

# **Petroleum Refinery Fenceline Monitoring Stakeholder Engagement**

Webinar for EJ Groups, Fenceline Communities and the Public

June 22, 2016

# Overview

---

- ▶ Fenceline Monitoring Requirements
- ▶ Why Monitor for Benzene?
- ▶ What is the “Action Level”?
- ▶ What are the Benefits to the Public?
- ▶ Schedule
- ▶ Public Display of Data - Examples
- ▶ Stakeholder Input
- ▶ Additional Information

# Fenceline Monitoring Requirements for Petroleum Refineries

---

- ▶ In 2015, in large part due to stakeholder input, EPA's air pollution rule for refineries includes:
  - ▶ Monitoring air concentrations of benzene along the perimeter (e.g. at the fenceline) of U.S. refineries
  - ▶ Reporting the monitored benzene concentrations to EPA
  - ▶ Conducting analysis and corrective action upon exceeding an established benzene concentration limit along the perimeter of these facilities

# Why Monitor around Petroleum Refinery Fencelines?



# What is Benzene?

---

- ▶ Benzene is a colorless hazardous air pollutant with a sweet odor that is widely used in the U.S.
- ▶ Used in the production of a wide variety of products including rubber, plastic, nylon and synthetic fibers
- ▶ Component of crude oil, gasoline, and cigarette smoke
- ▶ Highly flammable
- ▶ Evaporates into air quickly
- ▶ Human carcinogen via all routes of exposure

