EPA United States Environmental Protection Agency

Fenceline Air Quality Monitoring Technology Market Summit
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Air Pollution

- Great progress in past 25 years in reducing air pollution from smoke stacks
  - Visibly ugly and smelly smoke greatly reduced
- Less progress on reducing fugitive emissions
  - Especially for pollutants that are hard to see or smell

Making the Invisible Visible

- Technology advances are now giving us the ability to see invisible fugitive emissions
- Pollution that is visible enhances our ability to reduce or treat it. And sometimes enables industry to save money on lost feedstock or product.
- EPA's enforcement program has used advanced emissions monitoring to great success.
  - Some examples follow.

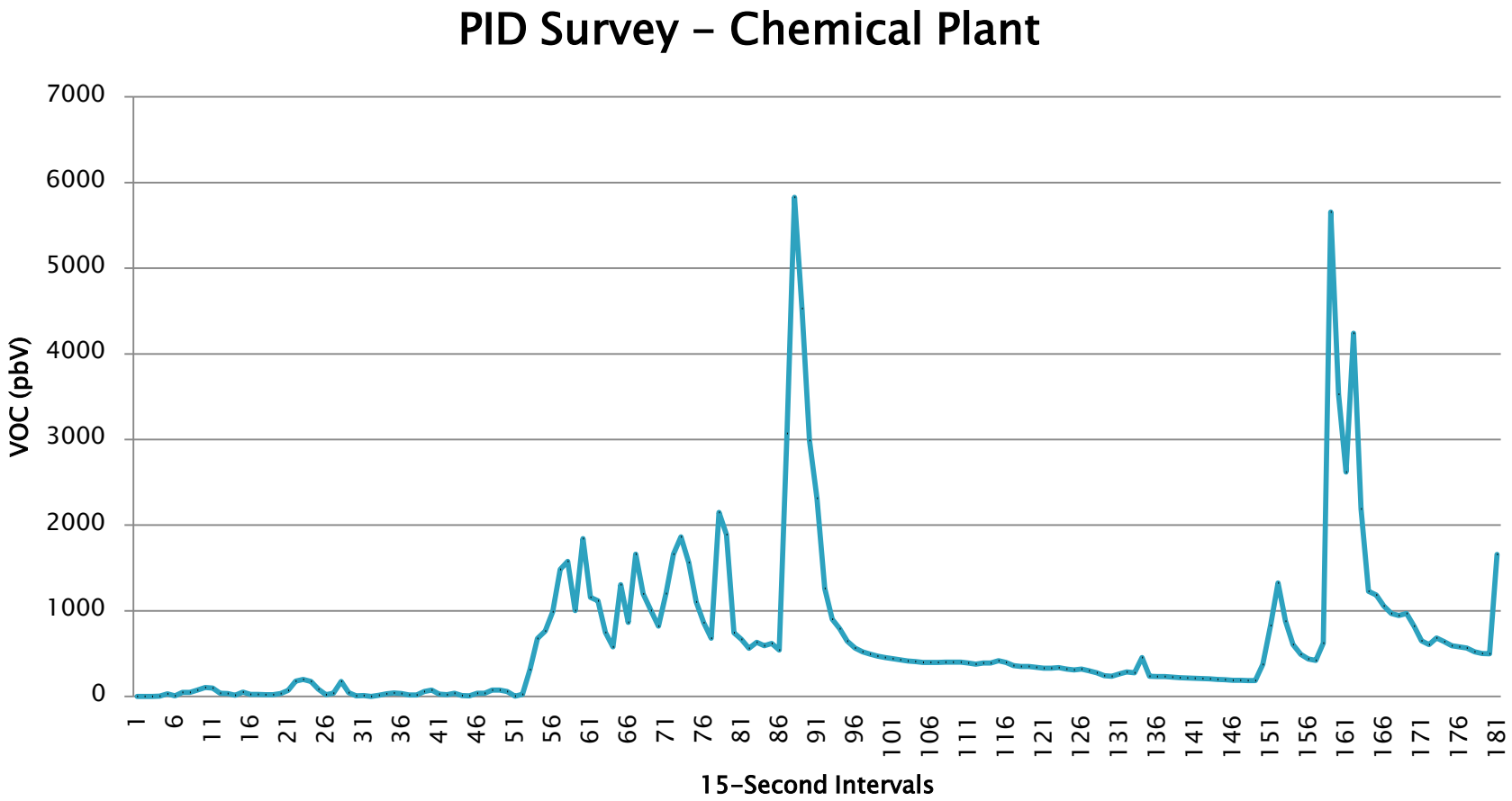
Photoionization Detectors

- Hand held detectors
  - Sensitive to 1 ppb
  - Measured concentrations are real-time
  - General VOCs, or benzene or butadiene-specific
- Alert inspectors to presence of…
  - Emissions from storage tanks, wastewater, etc
  - Equipment leaks
- Can detect process equipment leaks tens of feet away for further identification using FLIR cameras and TVAs

