

Post-AQS Data Confirmation

Aman Bains
CARB Quality Management Section
2019 PQAQO Training

Presentation Outline



- Data Review Process
- Measurement Quality Objectives
- Data Reports
 - AMP430 Data Completeness Report (**Quarterly**)
 - AMP256 Data Quality Indicator Report (**Quarterly**)
 - AMP350 Raw Data Report (**Yearly**)
 - AMP600 Data Certification Report (**Yearly**)
- Questions

- **Credibility and Defensibility**
 - Public use of data
 - Litigations
 - Funding for grants
 - Design values and attainment

Measurement Quality Objectives



Pollutant	Data Completeness	Precision %	Bias %	Audit %
Gaseous		<i>1-pt QC Checks</i>		<i>Performance Audit</i>
CO	≥75%	10	± 10	± 15
NO ₂		15	± 15	± 15
O ₃		7	± 7	± 10
SO ₂		10	± 10	± 15
Particulates		<i>Collocated Samples</i>	<i>Flow Rate</i>	<i>Flow Checks</i>
PM ₁₀	≥75%	10	± 4	± 10
PM _{2.5}		10	± 4	± 4

AMP 430 Data Completeness



MONITORS REPORTING

REP ORG: California Air Resources Board

MONITOR TYPE: SLAMS

DATE RANGE
REGION: ()
STATE: C

SITE ID
CITY
ADDRESS

06-029-001
Bakersfield
5558 Calif
06-029-001
Bakersfield
5558 Calif
06-029-001
Bakersfield
5558 Calif
06-029-001
Ridgecrest
100 WEST C

OBSERVATIONS

NUMBER / PERCENT

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	YEAR
06-029-001 Bakersfield 5558 Calif	3	2	3	1	3	2	3	3	0	3	2	3	28	28
06-029-001 Bakersfield 5558 Calif	100%	100%	100%	50%	100%	100%	100%	100%	0%	100%	100%	100%	90%	313
06-029-001 Bakersfield 5558 Calif	30	27	25	29	30	21	29	30	19	22	21	30	313	29
06-029-001 Bakersfield 5558 Calif	97%	96%	81%	97%	97%	70%	94%	97%	63%	71%	70%	97%	86%	94%
06-029-001 Ridgecrest 100 WEST C	2	2	3	2	3	2	3	2	2	3	2	3	29	13
	67%	100%	100%	100%	100%	100%	100%	67%	100%	100%	100%	100%	94%	100%
	5	5	3										13	
	100%	100%	100%										100%	

YEAR
28
90%
313
86%
29
94%
13
100%

AMP 256 Data Quality Indicator Report



Pollutant: 42602 (Nitrogen dioxide (NO2))						PQAO: California Air Resources Board (0145)					App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2018	09	CA	06-007-0008	1	S	01-JAN-18	31-DEC-18	26	26	100	5.20	+/- 5.06

Pollutant: 42101 (Carbon monoxide)						PQAO: California Air Resources Board (0145)					App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2018	09	CA	06-007-0008	3	S	01-JAN-18	31-DEC-18	26	26	100	3.14	+/- 2.73
2018	09	CA	06-019-0011	3	S	01-JAN-18	31-DEC-18	26	24	92	2.63	+/- 2.19
2018	09	CA	06-019-5001	1	S	01-JAN-18	31-DEC-18	26	22	85	4.84	+/- 4.72
2018	09	CA	06-023-1004	1	SP	01-JAN-18	31-DEC-18	26	25	96	1.99	+/- 1.79
2018	09	CA	06-023-1005	1	SP	01-JAN-18	31-DEC-18	26	26	100	2.48	+/- 2.10
2018	09	CA	06-025-0005	3	S	01-JAN-18	31-DEC-18	26	25	96	3.58	+/- 2.44
2018	09	CA	06-027-0002	1	S	01-JAN-18	31-DEC-18	26	24	92	2.22	+/- 1.85
2018	09	CA	06-029-2012	1	S	01-JAN-18	31-DEC-18	26	26	100	5.27	+/- 4.39
2018	09	CA	06-037-9033	1	S	01-JAN-18	31-DEC-18	26	26	100	16.08	- 10.44

