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Baker Hughes

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Air Quality Bureau
New Mexico Environment Department
525 Camino de los Marquez
Santa Fe, NM 87505

Re: Draft Rulemaking: Ozone Precursor Rule for Oil and Natural Gas Sector

Baker Hughes (NYSE: BKR) is pleased to submit comments to the New Mexico Environment Department Air Quality Bureau on the draft version of the state's ozone precursor rule for the oil and natural gas sector.

Baker Hughes is an energy technology company that provides solutions to energy and industrial customers worldwide. Built on a century of experience and with operations in over 120 countries, our innovative technologies and services are taking energy forward - making it safer, cleaner and more efficient for people and the planet.

Baker Hughes has a long history of working with operators large and small to drive more effective, efficient and environmentally responsible oil and gas development in New Mexico. From our offices in Hobbs and Artesia, Baker Hughes provides a full range of products and services from drilling and completion, to artificial lift and pressure control, to measurement and sensing and digital solutions.

Baker Hughes has technology today to cost-effectively detect, monitor and reduce methane and VOC emissions, utilizing associated gas otherwise flared as fuel; detecting and repairing leaks to improve flare combustion efficiency; or upgrading equipment to reduce venting in the course of ordinary operations. For instance, our technology such as LUMEN and flare.IQ not only help operators achieve their low carbon objectives, but also help drive down operational cost.

- Our flare.IQ flare control solution reduces methane emissions, ensures high-efficiency flare combustion, and reduces steam usage in flare systems. flare.IQ uses advanced algorithms to ensure a proper balance between flare, steam and fuel in the flare stack and prevent inefficient steaming.
- LUMEN is our integrated monitoring technology that detects fugitive emissions, quantifies the emission rate, and identifies the source location in real-time so operators can take immediate action and save costs. LUMEN Sky is an aerial drone-based platform fitted with an optical gas imaging camera to detect and pinpoint the location of an emission source. LUMEN Sky utilizes computer vision-based analytics to

estimate the flow rate of an emission source. LUMEN Terrain is a ground based IIOT (industrial internet of things) system that uses concentration data collected by a network of point sensors, along with local environmental conditions, to continuously monitor the emissions at a site and to alert operators to any anomalies caused by leaks or abnormal operations.

In addition, Baker Hughes produces a line of high efficiency, low emission gas turbines and compressors to serve a wide range of applications. For example, our LM2500 aeroderivative gas turbine has successfully provided power to e-Frac fleets since 2013, lowering emissions outputs, increasing operator efficiency, and reducing greenhouse gases with a simple cycle gas turbine machine. These lightweight turbines can be trailer mounted and are easily transported from site to site. They also perform well in pressure pumping application due to similar operating profiles as aircraft engines from which they are derived. Current design capacity of the Baker Hughes aeroderivative gas turbines offers 32,000 to 96,000 shaft horsepower (shp), with greater than 40% simple cycle efficiency. In the case of the LM2500+G4, one gas turbine provides the electricity for the whole fleet. In addition, these turbines can operate on flare gas that would otherwise be flared. Based on common Frac operating profiles, non-methane VOC's have been found to be 26% lower than tier 4 engines, operating on pipeline quality gas.

Air emissions from oil and gas development, including natural gas flaring, venting and fugitive emissions, are a critical issue and we believe the industry must commit to reducing those emissions. Natural gas is helping achieve the world's carbon-reduction goals, but production-related emissions threaten to undermine that progress and impact the industry's social license to operate. Our goal as a technology provider is to develop innovative solutions that help our customers thrive in a lower carbon business environment. The industry will continue to innovate, and at speed. It is our position that any regulatory framework should be technology neutral and performance based, and it ought to embrace new technologies and encourage competition. In light of that position, we offer the following recommendations.

RULE PREAMBLE REQUESTS FEEDBACK

NMED Request #3: Specific regulatory language regarding criteria necessary to demonstrate equivalency of alternative equipment leak monitoring plans in Section 20.2.50.16(C) NMAC.

Baker Hughes Recommendations: The key element of an alternative equipment leak monitoring plan is the application of an approved instrument monitoring method as defined in Section 20.2.50.8(B) NMAC:

> *"Approved Instrument Monitoring Method" means an infra-red camera, U.S. EPA Method 21, or other instrument-based monitoring method or program approved by the Department in advance and in accordance with 20.2.50 NMAC."*

We recommend the following regulatory language be inserted in Section 20.2.50.16(C)(3)(a) NMAC as an application requirement for an alternative equipment leak monitoring plan:

> (i) The individual alternative monitoring plan includes the application of an approved instrument monitoring method as defined in 20.2.50.8(B) NMAC.

Further, Baker Hughes recommends NMED insert into 20.2.50 NMAC a *new section* that describes the process by which the Department will approve instrument-based monitoring methods or programs as alternatives to infra-red camera and U.S. EPA Method 21. We strongly recommend that such an approval process be performance-based and open to any entity proposing a method or program that can meet those performance requirements.

Additionally, we recommend that any science-based methodology and/or technology that can be demonstrated to achieve an overall emissions volume reduction, equivalent to or greater than that achieved through the standard method (ex. portable analyzer or optical gas imaging camera, tri-annual inspections), be eligible for approval as part of an "Approved Instrument Monitoring Method" application.

