

# Air Quality Monitoring: Project Planning & Data Management

## Summary: Day 1 - Project Planning & Data Management

### Course Overview:

- Introduced data management and review for air quality monitoring.
- Emphasized clear monitoring objectives and planning.
- Incorporated Tribal case studies for real-world relevance.

### Air Quality Basics:

- Air quality changes by season, time, and location.
- Health risks include asthma, heart and lung problems.
- NAAQS sets national limits for pollutants (PM, NO<sub>2</sub>, O<sub>3</sub>, CO, SO<sub>2</sub>, Pb).

### Regulatory vs Non-Regulatory Monitoring:

- Regulatory: EPA-certified methods (FRM/FEM), legally valid data.
- Non-Regulatory: Community or tribal use, not used for compliance.

### Quality Systems & Systematic Planning:

- A structured system to ensure reliable and legal data.
- Based on the scientific method (reproducibility & transparency).

### Data Quality Objectives (DQOs):

- Define what data are needed and how accurate they must be.
- Indicators: Accuracy, Representativeness, Completeness, Comparability.

### Monitoring Project Planning:

- Define monitoring goals and questions.
- Select sites, tools, timeframe, and metrics (quantitative/qualitative).

### Data Management Systems (DMS):

- Handle large volumes of monitoring data.
- Tools for input, QA/QC, visualization, and sharing.
- Options: Built-in, third-party, or custom-built.

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## Data Review & Validation:

- AutoQC systems help ensure data integrity.
- Logs, calibration, and compliance checks are required.

## Remote Data Acquisition:

- Transmission via Wi-Fi, cellular, satellite, or manual (SneakerNet).

## Review Sheet: Key Terms & Concepts

- NAAQS: National standards for pollutant levels.
- FRM/FEM: EPA-approved monitoring methods.
- Systematic Planning: Organized planning based on the scientific method.
- DQO: Defines the quality level required for data.
- DQI: Metrics used to evaluate data quality.
- MQO: Limits of measurement error that meet project goals.
- DMS: Digital system to store, process, and analyze data.
- AutoQC: Automated checks to detect invalid data.
- Telemetry: Remote transfer of monitoring data.

## Review Questions

1. What is the purpose of a Quality System in air monitoring?
2. Name three Data Quality Indicators.
3. What are the differences between Regulatory and Non-Regulatory monitoring?
4. What are the benefits of systematic planning?
5. How does a DMS support data quality?
6. Why is documentation critical in data management?
7. What are some key considerations when choosing a DMS?