



# CRAFTING COMPETENCE

Training Tomorrow's Air  
Monitoring Technicians



South Coast  
AQMD

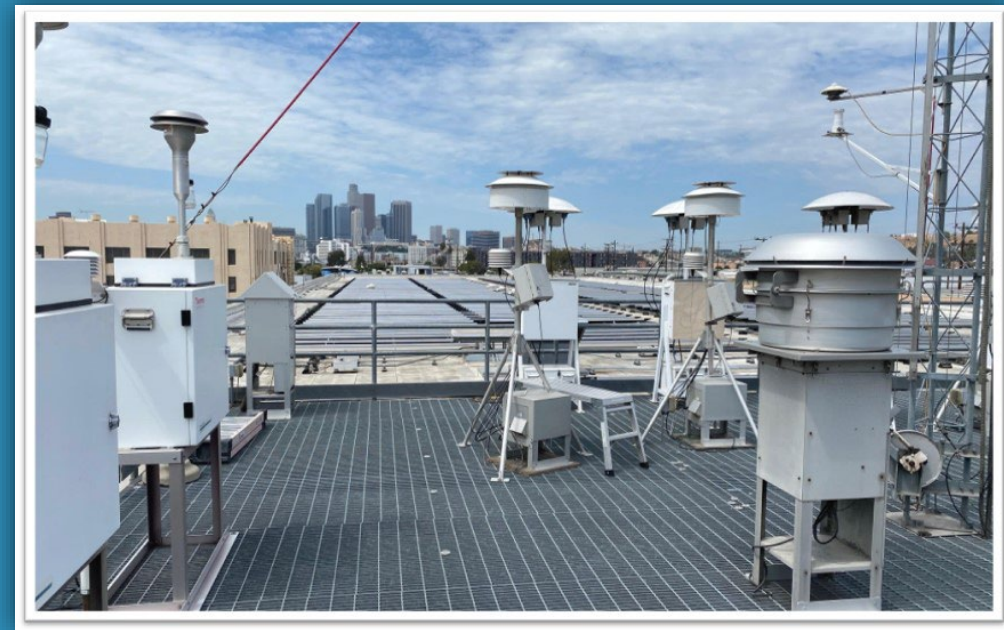
Rene M. Bermudez  
Atmospheric Measurements  
Manager  
South Coast AQMD

2024 NAAMC

August 12-15, 2024

# OVERVIEW

- ▶ Background
- ▶ Organizational Structure
- ▶ Objectives, Goals and Key Components
- ▶ South Coast AQMD Monitoring Network (MN)  
Air Quality Instrument Specialist (AQIS) Training  
Program
- ▶ Assessing Performance
- ▶ Final Thoughts



# BACKGROUND

- ▶ Challenges: Common Reasons Why We Lose Staff
  - ▶ Promotions
    - ▶ Within the agency
  - ▶ Retirement
    - ▶ Departure of institutional knowledge
  - ▶ Departure from Agency
    - ▶ State and local agencies
    - ▶ Refineries
    - ▶ NASA



# BACKGROUND

## ▶ Employee Retention Strategies

- ▶ Hire The Right People
- ▶ Allot Responsibilities Wisely
- ▶ Appreciate Good Work
- ▶ Performance Appraisals
- ▶ Work Life Balance
- ▶ Appropriate Training
- ▶ Cultivate Team Spirit!



# BACKGROUND

- ▶ Opportunities
  - ▶ Hire The Right People
    - ▶ Industrial/oil refinery/oil field experience
      - ▶ Hands on, mechanical experience
    - ▶ Electronics/troubleshooting
    - ▶ Philosophy
      - ▶ Ownership/self starters



## AQIS Attributes

Thank you for your effort to sit on this panel. Asst AQIS and AQIS I are entry level positions, but is one of the most important because it helps us build a solid base of staff who will rise to senior positions within the group. Identifying staff with the following attributes will help ensure we have adequate candidates for promotional recruitments. The most qualified candidates will have the following attributes:

