September 16, 2020

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Via Email to: nm.methanestrategy@state.nm.us

Dear Bureau Chief Bisbey-Kuehn:

On behalf of the Sierra Club, Clean Air Task Force, Western Environmental Law Center, Earthworks, San Juan Citizens Alliance, New Mexico Environmental Law Center, Diné C.A.R.E., Oil Change International, Conservation Voters New Mexico, CAVU - Climate Advocates Voces Unidas, Progress Now New Mexico, New Mexico Sportsmen, Rio Grande Indivisible, and Western Leaders Network, thank you for the opportunity to comment on the New Mexico Environment Department's draft *Oil Precursor Rule for Oil and Natural Gas Sector* ("Draft Rule"). Collectively, our organizations represent tens of thousands of New Mexicans, including many individuals who live in close proximity to oil and natural gas activity in the San Juan and Permian Basins. Reducing methane and volatile organic compound ("VOC") pollution from the oil and natural gas sector is one of our top priorities. Our organizations have a long history of engaging with federal, state, and local leaders to advocate for necessary protections against oil and natural gas sector pollution. We have participated at each step in this rulemaking, with several of our groups sending representatives to serve on the Methane Advisory Panel.

The publication of the Draft Rule constitutes an important step towards achieving nationally-leading methane emission limits, a key priority of Governor Michelle Lujan Grisham. The Governor set forth this policy in an executive order issued during her first month in office. *See Executive Order on Addressing Climate Change and Energy Waste Prevention*, E.O. 2019-003 (Jan. 29, 2019) ("Order"). Among other things, the Order explained:

- Methane is a powerful greenhouse gas, more than eighty times more effective at trapping heat than carbon dioxide over a twenty-year timeframe.

- The oil and gas industry is the largest industrial source of methane emissions.

- Emissions, venting, flaring, and leaks of natural gas by New Mexico's oil and gas industry result in the waste of an important source of domestic energy to the tune of an estimated $244 million per year.

- Oil and gas production growth in the New Mexico Permian Basin resulted in an 17% increase in venting and flaring volumes during the first seven months of 2018 compared to 2017 according to official state statistics.

- Efforts to reduce methane emissions throughout New Mexico will have a significant climate benefit as well as prevent the waste of energy resources.

- Science, innovation, collaboration, and compliance efforts can prevent waste, methane emissions and improve air quality while creating jobs for New Mexicans.

The Order goes on to direct NMED and the Energy, Minerals and Natural Resources Department 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 rules as soon as practicable."

Since the Order was issued, the urgency of addressing the climate crisis has only become more acute. As record wildfires, exacerbated by high temperatures associated with climate change, rage throughout the western United States, millions of Americans are faced with the worst air quality in the world. As Governor Lujan Grisham recently explained, declining air quality and rising temperatures present a threat to public health in New Mexico that is comparable to the threat posed by the COVID-19 pandemic.[1] Headlines from the past month such as *The Greenland Ice Sheet Has Melted Past the Point of No Return*,[2] *Death Valley, California, May Have Recorded the Hottest Temperature in World History*,[3] *Largest Wildfire in California History Rages out of Control*,[4] *Arctic Fires Set Record as Sea Ice, Ice Shelves Melt*,[5] and *Two Major Antarctic Glaciers Are Tearing Loose from their Restraints*[6] attest to the fact that climate change is already causing catastrophic, potentially irreversible damage. To do its part to mitigate this crisis, New Mexico must slash greenhouse gas emissions, beginning with the single largest source of emissions in the state, the oil and natural gas sector.[7] Oil and natural gas production and gathering activities in New Mexico emitted 1,016,000 metric tons of methane in 2017,[8] giving rise to a 20-year climate impact equal to the emission of nearly ***23 coal-fired power plants***.[9]

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[1] *Lujan Grisham Administration Condemns Federal Rollbacks of Methane Regulations* (Aug. 13, 2020).

[2] https://www.economist.com/graphic-detail/2020/08/25/the-greenland-ice-sheet-has-melted-past-the-point-of-no-return (Aug. 25, 2020).

[3] https://yaleclimateconnections.org/2020/08/death-valley-california-may-have-recorded-hottest-temp-in-world-history/ (Aug 17, 2020).

[4] https://www.nbcnews.com/now/video/largest-wildfire-in-california-history-rages-out-of-control-91458629544 (Sept. 10, 2020).

[5] https://www.washingtonpost.com/weather/2020/08/14/record-arctic-fire (Aug. 14, 2020).

[6] https://www.washingtonpost.com/climate-environment/2020/09/14/glaciers-breaking-antarctica-pine-island-thwaites/ (Sept. 14, 2020).

[7] https://www.climateaction.state.nm.us/documents/reports/NMClimateChange_2019.pdf at 4.

[8] *EDF: New Mexico Oil and Gas Data*

[9] The twenty-year global warming potential for fossil methane (including the carbon-cycle feedback) is 87, according to the fifth and most recent assessment report published by the Intergovernmental Panel on Climate Change (IPCC AR5). See Table 8.7 in Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang,

Even as emissions of methane and other greenhouse gases threaten the stability of the climate system, emissions of ozone-precursors including VOCs and NOx threaten regional and local air quality. Seven counties in the state of New Mexico, including all of the major oil and natural gas producing counties (Eddy, Lea, San Juan, and Rio Arriba), are currently at or above 95% of the 2015 national ambient air quality standard for ozone. This pollution threatens New Mexican's health and welfare, causing an estimated 22 premature deaths, 41 emergency room visits, and over 55,00 missed work and school days every year across the state.[10] Children, elderly individuals, and adults with asthma and other respiratory conditions face an especially high risk of adverse health impacts.[11] Oil and natural gas emissions are a major contributor to New Mexico's ozone problem, projected to contribute between 6 and 8 parts per billion to peak summer ozone levels in both the northwest and southeast corners of the state.[12]

Oil and natural gas emissions also contain toxic hazardous air pollutants ("HAPs"), such as formaldehyde, which causes cancer and respiratory symptoms, and benzene, which can cause cancer, anemia, brain damage, and birth defects. A 2016 report summarizing EPA risk assessments found that oil and natural gas emissions were causing residents of Eddy and San Juan Counties to experience an increased cancer risk of more than 1 in a million; residents of Lea County were subject to an increased cancer risk of greater than 1 in 250,000. Residents of San Juan County were also subjected to a respiratory health risk exceeding EPA's level of concern.[13]

While Governor Lujan Grisham correctly recognized in her Executive Order that the oil and natural gas industry is the largest source of methane emissions in New Mexico, new studies have shown that emissions from this industry are even larger than previously realized. For example:

D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf. Thus, 1,016,000 MT of methane has the same 20-year warming impact as 88,392,000 MT of CO2—equal to the annual emissions of 22.7 coal-fired power plants. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

[10] https://healthoftheair.org/

[11] *See* 80 FR 65304.

[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6718951/ (prospective study looking to 2025); see also https://pubs.acs.org/doi/abs/10.1021/acs.est.9b06983 (retrospective study based on 2014 emissions levels).

[13] https://www.catf.us/wp-content/uploads/2016/06/CATF_Pub_FossilFumes.pdf

- Rystad Energy reported that venting and flaring in the Permian Basin reached a new all-time high in the third quarter of 2019, averaging more than 750 million cubic feet per day.[14]

- The Environmental Defense Fund ("EDF") published a study showing that in 2017, New Mexico oil and gas operations emitted 1,016,000 metric tons of methane—more than five times the total reported by industry.[15]

- A study published in *Nature* reported that "anthropogenic fossil [methane] emissions are underestimated by about 38 to 58 teragrams . . . per year, or about 25 to 40 per cent of recent estimates."[16]

We trust you understand the gravity of this issue and will rise to the occasion in drafting nationally-leading regulations that will pave the way towards a zero-emission future.

TECHNICAL COMMENTS

1. Unless NMED Eliminates the Exemptions for Stripper Wells and Smaller Facilities, this will be the Most Ineffective Methane Rule Ever Promulgated

The proposed exemptions for stripper wells and facilities with a site-wide VOC potential to emit of less than 15 tons per year (collectively, the "Site-wide Exemptions")[17] must be *eliminated*. If either of these exemptions is maintained, this rule will fail to meet the Governor's climate goals and will leave hundreds of thousands of New Mexicans exposed to dangerous, preventable air pollution.

