

AQS **(Air Quality System)** **General Overview**

CARB PQAQO Training

January 25, 2017

Jennifer Williams EPA Region 9

AQS (Air Quality System) Overview



What is AQS?

Database that contains:

- Ambient air pollution data
- Meteorological data
- Descriptive information about each monitoring station
- Data quality assurance /quality control information



Who uses AQS?

Data is collected and uploaded by:

- EPA
- State agencies
- Local agencies
- Tribes

Data is extracted and used by:

- State / Local Agencies / Tribes
- EPA OAQPS (Office of Air Planning and Standards), EPA regional offices
- Researchers

AQS (Air Quality System) Overview



What is AQS used for?

Used by the Office of Air Planning and Standards (OAQPS) and other AQS users to:

- Assess air quality
- Assist in Attainment/Non-attainment designations
- Evaluate State Implementation Plans for Non-Attainment Areas
- Perform modeling for permit review analysis
- Other air quality management functions

Who manages AQS?

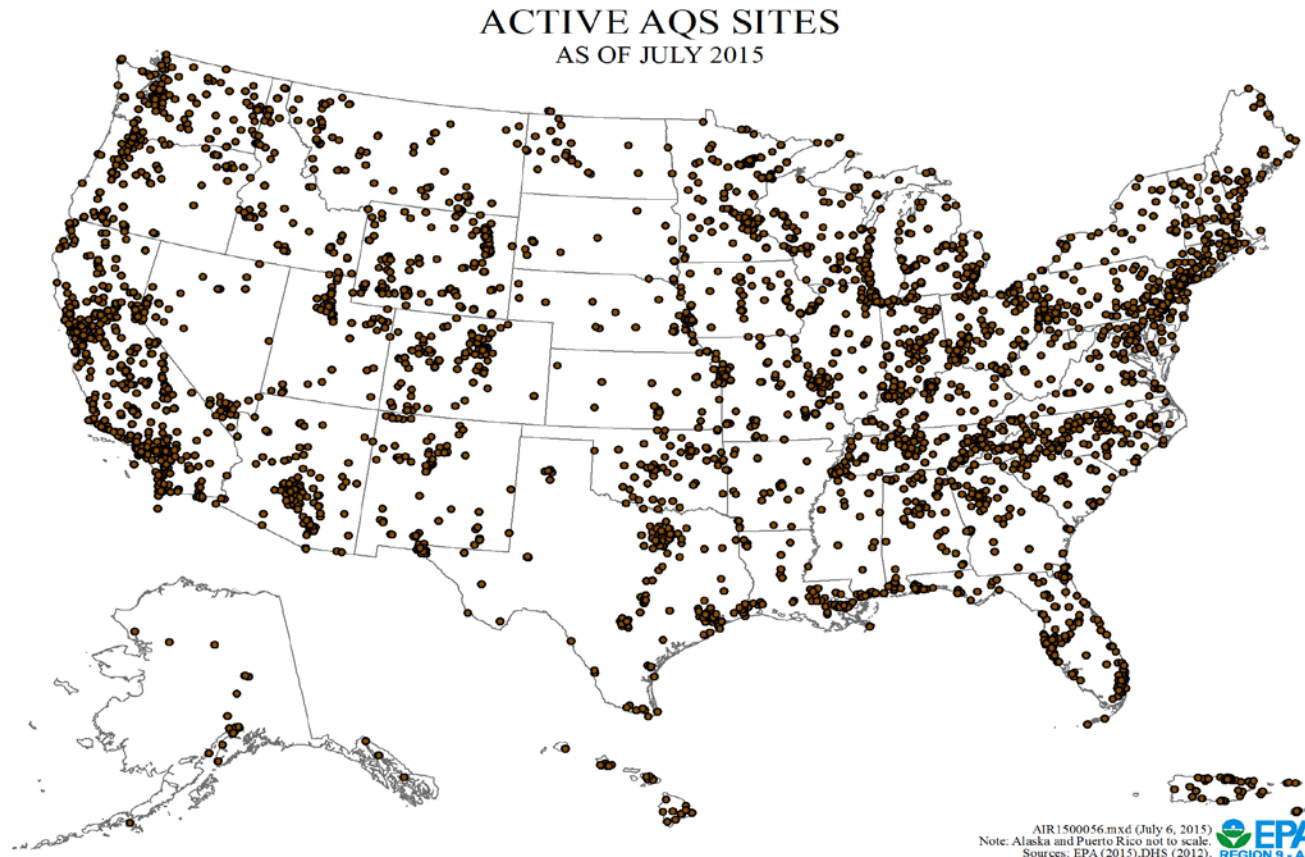
EPA OAQPS



AQS (Air Quality System) Overview



There are over 17,000 monitors in Region 9 and over 102,000 monitors (including R9) in the country.



AQS Submission Requirements



All data collected must be submitted to AQS no later than 90 days after the quarter in which the data was collected.

2017

January							February							March							April						
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S
1	2	3	4	5	6	7				1	2	3	4	5	6	7	8	9	10	11	2	3	4	5	6	7	8
8	9	10	11	12	13	14	5	6	7	8	9	10	11	12	13	14	15	16	17	18	9	10	11	12	13	14	15
15	16	17	18	19	20	21	12	13	14	15	16	17	18	19	20	21	22	23	24	25	16	17	18	19	20	21	22
22	23	24	25	26	27	28	19	20	21	22	23	24	25	26	27	28	29	30	31	23	24	25	26	27	28	29	
29	30	31					26	27	28												30						
May							June							July							August						
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S
1	2	3	4	5	6						1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7
7	8	9	10	11	12	13	4	5	6	7	8	9	10	11	12	13	14	15	16	17	8	9	10	11	12	13	14
14	15	16	17	18	19	20	11	12	13	14	15	16	17	18	19	20	21	22	23	24	15	16	17	18	19	20	21
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22	22	23	24	25	26	27	28
28	29	30	31				25	26	27	28	29	30	23	24	25	26	27	28	29	27	28	29	30	31			
													30	31													
September							October							November							December						
S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S
					1	2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	15	16	17	18	19	20	21	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
24	25	26	27	28	29	30	29	30	31				26	27	28	29	30	24	25	26	27	28	29	30			
																			31								

When is data due?

- Oct. – Dec. 2016 – Mar. 31, 2017
- Jan. – Mar. 2017 – Jun. 30, 2017
- Apr. – Jun. 2017 – Sep. 30, 2017
- Jul. – Sep. 2017 – Dec. 31, 2017
- Oct. – Dec. 2017 – Mar. 31, 2018

When is data certification for 2016 data due?