- A sense of responsibility
  - Field operators work alone on a daily basis.
  - Care about the quality of their work
- Team player, works well with others
  - Having open communication between operators helps to recognize, and resolve issues before they become widespread
- Awareness of what their role has been in the previous positions and having made an effort to make things better
  - Care about customer service, understanding that by producing data, we are providing a service to the AQMD planners, general public, and researchers.
  - Operators are arguably, one of the most important jobs. Understanding EPA sighting requirements and procedures can help prevent data loss. We look to operators to identify issues before they become big problems.
- Desire to learn more
  - Operators are always being exposed to new instrumentation and procedures, how well they do is related to their desire to learn more
- Hands on type of person
  - Site operators perform diagnostic tests, basic maintenance, and basic troubleshooting.
  - Working at a refinery
  - Working on cars, mechanical projects etc.
- Ability to prioritize
  - At times the workload is overwhelming, establishing priorities is essential to completing work.



# ORGANIZATIONAL STRUCTURE

- ▶ Organizational Structure and Roles for Air Quality Instrument Specialists (AQIS)
  - ▶ Assistant AQIS – BioWatch Program
    - ▶ Perform daily collections of filters
    - ▶ Documentation and filter delivery to lab
  - ▶ AQIS I – Operations, Daily Site Maintenance
    - ▶ Level 1 data validation
    - ▶ Documentation
    - ▶ Instrument diagnostics, site maintenance, load filter media
  - ▶ Sr. AQIS – Operation and Team Senior Staff
    - ▶ Provide guidance, training strategy
    - ▶ Monitors training progress and performance



# OBJECTIVES, GOALS AND KEY COMPONENTS

## ▶ Objectives

- ▶ Ensure Air Monitoring Technician (AMT) Staff Training and Performance
- ▶ Maintain a Robust Training Program
- ▶ Promote Cross Training

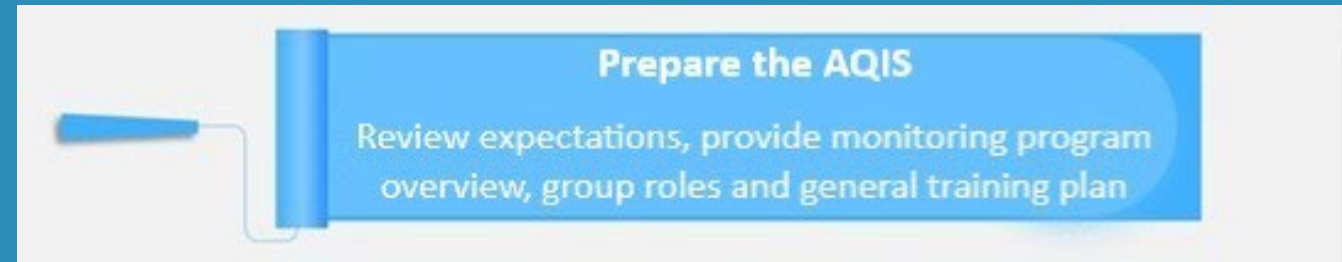
## ▶ Goals and Key Components

- ▶ Maintain Data Completeness
- ▶ Proficiency Metrics
- ▶ Promote Redundancy
  - ▶ Backup staffing



# SOUTH COAST AQMD TRAINING PROGRAM

- ▶ Training Phase One:  
Prepare the AMT
  - ▶ Meet with Every New Employee
  - ▶ Review Expectations for Position
- ▶ Overview of Monitoring Programs
  - ▶ BioWatch Network
    - ▶ Emphasize they will receive cross training