The Site-wide Exemptions would render the entire rule inapplicable to the vast majority of wells in the state. According to the Energy Information Agency, 65.1% of the oil wells in New Mexico (a total of 11,679 wells) are classified as stripper wells because they produce 10 barrels of oil a day or less.[18] There are 26,591 gas wells that produce less than 60,000 standard cubic feet per day.[19] Therefore, almost two-thirds of all oil and gas wells in the state would be almost completely exempt from a rule designed to reduce emissions from oil and gas wells. An even larger number of facilities would potentially be exempted because their site-wide potential to emit ("PTE") is less than 15 tons per year ("TPY"). **As our colleagues at EDF will show in**

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[14] *Permian Gas Flaring Reaches Yet Another High*, RYSTAD ENERGY (Nov. 5, 2019)

[15] *EDF: New Mexico Oil and Gas Data*

[16] Hmiel, B., Petrenko, V.V., Dyonisius, M.N. et al., *Preindustrial $^{14}CH_4$ Indicates Greater Anthropogenic Fossil CH_4 Emissions*, 578 NATURE 409 (2020)

[17] The Site-Wide Exemptions can be found at §§ 20.2.50.6 (C) and (D) and 20.2.50.25 of the Draft Rule.

[18] https://www.eia.gov/petroleum/wells/pdf/full_report.pdf, Table B39.

[19] *Id.*

their comments, approximately 95% percent of wells would be eligible for one or both exemptions under the proposed rule.

The Site-wide Exemptions do not serve a coherent purpose. First, for the most important sources of emissions subject to this regulation, there is little or no correlation between the size or productivity of the wells associated with the equipment and the emissions from the equipment. As a simple example, emissions from high-bleed controllers are completely independent of the level of production or PTE for the site where they are installed. Indeed, although replacement of high-bleed controllers has been required in Colorado, California, areas subject to EPA's Control Techniques Guidelines, and other jurisdictions, no U.S. jurisdiction has exempted stripper wells or low-PTE facilities from these mandates.

Nor is there a strong correlation between facility size and the cost-effectiveness of leak detection and repair ("LDAR"). The "super-emitter" phenomenon has been repeatedly documented. One study found that 1% of natural gas well sites were responsible for 44% of total methane emissions.[20] These "super-emitters" were responsible for far more pollution than would have been expected simply by looking at the potential to emit of the individual components at the site. As explained in the MAP Report, there is at best a weak relationship between the size of a well and the likelihood that it will be a super-emitter.[21] **None of the jurisdictions that have adopted LDAR requirements for the oil and natural gas production sector have ever adopted exemptions as sweeping as the ones NMED has proposed here.**[22]

Second, for the remaining sources, the draft regulations generally contain specific exemptions for lower-emitting equipment (for example, the exemption for glycol dehydrators with PTE less than or equal to 2 TPY in § 20.2.50.18(A)), and/or tier standards so that lower-emitting equipment is subject to less stringent standards (for example, the engine and turbine standards in § 20.2.50.13 and the storage tank standards in § 20.2.50.23). Indeed, the LDAR provisions themselves contain tiering provisions tied to PTE (see § 20.2.50.16(C)(2)(b)), similar to those used in Colorado's successful LDAR program. Because many of the equipment-specific regulations already include relaxed requirements for lower-emitting equipment, there is no need for a blanket exemption based on the PTE of the facility as a whole. No other U.S. jurisdiction has exempted stripper wells and smaller PTE sites from emission standards for venting oil and gas equipment in the way the draft rules contemplate.

To the extent that NMED intended these exemptions to provide relief to "smaller" oil and gas operators, the provision does not do that. The exemption is tied to the size of the facility, not the size of the operator. Many of the facilities that would be exempted are owned by companies that enjoy annual revenues of $500 million or greater, who can easily afford to implement best practices to reduce dangerous pollution.

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[20] https://www.nature.com/articles/ncomms14012

[21] MAP Report at 39 & n.17.

[22] *See* Table A, *supra*, (Applicability of LDAR Programs Regulating the Oil and Natural Gas Production Sector).

Given the lack of any precedent for NMED's proposed exemptions, the inconsistency between the proposed exemptions and other provisions of the rule,[23] and the fact that no commenter appears to have advocated for these exemptions,[24] it is clear that the rule would be better without these exemptions. NMED should not attempt to modify or fix them. Rather, NMED should simply delete the Site-wide Exemption provisions.

2. LDAR

Emissions from leaks and abnormal operating conditions are the largest source of methane emissions in New Mexico, contributing about 702,200 metric tons of methane emissions in 2017.[25] Using methane's 20-year global warming potential, the emissions in 2017 are the equivalent of 61 million metric tons of CO2—almost sixteen coal plants' worth.[26] It is possible to control emissions from equipment leaks and abnormal operating conditions in a cost-effective manner, using a quarterly LDAR program. Numerous jurisdictions require exactly this type of program.[27] LDAR programs have the added benefit of creating good-paying jobs that cannot be outsourced,[28] while preventing waste and increasing state tax revenue.

On its own, NMED's LDAR provision is excellent. It would be one of the strongest such regulations in the nation and would greatly benefit the state and its residents by preventing waste, reducing emissions, and creating jobs. The proposal should be strengthened by requiring monthly LDAR at facilities with the potential to emit at least 50 tons per year of VOCs—something Colorado now requires.[29] Otherwise, few changes are needed to 20.2.50.16 itself.

Unfortunately, the Site-wide Exemptions would render the LDAR provision largely toothless. We note that exempting wells from LDAR based on low production is strikingly similar to a key provision in the revisions to NSPS Subpart OOOOa that EPA finalized last month which, among other things, exempt well-sites that produce less than 15 barrels a day from LDAR requirements. Governor Lujan Grisham condemned these revisions, explaining that it was "utterly disheartening and sadly unsurprising to hear once again that critical environmental

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[23] For example, 20.2.50.16(b)(i) contemplates that LDAR should occur annually at well production or tank battery facilities with a PTE of less than 2 tons per year, semiannually at facilities with a PTE between 2 and 5 tons per year, and quarterly at facilities with a PTE equal to or greater than 5 tons per year. The Site-wide Exemptions would nullify this provision.

[24] The MAP Report contains isolated discussion of the question whether stripper wells should be exempt from quarterly LDAR requirements or from a possible requirement to retrofit existing storage tanks. *See* MAP Report at 243–44, 293.

[25] *EDF: New Mexico Oil and Gas Data*

[26] See supra, note 9, explaining how this equivalency was calculated.

[27] See MAP Report at 48–51.

[28] https://www.edf.org/how-reducing-methane-emissions-creates-jobs

[29] *See* 5 Colo. Code Regs. § 1001-9:D.II.E.4.b and Table 3.II.E.4.e.

regulations are being rolled back by the Trump administration[.]" NMED Cabinet Secretary James Kenney likewise condemned the revisions, explaining: "These rollbacks make it even more essential that our regulations secure greater emission reductions from the oil and gas sector."[30] We agree: these revisions are not good precedent for this rulemaking. Incredibly, the exemption for low production in the proposed NMED rule is even wider than the new exemption created by the Trump Administration. The revised Subpart OOOOa requires LDAR at any site producing more than 15 barrels of oil equivalent per day *per site*, while the NMED exemption is based on production per *well*. And NMED's proposal includes *an additional exemption* not found in the Trump Administration's revisions, based on the PTE of the site.

Indeed, the Site-wide Exemptions and the LDAR provisions are in direct conflict. The LDAR provision (20.2.50.16) sets forth a tiered approach, pursuant to which LDAR must occur annually at well production or tank battery facilities with a potential to emit of less than 2 tons per year, semiannually at facilities with a potential to emit between 2 and 5 tons per year, and quarterly at facilities with a potential to emit equal to or greater than 5 tons per year. Yet the Site-wide Exemptions provision (20.2.50.25) purports to exempt facilities with the potential to emit 15 tons or less from *any* of the rule's other requirements. Deleting the misguided Site-wide Exemptions will result in a strong, effective LDAR requirement that will provide significant benefits for New Mexicans.