Finally, we recommend that the Department look to the State of Colorado, Department Of Public Health And Environment, Air Quality Control Commission, Regulation 7, PART D Oil and Natural Gas Operations, Section I. Volatile Organic Compound Emissions from Oil and Gas Operations, Subsection I.L.8.[1] as an example of regulatory language establishing a procedure for approving an alternate instrument-based monitoring method or program.

NMED Request #4: Specific regulatory language to establish a pre-approved equipment leak monitoring plan in 20.2.50.16(C) NMAC.

Baker Hughes Recommendation: As per the preceding comments, we believe the key element of an alternative equipment leak monitoring plan, *pre-approved or otherwise,* is the application of an approved instrument monitoring method as defined in Section 20.2.50.8(B) NMAC.

NMED Request #5: For leak detection and repair requirements under Section 20.2.50.16 NMAC, specific

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[1] https://drive.google.com/file/d/16qTQLSTX1T49DYWp3voXRNl4_g-vbhQT/view

standards to be used by NMED to determine if certain new or existing technologies (real-time remote fence line and aerial surveillance, for example) or proposals are enforceable, effective, and equivalent. Specific feedback on data capture requirements, quality assurance, error rates, calibration requirements, training and certification, interference issues, quantification methods, and pollutant identification will assist the Department in exploring this option further.

Baker Hughes Recommendations: Regarding standards to determine if certain new or existing technologies or proposals are enforceable, effective, and equivalent, we recommend incorporation of the following:

- Emission reduction estimates including methodology and supporting data.
- Description of how the technology and/or methodology will achieve a reduction in total emissions volume equivalent to or greater than the standard method.
- Provision for operators to meet their regulatory obligations while piloting innovative and science-based methodologies and technologies for the purpose of demonstrating the above.
- Provision for operators to apply to use an alternative technology and/or methodology in a full scale program where emissions reduction equivalency, as described above, can be satisfactorily demonstrated through the provision of supporting documentation including, but not limited to: results of previous pilots with the same or a different operator, computer simulations, other methods based on sound science and engineering.

20.2.50.13 STANDARDS FOR ENGINES AND TURBINES

(B) Emission Standards

Comments: Section 20.2.50.13.B(3) NMAC states that:

> *"By January 1, 2022, owners and operators of existing engines shall complete an inventory of all existing engines and shall prepare a schedule for each existing engine to ensure that all existing engines comply with these requirements and meet or exceed the emission standards in Table 1 by January 1, 2028."*

However, 20.2.50.13.A(2) exempts from the 20.2.50.13 NMAC requirements existing sources that were subject to federal standards of performance under 40 CFR Part 60 and Part 63 between March 25, 2004 and January 1, 2009. We believe that the Department's intent is to exempt such existing sources from the requirements of 20.2.50.13.B NMAC and that the regulatory language could be clarified by referencing that exemption.

Baker Hughes Recommendation: Include the following clarifying language **(bold)** into 20.2.50.13.B(3) NMAC:

> *"By January 1, 2022, owners and operators of existing engines,* ***apart from those exempt under 20.2.50.13.A(2)****, shall complete an inventory of all existing engines and shall prepare a schedule*

for each existing engine to ensure that all existing engines comply with these requirements and meet or exceed the emission standards in Table 1 by January 1, 2028."

20.2.50.13 STANDARDS FOR ENGINES AND TURBINES

(B)(7) Emission Standards and Table 2 Emission Standards for Stationary Combustion Turbines

Comment: The outputs described in this section are unnecessarily confusing. Typically, combustion turbines are categorized by the heat input (MMBtu/hr) instead of their outputs due to the fact that a combustion turbine will have two different output ratings - mechanical shaft output and generator power output. The federal regulations categorize combustion turbines by their heat rate, and therefore the below recommended change would align the New Mexico regulation with the categorization by the EPA.

Baker Hughes Recommendation:

- Remove references to bhp outputs in paragraph 20.2.50.13(B)(7) NMAC:
  "(7) Owners and operators of stationary natural gas-fired combustion turbines with ~~a maximum design rating equal to or greater than 1,000 bhp (or~~ a maximum heat input capacity equal to or greater than 2.54 MMBtu/hr~~)~~ shall comply with the applicable emission standards for existing, new, or reconstructed turbines listed in Table 2 of 20.2.50.13 NMAC."
- Remove the column referencing bhp from Table 2: 2 Emission Standards for Stationary Combustion Turbines.

20.2.50.13 STANDARDS FOR ENGINES AND TURBINES

(B)(7) Emission Standards and Table 2 Emission Standards for Stationary Combustion Turbines

Comment: Section 20.2.50.13(A)(1) NMAC states that Section 20.2.50.13 NMAC standards apply to new and existing portable and stationary natural gas-fired spark ignition engines, compression ignition engines, and natural gas-fired combustion turbines. However, the standards described in Section 20.2.50.13(B)(7) NMAC and Table 2 Emission Standards for Stationary Combustion Turbines as stated only apply to stationary combustion turbines. Emission standards for portable combustion turbines are not included in the draft regulations.

Baker Hughes Recommendation: Clarify within Section 20.2.50.13(B) NMAC the emission standards for portable combustion turbines or why they are exempt from such standard.

We appreciate the chance to participate in this public comment period on the draft ozone precursor rule and applaud the Department's extra effort to engage stakeholders on this important topic. We look forward to continuing our engagement during the formal public comment period once draft regulations are developed.

Yours sincerely,

Paul Doucette