Operations AQIS I

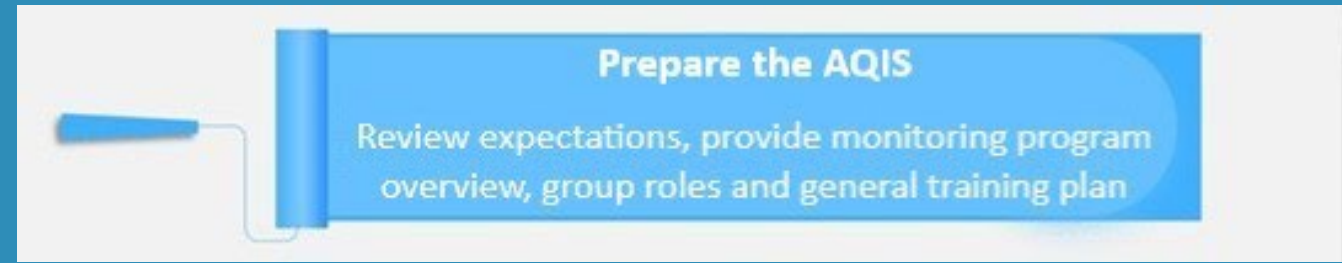
This is intended to be a Living document, updated as needed and as situations change; please notify the Principal AQIS as responsibilities are added. These are meant as a starting point, this assignment is what you make of it. There will be many other projects, or assignments depending on your skill set and your desire to make the most of your position.

- 1) Prioritize work daily.
- 2) Understand pollutant trends, and how data is used by our customers.
- 3) Review nightly spans on DMS and Airvision each morning for instrument performance issues.
- 4) Documentation issues at monitoring sites in logbooks.
- 5) Understand data collection and QC procedures and system.
- 6) Understand how to use tools available to perform job.
  - a. Cellular phone hotspot
  - b. Laptop and software (VPN)
  - c. Data Management system (DMS)
  - d. Airvision
- 7) Study and understand instrument diagnostics and what they mean to data quality
- 8) Complete Monthly Maintenance sheets and indicate issues with the monitors by the second week of the following month.
- 9) Be familiar with operational SOPs.

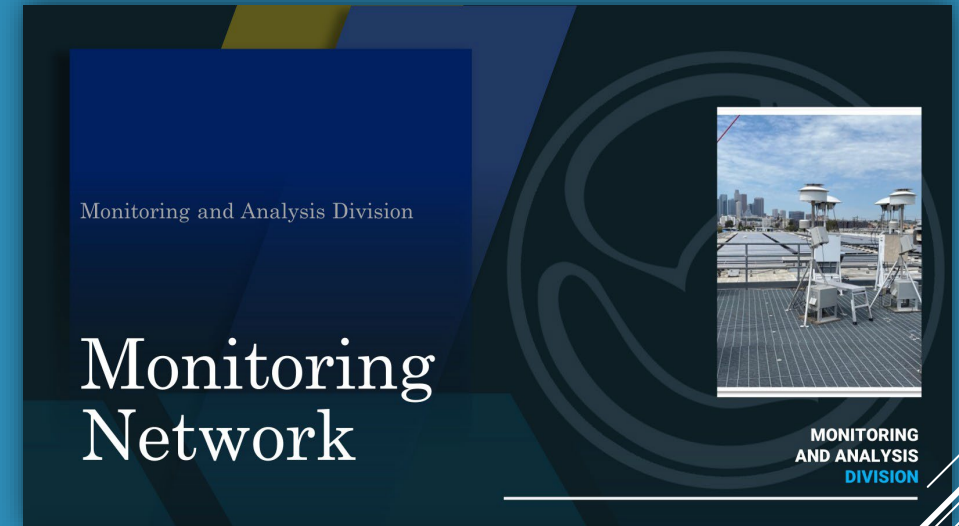


# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)

- ▶ Monitoring Network Review
  - ▶ Criteria Pollutant Network
  - ▶ U.S. EPA Role
  - ▶ CARB Role
  - ▶ South Coast AQMD Role