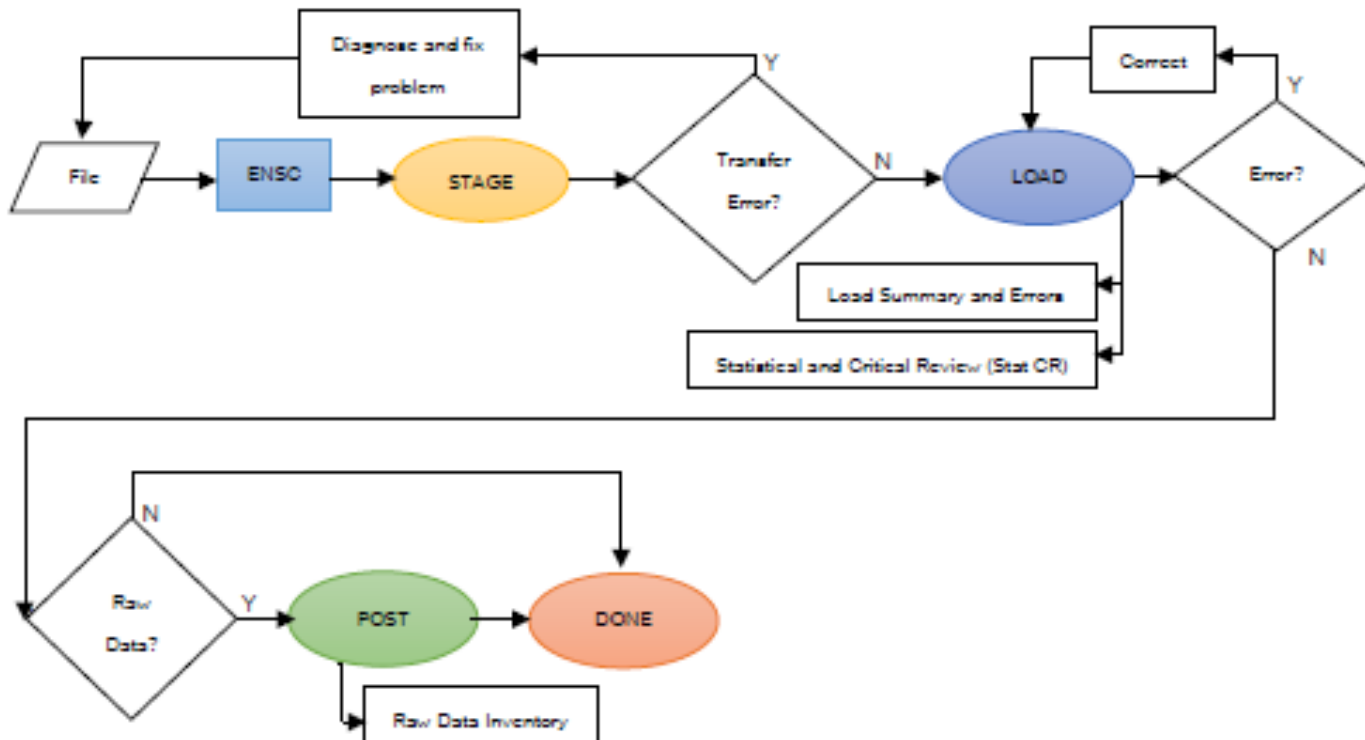
- May 1, 2017

Data Submission to AQS



Batch Data Submissions Flowchart

The following explains the data flow to AQS.



<https://www.epa.gov/sites/production/files/2016-01/loadingfilesaqswf>

Data Submission to AQS



AQS Users Guide:

<https://www.epa.gov/aqs/aqs-users-guide-0>

The User Guide is designed to familiarize the user with:

- The look and feel of AQS
- Running AQS
- Batch Loading data
- Creating and modifying site and monitor descriptive information
- Generating output information encompassing user data

2016 National Ambient Air Monitoring Conference PowerPoints:

<https://www.epa.gov/aqs/naam-conference-2016>

Monitoring Metadata



Monitor metadata can be equally important as the ambient concentration data because incorrect metadata may lead to data issues or errors in data interpretation.



Examples of important AQS monitor-level metadata fields:

- Agency roles
- Method code
- Parameter occurrence code
- Required sampling frequency and schedule
- Sampling period - start/close dates
- Type / scale / objective / network affiliation
- Primary monitor / QA collocation
- Distance to roadway / probe obstruction
- NAAQS exclusion

<https://www.epa.gov/aqs/aqs-code-list>

Maintain Site: How to add a new monitor



AQS

Action Help Session Admin Audit Retrieval **Maintain** Critical Rev Certification Batch Correct Main Menu

Site

Maintain Site (Read Only. Update/Insert not all)

Basic Site Data Additional Site Data Agency Roles

Site Identification

State Code

County Code

User Coordinates

Horizontal Datum

UTM Zone UTM Easting UTM Northing Longitude

Standard Coordinates: Datum Latitude Longitude

Horizontal Method

Horizontal Accuracy (Meters) Source Map Scale (Non-GPS)

Vertical Measure (Meters) Vertical Accuracy (Meters) Vertical Datum

Vertical Method

Street Address

Land Use Type Location Setting

City Code

Urban Area Code

AQCR Code

Site Established Date (YYYYMMDD) Time Zone Name

Owning Agency

Maintain Site: How to add a new monitor



AQS

Action Help Session Admin Audit Retrieval Maintain Critical Rev Certification Batch Correct Main Menu

Maintain Site (Read Only. Update/Insert not allowed.)

Basic Site Data Additional Site Data Agency Roles Tangent Roads Open Paths Comments Primary Monitor Periods

Site Identification

State Code

County Code Site Id Status Ind

User Coordinates

Horizontal Datum Latitude Longitude

UTM Zone UTM Easting UTM Northing

Standard Coordinates: Datum Latitude Longitude

Horizontal Method

Horizontal Accuracy (Meters) Source Map Scale (Non-GPS)

Vertical Measure (Meters) Vertical Accuracy (Meters) Vertical Datum

Vertical Method

Street Address

Land Use Type Location Setting

City Code

Urban Area Code

AQCR Code

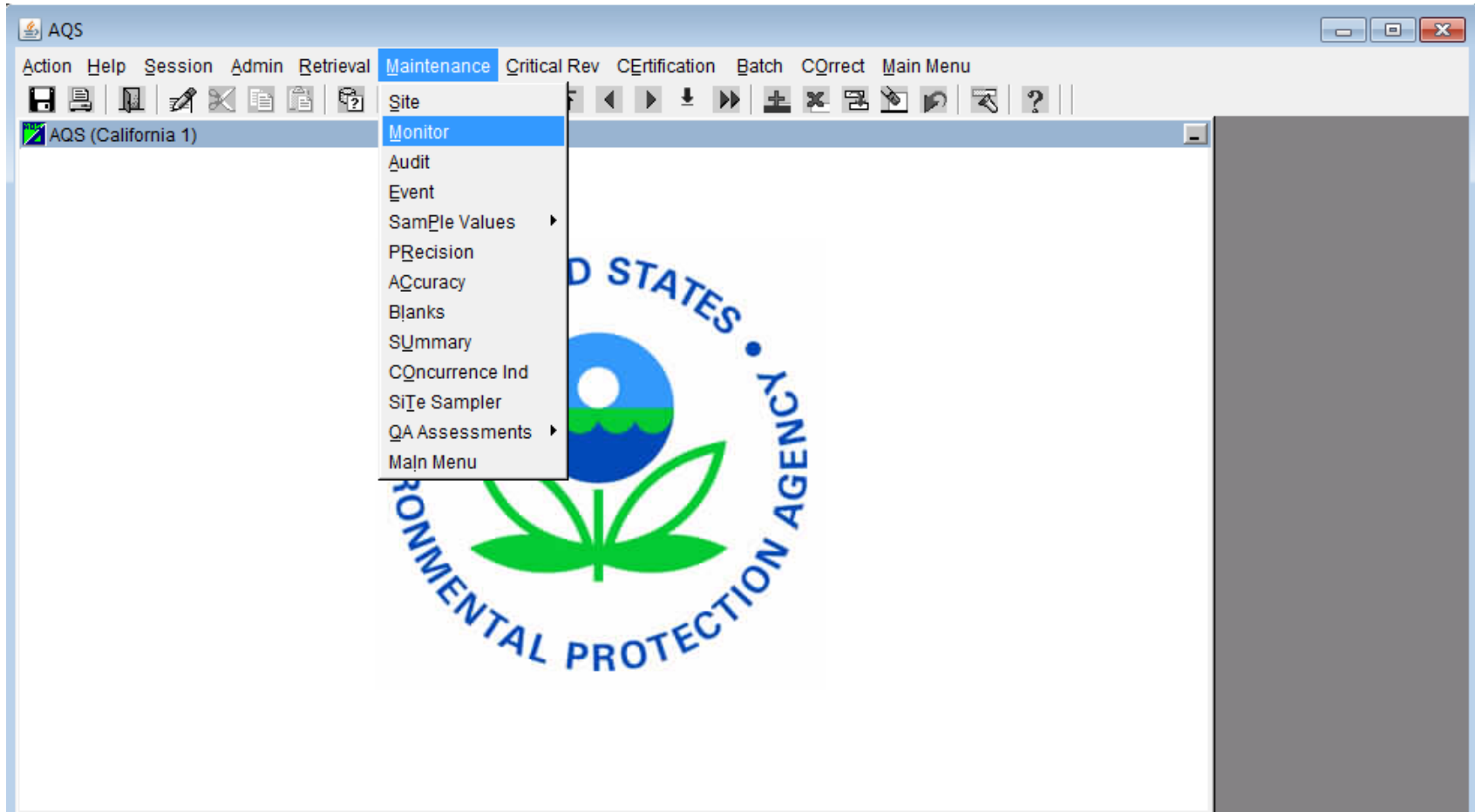
Site Established Date (YYYYMMDD) Time Zone Name