3. Pneumatic Devices

Pneumatic devices are the second largest sources of methane emissions in the New Mexico. In 2017, pneumatic controllers were responsible for 137,800 metric tons of methane emissions in New Mexico. Malfunctioning controllers were responsible for more than half of this total (83,800 metric tons). Low-bleed controllers were the second largest source, at 35,100 metric tons, followed by intermittent-bleed controllers (13,000 metric tons), and high-bleed controllers (4,600 metric tons). Pneumatic pumps contributed an additional 3,630 metric tons.[31]

It is extremely cost-effective to eliminate emissions from these devices. Unfortunately, NMED's proposed rules for controllers only affects high-bleed controllers, which only emit about 3% of total methane pollution from pneumatic controllers. NMED's proposed rule would allow operators to continue using highly-polluting controllers despite the fact that technically and economically feasible alternatives exist and other jurisdictions have rules in place that will reduce emissions far more effectively than will the proposed rule. The following problems must be fixed to ensure that the final rule adequately protects New Mexicans:

First, the Site-Wide Exemptions must be eliminated. We are not aware of any jurisdiction that exempts stripper wells or smaller facilities from requirements pertaining to pneumatic devices. As described above, such a blanket exemption is illogical, unwarranted, and would allow unnecessary pollution. Operators should remove all high-bleed controllers at all sites, regardless of production or site PTE, since doing so is cost-effective and inexpensive in all

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[30] https://www.env.nm.gov/wp-content/uploads/2020/08/2020-08-13-Admin-condemns-fed-methane-rollbacks.pdf

[31] *EDF: New Mexico Oil and Gas Data*

cases.[32] Further, operators should be inspecting controllers at all sites whenever LDAR inspections are performed (that is, according to the LDAR inspection schedule set out in proposed § 20.2.50.16, disregarding the Site-wide Exemptions). As described below, it is well-established that pneumatic controllers frequently malfunction and emit excessively, so broad programs for inspection of pneumatics are called for at all sites.

Second, the NMED rules must follow the lead of other jurisdictions and prohibit installation of new gas-driven controllers, given the cost-effectiveness and feasibility of doing so. Several technologies are available that can cost-effectively replace gas-driven pneumatic controllers, at new and existing sites, *with and without electricity available*. Compressed "instrument air" systems have been in use for years, and recently several systems for utilizing solar power to compress air on well-pads with no other available electrical power have come to the market.[33] More recently, electric controllers suitable for solar power/battery systems have been developed.[34] As discussed in the MAP Report, solar-powered pneumatic devices are a technically and economically feasible alternative to continuous-bleed devices.[35] These systems have been proven in Northern Alberta—a location far harsher for utilization of solar than New Mexico.[36] Our analysis has shown that utilizing these technologies, instead of gas-driven controllers, at new and existing well-pads and compressor stations is a cost-effective mitigation approach for reducing VOC and methane emissions.[37]

This conclusion is well supported by a number of recent regulations that prohibit installation of new gas-driven pneumatic controllers (unless their emissions are captured/controlled) at certain facilities:

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[32] EPA. Regulatory Impact Analysis Proposed New Source Performance Standards and Amendments to the National Emissions Standards for Hazardous Air Pollutants for the Oil and Natural Gas Industry (July 2011).

CDPHE, Cost-Benefit Analysis For proposed revisions to Colorado Air Quality Control Commission Regulation Number 3 (5 CCR 1001-5) and Regulation Number 7 (5 CCR 1001-9) (Feb. 2014).

[33] See for example https://lcotechnologies.com/products-crossfire.html and https://westgentech.com/epod/.

[34] Calscan Solutions. Bear Solar Electric Control System. Available at: http://www.calscan.net/products_bearcontrol.html.

[35] MAP Report at 19, 23.

[36] Carbon Limits. Zero emission technologies for pneumatic controllers in the USA: Applicability and cost effectiveness. (2016). Available at: https://www.carbonlimits.no/project/zero-emission-technologies-pneumatic-controllers-in-usa/.

Colorado Air Pollution Control Division, CDPHE. Pneumatic Controller Task Force Report to the Air Quality Control Commission. (June 2020). (PCTF report)

[37] Colorado rulemaking. Conservation Groups' Initial Economic Impact Analysis. (2017)

Carbon Limits (2016).

- **Alberta** has prohibited the installation of any new gas-driven pneumatic controllers that vent to the atmosphere, beginning on January 1, 2022.[38]

- **British Columbia** prohibits the use of any venting pneumatic controller at any new site, beginning January 1, 2021.[39]

- Very recently, **Colorado's** Air Pollution Control Division proposed a rule prohibiting installation of any venting controllers at all new or modified facilities statewide after May 1, 2021.[40] We anticipate that any existing wellpad will be considered to be "modified" if a new well is drilled or an existing well is re-completed.

- Finally, we note that **California** prohibited installation of new continuous-bleed controllers (whether "high-bleed" or "low-bleed") several years ago.[41] However, considering that intermittent-bleed controllers are far more common than continuous bleed controllers, and the fact that zero-emitting technologies such as utilizing instrument air or solar-generated electricity can be used to replace intermittent-bleed controllers, the California approach is not adequate.

In contrast to the approach taken by these jurisdictions, NMED proposes to allow operators to continue installing venting gas-driven pneumatic controllers indefinitely at sites that do not have access to electrical power. Given the challenges industry has noted in bringing grid electrical power to sites, we anticipate that, if the proposed regulations were finalized, industry would continue to use natural gas-driven controllers at the vast majority of sites in New Mexico.

Regulations are needed to ensure that operators utilize electric controllers, instrument air-driven controllers, or else capture natural gas that is used to drive these devices. NMED should adopt the approach taken by the above jurisdictions and prohibit new installation of venting pneumatic controllers.

Third, NMED should require operators to replace existing venting gas-driven pneumatic controllers at large facilities. British Columbia requires operators to replace all

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[38] Alberta Energy Regulator, Directive 060, § 8.6.1

[39] B.C. Rule § 52.05.

[40] Proposed 5 Colo. Code Regs. § 1001-9:D.III.C.3.d. We note that the proposed rules would allow operators to install venting controllers if necessary "for a safety or process purpose." Proposed 5 Colo. Code Regs. § 1001-9:D.III.C.3.d(i). Based on our experience with other provisions of Colorado regulations which include similar provisions, we do not expect operators to frequently attempt to utilize that provision. For example, see McCabe et al. (2014), *Waste Not: Common Sense Ways to Reduce Methane Pollution from the Oil and Natural Gas Industry,* Available at: https://www.catf.us/resource/waste-not-reduce-methane-pollution/, at 26 (documenting that no operator even requested an exemption under a similar provision in a parallel Colorado regulation that required replacement of high-bleed controllers).

[41] Cal. Code Regs. tit. 17, § 95668(e)(2).

venting gas-driven pneumatic controllers at large compressor stations by January 1, 2022.[42] In 2018, the Colorado Air Pollution Control Division investigated the status of pneumatic controllers at gathering compressor stations in the portion of the Denver-Julesberg Basin that is in the Front Range Ozone Non-Attainment area. They obtained information on 50 of the 58 stations in the area (86%). Of these 50 stations, only two (4%) were using, and planning to continue using, venting gas-driven controllers. The remaining stations were either using instrument air for controllers, installing equipment to use instrument air in the near future, or depressurized/offline.[43]

As stated above, retrofitting existing sites with solar-powered electric controllers or instrument air to eliminate venting controllers is a cost-effective way to reduce VOC and methane emissions. We used results from a 2016 study by the consultancy Carbon Limits,[44] together with a cost estimation tool produced by the same consultants,[45] to estimate the cost-effectiveness of retrofitting Permian Basin and San Juan Basin well-pads with solar-powered electric controllers. Our cost estimates include labor; costs of solar panels, batteries, and control panels; and account for the fact that the electrical systems used to power controllers can power multiple controllers, provided they are sized correctly. This means that the cost-effectiveness of these systems varies with the amount of pneumatic controllers and pumps at the site, and the cost per ton of abated pollution generally drops as the number of controllers / pumps increases. Since the number of controllers and pumps generally scales with the number of wells on a pad, we present abatement cost estimates for pads of various sizes.

We used greenhouse gas reporting program data to find the average number of pumps and controllers per well in the two basins, and the average VOC and methane content in the gas vented by controllers. We made conservative assumptions about the price of gas ($2/mcf) and we assumed that no electricity is available on site.

Table 1 shows the calculated abatement costs per ton of VOC and per ton of methane for retrofitting well-pads with one to six wells per pad.

Number of Wells on Pad	Permian Basin		San Juan Basin	
	Cost/ton VOC	Cost/ton Methane	Cost/ton VOC	Cost/ton Methane
1	$3,782	$2,579	$3,790	$948

[42] B.C. Rule § 52.05. Large compressor stations are defined as those with total compression power of at least three megawatts (4,023 horsepower).

[43] PCTF Report at 10.

[44] Carbon Limits (2016).