**Prepare the AQIS**  
Review expectations, provide monitoring program overview, group roles and general training plan

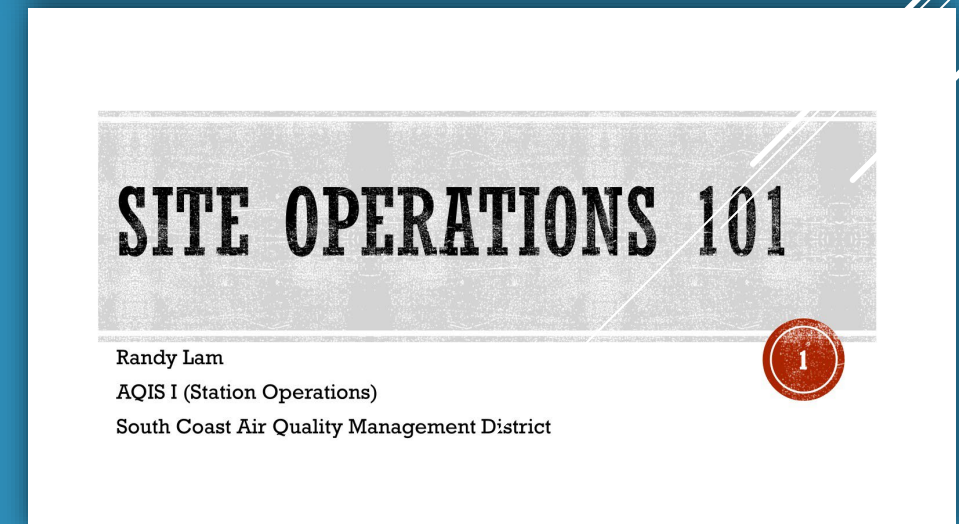


Monitoring and Analysis Division

## Monitoring Network




MONITORING AND ANALYSIS DIVISION



## SITE OPERATIONS 101

Randy Lam  
AQIS I (Station Operations)  
South Coast Air Quality Management District



# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)

- ▶ Basic Operations AMT Training “BOAT” Operator Assistance Guide (OAG)
  - ▶ Provides Overview to New Assistant AMT staff
    - ▶ References Standard Operating Procedures (SOPs)
      - ▶ Criteria pollutant monitoring network training
      - ▶ General station operations



South Coast Air Quality Management District  
Monitoring and Analysis Division  
QA0096\_Basic Operations AQIS Training\_V1.0

August 15, 2023  
Version 1.0  
Page 1 of 4

**Title:** QA0096\_Basic Operations AQIS Training

**Author/Title:** John Simone / Senior Air Quality Instrument Specialist

**Purpose/Background:**

The purpose of this Operation Assistance Guide (OAG) is to give an overview to new Air Quality Instrument Specialists (AQIS), in the basic concepts of operations of the Air Monitoring Network. This Basic Operations AQIS Training (BOAT) OAG sets general expectations for the Trainer and Trainee to complete station operations overview training. The goal is to provide introductory training to new AQIS Staff so that they can be exposed to the duties and responsibilities involved in the operation of the Air Monitoring Network Sites. This will allow these new employees to the Air Monitoring Network to have a broad understanding of the concepts and procedures involved, so that they can make best use of formal training programs.

1. Following the framework and guidance of *SOP00181\_AM\_Monitoring Network Training* the Program will provide the roadmap for the station operator responsibilities on all instrumentation within the South Coast AQMD air monitoring network.

**Electronic File Name:** QA0096\_Basic Operations AQIS Training\_V1.0

**SOP Reference:** *SOP00181\_AM\_Monitoring Network Training*  
*SOP00116, General Air Monitoring Station Operations*

**Contacts:** Amanda James (x3528) [ajames@aqmd.gov](mailto:ajames@aqmd.gov)  
Juan Garcia (x3186) [jgarcia@aqmd.gov](mailto:jgarcia@aqmd.gov)  
John Simone (x2482) [jsimone@aqmd.gov](mailto:jsimone@aqmd.gov)

**Equipment/Software/Consumables:**

- South Coast AQMD Laptop w/AQMD Document Distribution
- Operation's Standard Operating Procedures (SOP)
- Operation's Operator Assistance Guides (OAG)