Owning Agency

Updating Monitor Metadata in AQS



The Maintain Monitor Form



Example : New method installed at site



Click "F8" or the EXECUTE button

AQS

Action Help Session Admin Retrieval Maintenance Critical Rev Certification Batch Correct Main Menu

Maintain - Monitors (California 1)

State Code	County Code	Site Id	Parameter Code	POC	Status Ind
06	057	0005	88101	1	P

Project Class: []
Meas Scale: NEIGHBORHOOD
Probe Location: []
Probe Vert Dist: []
Samp Res Time: []
Close Date: []

Dominant Source: []
Open Path Num: []
Probe Height: 12
Surrogate Ind: []
Last Samp Date: 20140728
Monitoring Agency (Owner): 0145 California Air Resources Board

Probe Hor Dist: []
Unrest Air Flow: []
Last Post Date: 20141118

Check Completeness Duplicate Monitor

- Monitor Basic
- Sample Periods
- Type Assign.
- Network Affiliations
- Agency Roles
- Objectives
- Req Frequencies
- QA Collocation
- Methods
- Exclusions
- Pollutant Area
- Tangent Road
- Probe Obs.
- Reg Compliances
- Protocols
- Channels
- Comments

Example : New method installed at site



AQS

Action Help Session Admin Audit Retrieval Maintain Critical Rev Certification Batch Correct Main Menu

Maintain - Monitors (Read Only. Update/Insert Not Allowed.)

Monitor: 06-057-0005-88101-1

Code	Collection Description	Analysis Description	Begin Date	End Date
143	R & P Model 2000 PM-2.5 Air Sampler w/VSCC	Gravimetric	20151003	
117	R & P Model 2000 PM2.5 Sampler w/WINS	GRAVIMETRIC	19981230	20151002

- Monitor Basic
- Sample Periods
- Type Assign.
- Network Affiliations
- Agency Roles
- Objectives
- Req Frequencies
- QA Collocation
- Methods**
- Exclusions
- Pollutant Area
- Tangent Road
- Probe Obs.
- Reg Compliances
- Protocols
- Channels
- Comments

Example : Change Objective



AQS

Action Help Session Admin Audit Retrieval Maintain Critical Rev Certification Batch CORrect Main Menu

Maintain - Monitors (Read Only. Update/Insert Not Allowed.)

Monitor: 06-057-0005-88101-1

Monitor Objective Type	UA Represented	CBSA Represented	CSA Represented	MSA Represented	CMSA Represented
POPULATION EXPOSURE	0000				

- Monitor Basic
- Sample Periods
- Type Assign.
- Network Affiliations
- Agency Roles
- Objectives**
- Req Frequencies
- QA Collocation
- Methods
- Exclusions
- Pollutant Area
- Tangent Road
- Probe Obs.
- Reg Compliances
- Protocols
- Channels
- Comments

AQS Reports



AMP 390 – Monitor Description Report

AMP 430 – Data Completeness Report

AMP 300 – Violation Day Count Report

AMP 350NW – Raw Data NAAQS Averages Report

AMP 350 – Raw Data Report

AMP 450 – QuickLook Report

AMP 480 – Design Value Report

AMP 600 – Data Certification Report

The collage displays several key report pages:

- AMP 390:** Monitor Description Report showing station details and monitoring equipment.
- AMP 430:** Data Completeness Report with a table of monitoring events.
- AMP 300:** Violation Day Count Report showing violation statistics.
- AMP 350NW:** Raw Data NAAQS Averages Report with a large data table.
- AMP 350:** Raw Data Report with a large data table.
- AMP 450:** QuickLook Report with a table of pollutant data.
- AMP 480:** Design Value Report showing design value calculations for various pollutants.
- AMP 600:** Data Certification Report with a table of data quality indicators.

AMP 390 – Monitor Description Report



Monitor ID: 04-013-9997-44201-1
 Date of Latest Collection: 20160930
 Screening Group: Arizona Continuous
 Parameter Measured: 44201
 Last Updated: 20161014
 City: Phoenix

Monitoring Agency/Owner: 0053 Arizona Department Of Environmental Quality

Street Address: 4530 N 17TH AVENUE

Site Name: JLG SUPERSITE

CBSA: Phoenix-Mesa-Scottsdale, AZ

County: Maricopa

UAR: Phoenix, AZ

Project Type: POPU

Meas. Scale: NEIGH

Probe Location:

Probe Height (m):

Sample Residence Time:

Probe Height (m): 4.1
 Sample Residence Time: 1.94

AGENCY ROLES

DATES OF OPERATI
 Begin Date End Da
 19930701

Agency Role	Agency Name	Begin Date	End Date
ANALYZING	Arizona Department Of Environmental Quality	19930701	
COLLECTING	Arizona Department Of Environmental Quality	19930701	
REPORTING	Arizona Department Of Environmental Quality	19930701	
PQAO	Arizona Department Of Environmental Quality	20070101	
PQAO	Arizona Department Of Environmental Quality	19930701	20061231
CERTIFYING	Arizona Department Of Environmental Quality	19930701	

Monitor Type	Begin Date	End Date
SLAMS	19930701	

POPULATION EXPOSURE Phoenix-Mesa-Scottsdale, AZ

MONITOR METHODS

Method Code	Sample Collection	Sample Analysis	Begin Date	End Date
019	INSTRUMENTAL	ULTRA VIOLET	19930701	19981231
056	INSTRUMENTAL	ULTRA VIOLET	19990101	20020930
047	INSTRUMENTAL	ULTRA VIOLET	20021001	20110331
087	INSTRUMENTAL	ULTRA VIOLET ABSORPTION	20110401	

AMP 350 – Raw Data Report



(42401) Sulfur dioxide
 SITE ID: 04-013-9997 POC: 1
 COUNTY: (013) Maricopa
 CITY: (55000) Phoenix
 SITE ADDRESS: 4530 N 17TH AVENUE
 SITE COMMENTS:

STATE: (04) Arizona

(42401) Sulfur dioxide
 SITE ID: 04-013-9997 POC: 1

CAS NUMBER: 7446-09-5
 LATITUDE: 33.503833
 LONGITUDE: -112.095767
 UTM ZONE:
 UTM NORTHING:
 UTM EASTING:
 ELEVATION-MSL: 346
 PROBE HEIGHT: 4.1

MONITOR COMMENTS: REDUCED SENSITIVITY AT LOW CONCENTRATION

PER CITY

SUPPORT AGENCY: (0053) Arizona Department of Environmental Quality
 MONITOR TYPE: SLAMS

SITE ID: 04-013-9997 POC: 1

DURATION: 1 HOUR
 UNITS: Parts per billion
 MIN DETECTABLE: .2

COLLECTION AND ANALYSIS METHOD: (592) Instrumental Ultraviolet Fluorescence
 PQAQ: (0053) Arizona Department of Environmental Quality

