Business-Focused Ozone Precursor Monitoring Program

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Motivation

- Businesses may inadvertently be contributing to emissions of ozone precursors.
- Assisting them to identify and mitigate such emissions can move the needle in reducing surface-level ozone.
Project Scope

- Overall objective is to drive reductions in ozone levels through interfacing with businesses

Activities

- Conduct monitoring at various sites
- Identify significant sources of non-biogenic ozone precursors to provide actionable data to site owners
- Engage with local businesses
Research Questions

- Is there a measurable, singular source of VOCs that could largely explain exceedances?
- Are there any lessons that could be applied across various segments of the business community?
- What can businesses do to help Bexar County “move the needle,” even if their business is not identified as a significant source of emissions?
Monitoring Overview
CAMS

ADVANCED SCIENCE. APPLIED TECHNOLOGY.
Modes of Monitoring

Mobile Monitoring
(Public ROW)

- Obstructed Views
- Stationary Monitoring Not Practical

Aerial Monitoring

- Great Canvassing
- Cannot Determine Compound

Onsite Monitoring

- Identify Specific Compounds
- Locate Specific Sources
- Requires Cooperation From Business
Instruments

FLIR G300a

Syft Voice 200 SIFT-MS

ADVANCED SCIENCE. APPLIED TECHNOLOGY.
Monitoring Campaign

10 Large Industrial Sites
3 CAMS

3 CAMS
5 Large Industrial Sites
15 Retail Refueling Stations
10 Small Businesses
Monitoring Campaign – Cont’d

Small Businesses

Larger Sites
Results
Ozone Formation Potential

- VOCs differ in effects they have on ozone formation and accumulation
- Terms used include:
  - Ozone formation potential
  - Photoreactivity
  - Maximum incremental reactivity
- Example: toluene is 285 times as reactive as methane
Some Results

- Emissions from stacks observed with IR at three large sites
- Liquid fuel tank leak at one site
- No leaks found at 15 retail gas stations
- Methane leaks found at two large sites and near two smaller sites
Results – Cont’d

- Multiple paint and body shops with emissions
  - Ethylbenzene, toluene, propane, styrene, and benzene
- Low levels of propane, propene, and butane at all CAMS
  - Non-trivial amounts of isoprene and terpenes of likely biogenic origin measured
- VOCs observed during paving operations
Revisiting of Research Questions

- Is there an obvious, singular source of VOCs that could largely explain exceedances?
- Are there any lessons that could be applied across various segments of the business community?
- What can businesses do to help Bexar County “move the needle,” even if their business is not identified as a significant source of emissions?
Singular Source?

- No single sites were significant emitters
- A large percentage of all sites had emissions
Lessons That Could Be Applied

- Even well-managed sites had leaks
- Use of complimentary approaches was beneficial
  - Only one of the three non-stack emissions from larger sites would have been detected from aerial monitoring
- Methane leaks seems prevalent
  - Methane is a powerful greenhouse gas
Actions By Businesses

- Shift production
- Inspect equipment
- Substituting chemicals
- Abatement controls for VOCs
- Training and maintenance of equipment
- Fleet vehicle improvements
Mitigation

- Visits with individual businesses
- Workshop
- Creation of flyer
What Now?
Businesses of All Sizes Have a Role

Observation:

*No singular significant source was observed*

Impact:

*It is going to take actions from a number of businesses to make a difference*
Use Public Health Advisories to Drive Changes

Observation:

Only two days in 2019 and 2020 had an exceedance more than one day outside an Ozone Action Day

Impact:

Businesses that can modify operations during these windows might bend the curve
There is still work to do…

Observation:

*Exceedances still occurred, even during times of reduced activity driven by pandemic*

Impact:

*Baseline of ozone precursors suggests more needs to be done*
Questions?

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