

Fenceline Air Quality Monitoring  
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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



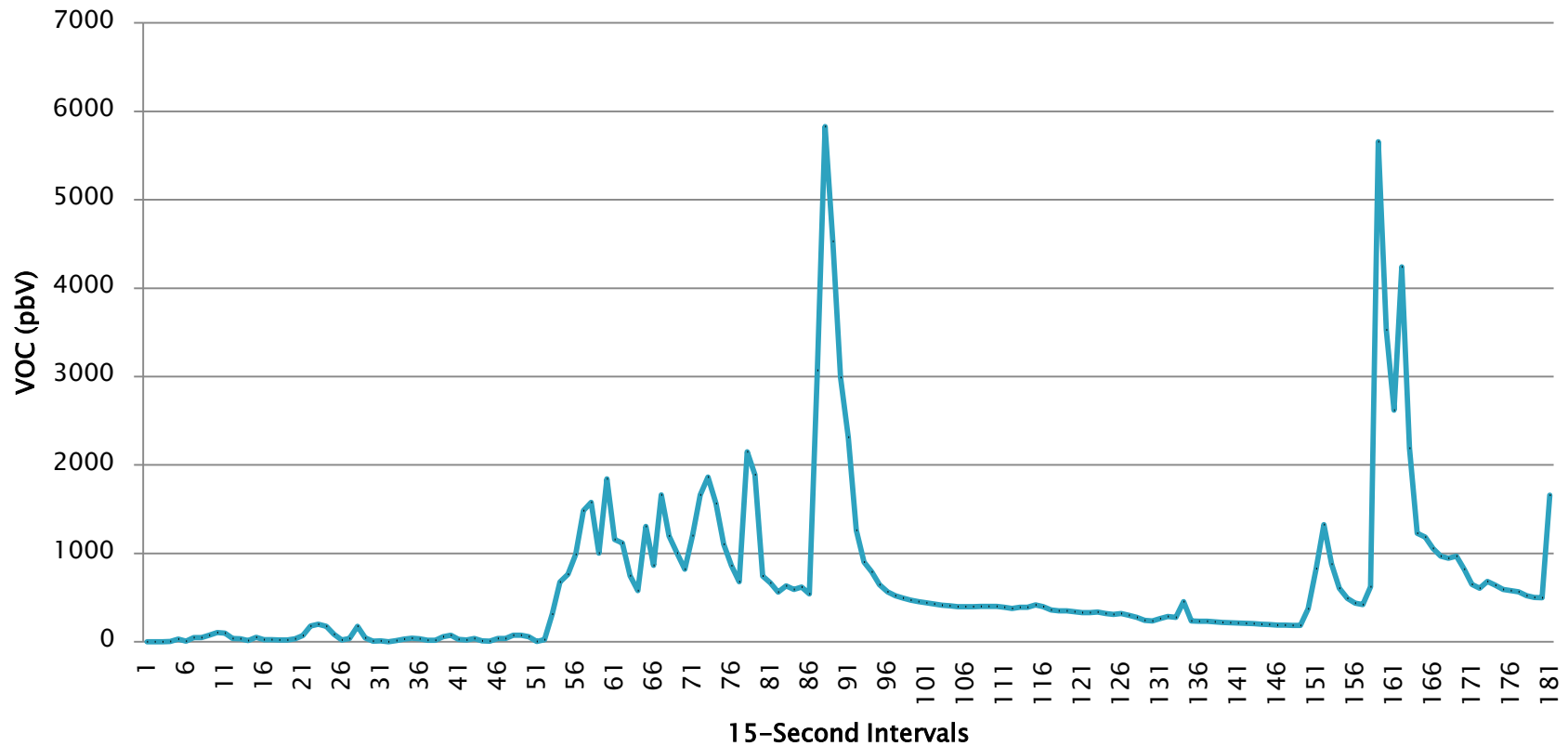
# FLIR IR Cameras

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



# Example of PID Results

## PID Survey – Chemical Plant

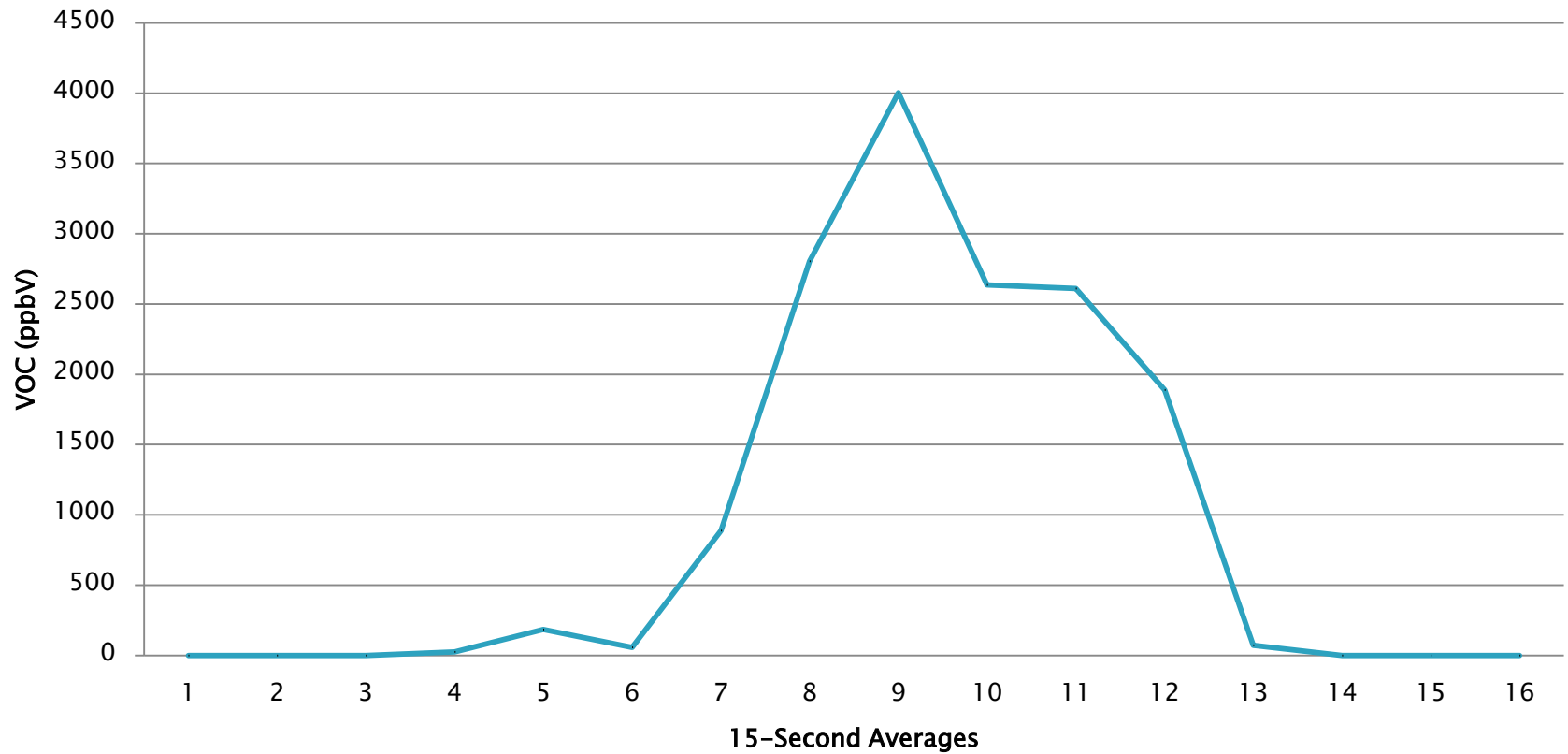


# The Culprit? Bad Tank Valve



# Another Example of PID Results

## PID Survey – Crude Oil Tank Farm





# 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  $\approx 90$  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 fence-line and community monitoring and posting results on the Web