constitutional challenge to the Waste Rule. There are, however, a number of circumstances that may distinguish *Ohio Oil Co.* from the present situation in the Permian Basin. The Indiana statute identified public safety and the avoidance of personal injury as an important ground for the venting prohibition;⁸³ the Waste Rule does not, and no such concerns seem to attend venting and flaring in the Permian Basin. The attorney general's petition against the defendant in *Ohio Oil Co.* made extensive allegations about the significance to surrounding municipalities and the local economy of the natural gas pool from which the defendant was producing oil and venting gas.⁸⁴ In the Permian Basin, in contrast, associated gas is largely a mere byproduct of oil production.

Moreover, the *Ohio Oil Co.* petition also alleged that the rate at which the defendant was venting gas threatened to water out the reservoir and irreparably destroy its potential to produce oil or gas.⁸⁵ Such inefficient or excessive dissipation of reservoir energy would constitute waste both at

⁸⁰ *Swepi*, 81 F. Supp. 3d at 1199–1201.

⁸¹ 177 U.S. 190, 200 (1900). The relevant portion of the statute read as follows:

Be it enacted by the General Assembly of the State of Indiana, That it shall be unlawful for any person, firm or corporation having possession or control of any natural gas or oil well, whether as a contractor, owner, lessee, agent or manager, to allow or permit the flow of gas or oil from any such well to escape into the open air, without being confined within such well or proper pipes or other safe receptacle, for a longer period than two (2) days next after gas or oil shall have been struck in such well. And thereafter all such gas or oil shall be safely and securely confined in such well, pipes or other safe and proper receptacles.

⁸² *Id.* at 210.

⁸³ *Id.* at 200.

⁸⁴ *Id.*

⁸⁵ *Id.*

common law⁸⁶ and statutory definitions of underground waste.⁸⁷ Even in case 2 or subcase 3.A, discussed above, where the operator’s routine venting and flaring is arguably necessary to avoid underground waste of oil, venting or flaring at excessive rates in a manner that destroys or threatens to destroy the reservoir would constitute prohibited waste.

Conclusion

Whether or not a court would find the Waste Rule to exceed OCD’s statutory authority under the Oil and Gas Act, or to expand the definition of “waste” beyond its common law and statutory moorings, in any given case, it is submitted that categorically eliminating routine venting and flaring of natural gas under the rubric of waste prevention is problematic. Regulating venting and flaring as sources of waste necessarily implicates the cost–benefit framework of common law and statutory waste. The factors that complicate the policy question of whether it is worth it to eliminate venting and flaring also complicate the legal question of whether it is possible to do so under existing statutory definitions of waste.

This is not to say that methane emissions, including especially routine venting and flaring, are unproblematic or that they cannot be limited legally. Rather, while it may be a worthy goal, achieving methane emission limitations is not obviously a simple matter of promulgating regulations under existing statutes. The true purpose behind efforts to curtail methane emissions from oil and gas production is to fight climate change. Advocates and regulators might do well to align this policy goal with the legal means of achieving it, rather than rely on existing statutory pathways that are imperfectly suited to the purpose.

⁸⁶ See *Manufacturers’ Gas & Oil Co. v. Indiana Natural Gas & Oil Co.*, 57 N.E. 912, 915 (Ind. 1900) (holding that it constituted actionable waste to produce natural gas at such a rate as to destroy the common reservoir).

⁸⁷ See N.M. STAT. ANN. § 70-2-3(A) (defining underground waste).