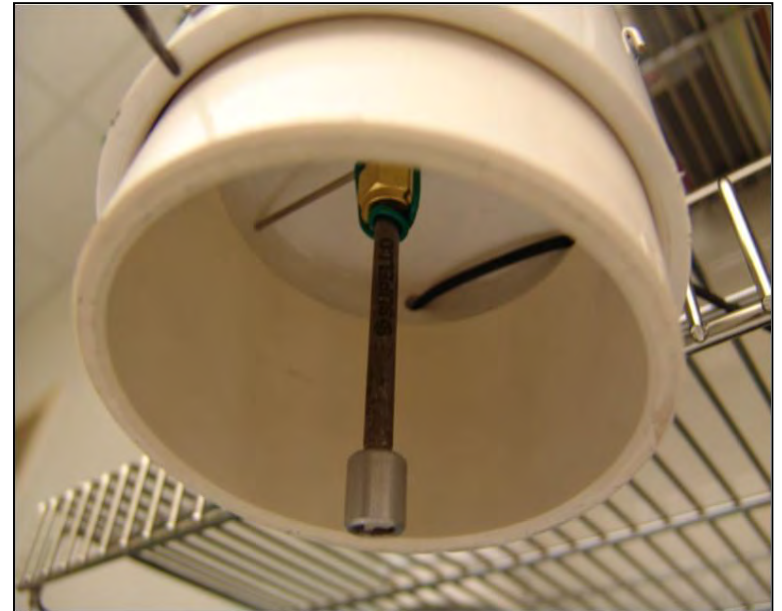




# Why Monitor for Benzene?

---

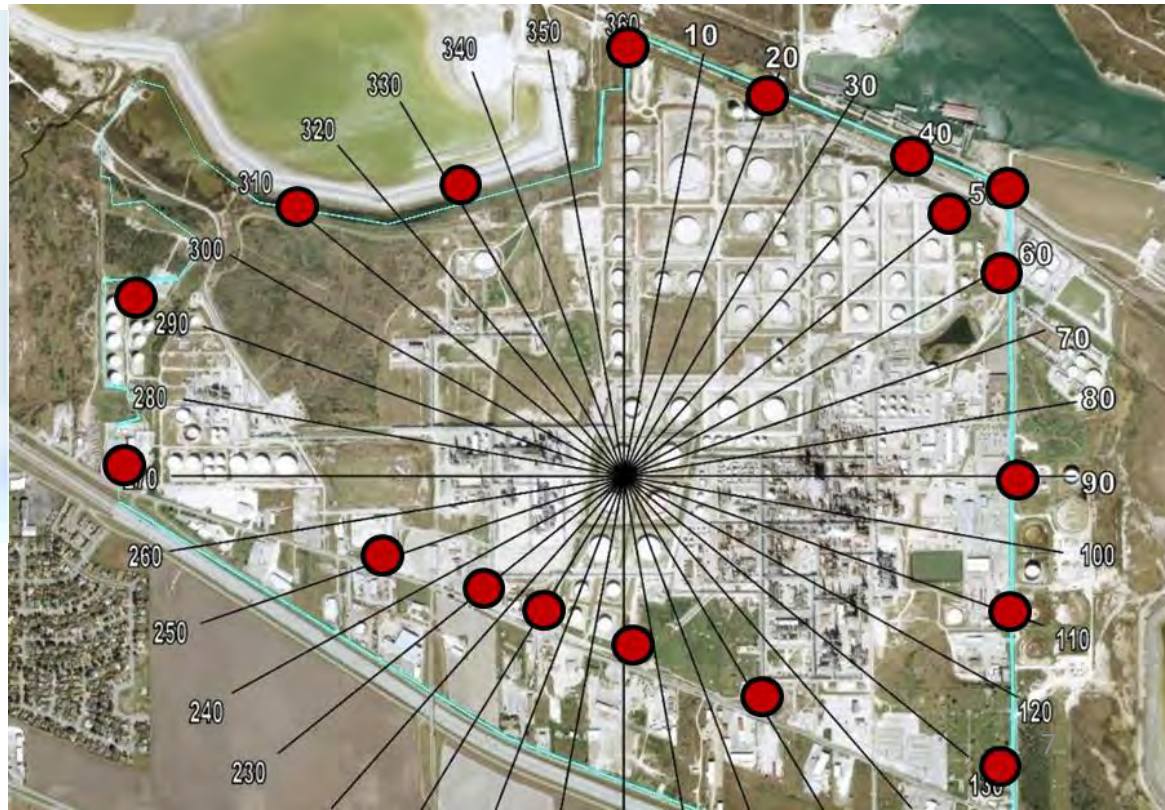
- ▶ Benzene is found in nearly all refinery processes and waste streams
- ▶ Majority of refinery benzene emissions are estimated to be from leaky pipes, valves and equipment and waste water sources