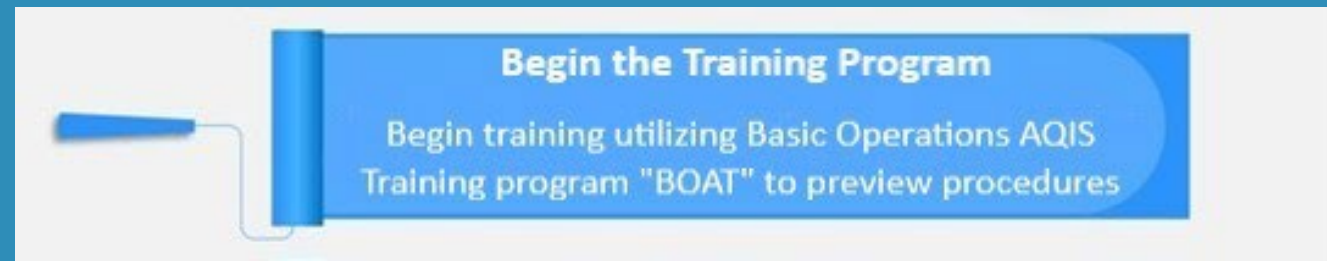
**Responsibilities**

The responsibilities for the BOAT Program are listed below for the Trainee and Senior Staff. Instruction will follow all applicable Standard Operating Procedures (SOP) or Operator Assistance Guides (OAG) for Station, or instrumentation being trained on.

1. Trainees will be new AQIS Operators that are either new hires or have been transferred from the Federal Monitoring Program or other South Coast AQMD divisions. These Operators in Training will be scheduled to participate in a series of training sessions including power point presentations, instrument demonstrations and a monitoring site visit.
2. As a trainee in the BOAT Program, the trainee shall; read corresponding SOP or OAG documentation, ask questions, take notes as appropriate, be on time, and assist in documenting training in a timely manner working with the Trainer.

# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)

- ▶ BOAT Training Guidelines
  - ▶ Senior Staff Provide Training
    - ▶ Responsible for following training table
    - ▶ Responsible for documentation of training
    - ▶ Provides a daily topic for discussion/training based on SOPs/OAGs
    - ▶ Demonstrate procedures as defined in SOP/OAGs for proficiency before next phase of training



**Basic Operations AQIS Training**

Trainee: \_\_\_\_\_

Trainer: \_\_\_\_\_

#	Training Activity	Reference	Done	Training Form
1.00	Station Operations	SOP00116	[ ] [ ]	
1.10	Organizational and Time Management Skills		[ ]	N/A
1.20	Sample, Cleaning & Verification Schedules		[ ]	N/A
1.30	AQMD Document Distribution (SOP/OAG/Manuals)		[ ]	N/A
1.40	Work Order System		[ ]	N/A
1.50	Logbooks (Station & Instrument)		[ ]	N/A
1.60	Maintenance Sheet Packet		[ ]	N/A
1.70	Downtime Log		[ ]	N/A
2.00	DMS (Data Management System)	SOP00116 SOP00117 SOP00118	[ ] [ ]	
2.10	Basic Controls		[ ]	N/A
2.20	Making a Graph		[ ]	N/A
2.30	Filtering Data		[ ]	N/A
2.40	Null Codes/Op Codes			
2.50	Reports			
2.60	Exports	Various SOP	[ ]	N/A
3.00	Criteria Gaseous Instruments	SOP00116 SOP00117 SOP00118	[ ] [ ]	
3.10	PC / Precision Checks, Span & Zero		[ ]	N/A
3.20	Weekly Filter Change & Maintenance		[ ]	N/A
3.30	Monthly Maintenance		[ ]	N/A
3.40	Instrument Specific SOP Documents	Various SOP	[ ]	N/A
4.00	Gaseous Manifold (System)	QA0046	[ ] [ ]	
5.00	Hi-Volume Samplers (SSI PM10 & TSP Lead)	SOP00078 SOP00164	[ ] [ ]	

# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)