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM	
1	.7	.9	.9	.8	.8	.9	.9	.9	.9	.9	.9	.8	.8	.9	.9	.8	.7	.8	1.0	1.2	1.6	2.0	1.2	.9	24	2.0	
2	1.1	1.5	1.7	2.0	2.2	2.2	2.4	3.0	4.4	2.6	1.8	1.3	1.2	1.1	1.1	1.1	1.0	1.1	1.4	1.8	1.6	1.2	1.3	1.1	24	4.4	
3	.9	.9	.8	.8	1.0	.9	.9	1.0	1.4	1.0	1.0	.9	.9	1.3	1.0	.9	.9	.9	1.3	1.9	2.5	2.7	3.0	3.0	24	3.0	
4	2.3	2.2	2.0	2.0	2.2	2.1	2.1	2.3	2.7	2.0	1.5	1.2	.8	.6	.6	.5	.5	.6	1.2	2.1	3.1	3.3	2.9	2.3	24	3.3	
5	2.1	2.0	1.7	1.5	1.5	2.0	2.0	3.0	3.4	1.8	1.5	1.2	.7	.5	.6	.5	.6	.8	1.9	2.8	3.6	3.5	3.0	3.1	24	3.6	
6	2.8	2.6	2.2	1.7	1.9	2.1	2.6	4.0	3.6	3.0	2.3	1.5	1.0	1.0	.9	.9	.9	1.7	3.3	4.0	4.8	4.3	3.8	3.8	24	4.8	
7	3.1	2.8	2.4	2.2	1.8	1.5	1.7	2.9	3.9	4.2	3.1	1	1.1	1.1	1.1	.5	.7	.6	.6	.7	.8	.7	.6	.6	24	4.2	
8	.8	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1	1.1	1.1	1.1	1.3	1.5	1.4	1.2	1.2	1.3	1.9	2.1	2.3	2.4	24	2.4
9	2.5	1.8	1.4	.9	.9	1.1	2.5	3.8	4.9	3.7	2.4	1	1.1	1.1	1.1	1.0	.9	1.0	1.3	2.0	1.5	1.1	.9	.9	24	4.9	
10	.9	.7	.6	.7	.6	.6	.7	.7	.7	.7	.8	1	1.1	1.1	1.1	.8	.8	.8	.9	1.4	2.4	3.1	2.6	2.1	24	3.1	
11	1.8	1.9	1.9	1.5	1.3	1.4	1.5	1.8	1.9	1.7	1.1	1	1.1	1.1	1.1	1.0	.9	1.0	1.0	1.2	1.0	.8	.9	.8	24	1.9	
12	.9	.9	.8	.8	.8	.9	1.2	1.7	2.0	1.6	1.2	1	1.1	1.1	1.1	1.4	1.3	1.2	1.1	1.2	1.4	2.1	2.6	2.3	2.1	24	2.6
13	2.0	2.0	1.8	1.5	1.7	1.6	2.0	2.2	2.1	1.5	BF	.8	.8	.9	.9	.9	.9	.9	1.1	1.0	.9	1.1	1.0	1.1	23	2.2	
14	.8	.8	.7	.8	1.1	1.5	1.8	3.0	2.8	1.8	1.0	1.0	.9	.6	.6	.6	.5	.6	.6	1.1	1.6	1.9	1.8	1.5	24	3.0	
15	1.4	1.6	1.5	1.6	1.6	1.9	2.6	3.2	4.0	3.2	1.5	.9	.9	.9	.9	.9	.9	1.2	1.8	1.3	1.1	1.3	1.1	1.0	24	4.0	
16	.8	.7	.8	.8	1.1	1.3	2.2	3.0	4.6	3.5	1.9	.9	.7	.7	.8	.9	.9	1.0	1.8	3.2	3.6	4.0	3.2	2.8	24	4.6	
17	3.0	2.6	1.7	1.4	1.4	1.5	1.7	2.0	2.0	1.2	.9	.8	.8	.8	.9	.8	.8	.8	1.5	2.4	3.0	3.2	2.4	2.4	24	3.2	
18	2.0	1.7	1.2	1.1	1.1	1.5	1.6	1.7	1.5	1.2	.6	.5	.5	.5	.5	.4	.4	.7	1.2	2.0	2.1	1.9	2.0	2.5	24	2.5	
19	2.6	2.6	2.1	1.9	2.1	1.7	1.0	.9	1.2	1.5	2.7	2.0	3.8	4.0	3.4	2.7	2.0	1.7	1.6	2.2	2.8	2.8	2.9	2.2	24	4.0	
20	2.0	1.8	1.5	1.4	1.3	1.5	2.1	2.7	3.1	2.1	1.3	1.1	1.7	4.5	4.6	4.5	3.6	3.3	3.2	3.7	3.5	3.5	3.6	3.4	24	4.6	
21	3.3	2.5	1.8	1.7	1.7	1.3	2.4	3.3	3.8	2.6	1.7	1.5	1.4	1.4	1.2	1.0	1.0	1.0	.9	.9	.9	1.1	.9	.9	24	3.8	
22	1.0	1.0	1.0	.9	.9	.9	1.0	1.0	1.1	.9	.8	.9	.8	.9	.8	.8	.9	.8	.9	.9	.9	.9	.9	.8	24	1.1	
23	.8	.7	.8	1.0	1.0	1.3	1.8	2.4	2.7	1.6	1.2	1.0	.9	.8	.8	.8	.7	.8	1.1	1.8	2.4	2.7	2.0	1.5	24	2.7	
24	1.4	1.0	1.0	1.0	1.0	.7	1.0	1.7	2.5	1.2	.9	.8	.8	.8	.7	.6	.7	.9	1.6	2.2	2.5	2.6	2.8	2.5	24	2.8	
25	2.0	1.5	1.6	1.9	1.9	1.8	1.7	1.8	1.8	1.1	1.0	.9	.9	.9	.9	1.1	1.1	1.2	1.6	2.4	2.2	2.8	2.7	2.7	24	2.8	
26	2.5	2.0	1.7	1.6	1.5	1.6	1.8	2.5	3.8	3.9	4.1	1.6	1.8	1.7	1.7	1.8	2.0	2.3	2.8	3.0	2.3	2.1	1.9	2.0	24	4.1	
27	1.6	1.9	1.7	1.8	1.5	.9	1.4	2.0	2.6	2.4	1.8	1.8	1.1	1.1	1.0	1.0	.9	.9	.9	1.9	2.3	3.0	3.1	3.0	24	3.1	
28	2.9	2.5	2.0	2.1	2.1	2.0	2.1	2.9	3.2	3.2	1.8	1.3	1.1	1.2	1.1	1.0	1.0	1.0	1.1	1.3	1.7	2.1	2.4	2.5	24	3.2	
29																										3.3	
30																										1.6	
31																										1.8	

MONTHLY OBSERVATIONS:	743	MONTHLY MEAN:	1.59	MONTHLY MAX:	4.9	1.8																		
MAX:	3.3	2.8	2.4	2.2	2.2	2.2	2.6	4.0	4.9	4.2	4.1	2.1	3.8	4.5	4.6	4.5	3.6	3.3	3.3	4.0	4.8	4.3	3.8	3.8
AVG:	1.75	1.60	1.41	1.35	1.38	1.40	1.65	2.17	2.54	1.99	1.52	1.14	1.10	1.18	1.15	1.14	1.10	1.10	1.38	1.79	2.08	2.21	2.06	1.95

MONTHLY OBSERVATIONS: 743 MONTHLY MEAN: 1.59 MONTHLY MAX: 4.9

AMP 430 – Data Completeness Report



DATE RANGE: JAN. 01, 2015 THRU DEC. 31, 2015
 REGION: (09) SAN FRANCISCO
 STATE: Arizona

REP ORG: Arizona Department Of Environmental Quality
 MONITOR TYPE: SLAMS

SITE ID CITY ADDRESS	PARAMETER	POC	DURATION METHOD	OBSERVATIONS												YEAR
				NUMBER / PERCENT												
				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
04-013-9997 Phoenix 4530 N 17TH AVENUE	Sulfur dioxide	1	1 592	743 100%	620 92%	741 100%	718 100%	740 99%	715 99%	741 100%	735 99%	718 100%	660 89%	584 81%	738 99%	8453 96%
04-013-9997 Phoenix 4530 N 17TH AVENUE	Nitrogen dioxide (NO2)	1	1 090	741 100%	666 99%	739 99%	716 99%	739 99%	712 99%	734 99%	711 96%	712 99%	659 89%	584 81%	57 8%	7770 89%
04-013-9997 Phoenix 4530 N 17TH AVENUE	Ozone	1	1 087	649 87%	667 99%	742 100%	717 100%	741 100%	718 100%	742 100%	720 97%	717 100%	740 99%	716 99%	737 99%	8606 98%
04-013-9997 Phoenix 4530 N 17TH AVENUE	PM10 Total 0-10um STP	3	1 122	678 91%	669 100%	742 100%	717 100%	722 97%	718 100%	741 100%	741 100%	714 99%	740 99%	687 95%	740 99%	8609 98%