- ▶ Exposure to benzene can lead to a variety of health effects, including increased risk of cancer
- ▶ Exposure to benzene was one of the primary contributors to health risks associated with refinery emissions



Benzene monitor

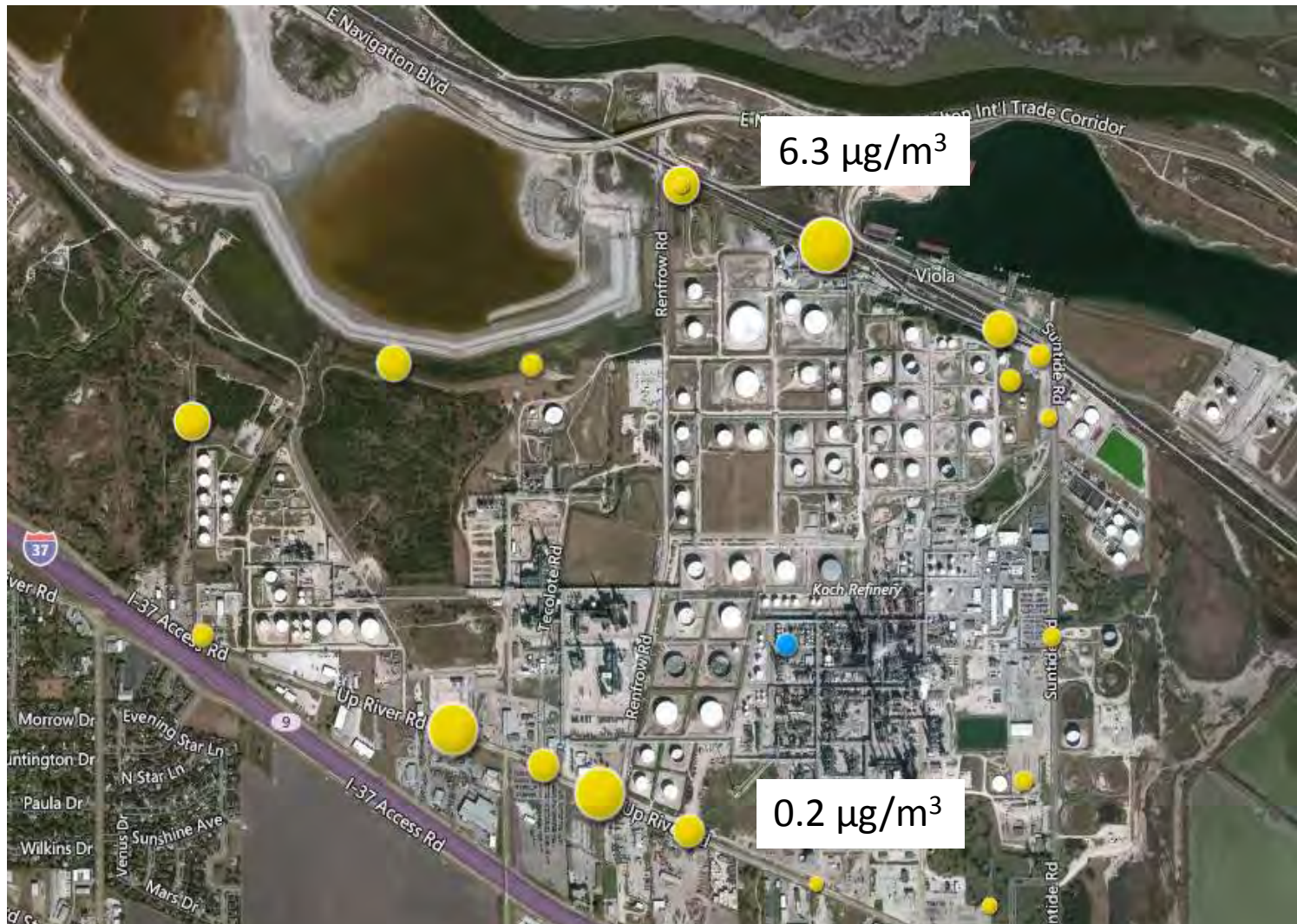
# Why Use Passive Diffusive Tube Monitoring?