Air Knowledge is a partnership training program in US EPA's Office of Air Quality Planning and Standards (OAQPS). These courses can be used to improve knowledge of air quality issues

Air Knowledge courses can be found at:  
<https://airknowledge.gov/>

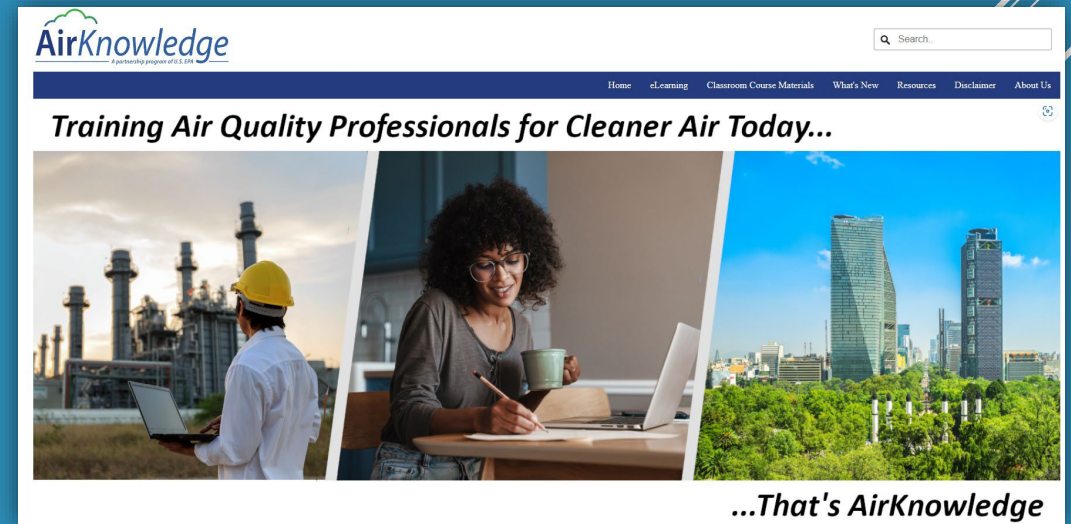
- ▶ BASC110 - Introduction to the National Ambient Air Quality Standards (NAAQS)
- ▶ AMBM103-SI - Introduction to Ambient Air Monitoring for Criteria Pollutants
- ▶ Ambient Monitoring QA/QC and Data Analysis
- ▶ Introduction to Ambient Air Monitoring
- ▶ Introduction to Environmental Statistics



Linked Learning

<https://learning.linkedin.com/>

- ▶ Critical Thinking for Better Judgement and Decision-Making
- ▶ Secrets of Effective Prioritization
- ▶ Mastering Self-Motivation



# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)



## Begin the Program

Begin training with Basic Operation Assistance Guide training "BOAT" provide basic skills needed as an AQIS

**South Coast AQMD**

### Station Operations by the Numbers

Annie Shin  
Air Quality Instrument Specialist II

00:00.00

The video player shows a dark background with a factory skyline and smokestacks. A small video feed of Annie Shin is visible in the top right corner of the player area.



# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)

## ▶ Hands On Training

- ▶ Legacy Training Through the Comprehensive Operations AMT Station Training Program "COAST"
- ▶ References SOPs
  - ▶ MN Network field training
  - ▶ General Station Operations
- ▶ Defines Training Roles
  - ▶ Trainee
    - ▶ Shall follow SOPs/OAGs
  - ▶ Trainer: experienced air monitoring technician who is a certified trainer, and site operator
    - ▶ Responsible for following training guidelines