[45] Carbon Limits. Zero emission technologies for pneumatic controllers in the USA: Abatement Cost Tool. (2016)

2	$1,853	$1,263	$3,098	$774
3	$1,572	$1,072	$3,005	$751
4	$1,572	$1,072	$2,863	$716
5	$1,279	$872	$2,853	$713
6	$1,279	$872	$2,819	$705

Source: CATF analysis using Carbon Limits Cost Estimation Tool for Zero-Emitting Controllers. Calculated using GHGRP data for number of controllers and pumps per well in Permian and San Juan Basins, together with GHGRP data for VOC and methane content of gas. Assumes conserved gas is valued at $2 per mcf. For San Juan basin, we assume maintenance costs for gas driven controllers corresponding to "dry gas," despite moderate VOC content of SJB gas. This is a conservative assumption, as Carbon Limits found that electric controllers are more cost-effective when replacing controllers driven by "even slightly" wet gas, since the wet gas causes maintenance issues for the gas-driven controllers.

As Table 1 shows, the abatement costs per ton of VOC and methane for retrofitting well-pads with solar-powered electric controllers are very reasonable, especially for pads with more than one well. As the NMED rulemaking proceeds, we will provide the Department with a more formal and documented proposal for retrofitting well-pads with solar-powered electric controllers. This is a cost-effective way to greatly reduce methane and VOC emissions from New Mexico oil and natural gas operations and NMED must fully evaluate this option.

Fourth, NMED must institute a robust inspection program for pneumatic controllers. Malfunctioning pneumatic devices are the largest source of emissions from pneumatic devices, and multiple studies have shown that they malfunction quite frequently.[46] For this reason, several jurisdictions (including Colorado and California) require operators to specifically inspect pneumatic controllers during LDAR inspections to ensure that pneumatic

[46] E.g., Stovern, 2020: Understanding oil and gas pneumatic controllers in the Denver-Julesburg basin using optical gas imaging, Journal of the Air & Waste Management Association.

Luck, B.; Zimmerle, D.; Vaughn, T.; Lauderdale, T.; Keen, K.; Harrison, M.; Marchese, A.; Williams, L.; Allen, D. Multiday Measurements of Pneumatic Controller Emissions Reveal the Frequency of Abnormal Emissions Behavior at Natural Gas Gathering Stations. Environ. Sci. Technol. Lett. 2019, 6, 348−352.

ERG and Sage Environmental Consulting, LP, *City of Fort Worth Natural Gas Air Quality Study, Final Report.* (July 13, 2011) ["Fort Worth Study"]. See 3-99 to 3-100 ("Under normal operation a pneumatic valve controller is designed to release a small amount of natural gas to the atmosphere during each unloading event. Due to contaminants in the natural gas stream, however, these controllers eventually fail (often within six months of installation) and begin leaking natural gas continually"). Available at https://fortworthtexas.gov/uploadedFiles/Gas_Wells/AirQualityStudy_final.pdf

The Prasino Group, *Determining bleed rates for pneumatic devices in British Columbia; Final Report* (Dec. 18, 2013), at 19 ("Certain controllers can have abnormally high bleed rates due to operations and maintenance; however, these bleed rates are representative of real world conditions and therefore were included in the analysis."). Available at: https://radiclebalance.com/wp-content/uploads/2020/06/ei-2014-01-final-report20140131.pdf.

devices are not venting between actuation events or otherwise operating improperly.[47] Both of these programs lay out specific inspection criteria for pneumatic controllers. The *Methane Guiding Principles Partnership* likewise recommends including pneumatic devices in LDAR programs, explaining that "[i]nspection and maintenance programs for pneumatic devices have been effective" in reducing emissions.[48]

At a bare minimum, NMED must add "pneumatic controller" to the list of equipment and component types that must be inspected during each AVO and OGI inspection in proposed §§ 20.2.50.16 C(2)(a) and (C)(2)(b). However, NMED should go further and develop a proper inspection program specifically designed to reduce emissions from malfunctioning pneumatic controllers.

Fifth, NMED should prohibit venting from pneumatic pumps. California prohibits venting from new *or existing* pneumatic pumps.[49] Existing pumps must be retrofitted, either by installing a vapor recovery system to collect vented gas, or by retrofitting the pump to use compressed air or electricity instead of gas.[50] Similarly, British Columbia and Alberta prohibit venting from new pneumatic pumps that operate more than 750 hours per year.[51] Because there are numerous cost-effective alternatives to venting from pneumatic pumps, NMED should prohibit this wasteful practice.

4. Liquids Unloading

About 21,700 metric tons of methane are vented to the atmosphere each year in New Mexico as a result of liquids unloading.[52] Almost all of these emissions occur in the San Juan Basin. Accordingly, reducing emissions from liquids unloading is especially important for the tribal communities in northwest New Mexico. Unfortunately, NMED's proposal is not nationally leading and does not go far enough in controlling this important source of emissions.

Regulations previously adopted by BLM and Colorado should serve as a starting point for New Mexico's regulations. BLM's Waste Prevention Rule, as promulgated in 2016, included important requirements that are not present in NMED's rule. Before an operator could manually purge a well for liquids unloading, the operator was required to "consider other methods for

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[47] Cal. Code Regs. tit. 17, § 95668(e) (3)–(4); 5 Colo. Code Regs. § 1001-9:D.III.F.2 – III.F.5

[48] https://methaneguidingprinciples.org/wp-content/uploads/2019/11/Reducing-Methane-Emissions-Synopsis-Pneumatic-Devices.pdf

[49] Cal. Code Regs. tit. 17, § 95668(e)(4).

[50] *Id.*, § 95668(e)(5).

[51] Alberta Energy Regulator, Directive 060, § 8.6.1; B.C. Rule § 52.06.

[52] *EDF: New Mexico Oil and Gas Data*

liquids unloading and determine that they [were] technically infeasible or unduly costly."[53] BLM also required operators to record the cause, date, time, duration, and estimated volume of each venting event.[54] Operators were also required to notify BLM if the cumulative duration of manual well purging events exceeded 24 hours during any month, or if the estimated volume of gas vented in liquids unloading by manual well purging from a well exceeded 75,000 standard cubic feet during any month.[55]

Similarly, in Colorado, "any means of creating differential pressure must first be used to attempt to unload the liquids from the well without emitting."[56] Venting is permitted only where all other options for unloading have been exhausted, and even then, only if the operator remains onsite to ensure the emissions are limited to the maximum extent practicable.[57] In adopting this provision, the Colorado Air Quality Control Commission explained: "EPA's Natural Gas STAR program advocates the use of a plunger lift system to reduce the need for liquids unloading, and indicates that such systems may pay for themselves in about one year. The Commission has determined that the use of technologies and practices to minimize venting, including plunger lift systems, are available and economically feasible, and encourages their use in Colorado."[58] The *Methane Guiding Principles Partnership* likewise recognizes that the use of automated liquid-removal systems (like plunger lifts) can be an effective way to eliminate the need for venting during liquids unloading.[59]

To craft a nationally leading rule that will adequately protect the health and welfare of New Mexicans, NMED should build upon the BLM rule and adopt additional emission control requirements that further reduce emissions while preserving operator flexibility. NMED should adopt regulations providing that:

- Before purging a well, an operator must attempt to unload the liquids from the well without emitting. Among other things, the operator must consider using velocity tubing, foaming agents, wellhead compression, or a plunger lift system. If the operator elects to manually vent, the operqtor must use a vapor recovery unit to capture gas that is vented, unless the vented gas not have sufficient heating value to sustain combustion.

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[53] 43 C.F.R. § 3179.104(c) (effective Nov. 16, 2016).

[54] *Id.*, § 3179.104(d)(2).

[55] *Id.*, § 3179.104(f).

[56] 5 Colo. Code. Regs. § 1001-9:D.II.G.1.a.

[57] *Id.*

[58] 5 Colo. Code Regs. § 1001-9, Part F.

[59] *Methane Guiding Principles: Venting.*

Even if an operator demonstrates to NMED's satisfaction that venting is the only viable option for unloading the well, the operator must take reasonably available steps to minimize venting. The proposed rule appropriately requires operators to reduce wellhead pressure prior to blowdown, monitor liquids unloading in close proximity to the well or via remote telemetry, and to close all well head vents and return the well to normal production as soon as possible. In addition, to protect public health, venting should not be permitted during ozone season (May 1 through September 30).