2018	09	CA	06-023-1005	1	SP	01-JAN-18	31-DEC-18	26	26	100	2.48	+/- 2.10
2018	09	CA	06-025-0005	3	S	01-JAN-18	31-DEC-18	26	25	96	3.58	+/- 2.44
2018	09	CA	06-027-0002	1	S	01-JAN-18	31-DEC-18	26	24	92	2.22	+/- 1.85
2018	09	CA	06-029-2012	1	S	01-JAN-18	31-DEC-18	26	26	100	5.27	+/- 4.39
2018	09	CA	06-037-9033	1	S	01-JAN-18	31-DEC-18	26	26	100	16.08	- 10.44

AMP 256 Data Quality Indicator Report



Pollutant: 42602 (Nitrogen dioxide (NO2))						PQAO: California Air Resources Board (0145)						App A?: Y									
Year	Regior	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q			Criteria Met?	Conf. Limits		% Bet. Cf Lim		
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3		Q4	Lower		Upper	
2018	09	CA	06-007-0008	1	S	01-JAN-18	31-DEC-18						0.00	0	0	3	0	Y	-6.22	12.98	100
								(Levels 6 thru 10)	-1.25	-1.50											
2018	09	CA	06-019-0007	1	S	01-JAN-18	31-DEC-18						0.00	3	0	0	0	Y	-7.86	9.21	100
								(Levels 6 thru 10)	1.25	1.31											
2018	09	CA	06-019-0011	3	S	01-JAN-18	31-DEC-18						0.00	3	0	0	0	Y	1.65	6.20	67
								(Levels 6 thru 10)	2.30	3.23											
2018	09	CA	06-019-0242	1	S	01-JAN-18	31-DEC-18						0.00	3	0	0	0	Y	-9.35	8.85	100
								(Levels 6 thru 10)	-2.27	-1.28											
2018	09	CA	06-019-2016	1	S													N			
								(Levels 6 thru 10)													
2018	09	CA	06-019-4001	1	S	01-JAN-18	31-DEC-18						-7.14	0	0	0	3	Y	-1.16	8.83	
								(Levels 6 thru 10)	-5.33	-2.76											
2018	09	CA	06-019-5001	1	S	01-JAN-18	31-DEC-18						-3.03	3	0	0	0	Y	-8.53	10.47	100
								(Levels 6 thru 10)	-4.55	-4.40											
2018	09	CA	06-023-1004	1	SP	01-JAN-18	31-DEC-18						0.00	0	3	0	0	Y	-8.34	5.06	100
								(Levels 6 thru 10)	1.09	1.21											
2018	09	CA	06-023-1005	1	SP	01-JAN-18	31-DEC-18						3.57	0	3	0	0	Y	-9.31	5.14	100
								(Levels 6 thru 10)	3.57	4.94											
2018	09	CA	06-025-0005	1	S	01-JAN-18	31-DEC-18						-6.06	3	0	0	0	Y	-20.81	12.29	100
								(Levels 6 thru 10)	-6.90	-7.74											
2018	09	CA	06-025-1003	1	S	01-JAN-18	31-DEC-18						-18.42	3	0	0	0	Y	-19.68	2.97	67
								(Levels 6 thru 10)	-20.00	-18.71											

SUPPORT AGENCY: (0790) Northern Sierra
 MONITOR TYPE: SLAMS
 COLLECTION AND ANALYSIS METHOD: (14)
 PQA0: (0145) California Air Resources Board

