Community Monitoring and EJ Initiatives

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September 13, 2023

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Environmental Justice

- EJ Drivers
- How to address EJ

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EJ Drivers / Reasons for EJ Attention

- **Construction and Operation Authorizations** (new & existing permits, amendments, renewals)
- **CapEx Projects** (potential delays, add'l cost, design changes):
  - Public participation (engagement)
    - Public notice, comment, meetings, hearings
  - Impact assessment
    - Dispersion modeling, cumulative impact / health risk assessment, traffic…
  - Emission controls, operating procedures
  - Monitoring
  - Applicability for permitting, controls, offsets
- **Agency visits, inspections, monitoring** (fenceline, community, mobile, aerial, optical gas imaging, leak detection and repair)
  - EPA monitoring van (GMAP) & airplane (ASPECT) following Administrator Regan's "Journey for Justice" tour
- **Agency information collection requests** (ICRs)
- **Emission events**
  - Enforcement, fines, agency negotiation
- **Litigation**
- **M&A**
- Shareholder **ESG** considerations

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How have companies been addressing EJ?

EJ Risk & Exposure Assessments:

- **Basic EJ reviews** for individual facilities
- **Sophisticated EJ tool** use to demonstrate **inapplicability of EJ** reqmts
- **Comprehensive EJ assessments**
- **Nation-wide EJ requirements database**
- **EJ Risk Benchmarking / Ranking** company-wide, nation-wide, industry peer comparisons
  - EJ indices, demographic indicators, publicly available compliance metrics
  - Compilation of Community Group/NGO/Interested Parties based on location and jurisdiction

Project funding & EJ metrics:

- **Applications for federal funding**
  - DOE Industrial Decarbonization, Regional Clean H2Hubs, Carbon Capture Demonstration Projects, Carbon Capture FEED for CO2 Transport
- **Key elements:**
  - Community Benefits Plan
  - Quality Jobs Plan
  - Diversity, Equity, Inclusion, and Accessibility (DEIA) Plan
  - Justice40 Initiative Plan
  - Community and Stakeholder Engagement Plan

Permitting, Compliance, Public Data:

- **Permitting, certifications** – air, NEPA, FERC, Class VI UIC permits (CCUS)
- **EJ Data** - review, revise, update
- **Community Engagement**
- **EJ Impact Assessments** (e.g., health risk reviews)
- **EJ Monitoring** – to compare with community monitoring results

ESG & Shareholder Drivers

- Petitions, requests, obligations requiring EJ assessments

Review & Comment on Rule Development

Internal EJ Awareness:

- Project Planning
- Environmental, Social
- Community, Gov't, & Public Relations

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Community Monitoring

- Regulatory Drivers
- Equipment Selection
- Network Design & Planning

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Federal Fenceline Monitoring Requirements

- **Refinery Sector Rule**
  - 40 CFR Part 63 Subpart CC §63.658
  - Method 325 A/B
    - Benzene
- ***Prevention of Significant Deterioration (PSD)***
  - *40 CFR Part 52.21(m)*
  - *Preapplication (preconstruction) analysis*
  - *Post-construction monitoring*
    - *Monitoring for any criteria or non-criteria pollutant at EPA Administrator's discretion*
- ***Clean Air Act - Section 114 Information Collection Requests (ICRs)***
  - *Chemical Manufacturers ICR*
    - *Compounds of Interest: Ethylene Oxide, Benzene, 1,3-butadiene*
- ***Tort Cases***
- ***Proposed* - Hazardous Organic NESHAP (HON)**
  - Method 325A/B Passive Sampling:
    - Benzene, 1,3- butadiene, chloroprene, and ethylene dichloride
  - Canister Sampling (Draft Method 327)
    - Ethylene oxide & vinyl chloride
- ***Proposed – Coke Oven NESHAP***
  - Method 325A/B Passive Sampling:
    - Benzene
- ***Proposed – Integrated Iron & Steel NESHAP***
  - EPA yet to finalize method
  - Sampling Method 40 CFR Part 50, Appendix B (Hi Volume)
  - Compendium Methods IO-3
    - Chromium (Cr) or hexavalent Chromium (Cr VI)