- ▶ Allows for continual monitoring of pollutant concentrations around the entire plant
- ▶ Has detection limits low enough to be able to detect the concentrations of the pollutants in the ambient air near a refinery during typical operating conditions





# What is the “Action Level” for Fenceline Monitoring?



$\Delta C$  for a 2 week period = high - low =  $6.3 \mu\text{g}/\text{m}^3 - 0.2 \mu\text{g}/\text{m}^3 = 6.1 \mu\text{g}/\text{m}^3$   
Action Level = Annual Average  $\Delta C < 9 \mu\text{g}/\text{m}^3$



# What are the Benefits of Monitoring to the Public?

---

- ▶ Encouraging early detection and correction of problems before they rise to the corrective action level
- ▶ Identifying toxic air emissions from refinery emissions sources such as equipment leaks and wastewater systems
  - ▶ Taking advantage of low concentration level sampling technology for hazardous air pollutants emitted by refineries
- ▶ Providing information on toxic air emissions to federal, state and local officials and the public
- ▶ Providing requirements for refineries to take action to correct toxic air emissions from refinery emission leaks
  - ▶ Protecting public health in communities surrounding refineries

# Schedule

Activity	Dates
Refineries install fenceline monitoring systems	Present – January 29, 2018
Refineries begin collecting data <ul style="list-style-type: none"><li>Collect 12 months of data to calculate annual average</li></ul>	January 30, 2018
Refineries report data to EPA's emissions data system <ul style="list-style-type: none"><li>Refineries continue to report data on quarterly basis</li><li>Refineries compare annual average to 9 micrograms per cubic meter</li></ul>	Spring 2019
EPA public release of benzene data on web page 30 days after quarterly reporting period ends <ul style="list-style-type: none"><li>Data will be refreshed quarterly on EPA's public web page</li></ul>	Summer 2019

# Public Display of Data – Examples

---

- ▶ Public display of data
  - ▶ EPA is designing a web page to display fenceline refinery data
  - ▶ Web page will be managed by EPA
  - ▶ Design will incorporate stakeholder ideas
  - ▶ Available to public in the Summer 2019



# Web Page Example

The screenshot shows the EPA website's header with the logo and navigation links for Spanish, Chinese (Simplified and Traditional), Vietnamese, and Korean. Below the header are tabs for 'Learn the Issues', 'Science & Technology', 'Laws & Regulations', and 'About EPA'. A search bar is located on the right. The main content area features a title 'Fenceline Monitoring for Petroleum Refineries' and an introductory paragraph. Below this are four sections: 'Refinery Information' with an image of a refinery and a list of questions; 'Health Information' with an image of a stethoscope and a list of questions; 'Access Monitoring Data' with an image of a tablet and data charts; and 'In Your Community' with an image of a playground and a list of resources.