5. Storage Tanks

In 2017, storage tanks in New Mexico were responsible for 22,700 metric tons of methane emissions. Of this total, 10,100 metric tons were emitted by oil and condensate tanks, while 12,600 metric tons were emitted by produced water tanks.[60]

Were it not for the Site-Wide Exemptions (which, as explained, would leave the vast majority of facilities in New Mexico essentially unregulated), NMED's proposed regulation of storage tanks would be quite strong. NMED has appropriately proposed to require capture or control of emissions from any tank with the potential to emit 2 tons per year of VOC or greater. This is the same threshold that now applies to tanks in Colorado.[61] NMED has also appropriately proposed to require operators to perform LDAR at storage tanks.

Unfortunately, however, the rule does nothing to compel, incentivize, or even encourage operators to capture gas for sale or use in a process, instead of flaring. While flaring is certainly superior to venting, flaring still results in large amounts of CO_2 pollution, with smaller amounts of CO, NOx, unburned hydrocarbon (methane and VOC), and (for sour gas) SO_2 pollution.[62] Flaring from tanks is a particularly large source of pollution. In the Permian Basin as a whole (including operators in both Texas and New Mexico), operators subject to EPA's greenhouse gas reporting rules reported emitting 1,390,000 tons of CO_2 from enclosed combustors or flares for

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[60] *EDF: New Mexico Oil and Gas Data*

[61] 5 Colo. Code Regs. § 1001-9:D:II.C.1.c.

[62] https://www.sciencedirect.com/science/article/pii/S1018363914000075#:~:text=Combustion%20of%20fossil%20fuels%20such,warming%20(EPA%2C%202008).&text=Uncontrolled%20oxides%20of%20nitrogen%20emission%20could%20be%20injurious%20to%20health

tanks at well-pads in 2018.[63] These emissions are smaller than, *but of similar scale to*, the 6,020,000 tons of reported CO_2 emissions in 2018 from flaring of associated gas from oil wells.[64]

Similarly, operators of gathering systems in the Permian as a whole reported emitting 712,000 tons of CO_2 from enclosed combustors or flares for tanks at gathering compressor stations in 2018.[65] This amounts to 35% of flaring from gathering compressor stations in the Permian that year.[66]

The failure of the draft NMED rule to promote capture for sale or use over control via combustion is greatly compounded by the failure of the draft companion waste rules from OCD to treat combusted gas from tanks as waste.[67] As we argue in our comments to OCD, this is not logical or in the spirit of the OCD rules, and it is also not in the spirit of NMED's Draft Rule. The hydrocarbons in vapors from a tank are valuable products that should be conserved and used rather than combusted, just as the hydrocarbons in associated gas should be used rather than combusted. And, the CO_2 and other pollutants emitted by combustors controlling emissions from tanks, while smaller in volume, are harmful in the same way that pollutants from associated gas flaring are harmful.

Relatively new technologies are also available to facilitate capture of gas for sales or process. For example, catalytic systems are available to remove oxygen that can contaminate gas recovered from tanks, so that it can be injected into gathering pipelines without contaminating the gas in those pipelines.[68]

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[63] EPA Subpart W, https://oaspub.epa.gov/enviro/AD_HOC_TABLE_COLUMN_SELECT_V2.retrieval_list. EF_W_ATM_STG_TANKS_CALC1OR2: "Large" tanks, greater than or equal to 10 bbls of throughput per day. CO_2 emissions from Tanks with Flaring for basin 430 (Permian). EF_W_ATM_STG_TANKS_CALC3: "Small" tanks, less than 10 bbls of throughput per day. CO_2 emissions from Tanks with Flares for basin 430 (Permian). EF_W_ASSOCIATED_NG_UNITS: Data for associated gas venting and flaring. Associated Gas Flaring CO_2 for basin 430 (Permian).

[64] *Id.*

[65] EPA Subpart W, https://oaspub.epa.gov/enviro/AD_HOC_TABLE_COLUMN_SELECT_V2.retrieval_list. EF_W_EMISSIONS_SOURCE_GHG: CO2 emissions from Atmospheric Storage Tanks for basin 430 (Permian)

[66] *Id.*

[67] Draft § 19.15.27.8, paragraph E(3) lists all sources of vented or flared gas that must be reported by operators of well facilities to OCD on from C-115B; venting or flaring from most of these sources is limited by Draft 19.15.27.9. While paragraph E(3) includes "uncontrolled storage tanks" as a source that must be reported, it does not include gas that is combusted from controlled tanks. Similarly, for gathering systems, Draft 19.15.27.22, paragraph C(7) includes "uncontrolled storage tanks" as a source that must be reported, but omits gas that is combusted from controlled tanks.

[68] See, for example, https://www.ecovaporrs.com/zero2-solutions/.

In addition to the changes we urge OCD to make to incentivize capture for sale over combustion, NMED's proposal could easily be strengthened to address this issue and bring the tanks provisions in line with the Governor's directives. First, NMED should require that vapors from new tanks be captured and routed to a process or sales, rather than controlled via combustion. Additionally, NMED should create a phase-in schedule to convert tanks with larger PTE from control via combustion to capture for sales or use.

NMED should also strengthen other provisions in the storage tank rule in order to achieve the Governor's goal of setting nationally-leading methane regulations. For example, while NMED proposes to require operators to capture and control 95% of emissions from storage tanks with the potential to emit between 6 and 10 tons per year, operators in Wyoming are required to capture and control ***98%*** of emissions from these tanks.[69] Similarly, while NMED laudably proposes to require operators to install a control device to ensure that thief hatches automatically close once tank overpressure is relieved, it has not proposed to require automatic tank gauging. Automatic tank gauging systems can eliminate the need for operators to open the thief hatch to measure the liquid in the tank, thereby reducing venting, and reducing the chance of emissions from improperly sealed thief hatches after gauging is completed. These systems are already widely deployed. Colorado requires that new tanks have gauging systems allowing operators to measure the quantity of liquid in the tank without opening the thief hatch.[70] Beginning on January 1, 2021, new tanks in Colorado must have systems allowing operators to measure the quantity *and quality* of liquid in the tank without opening the thief hatch.[71] The *Methane Guiding Principles Partnership* likewise endorses the use of automatic gauging.[72]

We strongly encourage NMED to make the storage tank provision stronger by (1) requiring operators to capture vapors from all new tanks and route them to a process or sales, rather than control emissions from new tanks with combustion; (2) phase in requirements for capture, rather than control via combustion, for existing tanks with larger PTE; (3) increasing the capture-and-control requirement from 95% to 98% for tanks with the potential to emit 6 tons per year or greater; and (4) requiring automatic tank gauging at new storage tanks.

However, the largest problem is not that the storage tank provision is too weak; the problem is that the vast majority of storage tanks will not be subject to this provision unless the Site-wide Exemptions are eliminated. If these exemptions remain, oil and natural gas operations will continue emitting large amounts of methane and VOCs that could be mitigated at reasonable cost, causing unnecessary climate harm and contributing to elevated levels of ozone pollution in

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[69] http://deq.wyoming.gov/media/attachments/Air%20Quality/New%20Source%20Review/Guidance%20Documents/5-12-2016%20Oil%20and%20Gas%20Guidance.pdf

[70] 5 Colo. Code Regs. § 1001-9:D.II.C.4.a.(i) and § 1001-9:D.II.A.21 (definition of "Storage tank measurement system."

[71] 5 Colo. Code Regs. § 1001-9:D.II.C.4.a.(ii).

[72] *Methane Guiding Principles: Venting.*

New Mexico. Because emissions from tanks are particularly rich in VOC relative to many other oil and natural gas sources, applying the Site-wide Applicability limits to tanks will have an especially pronounced impact on regional ozone pollution. Moreover, tanks emissions are also rich in hazardous air pollutants, like cancer-causing benzene, which can cause acute harm to people living near oil and natural gas production sites. There is simply no reason any storage tank in New Mexico should be exempt from NMED's regulations.

6. Compressors

Compressor leaks were responsible for 17,500 metric tons of methane in New Mexico in 2015.[73] There are cost-effective options for reducing emissions from both centrifugal and reciprocating compressors that are well established and have been required in other jurisdictions for some time. Unfortunately, NMED's proposal is significantly weaker than what several other jurisdictions already require. In some instances, it is less demanding than the EPA regulations that already apply to New Mexico operators.[74]

The following changes are needed to ensure that NMED's rule achieves emission reductions that are comparable to what other jurisdictions already require.

- **The Site-Wide Exemptions must be eliminated.** We are not aware of any U.S. jurisdiction that exempts stripper wells or smaller facilities from requirements pertaining to compressors.