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State & Local Fenceline Monitoring

- California
  - **Assembly Bill 1647**
    - Refineries required to develop fenceline monitoring programs
    - BAAQMD Reg. 15, Rule 12, SCAQMD Rule 1180, Valley Air District Rule 4460
  - **Oil & Gas Rule**
    - upwind/downwind methane monitoring
- Colorado
  - **Regulation 7**
    - Methane monitoring before, during, and after pre-production operations.
- City of Chicago
  - **Bulk Material Storage Rules** –
    - PM_{10} fenceline monitoring
    - HAPs monitoring at the fenceline
  - **Rules for Large Recycling Facilities** –
    - PM_{10} fenceline monitoring near sensitive receptors
    - HAPs monitoring at the fenceline

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Questions to ask about your monitoring program

- What pollutants are we monitoring for?
- What instruments or methods are needed?
  - Passive Samplers
  - Canisters
  - EPA FRM/FEM
  - Near-reference or Low-Cost Sensors
  - A combination of some or all
- How do we properly operate the instruments?
- How will we collect and verify the data?
- What happens after these data are collected and
  - Who sees this data?
  - How does this help with compliance?

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Equipment Selection

- Clean Air Act specifies compliance monitors must be either Federal Reference Method **(FRM)** or Federal Equivalent Methods **(FEM)**
  - Both FRMs and FEMs have very strict measurement performance criteria found in **40 CFR 53** to ensure that data supports accurate and effective air quality management decisions.
- EPA list of the designated FEM and FRM: https://www.epa.gov/amtic/air-monitoring-methods-criteria-pollutants
- Meteorological measurements should be considered for concentration origin analysis

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Instrument Selection – EPA Quality Monitors

Benefits of FEM/FRM

- Defensible measurements
- Designed for field calibrations and quality control tests
- Deliver accurate and precise measurements
- Can be used for compliance measurements
- Quick results from continuous monitors

Drawbacks of FEM/FRM

- Costly
- Often require line power
- Shelter and support equipment required

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Instrument Selection – Low-Cost Sensors

Benefits of Low-Cost Sensors

- Relatively “Low Cost”
  - Easier to deploy a more expansive network
- Supplement or Gap fill the EPA/SLAMS networks
- Obtain spatial gradients
- Identifying high exposure microenvironments
  - Hot spot identification
- Provide data in near-real time
- Identifying atmospheric conditions that lead to high concentrations locally and regionally
- Source tracking

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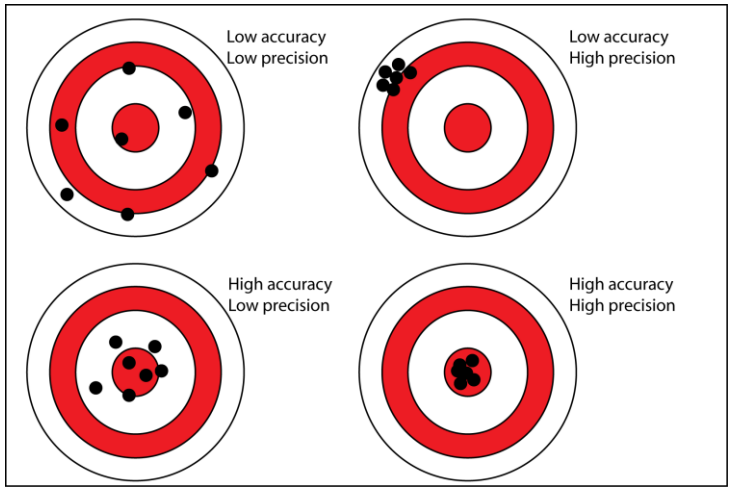
Instrument Selection – Low-Cost Sensors

Drawbacks of Low-Cost Sensors

- Non-regulatory sensors and are not defensible for air quality compliance
- A robust monitoring plan is still required
- All sensors are not equal and have their own reliability, accuracy and precision issues
- Easily misused and misinterpreted by community groups, the public, universities, agencies, and consultants
  - Examples of misuse:
    - Site selection and sensor placement
    - Inconsistent calibration and correction methods
    - Misinterpretation of data