350 Raw Data Report



Day	MONTH											
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1		6.6 1										
2	AN											
3						5.1	4.2				6.2	3.4
4		5.6 1		4.5	AN				9.2	3.7	AJ	3.0
5	AN					3.9	10.6	26.1 IT			5.2	
6				4.5	AR				18.0	AV	3.8	3.8
7		5.3 1				5.6	3.9	32.6 IT				12.0
8				5.4	4.6				4.3	AV		
9						2.7	4.1	P 37.3 IT			8.2 IT	14.3
10			AN	3.6	3.0				7.1			
11	6.3 1					5.5	8.3	6.6 IT			10.9 IT	11.2
12				4.9	2.5				5.0			
13			AN			7.8	6.1	10.1 IT			11.7 IT	2.2
14	7.3 1			2.3	4.4				3.9	AV		
15								AN				
16				9.9			8.9		7.9	AN	TS	5.7
17	AG							10.3				
18				6.0		4.4	19.0				TS	7.7
19								15.1 IT	3.9	AN		
20	5.0 1				2.9	6.6	6.4 IT				4.7	3.6
21				AJ	3.1				6.1	AN		
22					4.0			8.4			AJ	
23	9.4 1			AN	4.8	5.6	25.6 IT		5.4		1.0	4.0
24			1.0					5.8			4.1	
25							P 35.6 IT					2.3
26	4.8 1											

AMP 350 Raw Data Report



SUPPORT AGENCY: (0790) Northern Sierra AQMD

MONITOR TYPE: SLAMS

COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VE

PQAO: (0145) California Air Resources Board

REPORT FOR: DECEMBER 2018

DU
UN
M

OBS MAXIMUM

HOURLY

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
1	8.0	7.0	6.0	6.0	6.0	5.0	4.0	5.0	3.0	4.0	5.0	4.0	4.0	6.0	6.0	5.0	6.0	7.0	10.0	8.0
2	6.0	5.0	6.0	8.0	8.0	6.0	5.0	6.0	6.0	7.0	6.0	5.0	5.0	6.0	5.0	6.0	6.0	9.0	15.0	15.0
3	6.0	4.0	5.0	5.0	3.0	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	5.0	7.0	7.0	18.0	12.0	10.0
4	10.0	6.0	3.0	4.0	4.0	5.0	3.0	3.0	6.0	9.0	7.0	6.0	4.0	10.0	14.0	11.0	8.0	13.0	9.0	6.0
5	5.0	9.0	10.0	13.0	8.0	7.0	7.0	6.0	4.0	9.0	8.0	7.0	9.0	6.0	6.0	6.0	7.0	6.0	6.0	5.0
6	7.0	5.0	6.0	8.0	8.0	6.0	7.0	8.0	11.0	8.0	7.0	7.0	4.0	4.0	3.0	7.0	12.0	10.0	10.0	8.0
7	12.0	11.0	8.0	7.0	8.0	7.0	8.0	10.0	8.0	7.0	11.0	7.0	12.0	16.0	9.0	8.0	7.0	15.0	14.0	16.0
8	12.0	15.0	13.0	11.0	11.0	14.0	12.0	11.0	14.0	11.0	11.0	13.0	8.0	4.0	6.0	13.0	12.0	13.0	16.0	19.0
9	19.0	18.0	20.0	16.0	13.0	12.0	13.0	11.0	10.0	5.0	5.0	7.0	9.0	6.0	10.0	17.0	25.0	29.0	17.0	19.0
10	8.0	7.0	10.0	8.0	6.0	6.0	6.0	9.0	8.0	6.0	8.0	6.0	5.0	5.0	5.0	9.0	14.0	17.0	16.0	15.0
11	5.0	9.0	6.0	6.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	7.0	4.0	5.0	11.0	15.0	12.0	16.0	24.0	22.0
12	18.0	18.0	23.0	21.0	24.0	16.0	17.0	10.0	14.0	10.0	11.0	10.0	6.0	5.0	5.0	6.0	6.0	10.0	10.0	11.0
13	7.0	10.0	10.0	8.0	8.0	10.0	8.0	9.0	10.0	10.0	8.0	7.0	5.0	6.0	8.0	12.0	AN	19.0	22.0	13.0
14	7.0	5.0	10.0	8.0	5.0	7.0	4.0	2.0	5.0	6.0	7.0	9.0	18.0	17.0	14.0	11.0	11.0	8.0	12.0	10.0
15	10.0	7.0	10.0	7.0	12.0	10.0	7.0	8.0	6.0	6.0	8.0	5.0	1.0	3.0	6.0	7.0	10.0	10.0	24.0	18.0
16	8.0	9.0	7.0	6.0	4.0	5.0	4.0	3.0	4.0	5.0	5.0	5.0	6.0	5.0	6.0	7.0	8.0	7.0	9.0	6.0
17	5.0	5.0	5.0	5.0	5.0	5.0	7.0	6.0	5.0	5.0	5.0	3.0	4.0	4.0	4.0	5.0	8.0	5.0	5.0	8.0
18	6.0	7.0	9.0	7.0	6.0	6.0	6.0	10.0	AN	5.0	8.0	5.0	4.0	5.0	3.0	4.0	3.0	4.0	6.0	7.0
19	3.0	3.0	4.0	4.0	2.0	2.0	1.0	4.0	5.0	3.0	3.0	3.0	2.0	1.0	.0	1.0	3.0	4.0	6.0	10.0