- **NMED should not exempt well-pad compressors.** Both California and Canada's federal government regulate compressors located on well-pads.[75] In addition, Colorado regulates centrifugal compressors located at well-pads.[76] It is not rational to exempt compressors based on where they are located. For example, the control strategies for wet-seal centrifugal compressor seals are generally applicable at all sites, and are not less effective simply because the compressor is in proximity to a well or a group of wells. Controlling these

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[73] https://www.edf.org/sites/default/files/new-mexico-methane-analysis.pdf

[74] For example, NMED's proposed regulation of reciprocating compressors is weaker than Subpart OOOO, adopted in 2012. NMED proposes to require operators to do one of the following: (1) change the rod packing every 26,000 operating hours or every 3 years, whichever is later, or (2) collect emissions from the rod packing under negative pressure and route via a closed vent system to a control system, a recovery system, fuel cell, or a process stream. This is substantively identical to Subpart OOOO. 40 C.F.R. § 60.5385. But in contrast to Subpart OOOO, which applies to all reciprocal compressors installed or modified upstream of the wellhead, NMED's proposal would exempt compressors located at facilities with a calculated potential to emit of less than 15 tons per year.

[75] Cal. Code Regs. tit. 17, § 95668 (c)(3), (d); *see Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)* (SOR/2018-66) [hereinafter "Canada Federal Regulations"], § 14.

[76] 5 Colo. Code Regs. § 1001-9:D.II.B.3.b.

emissions is particularly straightforward and cost-effective, so there is no reason any wet-seal centrifugal compressor should be exempt from the rule.

- **With respect to existing reciprocal compressors, NMED should look to Canada.** Canada requires operators to measure emissions from reciprocating compressor rod packing vents and conduct repairs in the event the compressor is emitting in excess of 0.023 standard cubic meters (0.81 standard cubic feet) per minute per cylinder.[77] California's regulation takes a similar approach, but has an overly lenient threshold for repair (2 standard cubic feet per minute, per cylinder).[78]

7. Completions and Recompletions[79]

Completions and recompletions are an important source of methane emissions, that will increase in importance if changing commodity prices lead to another wave of build-out. Although this topic was discussed extensively by the Methane Advisory Panel, it is conspicuously missing from NMED's proposed rule. NMED should correct this oversight by requiring the use of green completions except in strictly limited circumstances.

Although EPA requires green completions at most wells under Subpart OOOOa,[80] some operators have been exploiting ambiguities in this regulation to avoid deploying reduced emission completion ("REC") equipment. NMED should adopt regulations that are more protective of public health and the environment. Canada's federal regulations which provide that "Hydrocarbon gas associated with flowback at a well at an upstream oil and gas facility ***must not be vented*** during flowback but must instead be captured and routed to hydrocarbon gas conservation equipment or hydrocarbon gas destruction equipment."[81] There is only one exception to this flat ban on venting: the prohibition does not apply "if all the gas associated with flowback at the well does not have sufficient heating value to sustain combustion."[82] Similarly, Colorado regulators have recently proposed to require control of at least 95% of emissions during the entire flowback period.[83]

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[77] *See* Canada Federal Regulations, § 18(3)(b).

[78] Cal. Code Regs. tit. 17, § 95668(c)(4)(D).

[79] A more extensive discussion of this topic is found in Western Environmental Law Center, et al.'s comments on the Oil Conservation Division's Natural Gas Waste Draft Rule. We incorporate this discussion herein by reference.

[80] 40 C.F.R. § 60.5375a.

[81] Canada Federal Regulations, § 11(2).

[82] *Id.*, § 11(3).

[83] Proposed 5 CCR 1001-9, VI.D.1.a.

These regulations are more protective than the regulations in Subpart OOOOa, for two reasons. First, unlike EPA's regulations, the Canada and Colorado regulations do not allow venting during the initial flowback stage (unless the gas produced at this stage does not have sufficient heating value to sustain combustion). Second, neither regulation contains the frequently abused "technical infeasibility" exemption that is found in EPA's regulations.

The "technical infeasibility" exemption is unnecessary and undermines the effectiveness of Subpart OOOOa. We are skeptical that there are in fact normal flowback situations where REC cannot be designed to address. Studies have shown that REC can be successfully deployed even on low-pressure wells.[84] But to the extent there are normal flowback situations where REC cannot be deployed, industry should be required to specifically identify them so the exemption can be narrowly tailored.

Another problem is that the "technical infeasibility" exemption has been interpreted to allow operators to obtain an exemption from green completion requirements *even when the grounds for the exemption (e.g., lack of gathering lines) are known in advance*. In adopting this rule, EPA considered but rejected comments urging the agency to disallow technical infeasibility exemptions in these cases.[85] As EPA's discussion indicates, in many cases operators know in advance that it is not feasible to comply with green completion requirements due to lack of gathering lines, right of way issues, or similar factors. In these cases, there is a technically feasible alternative to wasting the gas: delay drilling until these infrastructure concerns are addressed. Exemptions to green completion requirements should be permitted only in true emergencies. We encourage NMED to adopt a provision for completions and recompletions modeled after Canada's rule and Colorado's proposal.

8. Other Issues

a. Evaporation Ponds

We applaud NMED for proposing to regulate evaporation ponds, also called produced water ponds and "sumps." These ponds can be a significant source of VOC and methane emissions, although their emissions are poorly studied.[86] There is regulatory precedent from two California jurisdictions for controlling emissions from these facilities. More than 30 years ago, the Ventura County Air Pollution Control District enacted regulations to control VOC emissions

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[84] https://www.epa.gov/sites/production/files/2017-08/documents/reduced_emission_completions_farm_2006.pdf at 8 (discussing Weatherford Green Completion equipment which can be used when well pressure is less than 80 psig).

[85] *See* 81 FR 35852.

[86] Marc L. Mansfield, et al., *Emissions of Organic Compounds from Produced Water Ponds III: Mass-transfer Coefficients, Composition-emission Correlations, and Contributions to Regional Emissions*, SCI. OF TOTAL ENVIRO. (Feb. 2018) (estimating that emissions from produced water ponds account for about 4% to 14% of all organic compound emissions by the oil and natural gas sector of the basin in Utah's Unita Basin); Seth N. Lyman, et al., *Emissions of Organic Compounds from Produced Water Ponds I: Characteristics and Speciation*, SCI. OF TOTAL ENVIRO. (Nov. 2017) (noting that, as of late 2017, "[a]lmost no studies of emissions from produced water ponds have been conducted").

from evaporation ponds. These regulations (1) prohibit so-called "first stage" sumps—i.e., surface ponds that receive a stream of produced water directly from an oil production well or field gathering system; and (2) require operators to cover 90% of the surface of the pond with a barrier that is impermeable to VOCs.[87] The San Joaquin Valley Air Pollution Control District more recently enacted regulations that prohibit first stage sumps and require operators to cover their pond with an impermeable barrier.[88]

NMED's proposal, like the Ventura and San Joaquin rules, would ban first stage evaporation ponds by requiring liquids to pass through a storage tank designed to capture flash emissions before being transferred to the pond. NMED's proposal would also follow these other jurisdictions in requiring operators to install an impermeable barrier to prevent VOC emissions from venting into the atmosphere. Each pond would be required to install a system to capture and control VOC emissions. Finally, the proposed rule would require operators to inspect each pond on a monthly basis to ensure that emissions are being captured and controlled. All of these provisions are technically feasible, cost-effective, and likely to lead to important reductions in methane and VOC emissions.

NMED requests comment on the appropriate applicability threshold for this provision, including "whether to establish emission standards based on the pond's potential to emit or throughput." We encourage NMED to consider what other jurisdictions have done in identifying appropriate applicability thresholds. San Joaquin recognizes an exemption for evaporation ponds that have estimated emissions of 0.007 pounds per square foot per day or less. Ventura exempts ponds from compliance if the liquid contains less than 5 milligrams of VOCs per liter.

Following these jurisdictions, NMED should look at emissions intensity or overall potential to emit in crafting its provision, as opposed to a throughput-based approach. That is because the cost of control depends both on the size of the pond and the content of the water. A small pond with relatively VOC-rich water may present a more cost-effective emission control opportunity than a large pond with relatively VOC-poor water. We believe either the San Joaquin or Ventura threshold would be appropriate here.

b. Pig Launching and Receiving

We applaud NMED for proposing to regulate pipeline pigging launching and receiving operations. Pigging is an important maintenance activity that can improve environmental performance by increasing pipeline capacity (thereby reducing the need to flare). Pigging also

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[87] *Ventura County Air Pollution Control District Rule 71.4* (adopted Oct. 4, 1988; most recently amended Jun. 8, 1993).