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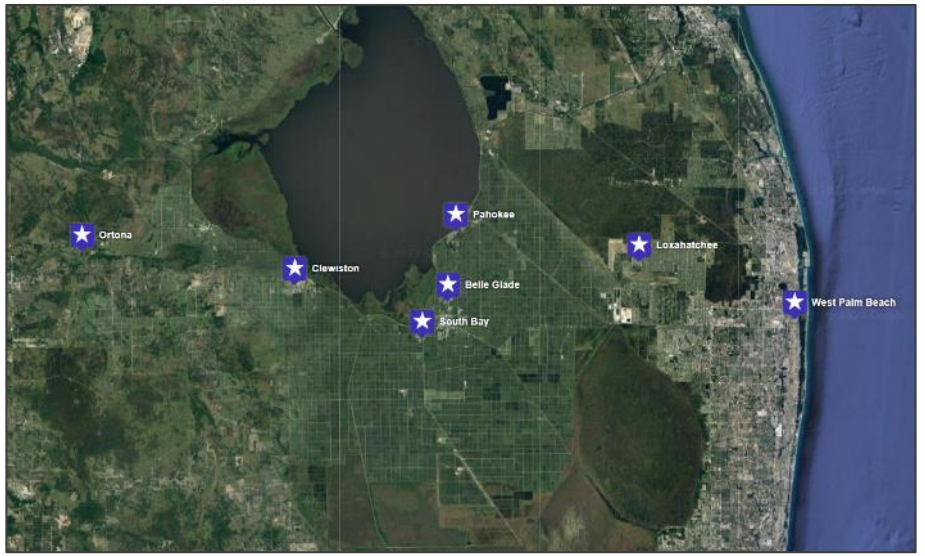
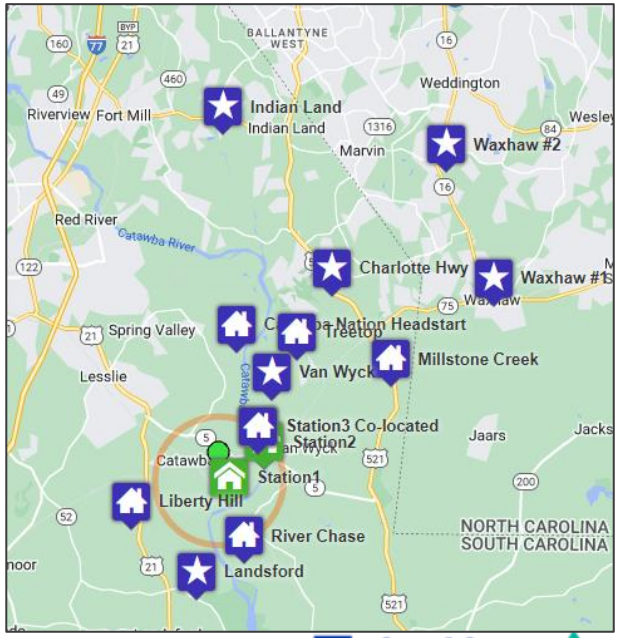
Monitoring Site Selection

The most common obstacle for community monitoring networks is placement of the monitors

- Placement Considerations
  - Sensitive neighborhoods for EJ
  - Fence line for source impact evaluation
  - Baseline locations in non-sensitive neighborhoods
- Examples of hurdles:
  - Finding a willing property owner to allow for installation
  - Finding a location on the property with acceptable exposure
    - Some locations are not always suitable to meet U.S. EPA siting criteria
  - Time and cost of land lease
  - Accessibility for calibration, sample exchange, or other maintenance
  - Power considerations