OBSERVATIONS												
NUMBER / PERCENT												
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
743	620	741	718	740	715	741	735	718	660	584	738	8453
100%	92%	100%	100%	99%	99%	100%	99%	100%	89%	81%	99%	96%

AMP 480 – Design Value Report



Pollutant: Site-LevelPM2.5 - Local Conditions(88101)
Standard Units: Micrograms/cubic meter (LC) (105)
NAAQS Standard: PM25 24-hour 2012 / PM25 Annual 2012
Statistic: Annual Weighted Mean **Level:** 12
Statistic: Annual 98th Percentile **Level:** 35

Design Value Year: 2015

REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.

State Name: Arizona

Site ID / STREET ADDRESS	2015					2014					2013					24-Hour		Annual	
	Cred. Comp.	98th	Wtd.	Cert&	Eval	Cred. Comp.	98th	Wtd.	Cert&	Eval	Cred. Comp.	98th	Wtd.	Cert&	Eval	Design	Valid	Design	Valid
	Days	Qtrts	Perctil	Mean		Days	Qtrts	Perctil	Mean		Days	Qtrts	Perctil	Mean		Days	Qtrts	Perctil	Mean
04-013-9997 4530 N 17TH AVENUE	363	4	23.2	7.7	S	365	4	22.5	7.0	S	343	4	21.6	7.1	S	22	Y	7.3	Y

Pollutant: Ozone(44201)
Standard Units: Parts per million(007)
NAAQS Standard: Ozone 8-hour 2015

Design Value Year: 2015

REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.

Statistic: Annual 4th Maximum **Level:** .07

State: Arizona

Site ID	Poc STREET ADDRESS	2015				2014				2013				3 - Year			
		Valid	Percent	4th	Cert&	Valid	Percent	4th	Cert&	Valid	Percent	4th	Cert&	Percent	Year	Design	D. V.
		Days	Complete	Max	Eval	Days	Complete	Max	Eval	Days	Complete	Max	Eval	Complete	Value	Validity	
04-013-9997	4530 N 17TH AVENUE	358	98	.075	S	364	100	.077	S	344	94	.079	S	97	.077	Y	

S **Statistic:** | 3 - Year
Statistic: | Percent Design D. V.
 | **Complete Value Validity**
 | 97 .077 Y

Level: .07 12
Level: 35

... which AQS report is right for you?



Q: What AQS report would you use to find out if a monitor's method code has changed in the past five years?

A: The Monitor Description Report – **AMP 390**

Monitor ID: 04-013-9997-44201-1
 Date of Latest Collection: 20160930
 Screening Group: Arizona Continuous
 Monitoring Agency/Owner: 0053 Arizona Department Of Environmental Quality
 Street Address: 4530 N 17TH AVENUE
 Site Name: JLG SUPERSITE
 County: Maricopa
 Project Type: POPULATION-ORIENTED SURVEILLANCE
 Meas. Scale: NEIGHBORHOOD
 Probe Location: GROUND LEVEL SUPPORT
 Probe Height (m): 4.1
 Sample Residence Time: 1.94
 Parameter Measured: 44201
 Last Updated: 20161014
 City: Phoenix
 CBSA: Phoenix-Mesa-Scottsdale, AZ
 UAR: Phoenix, AZ
 Dominant Source:
 Location Setting: Urban And Center City
 Horizontal Distance (m):
 Vertical Distance (m):
 Unrestricted Air Flow?: Y

DATES OF OPERATION		AGENCY ROLES			
Begin Date	End Date	Agency Role	Agency Name	Begin Date	End Date
19930701		ANALYZING	Arizona Department Of Environmental Quality	19930701	
		COLLECTING	Arizona Department Of Environmental Quality	19930701	
		REPORTING	Arizona Department Of Environmental Quality	19930701	
		PQAO	Arizona Department Of Environmental Quality	20070101	
		PQAO	Arizona Department Of Environmental Quality	19930701	20061231
		CERTIFYING	Arizona Department Of Environmental Quality	19930701	

MONITOR TYPE INFORMATION				
Monitor Type	Begin Date	End Date	Action Type	Action Reason
SLAMS	19930701			

MONITORING OBJECTIVES			
Monitor Objective Type	UAR Name	CBSA Name	CSA Name

MONITOR METHODS

Method Code	Sample Collection	Sample Analysis	Begin Date	End Date
019	INSTRUMENTAL	ULTRA VIOLET	19930701	19981231
056	INSTRUMENTAL	ULTRA VIOLET	19990101	20020930
047	INSTRUMENTAL	ULTRA VIOLET	20021001	20110331
087	INSTRUMENTAL	ULTRA VIOLET ABSORPTION	20110401	

... which AQS report is right for you?



Q: What AQS report would you use to find out the percent of PM₁₀ data that has been reported for a monitor in 2015?

A: The Data Completeness Report – **AMP 430**

DATE RANGE: JAN. 01, 2015 THRU DEC. 31, 2015
 REGION: (09) SAN FRANCISCO
 STATE: Arizona

REP ORG: Arizona Department Of Environmental Quality
 MONITOR TYPE: SLAMS

SITE ID CITY ADDRESS	PARAMETER	POC	DURATION METHOD	OBSERVATIONS												YEAR
				NUMBER / PERCENT												
				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
04-013-9997 Phoenix 4530 N 17TH AVENUE	42401 Sulfur dioxide	1	1 592	743	620	741	718	740	715	741	735	718	660	584	738	8453
04-013-9997 Phoenix 4530 N 17TH AVENUE	42602 Nitrogen dioxide (NO2)	1	1	741	666	739	716	739	712	734	711	712	659	584	57	7770

678	669	742	717	722	718	741	741	714	740	687	740	8609
91%	100%	100%	100%	97%	100%	100%	100%	99%	99%	95%	99%	98%

... which AQS report is right for you?



Q: What AQS report would you use to find out when a QC check was performed on an instrument?

A: The Raw Data Report—**AMP 350**

9	2.5	1.8	1.4	.9	.9	1.1	2.5	3.8	1.1	1.1	1.0	.9	1.0	1.3	2.0	1.5	1.1	.9	24	4.9
10	.9	.7	.6	.7	.6	.6	.7	.7	.9	.8	.8	.8	.9	1.4	2.4	3.1	2.6	2.1	24	3.1
11	1.8	1.9	1.9	1.5	1.3	1.4	1.5	1.8	1.0	.9	1.0	1.0	1.0	1.2	1.0	.8	.9	.8	24	1.9
12	.9	.9	.8	.8	.8	.9	1.2	1.7	1.4	1.3	1.2	1.1	1.2	1.4	2.1	2.6	2.3	2.1	24	2.6
13	2.0	2.0	1.8	1.5	1.7	1.6	2.0	2.2	.9	.9	.9	.9	1.1	1.0	.9	1.1	1.0	1.1	23	2.2
14	.8	.8	.7	.8	1.1	1.5	1.8	3.0	.6	.6	.5	.6	.6	1.1	1.6	1.9	1.8	1.5	24	3.0
15	1.4	1.6	1.5	1.6	1.6	1.9	2.6	3.2	.9	.9	.9	1.2	1.8	1.3	1.1	1.3	1.1	1.0	24	4.0
16	.8	.7	.8	.8	1.1	1.3	2.2	3.0	.8	.9	.9	1.0	1.8	3.2	3.6	4.0	3.2	2.8	24	4.6
17	3.0	2.6	1.7	1.4	1.4	1.5	1.7	2.0	.9	.8	.8	.8	1.5	2.4	3.0	3.2	2.4	2.4	24	3.2
18	2.0	1.7	1.2	1.1	1.1	1.5	1.6	1.7	.5	.4	.4	.7	1.2	2.0	2.1	1.9	2.0	2.5	24	2.5
19	2.6	2.6	2.1	1.9	2.1	1.7	1.0	.9	3.4	2.7	2.0	1.7	1.6	2.2	2.8	2.8	2.9	2.2	24	4.0