24	10.0
24	15.0
24	18.0
24	14.0
24	117.0

NO.:	29	29	29
MAX:	19.0	18.0	23.0
AVG:	7.76	7.38	8.14
MONTHLY OBSERVATIONS:			

16.0	14.0	15.0	11.0	8.0	15.0	13.0	11.0	11.0	10.0	13.0	11.0	10.0	10.0	13.0	14.0	15.0	24	18.0
6.0	5.0	5.0	4.0	7.0	9.0	8.0	6.0	8.0	7.0	5.0	4.0	24	9.0					
6.0	4.0	8.0	9.0	8.0	11.0	14.0	16.0	11.0	7.0	10.0	6.0	24	16.0					
8.0	8.0	9.0	12.0	12.0	10.0	12.0	9.0	9.0	11.0	9.0	9.0	24	15.0					
4.0	5.0	2.0	1.0	1.0	1.0	2.0	5.0	6.0	6.0	4.0	6.0	24	7.0					
2.0	.0	1.0	2.0	1.0	1.0	4.0	4.0	4.0	3.0	3.0	24	8.0						
3.0	2.0	1.0	4.0	9.0	9.0	16.0	9.0	9.0	10.0	11.0	9.0	24	16.0					
.0	-2.0	5.0	4.0	4.0	4.0	4.0	5.0	6.0	8.0	5.0	3.0	24	11.0					
.0	3.0	2.0	2.0	3.0	6.0	6.0	5.0	4.0	2.0	5.0	5.0	24	6.0					
AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	8	6.0					
AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	0						
AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	0						
28	28	28	28	27	28	28	28	28	28	28	28							
18.0	17.0	15.0	17.0	25.0	29.0	24.0	22.0	21.0	24.0	117.0	19.0							
5.68	5.64	6.21	7.36	8.07	10.21	11.50	10.57	9.43	9.64	12.36	8.07							