**EPA** US Environmental Protection Agency

Español | 中文: 繁體版 | 中文: 简体版 | Tiếng Việt | 한국어 | Log out


Learn the Issues | Science & Technology | Laws & Regulations | About EPA

Search EPA.gov

## Fenceline Monitoring for Petroleum Refineries


On December 1, 2015, the Environmental Protection Agency (EPA) issued a final rule that will further control toxic air emissions from petroleum refineries and provide important information about refinery emissions to the public and neighboring communities. This site offers more about that regulatory action, the health effects of benzene, and offers several options for viewing data from refinery fenceline monitors.

### Refinery Information




- What are refineries?
- How does EPA regulate refineries?

### Health Information




- What are health effects of benzene?

### Access Monitoring Data

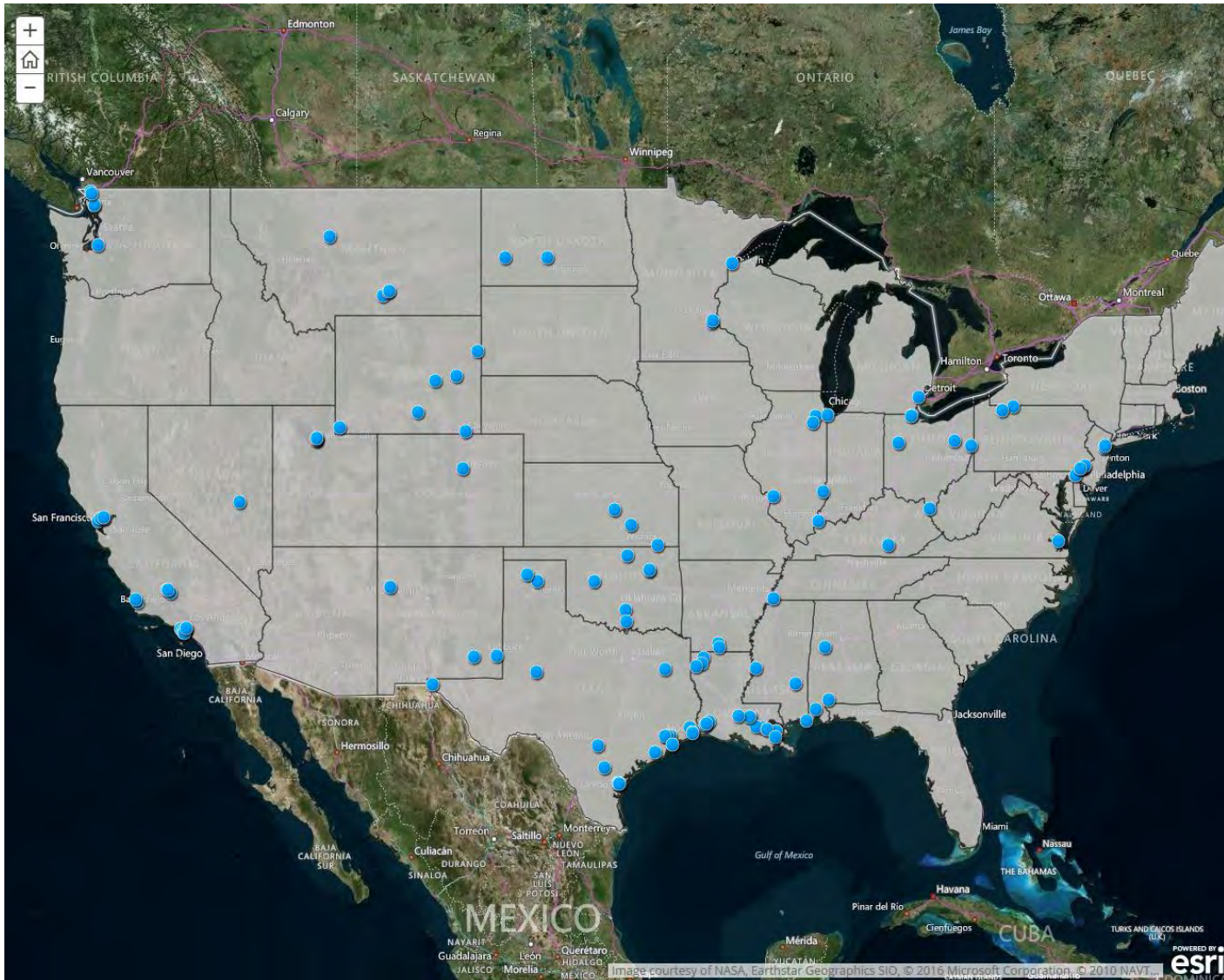


### In Your Community



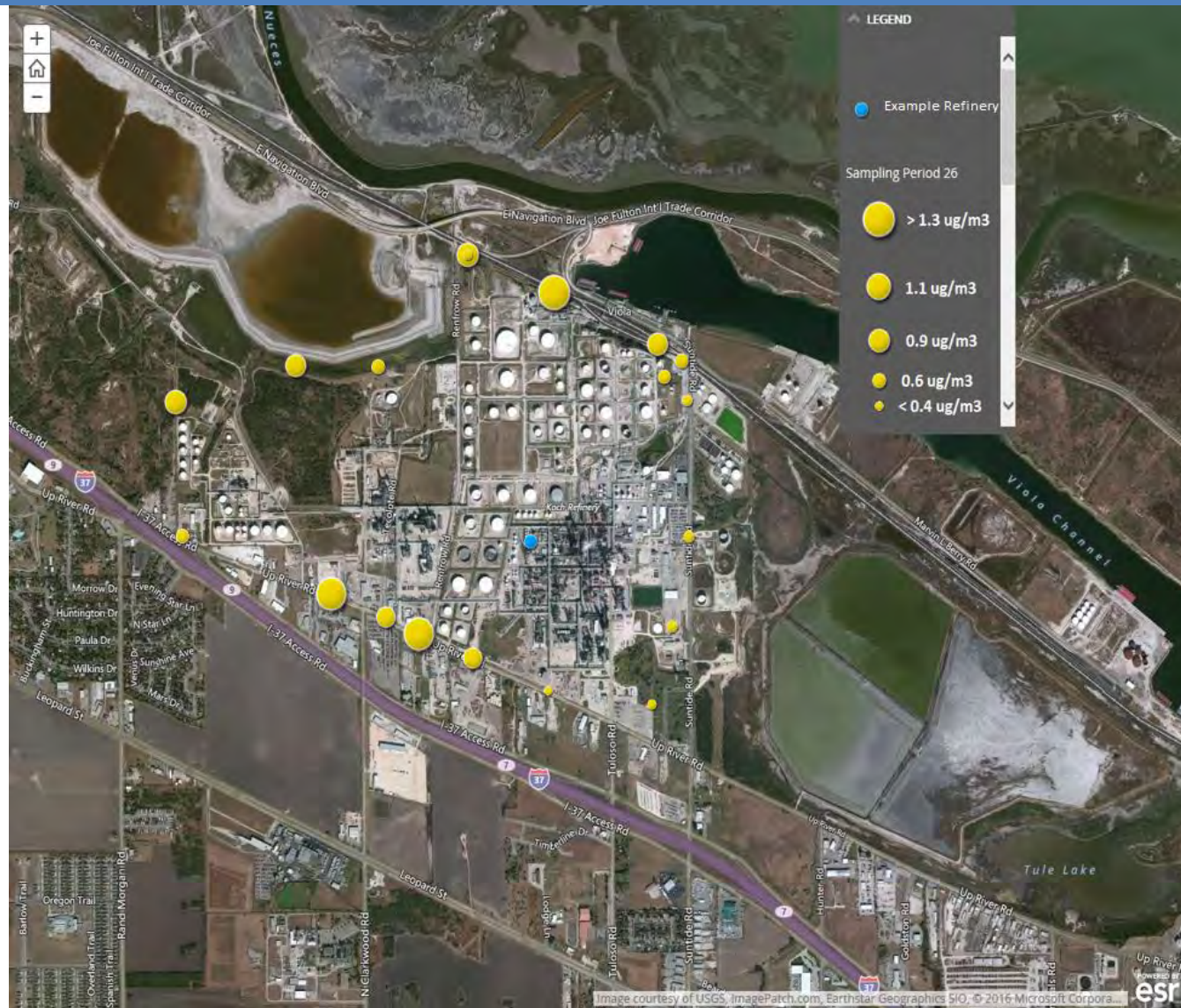
- Envirofacts

# Story Map – Home Page





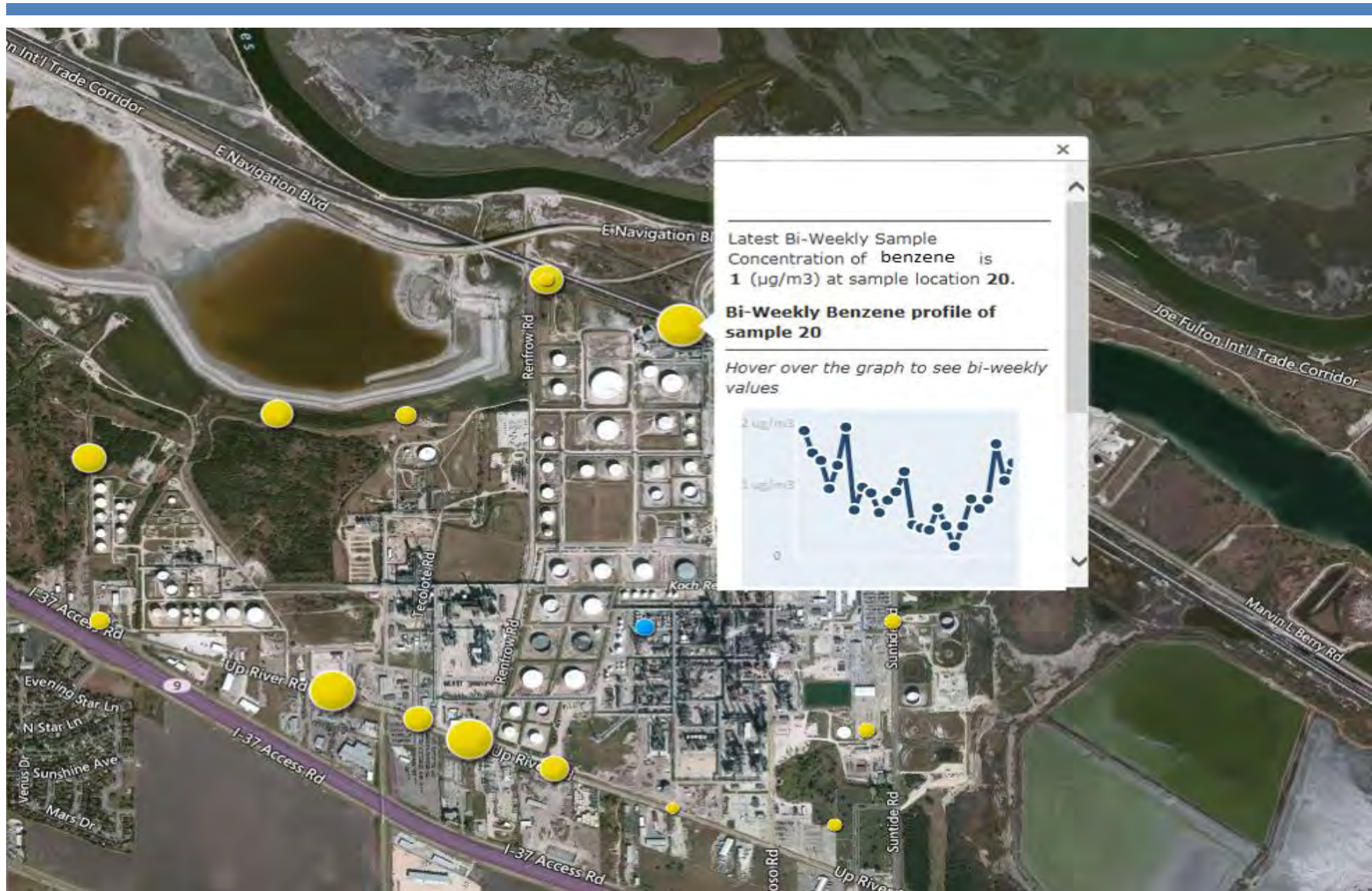
# Facility: Fenceline Monitors



\*\*data are for demonstration purposes only\*\*



# Facility: Individual Fenceline Monitor Pop-up



\*\*data are for demonstration purposes only\*\*



# Facility: Facility Wide Pop-up



\*\*data are for demonstration purposes only\*\*

# Stakeholder Input

---

- ▶ How to provide your input

- ▶ Email: [fencelineteam@epa.gov](mailto:fencelineteam@epa.gov)

- Please send input by July 31, 2016

- ▶ What information needs to be included on the web page to understand the data?

