REBELLION
PHOTONICS

As a solutions provider with proven technology to help reduce methane emissions from the oil and gas sector, Rebellion Photonics would like to provide comments on EPA's draft rule in order to ensure it reflects the current state of methane science and technology to address this issue.

Oil and gas companies emit 7 million tons of methane from their operations every year. Methane escaping from the oil and gas industry has the same 20-year climate impact as 160 coal-fired power plants, and represents enough wasted natural gas to heat over 5 million homes. These emissions are currently projected to increase 25 percent over the next decade. Methane emissions are a significant climate and energy-waste problem that's only going to grow.

We believe there are ways the draft rule could be improved and our technology could help solve this problem. Gas Cloud Imaging technology such as Rebellion Photonics camera is an available, cost effective, and proven solution for detection and reduction of methane and other VOC's from the installation of new equipment, upgrades, and modified sources in the oil and gas industry.

While we credit the EPA with their initial proposal for bi-annual leak detection inspections, the step up and down provisions based on the number of leaking components is based on faulty logic. Studies have shown that leaks by nature are random and thus make comprehensive and frequent LDAR critical.
Emerging data show that a disproportionate share of fugitive emissions can come from a relatively small percentage of leaks that can appear almost anywhere, anytime – at new and old facilities, and big and small ones. A well site that looks good today might be a big problem tomorrow. . More frequent intervals such as monthly or quarterly inspections are what is needed and still just as cost effective. Stepping up the frequency of inspections allows for better identification and fixing of leaks which will greatly impact the overall reduction of methane.

Rebellion's Gas Cloud Imaging Camera employs advanced hyperspectral infrared imaging technology, engages advanced detection algorithms, and employs powerful data storage and transmittal technology. The GCI is different from other leak imagers because ***leak detection is automated, identification and quantification are possible, and wide areas can be monitored.*** With the ability to "see" the leak, operators can pinpoint the leak source to initiate repair on the spot. The GCI has the potential to catch leaks early and help operators avoid walking into a hazardous cloud. It will also aid operators when making process safety decisions to avoid leak escalation that can lead to "low-frequency, high-consequence" incidents.

We have seen in Colorado, where state regulations are the strictest in the country that significant reductions can be made cost-effectively. Our technology, which is an approved instrument monitoring method for Colorado Air Quality Control Commission Regulation No 7 STEM and LDAR, is cost effective at just $250 per site for inspections…….This is affordable even for the low producing well sites. We believe these Colorado regulations could be a model for the nation. Customers there are complying with the law, reducing emissions

in a cost-effective manner. With some customers, we can cover in upwards of 25 sites per day and have monitored over 1,100 pieces of overall equipment in one week. Our camera allows for speedy, efficient leak detection and with the ability to quickly scan sites, it enables companies to perform inspections more often. It also supports our customers' ability to prioritize maintenance and repair of sites which thus reduces spent labor, time, and gas losses. When putting all of these factors together in dollars and cents, it more than pays for the service operation of the camera.

Well site inspections in Colorado have also offered to us numerous examples of the importance of more frequent LDAR inspections. A simple thief hatch proves to be quite the culprit in a large percentage of the leaks we find…..This leak at times can be traced back to something as simple as a dirty seal…..A dirty seal that may have shown not to be leaking one month ago or even one day ago. Again, leaks are random in nature. So, inspecting a piece of equipment such as a thief hatch proves to be something that is more effective on an increased basis versus a decreased basis if we're working to cut methane emissions.

The importance of follow up surveys after repair is just as critical to ensure correct maintenance/repair of the emitting equipment and also that correcting one leaking component does not create a new one. Again, this is where Colorado leads the nation in how they approach their regulations….They have companies keep logs of inspections, leaks, 1st or 2nd or 3rd attempt of leak repair, and then finally inspection of the fixed equipment. Rebellion creates a turnkey approach to this for our customers by providing a web portal included in our $250 per site that can store well site inspection videos, both of leaks and then post leak repair, and the required maintenance logs.

EPA's proposed rule covers new and modified sources. We would encourage EPA to take an expansive approach to how it treats modified sources, particularly when it comes to the application of LDAR for modified sources. As we've discussed, much of what drives fugitive emissions is human error. When equipment is modified, we've very often seen it done incorrectly, leading to large leaks. The only way to know confidently whether equipment that has been modified is working correctly is by conducting LDAR on it.

In the end, we are finding the forward charge of the EPA and the thought of potentially stricter methane regulations have made companies take note and begin to implement actions with their sites by utilizing our proven technology in an attempt to capture fugitive emissions and reduce lost product. In the end, lower methane emissions are good for companies, good for the industry as a whole, and good for the environment.