Null data codes, qualifier codes and flags



Null Data Codes

- Data is determined to be invalid
- Null data does count toward completeness
 - AJ: Filter damage
 - BL: QA Audit



Qualifier Codes

- Data does not meet a particular criteria, but has been determined to be valid
 - 2: Operational deviation
 - SX: Does not meet siting criteria

Null data codes, qualifier codes and flags



Informational Flags (“I” series)

- Related to external environmental conditions
 - J: construction
 - IT: wildfire

Request for Exclusion Flags (“r” series)

- Formal request for data exclusion under the Exceptional Events Rule (EER)
 - rj: high winds
 - rt: wildfire



Null data codes, qualifier codes and flags



AA AU BC AP AM BL
 BA AF AW AV AQ XX BM
 BD BE MB BD ST DL BN
 AB AA BJ SA TS AD
 AC BM AZ DA MC AI AN BH AE FI TC

BI AH AG
 CS
 AR
 AS
 BK AX AK
 ST AT BD
 BR AB
 AY AN
 AJ AO
 AL BB BF
 BL XX AW
 AA SC
 BA AS
 BD AX
 AT DL AB
 BDAEDL
 SA
 BM FIAR
 AF
 AJ TCAB
 ABBA DA
 AA
 AY ST CS
 BH AV
 BEMC

Null data codes, qualifier codes, and flags



Code/Flag Recommendations

- Always code missing data
- Use descriptive qualifier codes or informational flags
- Do not use Miscellaneous Void (AM)

CONSISTENCY

- AQS coding should be part of data validation SOP
- Rationale for data code/flags should be supported by the appropriate

DOCUMENTATION

- Station logbooks
- QC check & audit documentation
- Maintenance records
- Validation records

replace sample line after -
to start found line from soe
operation block op. claims line
and started reading at 10:50 AM
Enabled Logger at 12:15
Completed ZSP
Disabled Logger @ 1148
Enabled @ 1300
7-7-09 Disassembled @ 10:59. AFTER I
turned on GAS ANALYSIS ALARM
CAME OUT. (NO FLOW) PUMP OFF.
Moved the pump a little and
it came on. Changed DIAPHRAM
and pump stayed on for a
little while but went off
AGAIN. Spoke to Bonnie &
Terry about problem.
Unable to do ZSP check.
Terry will come out tomorrow
8.

CALIFORNIA AIR RESOURCES BOARD
OZONE VERIFICATION REPORT

To: MARICOPA COUNTY AZ, EPA
REY SANTILLANO
Log Number: 2013107

From: Jerry Freeman
Data Analysis and Special Projects
Calibration Date: 4/2/2013
Report Date: 4/2/2013

IDENTIFICATION

Instrument:	API T400 OZONE PRIMARY STANDARD	Site Name:	MJD Standards Lab
Property No.:	109024	Site Number:	34-299
Serial No.:	608	Location:	1927 13th Street Sacramento, CA 95811
Previous Log No.:	NA		
Bar Code No.:	109024		
Elevation:	25.00		
Property of:	MARICOPA COUNTY AZ, EPA		

CALIBRATION STANDARD	ID Number
NIST STANDARD REFERENCE PHOTOMETER	4

VERIFICATION RESULTS

COMPONENT	OZONE
Instrument Range	500 ppb
Display	0.1
Air Flow Rate, SLPM	850
Air Flow Setting	850
Best Fit Linear Regression	Slope: 1.0001 Intercept: -0.0002
Deviation From True (%)	-0.01%
Change from Previous Calibration (%)	0.98%
Previous Calibration Date	3/28/2013

Comments: This primary standard meets the criterion set by the EPA for a successful ozone photometer verification. The calculated slope of the comparison data is within 3% of the true and the intercept is less than 3.0 ppb. The resultant slope and intercept values should not be used for correcting any ozone Standard's data or any ozone air monitoring data.

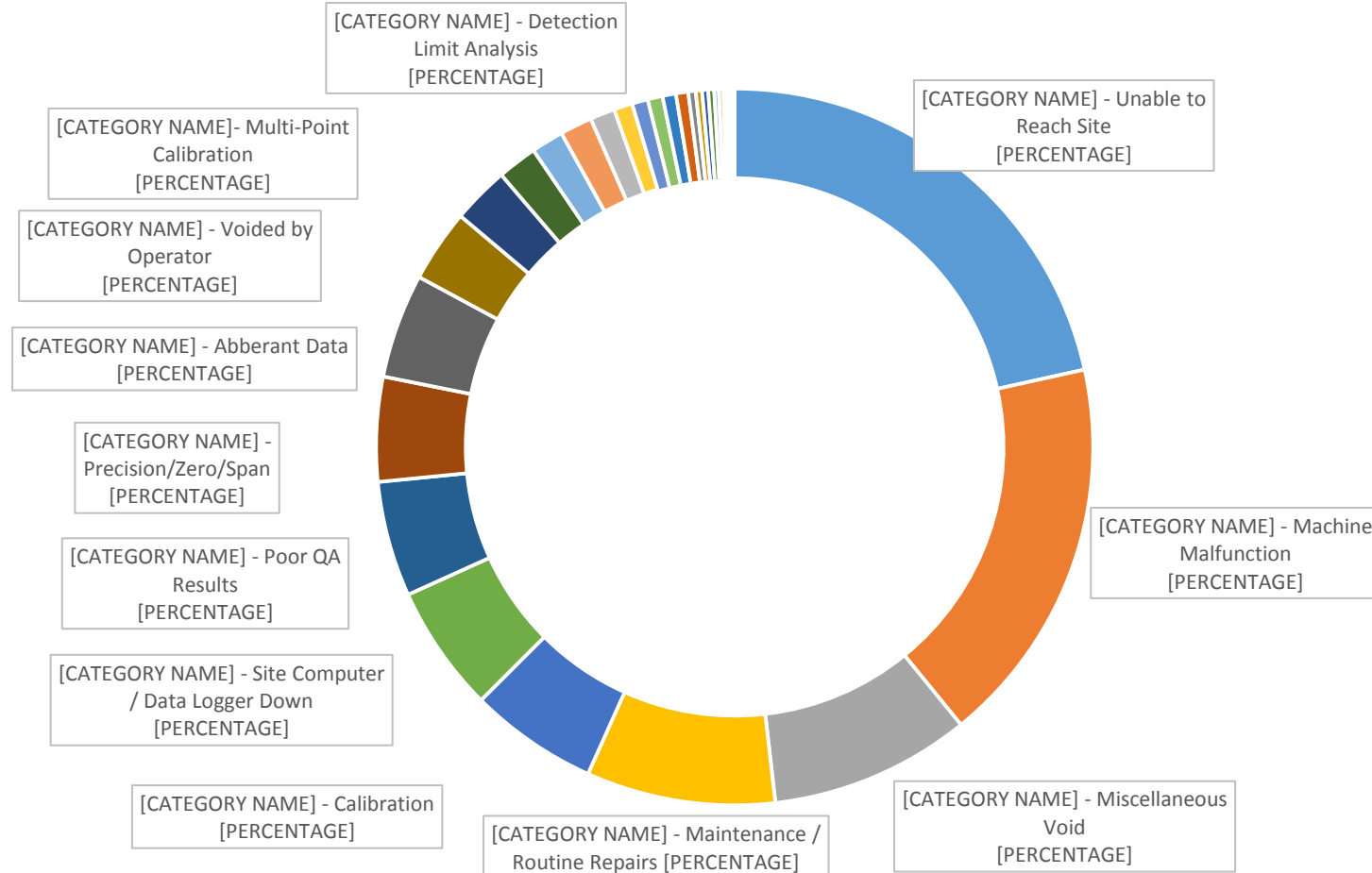
Certification Equation:
True Ozone Conc = 0.9999 x (Net Display) - 0.0002 ppm