MONTHLY OBSERVATIONS: 677 MONTHLY MEAN: 7.75 MONTHLY MAX: 117.0

AMP 350 Raw Data Report



(81102) PM10 Total 0-10um STP																									CAS NUMBER:			
SITE ID: 06-097-0002		POC: 2		LATITUDE: 38.610905		LONGITUDE: -122.868794		STATE: (06) California		AQCR: (030) SAN FRANCISCO BAY AREA		UTM ZONE:		UTM NORTHING:		UTM EASTING:		ELEVATION-MEL: 30		PROBE HEIGHT:		SUPPORT AGENCY: (0791) Northern Sonoma County APCD						
COUNTY: (097) Sonoma		CITY: (33056) Healdsburg		SITE ADDRESS: 133 MATHESON ST., HEALDSBURG		SITE COMMENTS: ARB SITE NAME & NO. HEALDSBURG-133 MATHESON (4900898), STARTED 11/85. REPLACED HE		MONITOR COMMENTS:		REPORT FOR: MARCH 2018		DURATION: 1 HOUR		UNITS: Micrograms/cubic meter (25 C)		MIN DETECTABLE: 4		COLLECTION AND ANALYSIS METHOD: (122) INSTRUMENT MET ONE 4 MODELS BETA A		PQAO: (0145) California Air Resources Board		MONITOR TYPE: SLAMS						
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	4	2	-1	4	5	5	5	23	15	23	24	16	26	16	14	19	18	18	4	5	7	7	3	3	24	26.		
2	9	5	8	5	1	4	3	2	6	21	12	16	11	7	4	27	6	5	6	13	11	7	4	7	24	27.		
3	4	4	5	2	0	5	4	4	5	6	9	6	4	10	5	0	1	4	5	9	9	8	10	7	24	10.		
17	6	5	5	6	3	6	4	10	10	6	8	10	7	5	7	7	7	5	0	0	1	12	11	8	3	24	12.	
18	0	1	9	5	1	2	3	3	11	10	10	6	1	3	8	5	4	6	12	6	4	6	5	5	24	12.		
19	8	5	3	6	5	7	10	13	18	17	10	5	7	8	8	BA	7	11	10	17	12	10	7	11	23	18.		
20	10	5	4	5	5	13	9	8	11	9	12	12	6	6	8	6	3	1	8	6	3	0	3	0	24	13.		
21	0	0	0	0	2	2	2	4	4	2	3	5	7	5	3	1	0	1	5	5	3	2	2	2	24	7.		
22	3	1	2	3	4	12	10	12	6	20	8	5	8	7	8	10	10	8	12	8	7	7	14	11	24	20.		
23	6	8	10	12	8	10	12	13	29	11	17	17	16	15	11	14	12	12	13	11	16	7	5	5	24	29.		
24	2	2	2	0	0	3	4	2	36	17	11	8	17	14	16	19	21	5	2	3	5	6	8	6	24	36.		
25																										0		
26																											0	
27																											0	
28																											0	
29																											0	
30																											0	
31																											0	
NO.:	24	24	24	24	24	24	24	24	24	24	24	24	24	23	23	24	24	24	24	24	24	24	24	24	24	24		
MAX:	12.	11.	11.	12.	13.	13.	17.	25.	36.	24.	24.	17.	26.	20.	18.	27.	22.	19.	17.	29.	18.	14.	14.	12.				
AVG:	5.6	4.7	5.2	4.9	4.3	5.8	6.9	9.3	12.5	12.9	11.1	9.3	9.5	8.3	7.4	8.8	9.6	8.3	8.5	9.4	8.8	7.4	6.6	6.2				

AMP 600



Certifying Year: 2018
 Certifying Agency: California Air Resources Board (0145)

Parameter: PM10 Total 0-10um STP (81102) CONTINUOUS
 PQAO Name: California Air Resources Board (0145)
 Quality Assurance Project Plan Approval Date:

Monitors Summaries

AQS Site ID	POC	Monitor Type	Routine Data (ug/m3)			Flow Rate Verification		Flow Rate Audit		QAPP Appr.	Collocation		
			Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias		% Complete	AQS Rec Flag	CA Rec Flag

Monitors Summaries

AQS Site ID	POC	Method	Monitor Type	Routine Data (ug/m3)					Flow Rate Audit		Collocation			
				Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias	% Complete	CV	% Complete	PQAO Crit. Met
06-023-1004	1	143	SLAMS	7.76	.8	39.6	0		100	+1.80	100			Y
06-015-0007	1	195	SPM	7.87	.4	61.5	0		42	+/-	0			N
06-023-1005	1		SPM				0		0	+/-	0			Y
06-023-1005	2	143	SLAMS	3.37	.8	8.3	0		100	+/-	0			Y