[88] *San Joaquin Valley Air Pollution Control District Rule 4402* (adopted Apr. 11, 1991; most recently amended Dec. 15, 2011).

reduces the amount of energy needed for compression.[89] However, it is important that operators use best practices while pigging to minimize emissions.

Gas is vented both when a pig is inserted into a pipeline before launch and when it is removed from a pipeline at a receiving station. Gas is also vented from the storage tanks that receive the liquid and debris removed by the pig. All of these emissions can be easily controlled. To begin, operators can reduce the volume of gas potentially subject to release by creating short pig barrels (i.e., by using temporary line stops to isolate the section of the pipeline where the pig will be launched or received).[90] Operators routinely use vapor recovery systems to capture gas from the pig launching or receiving chamber.[91] Finally, proper planning can reduce the number of blowdowns that are necessary, by allowing the operator to conduct multiple repairs and maintenance operations during a single downtime event.[92]

We believe NMED has appropriately chosen to apply these standards to new and existing operations with the potential to emit 1 ton per year of VOC or greater (although the Site-Wide Exemptions must be eliminated to ensure that this provision actually applies to all of the operations it was designed to apply to). We likewise agree that a 98% capture and control requirement for these emissions is appropriate. Finally, we agree that the operational standards and best management practices NMED has proposed are achievable and likely to result in meaningful emission reductions. Many of these best management practices are required under permit programs such as Pennsylvania's.[93]

c. Dehydrators

NMED's proposed emissions standards for dehydrators are a good start. NMED has appropriately chosen to apply these standards to new and existing dehydrators with the potential to emit 2 tons per year of VOC or greater (although the Site-Wide Exemptions must be eliminated to ensure that this provision actually applies to all of dehydrators it was designed to apply to). The proposed capture-and-control requirement of 95% is readily achievable and consistent with what other states (such as Colorado) already require.[94] Although this is a good start, the rule will be quickly rendered obsolete absent a timeline for completing a transition to

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89 *Methane Guiding Principles: Energy Use*.

90 https://methaneguidingprinciples.org/best-practice-guides/operational-repairs/ ; https://www.gti.energy/wp-content/uploads/2019/09/CH4-10-Sept18-Nathan-Wheldon-Presentation.pdf

91 https://www.epa.gov/sites/production/files/2016-06/documents/pigging.pdf ; https://www.ourair.org/wp-content/uploads/Draft-PT70-Reeval-7904-R11-03-02-2018.pdf section 4.7.

92 https://methaneguidingprinciples.org/best-practice-guides/operational-repairs/

93 9 Pennsylvania BAQ-GPA/GP-5, § K(1).

94 5 Colo. Code Regs. 1001-9:D.II.

zero-emission dehydrators (a common technology discussed in the MAP Report).[95] NMED should go further and provide that all new dehydrators must be zero emission, and that existing dehydrators should be retrofitted to be zero emission within three years of the rule's effective date. This will give industry time to acquire and deploy solar-powered zero-emission dehydrators.

d. Hydrocarbon Liquid Transfers

NMED has proposed strong, sensible regulations for hydrocarbon liquid transfers. The issue of venting associated with truck loading was discussed in the MAP Report.[96] Several jurisdictions regulate these emissions. For example, Colorado now requires operators to use a vapor collection and return systems to collect emissions from hydrocarbon liquid transfers.[97] In Utah, operators must control emissions during truck loading operations at using a vapor capture line, which must be connected to a control device or process and must achieve a VOC destruction efficiency of 95% or better.[98] Pennsylvania likewise requires load-out operations to achieve a VOC destruction efficiency of 95% or greater.[99] Building on these precedents, NMED has appropriately proposed to require operators to use vapor balance or control technology, or to control VOC emissions by 98% using a flare, when transferring liquids between transfer vessels and storage tanks.

e. Engines and Turbines

NMED has appropriately proposed to regulate exhaust emissions from natural gas-fired spark ignition engines, compression ignition engines, and natural gas-fired combustion turbines. Because engines and turbines are not fully efficient in oxidizing fuel, exhaust from these units contains unburned hydrocarbons (including methane and VOCs), as well as other pollutants such as CO and NOx. As explained in the MAP Report, good combustion practices and the use of catalytic controls can reduce emissions of all of these pollutions by ensuring that the desired combustion reaction occurs as efficiently as possible for a given air/fuel mix.[100] The *Methane Guiding Principles Partnership* has identified a variety of other control options for reducing emissions from engines, including the use of automated air-to-fuel ratio control systems that

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[95] MAP Report at 76.

[96] *Id.* at 237–38.

[97] 5 Colo. Code. Regs. § 1001-9:D.II.C.5.

[98] Utah Admin. Code r. R307-504-4.

[99] 9 Pennsylvania BAQ-GPA/GP-5, § F(1)(a).

[100] MAP Report at 97. For a given fuel mix, emissions of CO, NOx, and methane/VOCs are directly correlated, and increase or decrease depending on how efficient the combustion process is. Changing the fuel mix impacts emission rates of different pollutants differently. Increasing the ratio of air to fuel results in more CO and NOx while reducing methane and VOCs. Decreasing this ratio reduces CO/NOx while increasing methane/VOCs. To control for fuel mix effects, emission limits are expressed in terms of ppmvd at a particular air-to-fuel ratio (usually 3% O_2).

optimize engine performance, and regular replacement of compressor-cylinder to minimize leakage through o-rings, covers, and pressure packing.[101]

NMED's proposed emission standards for new and existing stationary combustion turbines are readily achievable and consistent with the standards applied in Pennsylvania.[102] NMED's proposed emission standards for new natural gas-fired spark-ignition engines are likewise readily achievable and consistent with what Pennsylvania requires.[103]

For existing engines, NMED's identifies a standard of performance that existing engines should eventually achieve. These standards (which vary depending on horsepower and engine type) are equivalent to the standards Pennsylvania applies to engines constructed between February 2013 and August 2018.[104] Rather than requiring operators to immediately bring all of their engines into compliance with these standards, NMED proposes to allow operators to do so in stages. Thus, 30% of an operator's engines would be required to comply with the standards by 2024, 65% would be required to comply by 2026, and 100% would be required to comply by 2028. Because NMED did not publish a preamble to this proposal, it is not clear that it makes sense to phase these standards in over an eight-year period. We would ask that NMED share its reasoning and analysis when the Draft Rule is put out for formal comment, so that we can better evaluate it. In addition, NMED should delete the proposed exemption for engines that were placed into service between March 25, 2004 and January 1, 2009. This exemption would undermine the proposal to gradually improve the performance of existing engines, because it would give operators an incentive to leave these engines in place indefinitely while retrofitting or replacing newer, cleaner engines. If these engines cannot be retrofitted to meet the proposed standard, NMED should require operators to take them out of service by 2028.

f. Heaters

We appreciate that NMED has proposed to regulate exhaust emissions from natural-gas fired heater units. While individual units may not be major sources of air pollution, the large number of units in the field means cumulative emissions may be significant.[105] Accordingly, it is important to control emission from this source to the extent practicable. NMED should strengthen its regulation of exhaust emissions. It should also look at options for reducing flash emissions from the heater treaters—something the current regulation is completely silent on.

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[101] *Methane Guiding Principles: Energy Use*.

[102] 9 Pennsylvania BAQ-GPA/GP-5, § M(1)(b).

[103] *Id.*, § C(1)(c).

[104] *Id.*, § C(1)(b)(i).

[105] https://www.colorado.gov/pacific/sites/default/files/AP_PO_Heater-Treaters_1.pdf (although emissions associated with individual heater treaters may fall below regulatory thresholds, "cumulative heater-treater NOx emissions . . . are projected to be the largest single area source category in Colorado by 2018").

Because heaters are not fully efficient in oxidizing fuel, exhaust from these units contains unburned hydrocarbons (including methane and VOCs) as well as CO and NOx. Good combustion practices can reduce emissions of all of these pollutants by ensuring that the desired combustion reaction occurs as efficiently as possible for a given air/fuel mix. The use of low-NOx burners and catalytic controls can reduce emissions still further, although these controls may not be feasible for smaller units.[106]

NMED has proposed NOx and CO emission limits for new and existing heaters. Existing heaters are required to comply with a 30 ppmvd @ 3% O_2 limit for NOx and a 300 ppmvd @ 3% O_2 limit for CO. New heaters are subject to the same NOx limit but are required to comply with a 130 ppmvd @ 3% O_2 limit for CO. These limits were apparently derived from Pennsylvania's regulations,[107] and are fully achievable and appropriate. However, it also appears that at least some jurisdictions have imposed more stringent emission limits for heaters of comparable size. For example, the San Joaquin Valley Air Pollution Control District found in 2005 that a 16.8 MMBtu/hr heater treater using best available control technology could achieve a CO emission rate of 111 ppmvd @ 3% O_2 and a NOx limit of 15 ppmvd @ 3% O_2.[108] As explained, a unit achieving these lower CO and NOx emission limits would also emit less methane and VOCs. NMED should look carefully at what San Joaquin and other regulators have done to determine if the proposed emission standards for CO and NOx can be strengthened.