FLIR IR Cameras

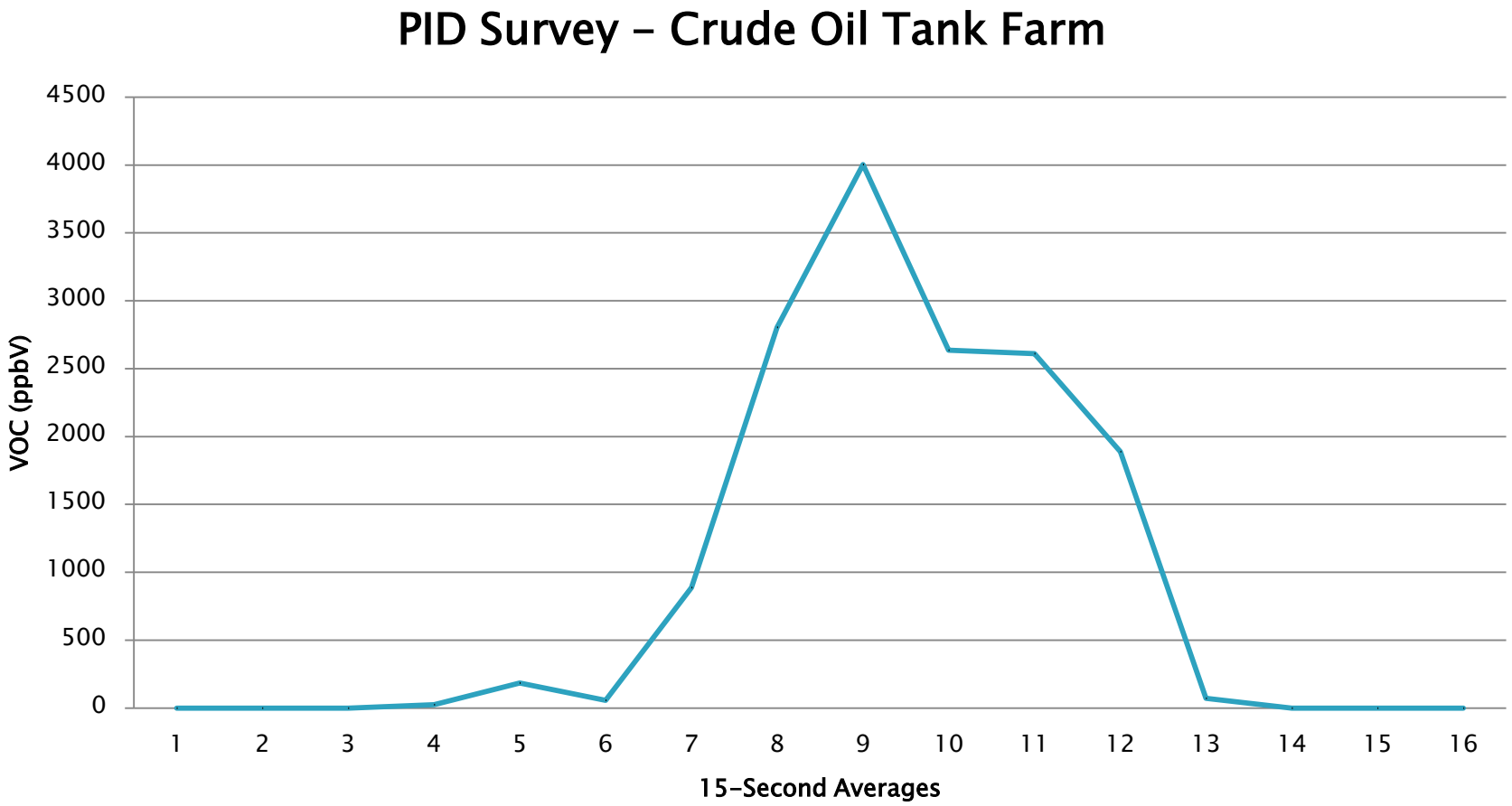
- Enables inspectors, employees, and others to see the pollution
- Finds leaks in difficult to monitor sources or unexpected areas.

Example of PID Results



The Culprit? Bad Tank Valve

Another Example of PID Results



The Culprit? Malfunctioning Tank

"Open-Path" Monitors

- EPA Inspectors use an open-path monitor for CAA investigations
- At least one chemical plant uses a monitor for process emissions detection to protect surrounding areas

EPA Open-Path Monitoring Example

- A coke plant claimed it was a minor source of HAPs and didn't have to comply with CAA air toxics regulations
- EPA's monitor showed the plant was a substantial source of benzene
- EPA issued a test order to use DIAL for whole-facility benzene emissions

Coke Plant Results–

- DIAL data showed the coke plant emitted ≈90 tpy of benzene and was therefore subject to air toxics rules
- Follow-up compliance work substantially reduced benzene emissions and impacts to the community

Passive FTIR Open-Path Monitor

- EPA uses PFTIR to test flares to determine combustion efficiency
- PFTIR works by measuring flare plume gases
- We found many flares with poor combustion efficiency that emitted substantial amounts of VOCs

PFTIR: Case Example

- Some of Marathon Petroleum Corp flares exhibited low combustion efficiency as measured by PFTIR
- The company worked closely with EPA
- As a result, Marathon will minimize flaring, and install automated flare controls to achieve 98% combustion efficiency
- Marathon will save money, and reduce VOC emissions by 2,000 tpy and HAP emissions by 135 tpy

Increasing Demand for Advanced Monitoring Instruments

- Can save money (e.g., Marathon case)
- Allows companies to monitor performance to comply and protect workers and communities
- Government inspectors increasingly using advanced monitoring tools: companies may want to increase their own monitoring too
- Will see more requirements for fenceline and community monitoring and posting results on the Web