06-023-1005	1		SPM				0	0	+/-	0	Y	Y	N	N
06-023-1005	2	143	SLAMS	3.37	.8	8.3	0	100	+/-	0	Y	Y	Y	N

AMP 600

AQS Recommended Flag	Cert. Agency Recommended Flag	<u>Reason for AQS Recommendation</u>
N		Annual Summary completeness < 70%.
N		1-Point QC Completeness < 65%.
N		Quality Assurance Project Plan not approved in 10 years.
AQS Recommended Flag	Cert. Agency Recommended Flag	<u>Reason for AQS Recommendation</u>
N		Quality Assurance Project Plan not approved in 10 years.
N		Annual Performance Evaluation Audit Missing or 1 Level.

AMP 600



Dear Mr. Xu:

<u>Pollutant</u>	<u>Site Name</u>	<u>AQS #</u>	<u>Reason for recommending certification</u>
PM ₁₀	Jacobs	06-023-1004-81102(poc1)	Quality Assurance Project Plan pending approval
PM _{2.5}	Jacobs	06-023-1004-88101(poc1)	Quality Assurance Project Plan pending approval
PM _{2.5}	Humboldt Hill	06-023-1005-88101(poc2)	Monitor end date of 20180411, before the 2018 flow audit could be performed

At this time the District is not recommending certification of the following data:

<u>Pollutant</u>	<u>Site Name</u>	<u>AQS #</u>	<u>Reason for not recommending certification</u>
PM _{2.5}	Crescent City	06-015-0007-88101(poc1)	Annual Summary completeness <70% Flow Rate Audit completeness <65% PQAO level collocation criteria not met
PM _{2.5}	Humboldt Hill	06-023-1005-88101(poc1)	Annual Summary completeness <70% Flow Rate Audit completeness <65%

AMP 600



Data Evaluation and Concurrence Report Summary

08/17/2019

Certification Year: 2018
 Certifying Agency (CA): Ventura County APCD (1118)

Pollutants in Report:

<u>Parameter Name</u>	<u>Code</u>	<u>Monitors Evaluated</u>	<u>Monitors Recommended for Concurrence by AQS</u>	<u>Monitors NOT Recommended for Concurrence by AQS</u>
Nitrogen dioxide (NO2)	42602	2	2	0
Ozone	44201	5	5	0
PM10 Total 0-10um STP	81102	2	0	2
PM2.5 - Local Conditions	88101	6	0	6

PQAOs in Report:

<u>PQAO Name</u>	<u>PQAO Code</u>	<u>TSA Date</u>
California Air Resources Board	0145	08/06/15

Summary of 'N' flags for all pollutants:

<u>PQAO</u>	<u>Code</u>	<u>AQS Site-ID</u>	<u>POC</u>	<u>AQS Recommended Flag</u>	<u>Cert. Agency Recommended Flag</u>	<u>Reason for AQS Recommendation</u>
0145	81102	06-111-2002	3	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	81102	06-111-3001	3	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	88101	06-111-0007	3	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	88101	06-111-3001	3	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	88101	06-111-1004	3	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	88101	06-111-2002	3	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	88101	06-111-2002	4	N	Y	Quality Assurance Project Plan not approved in 10 years.
0145	88101	06-111-0009	3	N	Y	Quality Assurance Project Plan not approved in 10 years.

Signature of Monitoring Organization Representative: _____

Summary

- View AMP430 and AMP256 quarterly
- View AMP350 and AMP600 yearly
- View Post-AQS Data Confirmation (Bulletin 005)
 - <https://ww2.arb.ca.gov/our-work/programs/quality-assurance/quality-assurance-bulletins>
- Questions
 - Aman Bains, (916) 323-0032
 - abains@arb.ca.gov