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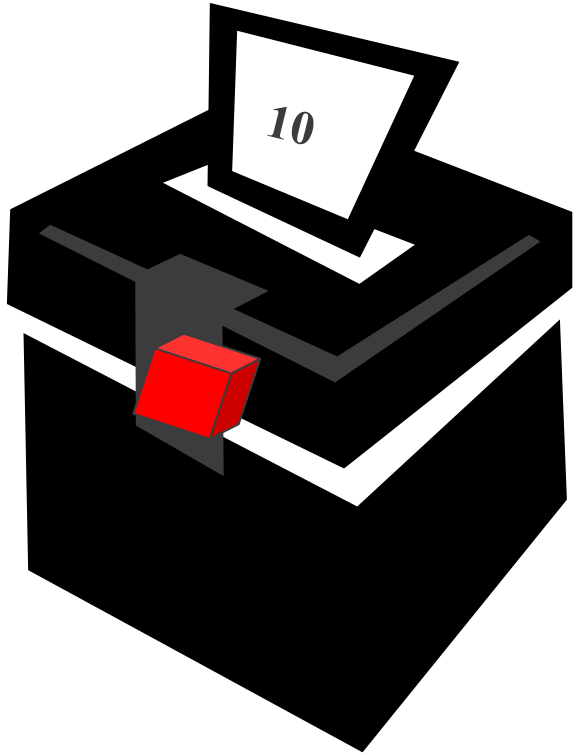
Data Quality is Important



Avoid the Black Box Effect

- Numbers vs. Data

When does a number become data?

- Number + Context + QA/QC = Data
- Ambient data can be good or bad. The adequacy of the *Quality Assurance* and *Quality Control* (QA/QC) allows you to tell the difference.
- With context, you should be able to determine if data can be corrected, qualified, or rejected. Otherwise, the monitor is a Black Box.

Quality Assurance Guidance and Tools

- Quality Assurance Project Plan (QAPP) – all encompassing QA document for a specific site or network
- EPA Regulatory Guidance
  - 40 CFR Part 58
    - **Appendix A** Quality Assurance Requirements for Monitors Used in Evaluation of National Ambient Air Quality Standards
    - **Appendix B** Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring
    - **Appendix E** Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring
  - Quality Assurance Handbook for Air Pollution Measurement Systems
    - **Volume II:** Ambient Air Quality Monitoring Program
    - **Volume IV:** Meteorological Measurements Version 2.0
- EPA Air Sensor Toolbox to aid in public understanding of measurement quality control
  - https://www.epa.gov/air-sensor-toolbox