Verified by: [Signature] Checked by: [Signature]

2015 PM_{2.5} FRM null data code distribution



2015 PM_{2.5} (88101) Null Code Data



AQS Data Coding Exercise



DESCRIPTION:

Audit team performs a semi-annual flow check on a PM_{2.5} FEM BAM1020



POSSIBLE CODE/FLAGS:

BC:
Multi-Point
Calibration

AT:
Calibration

BL:
QA Audit

BM:
Accuracy Check

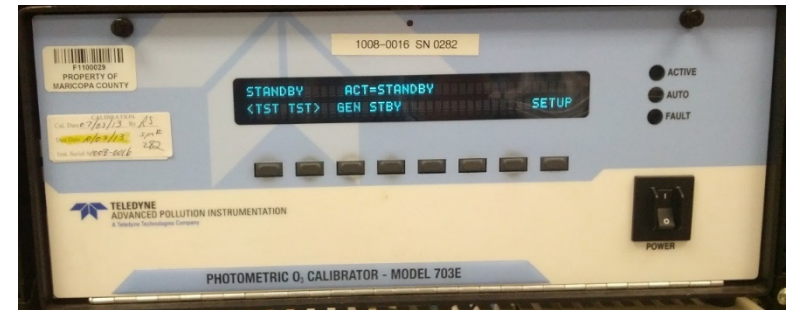
AM:
Miscellaneous Void

AQS Data Coding Exercise



DESCRIPTION:

Site technician takes an ozone analyzer off-line and performs a one-point QC check



POSSIBLE CODE/FLAGS:

BD:
Auto Calibration

AY:
QC Control Points
(zero/span)

BF:
Precision/Zero/Span

AC:
QC Audit

AX:
Precision Check

AQS Data Coding Exercise



DESCRIPTION:

During a filter weighing session, the lab technician discovers that there is a fingerprint on the filter.



POSSIBLE CODE/FLAGS:

AJ:
Filter Damage

AQ:
Collection Error

AR:
Lab Error

BJ:
Operator Error

FI:
Filter Inspection Flag

AQS Data Coding Exercise



DESCRIPTION:

An ozone probe is within 10 m of a tree dripline.



POSSIBLE CODE/FLAGS:

3:
Field Issue

SX:
Does Not Meet Siting
Criteria

QX:
Does Not Meet QC
Criteria

SC:
Sampler
Contamination

AM:
Miscellaneous void

AQS Data Coding Exercise



DESCRIPTION:

A storm knocked out the power to the site.

POSSIBLE CODE/FLAGS:



AL:
Voided by Operator

BB:
Unable to Reach Site

AR:
Lab Error

AF:
Scheduled but not
Collected

AV:
Power Failure

AQS Data Coding Exercise



DESCRIPTION:

The data logger failed to upload the data. Upon arrival to the station it was found that the site's computer and data loggers were disconnected.



POSSIBLE CODE/FLAGS:

BC:
Multi-Point
Calibration

AT:
Calibration

BK:
Site Computer/ data
logger down

AQ:
Collection Error

AM:
Miscellaneous Void

AQS Data Coding Exercise



DESCRIPTION:

Site operator does not lock the door to the monitoring site and leaves a sandwich on top of an ozone analyzer. A bear enters the site and destroys everything.



POSSIBLE CODE/FLAGS:

AW:
Wildlife Damage

AP:
Vandalism

BJ:
Operator Error

BK:
Site Computer/ Data
Logger Down

6:
QAPP Issue

What's wrong with this AMP 350

– Raw Data Report?



DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	21.0	25.0	23.0	9.0	6.0	10.0	8.0	10.0	9.0	10.0	6.0	2.0	1.0	2.0	5.0	9.0	10.0	13.0	13.0	20.0	32.0	31.0	32.0	27.0	24	32.0
2	28.0	22.0	24.0	23.0	27.0	23.0	21.0	23.0	24.0	21.0	20.0	23.0	17.0	19.0	22.0	17.0	14.0	27.0	19.0	19.0	27.0	28.0	31.0	25.0	24	31.0
3	25.0	27.0	26.0	28.0	25.0	28.0	24.0	22.0	26.0	23.0	22.0	19.0	22.0	22.0	25.0	21.0	24.0	27.0	29.0	34.0	41.0	38.0	47.0	46.0	24	47.0
4	37.0	38.0	35.0	31.0	35.0	36.0	36.0	33.0	36.0	34.0	25.0	25.0	21.0	21.0	24.0	21.0	24.0	18.0	28.0	25.0	34.0	28.0	26.0	21.0	24	38.0
5	17.0	18.0	26.0	22.0	27.0	29.0	34.0	31.0	32.0	25.0	25.0	20.0	13.0	14.0	11.0	12.0	11.0	25.0	27.0	19.0	14.0	16.0	12.0	15.0	24	34.0
6	24.0	27.0	29.0	35.0	39.0	46.0	46.0	44.0	38.0	34.0	30.0	25.0	29.0	30.0	24.0	17.0	18.0	22.0	25.0	33.0	30.0	32.0	30.0	25.0	24	46.0
7	24.0	19.0	13.0	19.0	18.0	18.0	21.0	28.0	31.0	27.0	19.0	15.0	22.0	20.0	30.0	23.0	32.0	28.0	25.0	17.0	19.0	23.0	23.0	13.0	24	32.0
8	14.0	26.0	20.0	16.0	18.0	18.0	21.0	22.0	35.0	31.0	33.0	37.0	43.0	47.0	47.0	48.0	41.0	55.0	49.0	44.0	37.0	51.0	41.0	31.0	24	55.0
9	32.0	39.0	34.0	34.0	28.0	36.0	39.0	31.0	31.0	35.0	32.0	24.0	23.0	16.0	19.0	21.0	22.0	17.0	21.0	15.0	14.0	19.0	23.0	17.0	24	39.0
10	19.0	20.0	19.0	18.0	16.0	16.0	13.0	12.0	11.0	14.0	12.0	11.0	15.0	14.0	16.0	9.0	12.0	13.0	13.0	15.0	10.0	12.0	17.0	21.0	24	21.0
11	18.0	14.0	13.0	21.0	10.0	17.0	16.0	15.0	15.0	16.0	19.0	23.0	26.0	16.0	10.0	10.0	6.0	5.0	9.0	8.0	8.0	6.0	11.0	15.0	24	26.0
12	12.0	9.0	9.0	15.0	15.0	13.0	8.0	12.0	20.0	18.0	15.0	13.0	19.0	15.0	14.0	11.0	6.0	6.0	8.0	7.0	8.0	11.0	12.0	10.0	24	20.0
13	12.0	11.0	10.0	8.0	13.0	14.0	11.0	11.0	13.0	10.0	11.0	10.0	5.0	7.0	7.0	5.0	6.0	6.0	6.0	8.0	10.0	11.0	11.0	8.0	24	14.0
14	13.0	16.0	10.0	12.0	15.0	10.0	10.0	13.0	33.0	39.0	32.0	25.0	29.0	25.0	30.0	32.0	33.0	35.0	36.0	40.0	39.0	44.0	39.0	23	44.0	
15	39.0	46.0	45.0	46.0	44.0	43.0	45.0	46.0	48.0	41.0	34.0	36.0	34.0	34.0	26.0	26.0	27.0	30.0	26.0	27.0	29.0	19.0	27.0	33.0	24	48.0
16	26.0	33.0	29.0	32.0	28.0	29.0	33.0	33.0	39.0	40.0	39.0	38.0	41.0	40.0	37.0	34.0	26.0	32.0	32.0	34.0	29.0	29.0	23.0	20.0	24	41.0
17	21.0	20.0	19.0	20.0	15.0	15.0	14.0	11.0	9.0	7.0	9.0	11.0	12.0	12.0	16.0	9.0	13.0	16.0	13.0	20.0	20.0	25.0	19.0	14.0	24	25.0
18	16.0	12.0	26.0	26.0	26.0	28.0	28.0	33.0	27.0	14.0	11.0	18.0	16.0	11.0	8.0	4.0	2.0	3.0	6.0	7.0	13.0	15.0	12.0	12.0	24	33.0
19	9.0	16.0	17.0	23.0	13.0	11.0	18.0	10.0	7.0	6.0	8.0	7.0	9.0	7.0	7.0	8.0	9.0	8.0	8.0	11.0	12.0	13.0	18.0	9.0	24	23.0
20	13.0	14.0	11.0	12.0	20.0	12.0	18.0	22.0	21.0	22.0	21.0	23.0	15.0	15.0	13.0	11.0	7.0	5.0	5.0	8.0	12.0	14.0	12.0	14.0	24	23.0
21	11.0	17.0	11.0	10.0	12.0	15.0	19.0	14.0	12.0	10.0	9.0	11.0	9.0	8.0	9.0	8.0	9.0	8.0	12.0	18.0	17.0	19.0	17.0	13.0	24	19.0
22	12.0	22.0	14.0	11.0	13.0	20.0	21.0	20.0	19.0	17.0	15.0	17.0	13.0	17.0	22.0	17.0	10.0	19.0	18.0	20.0	22.0	24.0	24.0	23.0	24	24.0
23	23.0	23.0	20.0	24.0	23.0	30.0	24.0	38.0	29.0	19.0	9.0	12.0	15.0	10.0	14.0	15.0	16.0	12.0	16.0	22.0	27.0	25.0	26.0	26.0	23	38.0
24	17.0	20.0	20.0	18.0	21.0	24.0	22.0	25.0	20.0	15.0	11.0	12.0	12.0	13.0	16.0	23.0	20.0	26.0	28.0	29.0	32.0	23.0	24.0	24.0	24	32.0
25	25.0	33.0	26.0	28.0	26.0	23.0	20.0	22.0	22.0	13.0	18.0	15.0	10.0	19.0	16.0	11.0	14.0	13.0	21.0	20.0	20.0	18.0	25.0	21.0	24	33.0
26	22.0	17.0	23.0	21.0	17.0	15.0	17.0	16.0	23.0	29.0	17.0	15.0	15.0	15.0	9.0	12.0	13.0	19.0	16.0	18.0	18.0	23.0	27.0	23.0	24	29.0
27	17.0	18.0	14.0	16.0	13.0	11.0	9.0	9.0	10.0	12.0	14.0	9.0	11.0	5.0	1.0	2.0	7.0	6.0	10.0	12.0	11.0	12.0	19.0	24	19.0	
28	13.0	10.0	7.0	8.0	10.0	18.0	13.0	19.0	20.0	18.0	19.0	14.0	16.0	17.0	9.0	9.0	5.0	9.0	9.0	146.0	94.0	104.0	105.0	39.0	23	146.0
29	20.0	12.0	9.0	15.0	20.0	13.0	14.0	20.0	18.0	14.0	14.0	12.0	11.0	9.0	9.0	10.0	13.0	10.0	9.0	9.0	9.0	14.0	10.0	23	20.0	
30	7.0	11.0	9.0	9.0	8.0	10.0	9.0	11.0	17.0	15.0	18.0	8.0	9.0	19.0	9.0	7.0	6.0	9.0	9.0	10.0	17.0	18.0	16.0	13.0	24	19.0
31	16.0	19.0	18.0	16.0	5.0	3.0	4.0	4.0	2.0	2.0	1.0	.0	1.0	.0	2.0	4.0	3.0	9.0	10.0	18.0	17.0	16.0	15.0	10.0	24	19.0

Top 10 issues with AQS



1. No monitor open/close date
2. Incorrect method codes
3. Incorrect sampling frequency ($PM_{2.5}/PM_{10}$)
4. Incorrect use of null data codes
5. Late or missing data
6. Incorrect parameter code (i.e FEM monitors w/ non-regulatory codes)
7. Missing QA/QC data
8. "Other" monitor type
9. No designated primary monitor (affects collocation)
10. Outdated QAPPs

AQS Updates



- Support for Discoverer has already been dropped
- OAQPS is working on a Discoverer replacement
- Currently working on a PM₁₀ combined site report
- Update to allow for batch upload to monitor metadata fields
- Expansion of seasonal sampling for all pollutants
- Support for multiple/simultaneous file upload

RSS Feed:

<https://www.epa.gov/feed/37577/rss.xml>

AQS new user information



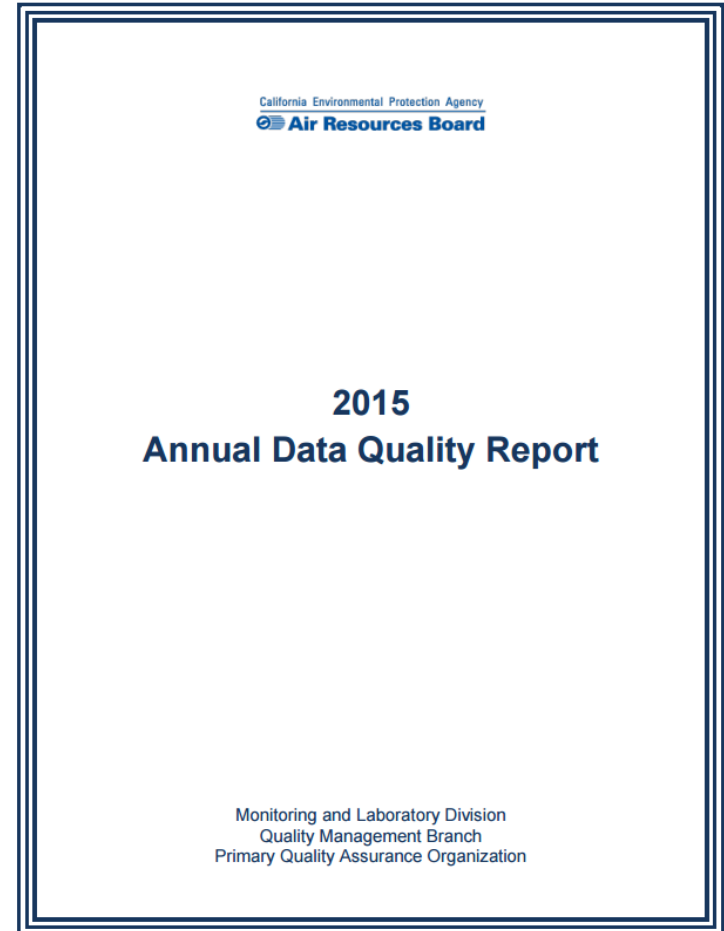
New User:

- Register for a User ID and password
 - Fill out and sign *AQS User Registration and Security Guidelines* forms
 - Mail or FAX both sheets to EPA, NADG **(919) 541-7674** or via email to EPACallCenter@epa.gov
- Once registered, you will be emailed an AQS User ID and password.
- Use your Java-enabled web browser to go to <https://www.epa.gov/aqs>

ARB Data Quality Reports



- ARB produces an annual Data Quality Report to assess data quality in relation to measurement quality objectives for each district.
- See where your district can improve AQS reporting.



Resources



- Region 9: Fletcher Clover
 - 415.972.3991
 - clover.fletcher@epa.gov
- EPA Helpdesk
 - 866.411.4372
 - epacallcenter@epa.gov