South Coast Air Quality Management District Monitoring and Analysis Division QA0089_Comprehensive Operations AQIS Station Training	August 3, 2023 Version 1.0 Page 1 of 5
<b>Title:</b> QA0089_Comprehensive Operations AQIS Station Training	
<b>Author/Title:</b> Amanda James / Senior Air Quality Instrument Specialist	
<b>Purpose/Background:</b> The purpose of this Operation Assistance Guide (OAG) is to provide guidance in the training of new Air Quality Instrument Specialist (AQIS) into the Operations of the Air Monitoring Network. The Comprehensive Operations AQIS Station Training (COAST) program sets expectations for the Trainer and Trainee to complete comprehensive station operations training. The goal is to provide the comprehensive training to new AQIS Staff so that Senior Staff can rate them as proficient in the duties and responsibilities involved in the operation of the Air Monitoring Network Sites.	
1. Following the framework and guidance of <i>SOP00181_AM_Monitoring Network Training</i> the COAST Program will provide the roadmap for the station operator responsibilities on all instrumentation within the South Coast AQMD air monitoring network.	
<b>Electronic File Name:</b> QA0089_Comprehensive Operations AQIS Station Training V1.0	
<b>SOP Reference:</b> <i>SOP00181_AM_Monitoring Network Training</i> <i>SOP00116, General Air Monitoring Station Operations</i>	
<b>Contacts:</b> Amanda James (x3528) ajames@aqmd.gov Juan Garcia (x3186) jgarcia@aqmd.gov John Simone (x2482) jsimone@aqmd.gov	
<b>Equipment/Software/Consumables:</b> <ul style="list-style-type: none"><li>• South Coast AQMD Laptop w/AQMD Document Distribution</li><li>• Operation's Standard Operating Procedures (SOP)</li><li>• Operation's Operator Assistance Guides (OAG)</li></ul>	
<b>Responsibilities</b> The responsibilities for the COAST Program are listed below for the Trainee, Trainer, and Senior Staff. Instruction will follow all applicable Standard Operating Procedures (SOP) or Operator Assistance Guides (OAG) for Station, or instrumentation being trained on.	
1. Staff responsible for operations of the stations are classified as Assistant Air Quality Instrument Specialist (AQIS) or higher classification. For the purpose of this document, they will be referred to as the AQIS Operator.	
2. Trainees will be new AQIS Operators that will be assigned to a Trainer to serve as a mentor for the purposes of training. Follow appropriate SOP or OAG documentation, ask questions, take notes as appropriate, be on time, and assist in documenting training in a timely manner working with the Trainer.	

# SOUTH COAST AQMD TRAINING PROGRAM (CONTINUED)

## ▶ COAST Training Guidelines

- ▶ Site Operator Mentors new AMT
  - ▶ Responsible for following training table
  - ▶ Responsible for completing individual training form
  - ▶ Demonstrate processes outlined in SOPs/OAGs
  - ▶ Observe trainee perform processes in SOPs/OAG and provide update to Senior AQIS
- ▶ Senior AQIS
  - ▶ Assign certified AQIS I trainer
  - ▶ Follow up on progress
  - ▶ Ensure documentation is completed
  - ▶ Conduct proficiency observations once training is completed