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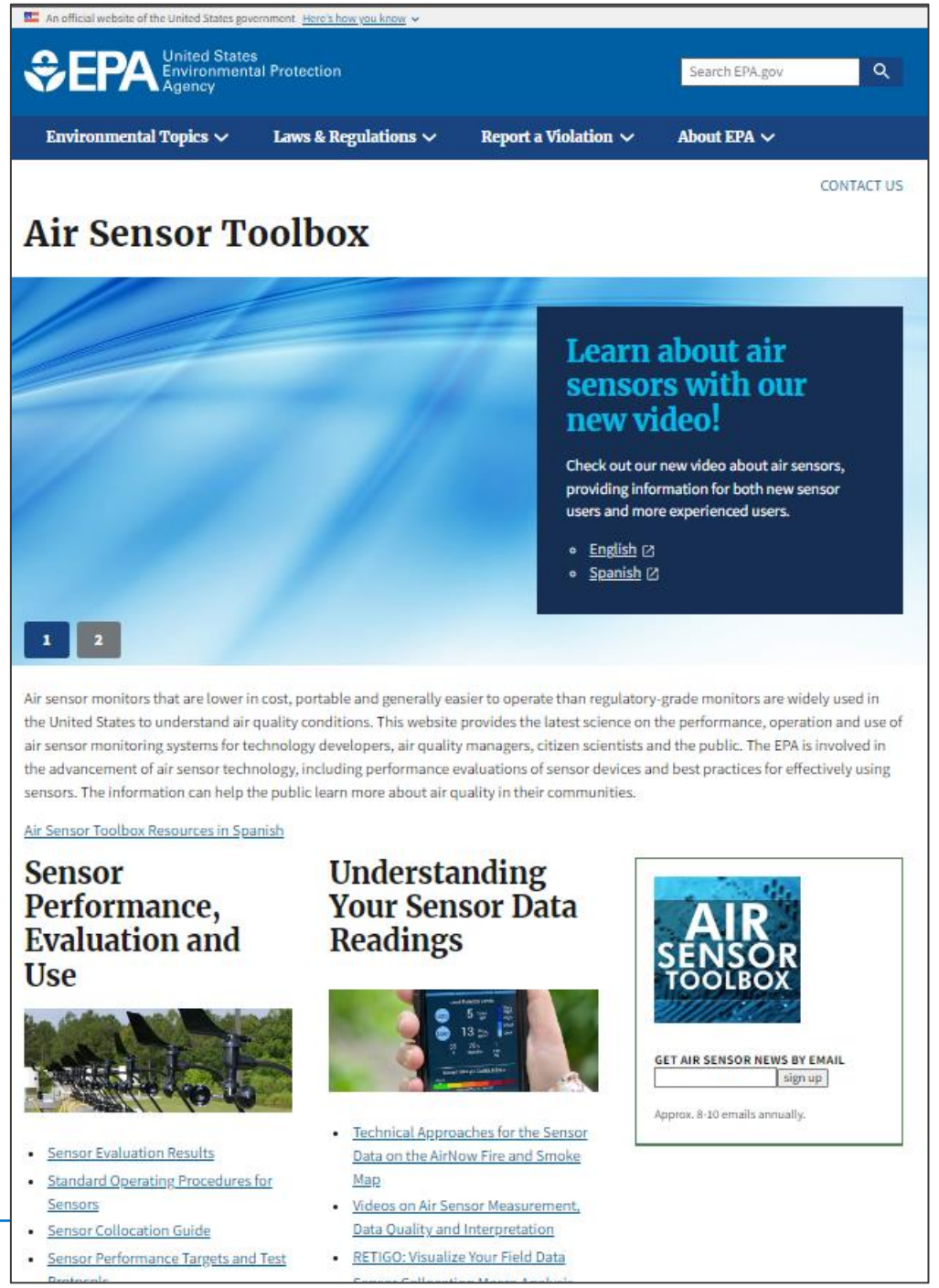
EPA Air Sensor Toolbox

- Provides all users a basic understanding of operating sensors
- User Guides and Standard Operating Procedures for more robust data
- Performance metrics for acceptance testing sensors
- Performance evaluations of popular or widely used sensors
  - Also available at SCAQMD AQ-SPEC



Public Engagement/Educational Web Pages

Air Quality Monitor Locations

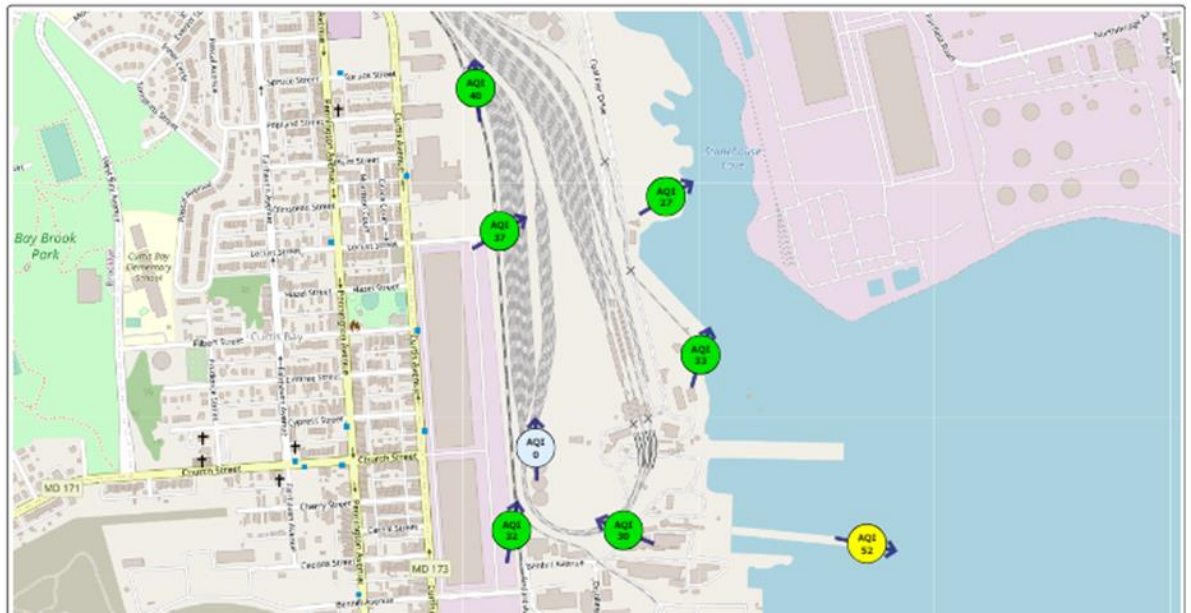
Monitoring locations were selected based on wind rose data, air dispersion modeling results, and EPA guidance to collect PM data around the property boundary to better understand the off-site air quality impacts of the [redacted] air modeling site characterization identified scenarios with higher parameter concentrations. Monitors were located inside these areas and with correlated cross-wind locations. This will enable data comparison for predominant wind patterns across the facility. The FEM monitors are located at stations AQ5 and AQ8 and LCS sensors are located at all locations.