- ▶ Within context of the rule, what information and data on benzene do you want to see on the web page?

- ▶ Do you have ideas for other ways to share the information besides a web page?

- ▶ What other information would be helpful for you?

- ▶ Other EPA information about air toxics? Links to EPA environmental justice tools?

- ▶ Is there other training or support that might be helpful?



# Additional Information

---

For updates and additional information:  
<https://www3.epa.gov/ttn/atw/petref.html>

# Appendix

---

# Clean Air Act

---

- ▶ New Source Performance Standards (NSPS)
  - ▶ CAA Section 111(b) requires to EPA to set and periodically review, emission standards for new sources of criteria air pollutants (CAP), volatile organic compounds (VOC), and other pollutants
- ▶ Air Toxics Rules: Maximum Achievable Control Technology (MACT) and Residual Risk and Technology Reviews
  - ▶ CAA Section 112(d) requires EPA to set emission standards for hazardous air pollutants (HAP) based on performance of the maximum achievable control technology (MACT)
  - ▶ EPA is required to conduct two reviews and update the existing standards, if necessary
    - Residual Risk Assessment: To determine whether additional emission reductions are warranted to protect public health or the environment. This is a one-time review.
    - Technology Reviews: To determine if better emission control approaches, practices, or processes are now available. Technology reviews are required every eight years.



# Rulemakings

---

## ▶ NSPS

- ▶ 1974 NSPS – covers fuel gas combustion devices, FCCU and sulfur plants
- ▶ 2008 and 2012 NSPS – covers same above and delayed cokers, flares and process heaters specifically

## ▶ MACT

- ▶ 1995 MACT (known as MACT 1) covers non-combustion or evaporative sources, such as equipment leaks, tanks, wastewater, miscellaneous process vents; amended to cover heat exchange systems, including cooling towers
- ▶ 2002 MACT (known as MACT 2) covers combustion sources: catalytic cracking units, catalytic reforming units and sulfur recovery units

## ▶ Risk and Technology Review (RTR)

- ▶ 2007 – proposed risk and technology review amendments for non-combustion sources
- ▶ 2009 – withdrew amendments
- ▶ 2013 – promulgated standards for heat exchanger systems
- ▶ 2014 – proposed RTR and amendments (79 FR 36880; June 30, 2014)
- ▶ 2015 – finalized amendments

# Fenceline Monitoring – Monitor Siting

---

- ▶ 12-24 monitors (based on size of facility) are required around the perimeter of each refinery
  - ▶ Additional monitors required if sources are near fenceline
- ▶ Monitors will be placed following requirements in EPA Method 325A
- ▶ Geographic coordinates for each monitoring location will be reported

# Fenceline Monitoring – Data Collection

---

- ▶ At least one sample collected from each individual monitoring location every two weeks
- ▶ Samples analyzed for benzene following requirements in EPA Method 325B
- ▶ The highest and lowest benzene concentration is identified for each bi-week sampling period
- ▶ The “delta C ( $\Delta C$ )” for that monitoring period is calculated as the difference of these two concentrations
- ▶ 26 consecutive bi-week  $\Delta C$  values are averaged to calculate an annual average  $\Delta C$  value
  - ▶ Collect benzene data for one year to develop first annual average  $\Delta C$  value

# Fenceline Monitoring – Data Reporting

---

- ▶ Upon completion of the first year of monitoring, benzene data are reported to EPA through EPA's data management system
  - ▶ Includes actual measurements for each 2 week period for each monitoring station
- ▶ Refinery owners must maintain the annual average  $\Delta C$  value at or below 9 micrograms per cubic meter,  $\mu\text{g}/\text{m}^3$  (2.8 parts per billion by volume, ppbv)