NMED has also proposed requirements for proper maintenance, inspection, and testing of heaters. Although these requirements are generally appropriate, they should be strengthened by requiring *annual*, rather than biennial, inspection and maintenance.

In addition to regulating exhaust emissions, NMED should consider options for regulating flash emissions. Heaters are used to increase the temperature of hydrocarbons in order to break oil-water emulsions and prevent formation of ice or natural gas hydrates, ensuring that the oil or gas will meet pipeline specifications. This temperature increase can cause methane and VOCs to flash. Regulators commonly require operators to control these emissions by routing flashed gas to a pipeline or, in upset conditions, to a flare.[109] NMED should consider imposing a similar requirement here.

g. Compressor Starter Motors

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[106] *Id.*

[107] 9 Pennsylvania BAQ-GPA/GP-5, § L(1)(b).

[108] Best Available Control Technology (BACT) Guideline 1.8.4m (Sept. 12, 2005).

[109] Mont. Dept. of Envtl. Quality, *Air Quality Permit #3411-00* ("Westport shall control Volatile Organic Compound (VOC) emissions from the heater treater by routing the emissions (separated gas) to a pipeline. During emergencies or facility upsets, the emissions shall be routed to a flare."); *see also* Wyo. Dept. of Envtl. Quality, *Permit Application Analysis AP-16768* (Aug. 18, 2015) ("All produced gas from the battery, including gas evolved in the heater treaters, shall be routed to the smokeless flare to reduce the mass content of VOCs and HAPs in the produced gas vented to the device by at least ninety-eight percent (98%) by weight.").

NMED should regulate compressor starter motors used to start combustion engines. These devices work by releasing pressurized natural gas from a tank which expands through the starter turbine, causing the engine to start. The gas is then vented to the atmosphere.

Operators have reported that "[r]eplacing gas starters with air or nitrogen can result in quick payback" while reducing methane and VOC emissions.[110] The *Methane Guiding Principles Partnership* likewise recommends replacing natural gas-driven starters with electrical starters or pneumatic starters that use air or nitrogen.[111] Emissions from these devices can also be controlled by a vapor recovery unit or a flare.[112] NMED should prohibit the installation of new starters that vent to the atmosphere and require operators to replace existing natural gas-driven starters with a zero-emission alternative within three years of the effective date of this rule.

h. Casinghead Gas

NMED should prohibit venting of casinghead gas from oil wells. The industry's *Methane Guiding Principles Partnership* recommends that operators reduce these emissions by using a vapor recovery system or flaring.[113] If the gas is not sufficiently pressurized to permit recovery, it can be routed to a compressor.[114] Capturing casinghead gas may even increase the productivity of a well by reducing backpressure on the wellbore.[115] A case study from Lea County found that an operator was able to increase both oil and gas production, increasing productivity by $7,500 a month, by compressing casinghead gas and routing to process.[116] NMED should draft a provision that generally requires operators to recover casinghead gas and put it to beneficial use.

i. Control Devices

NMED appropriately proposes to enact a suite of best management practices for emission control devices including open flares, vapor recover units ("VRUs"), and the like. The requirements to inspect control equipment, provide for a backup control device to operate during VRU downtime, and to retrofit existing flares with auto-igniters will be particularly impactful. We join our colleagues at EDF in calling on NMED to strengthen these regulations by requiring

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110 https://www.epa.gov/sites/production/files/2016-06/documents/replacegas.pdf

111 *Methane Guiding Principles: Energy Use*.

112 *Methane Guiding Principles: Venting*.

113 *Id.*

114 https://www.epa.gov/sites/production/files/2017-07/documents/blackman_pennstate_2009.pdf at 5.

115 https://www.epa.gov/sites/production/files/2016-04/documents/finch.pdf at 32.

116 https://www.epa.gov/sites/production/files/2016-04/documents/finch.pdf at 36.

operators to achieve a 98% destruction removal efficiency of all flares and combusters used to control emissions.

Unfortunately, these common-sense requirements are undermined, like everything else in the proposal, by the Site-wide Exemptions. The idea of tens of thousands of wells venting methane into the air through unlit flares—with no regulatory obligation to fix the problem—underscores the dire need to excise the Site-wide Exemptions from the rule.

CONCLUSION

We appreciate the opportunity to comment on the Draft Rule, and look forward to continuing to work with you to improve it. Please do not hesitate to reach out with questions about any of our comments or any other issue that may arise during this rulemaking.

Respectfully submitted,

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Earthworks
San Juan Citizens Alliance
New Mexico Environmental Law Center
Diné C.A.R.E.
Oil Change International
Conservation Voters New Mexico
CAVU - Climate Advocates Voces Unidas
Progress Now New Mexico
New Mexico Sportsmen
Rio Grande Indivisible
Western Leaders Network

Table A. Applicability of LDAR Programs Regulating the Oil and Natural Gas Production Sector.

Jurisdiction	Applicability of LDAR Provision	Exemption for Stripper Wells?	Exemption for Facilities with Potential to Emit Less than 15 TPY of VOCs?
EPA Subpart OOOOa (as adopted June 3, 2016)[i]	LDAR required at any new or modified well site where storage tanks or other equipment with the potential to emit fugitive emissions are located. 40 C.F.R. § 60.5365*a* (2016)	No. EPA specifically rejected the suggestion that it adopt such an exemption: "One option examined includes an exemption from low production well site fugitive requirements, but was rejected because we believe that low production well sites have similar equipment and components as sites that are not categorized as low production. Without data supporting a difference in emissions between low production well sites and not low production well sites, the EPA believes exempting low production well sites would reduce the effectiveness of the rule, especially considering the high proportion of small firms in the industry." 81 FR 35892.	No
California	LDAR requirements apply to all oil and gas wells, regardless	No	No

	of potential to emit. Cal. Code Regs. tit. 17, § 95669.		
Canada (Federal)	LDAR requirements applies to all equipment located at an oil and natural gas well, except "an equipment component used on a wellhead at a site at which there is no other wellhead or equipment except for gathering pipelines or a meter connected to the wellhead." SOR/2018-66, § 28(1).	No	No
Colorado	LDAR requirements apply to any "well production facility," defined as "all equipment at a single stationary source directly associated with one or more oil wells or natural gas wells upstream of the natural gas processing plant." 5 Colo. Code Regs. § 1001-9:D.II.A.25.	No	No
Ohio	New or modified oil and natural gas production operations must develop LDAR program to be eligible	No	No

	for General Permit 12.1 or 12.2.		
Pennsylvania	New or modified unconventional wells, wellheads, and associated equipment must develop LDAR program to be eligible for general operating permit. 9 Pennsylvania BAQ-GPA/GP-5, § G.	No	No
Utah	"[A]ll oil and natural gas exploration, production, and transmission operations; well production facilities; natural gas compressor stations; and natural gas processing plants in Utah" must comply with applicable regulations, including the requirement to conduct semi-annual LDAR. Utah Admin. Code r. R307-501-3, 509-4.	No	No
Wyoming	All new or modified facilities where fugitive emissions are greater than or equal to 4 TPY of VOCs must submit a Fugitive Emissions Monitoring Protocol. *See* Oil and Gas	No	No (threshold is 4 TPY of VOCs)

	Production Facilities, Chapter 6, Section 2 Permitting Guidance.		

[i] On August 13 2020, EPA finalized revisions to OOOOa that, among other things, exempt wells that produce less than 15 barrels a day from LDAR requirements. Governor Michelle Lujan Grisham condemned this action, explaining that it was "utterly disheartening and sadly unsurprising to hear once again that critical environmental regulations are being rolled back by the Trump administration[.]" NMED Cabinet Secretary James Kenney likewise condemned the revisions, explaining: "These rollbacks make it even more essential that our regulations secure greater emission reductions from the oil and gas sector." https://www.env.nm.gov/wp-content/uploads/2020/08/2020-08-13-Admin-condemns-fed-methane-rollbacks.pdf