Air Quality Standards

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, including particulate matter (PM). Air Quality Standards established by the EPA for PM_{10} and $PM_{2.5}$ are based on 24-hour averages from midnight to midnight local standard time (LST).

Air Quality Index

EPA created the Air Quality Index (AQI) to give the public an understanding of current air quality. The AQI is a measuring stick that standardizes concentrations of different criteria pollutants into a single, easy to understand index. The AQI is divided into six categories with each category corresponds to a different level of health concern. For each pollutant an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for protection of public health. AQI values at or below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is unhealthy: at first for certain sensitive groups of people, then for everyone as AQI values get higher.



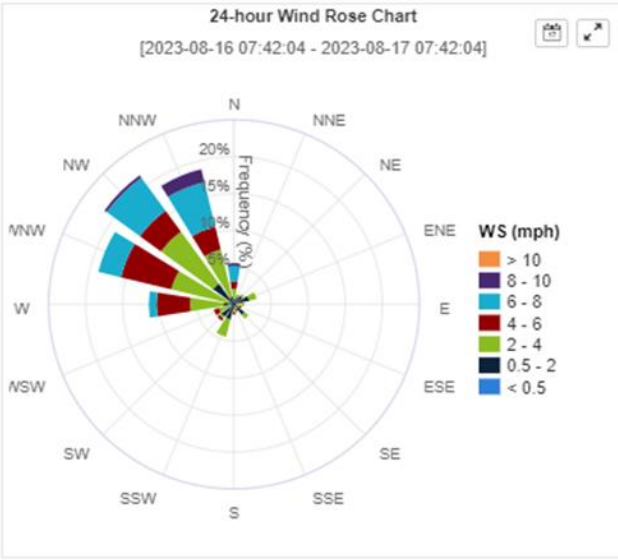
U.S. EPA Air Quality Index

Index Value*	Descriptor
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy for Sensitive Groups
151 to 200	Unhealthy
201 to 300	Very Unhealthy
301 and higher	Hazardous

*Calculated from 24-hour average particulate concentrations

Wind Rose

Wind data are often presented in a wind rose as a graphical tool to show the distribution of wind speed and wind direction around a compass. Wind directions represent the origin of the wind (the direction wind is blowing from).



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Summary

- EJ initiatives have resulted in a nationwide need for more air monitoring data
- Rulemaking efforts by EPA and local agencies are resulting in more fence line and community-based monitoring
- Effective network planning
  - Understand the objectives of the monitoring program and select proper instrumentation
  - Logistics for site selection can lead to difficulty or delay in program implementation
  - Ensuring effective quality control procedures allows for complete understanding of data limitations and qualification of data for meeting objectives

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Questions?

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