Comprehensive Operations AQIS Station Training Plan

Trainee: \_\_\_\_\_

Trainer: \_\_\_\_\_

#	Training Activity	Reference	Done	Training Form
1.00	Station Operations	SOP00116	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Organizational and Time Management Skills		<input type="checkbox"/>	N/A
1.20	Sample, Cleaning & Verification Schedules		<input type="checkbox"/>	N/A
1.30	AQMD Document Distribution (SOP/OAG/Manuals)		<input type="checkbox"/>	N/A
1.40	Work Order System		<input type="checkbox"/>	N/A
1.50	Logbooks (Station & Instrument)		<input type="checkbox"/>	N/A
1.60	Maintenance Sheet Packet		<input type="checkbox"/>	N/A
1.70	Downtime Log		<input type="checkbox"/>	N/A
2.00	Criteria Gaseous Instruments	SOP00116 SOP00117 SOP00118	<input type="checkbox"/>	<input type="checkbox"/>
2.10	PC / Precision Checks, Span & Zero		<input type="checkbox"/>	N/A
2.20	When & How to Re-Zero		<input type="checkbox"/>	N/A
2.30	Weekly Filter Change & Maintenance		<input type="checkbox"/>	N/A
2.40	Monthly Maintenance		<input type="checkbox"/>	N/A
2.50	Instrument Specific SOP Documents	Various SOP	<input type="checkbox"/>	N/A
3.00	NCORE Gaseous Instruments	SOP00116 SOP00117 SOP00118	<input type="checkbox"/>	<input type="checkbox"/>
3.10	PC / Precision Checks, Span & Zero		<input type="checkbox"/>	N/A
3.20	When & How to Re-Zero		<input type="checkbox"/>	N/A
3.30	Weekly Filter Change & Maintenance		<input type="checkbox"/>	N/A
3.40	Monthly Maintenance		<input type="checkbox"/>	N/A
3.50	Instrument Specific SOP Documents	Various SOP	<input type="checkbox"/>	N/A
4.00	Gaseous Manifold (Maintenance)	QA0046	<input type="checkbox"/>	<input type="checkbox"/>
5.00	Hi-Volume Samplers (SSI PM10 & TSP Lead)	SOP00078 SOP00164	<input type="checkbox"/>	<input type="checkbox"/>
5.10	Filter / Sample Handling & Transport		<input type="checkbox"/>	N/A
5.20	Blanks (Field)		<input type="checkbox"/>	N/A
5.30	Chain of Custodies (COC's)/MSR		<input type="checkbox"/>	N/A
5.40	Sampling: Setup, Loading & Unloading		<input type="checkbox"/>	N/A
5.50	Data Processing		<input type="checkbox"/>	N/A
5.60	Monthly Verifications (Flow etc) Fixed Orifice		<input type="checkbox"/>	N/A
5.70	Monthly Verifications (Flow etc) Digital CTS	QA0049	<input type="checkbox"/>	<input type="checkbox"/>
6.00	FRM PM2.5 Partisol	SOP000151	<input type="checkbox"/>	<input type="checkbox"/>
6.10	Filter / Sample Handling & Transport		<input type="checkbox"/>	N/A
6.20	Blanks (Field & Trip)		<input type="checkbox"/>	N/A
6.30	Chain of Custodies (COC's)		<input type="checkbox"/>	N/A
6.40	Sampling: Setup, Loading & Unloading		<input type="checkbox"/>	N/A
6.50	Data Processing		<input type="checkbox"/>	N/A
6.60	Monthly Verifications (Flow etc)		<input type="checkbox"/>	N/A
6.70	Missed Sample Report (MSR)	QA0037	<input type="checkbox"/>	<input type="checkbox"/>

# ASSESSING PERFORMANCE

## Performance Strengths and Weakness

### Plan

- ▶ Setting Expectations
- ▶ SOP/OAG Proficiency Testing
  - ▶ Upon completion of COAST

### Manage

- ▶ Senior Oversight of AMT Staff
  - ▶ Ongoing monitoring of performance
- ▶ Refresher Training
  - ▶ SOP updates
- ▶ Communication
  - ▶ Lab/QA/MN Meetings
  - ▶ Quarterly meetings
    - ▶ Training component





# ASSESSING PERFORMANCE (CONTINUED)



## Review

- ▶ Data Completeness
  - ▶ As a metric of performance to determine areas for improvement

## Reward

- ▶ Performance Appraisal Process
  - ▶ Review performance, establish goals and career development
  - ▶ Recognize commendable performance
- ▶ Foster a Team Culture
  - ▶ Semi-annual group activities

## Renew

- ▶ Evaluate Process



# FINAL THOUGHTS

- ▶ Challenges
  - ▶ Retention
  - ▶ New Staff
  - ▶ Opportunities
- ▶ Objectives
  - ▶ Ensure AQIS Staff Training and Performance
- ▶ Goals and Key Components
  - ▶ Maintain a High Level of Data Completeness
  - ▶ Robust Training Program
- ▶ South Coast AQMD MN AQIS Training Program
  - ▶ BOAT / COAST
- ▶ Assess Effectiveness





# QUESTIONS?



Contact: [Rbermudez@AQMD.GOV](mailto:Rbermudez@AQMD.GOV)