

Department of Public Health & Environment

Applications of PIDs in Colorado

The Good, The Bad, & The Ugly

Jason Schroder

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ASIC

Road Map

DATA...DATA...DATA...

- PID Unit Overview
- PIDs and Colorado Regulation 7
- PIDs as a Screening Tool
- PIDs as Triggers







SENSIT SPOD VOC+MET

https://www.gasleaksensors.com/prod ucts/sensit-spod-voc-emissions-air-poll utant-monitor.html

aeroqual AQS-1 PM+MET+(VOC+NO₂+O₃) https://www.aeroqual.com/products/aqs-mi ni-air-guality-stations/ags-remediation-air-g

ni-air-quality-stations/aqs-remediation-air-q uality-monitor Lunar Outpost Canary PM+MET+(VOC+CO+CO₂+NO₂+ O₃+O₂+SO₂+CH₄) https://outpostenvironmental.com/products/

PID units come in different shapes and sizes



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A case study from an Oil and Natural Gas Well Pad Development Site



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aeroqual AQS-1 MET+VOC























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Responsive Thresholds:

90

- 1 hr average > 1ppm = internal investigation a) b) 4 hr average > 5ppm = responsive action
- 1/6/2022 Four 1hr avg observations > 1ppm
 - Internal investigation: Found that cold temperatures impaired production equipment
 - **Corrective Action:** Equipment was thawed
 - **Result:** VOC levels returned to below 1ppm threshold



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- 1/6/2022 Four 1hr avg observations > 1ppm
 - Internal investigation: Found that cold temperatures impaired production equipment
 - **Corrective Action:** Equipment was thawed
 - **Result:** VOC levels returned to below 1ppm threshold
 - 1/19/2021 Two 1hr avg observations > 1ppm
 - **Internal investigation:** found that two oil tank thief hatches were leaking
 - **Corrective Action:** Hatch gaskets were replaced and all hatches were cleaned
 - **Result:** VOC levels return to below 1 П ppm threshold

The Good

- 1. Inexpensive method to evaluate real time VOC emissions during O&NG operations.
- 2. Regulation places the burden on the emitter to monitor their own emissions, while the state acts as oversight.
- 3. The data can provide real time decision ability to make corrective actions as emission occur during operations.





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The Ugly

- 1. No standardized data submission format.
- 2. Industry push back on logistical details and changes.
- 3. Massive amounts of data.









Picture by Denver Post 12/2019

PIDs as a Screening Tool

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- PID signals correspond with elevated Benzene, methane, and other O&NG alkanes
- Wind Direction indicates direction of well pad
- GC benzene likely an underestimation due to longer averaging time.

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- 1. PIDs are very helpful in prioritizing sites to utilize more informative monitoring equipment.
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- 3. Difficult to secure

















Add unknown compounds bar

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- 1. Helpful to evaluate short term speciated VOCs.
- 2. Inexpensive method to obtain speciated VOC measurements in remote ,or confined areas with no power.
- 3. Small foot print.

The Bad

- 1. 1-4 canisters (also good depending on objective).
- 2. Lab turn around times can be exceedingly long (>1 month)
- 3. Data platforms, finding one that contains all our needs (unit control, setting notifications, data evaluation)

The Ugly

- 1. Choosing an appropriate trigger thresholds.
- 2. Choosing an appropriate sample collection duration.
- 3. Can get expensive (if threshold is too sensitive).





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Thank You!

Questions























