Air Quality Data Validation

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CARB PQAO Training

June 5, 2019

Data is Validated by Bracketing in Time with QC or Calibration Checks

- Separate valid measurements from erroneous recordings and out of tolerance periods.
- As important as any other part of air monitoring.

Current Date: 3/15/2019 7:44 AM

Monthly Report

November 2018

Site Name:

Parameter: OZONE 44201

Avg Interval: 1 hour

Units: PPB 008 Method: 087

Hours

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Summary Max	Summary Avg	Summary RDS
01	40.8	AT	35.5	35.3	33.4	32.9	29.9	30.8	34.9	39.7	43.5	49.2	54.1	58.0	61.5	62.1	56.9	35.2	37.1	43.0	48.6	47.5	47.2	44.7	62.1	43.5	23
02	43.7	AT	40.1	36.4	36.2	35.2	30.0	32.4	35.1	50.5	55.8	60.4	63.4	67.8	69.2	69.6	67.3	44.6	52.4	44.9	45.4	50.5	50.6	48.4	69.6	49.1	23
03	47.7	AT	42.7	42.1	41.7	37.8	35.8	36.8	39.1	53.2	60.0	62.7	67.2	70.1	69.6	70.5	66.0	43.0	43.3	45.7	57.4	57.0	51.0	50.5	70.5	51.7	23
04	49.0	AT	45.3	44.0	42.3	40.1	39.4	38.6	40.1	47.1	57.5	66.4	70.0	76.3	77.1	76.6	69.3	42.2	38.7	48.6	53.8	56.2	56.9	55.4	77.1	53.5	23
05	54.0	AT	50.1	46.7	44.0	41.2	40.3	41.0	42.7	48.3	51.6	56.2	52.9	59.5	61.9	61.7	59.3	40.5	33.2	32.7	39.4	41.7	39.9	38.8	61.9	46.8	23
06	43.1	AT	45.6	43.2	39.4	39.7	38.3	39.1	41.8	56.0	61.1	65.7	66.9	69.8	68.8	57.8	58.3	39.5	37.2	39.7	44.6	49.0	44.2	45.9	69.8	49.3	23
07	46.7	AT	46.0	46.2	42.8	38.4	37.3	38.2	42.6	50.4	56.3	60.2	65.0	70.9	71.1	69.8	70.3	66.0	47.7	49.5	51.2	49.5	45.3	48.7	71.1	52.6	23
08	43.4	AT	38.1	28.8	32.5	34.6	34.0	34.6	28.7	43.8	38.1	41.2	51.1	54.5	57.8	60.8	59.4	38.1	33.3	34.5	32.6	36.9	44.2	46.2	60.8	41.1	23
09	46.0	AT	41.9	40.6	41.0	37.1	36.5	35.0	37.9	44.2	48.3	56.4	60.9	62.3	66.2	68.4	61.4	36.7	42.5	45.5	50.9	51.6	45.4	49.1	68.4	48.0	23
10	47.8	AT	42.2	41.2	38.7	37.5	35.8	36.3	37.2	39.5	43.2	47.2	50.6	52.9	55.7	56.4	47.9	34.0	32.6	38.7	37.0	42.5	41.2	41.1	56.4	42.4	23
11	39.9	AT	37.3	37.1	35.0	33.4	34.8	34.4	36.4	42.8	47.5	52.2	57.5	63.0	64.3	64.4	49.0	35.5	38.8	45.6	43.4	41.0	38.9	40.5	64.4	44.0	23
12	40.7	AT	37.2	38.4	37.3	36.3	36.5	31.7	35.9	34.7	41.1	47.4	53.8	58.6	60.2	60.6	45.4	38.3	50.7	49.3	48.3	45.8	45.9	41.8	60.6	44.1	23
13	38.4	AT	36.8	35.5	36.1	35.8	35.1	32.2	33.2	34.0	36.5	41.7	44.6	45.0	45.4	46.2	37.2	25.7	24.3	28.9	34.2	36.6	31.5	32.2	46.2	35.9	23
14	32.6	AT	32.3	31.6	31.8	30.6	28.5	26.8	30.6	37.4	39.7	38.3	41.5	44.0	47.9	49.7	36.0	28.8	31.2	40.5	42.4	40.4	37.0	36.1	49.7	36.3	23
15	35.6	AT	33.4	32.2	32.1	32.5	31.4	30.2	31.6	35.6	39.4	45.0	50.2	54.1	56.9	59.3	57.2	39.5	37.5	37.3	36.7	43.4	40.6	37.9	59.3	40.4	23
16	36.3	AT	33.8	32.8	31.2	31.6	31.1	28.3	30.0	37.6	48.8	54.7	59.4	61.6	63.9	64.5	50.8	39.4	40.7	49.2	51.4	48.7	48.4	46.5	64.5	44.3	23
17	43.6	AT	37.8	36.4	34.7	33.1	32.5	31.8	32.1	38.0	48.0	58.4	63.1	64.1	67.1	69.9	52.1	41.6	35.1	48.6	52.6	50.3	44.2	45.8	69.9	46.1	23
18	43.7	AT	39.0	36.0	36.3	35.6	32.8	33.7	34.6	40.2	50.2	62.8	59.7	71.1	75.6	75.7	57.9	45.1	43.7	51.5	51.8	53.7	53.9	50.7	75.7	49.3	23
19	47.2	AT	39.8	38.3	35.2	34.4	32.9	30.0	34.0	39.3	40.8	46.0	50.6	51.1	53.5	58.0	48.3	36.8	41.9	41.3	37.9	42.8	40.8	37.9	58.0	41.6	23
20	36.6	AT	34.3	33.7	33.3	32.5	31.9	31.6	30.2	35.1	38.0	42.6	46.2	49.0	50.3	51.7	37.5	32.2	31.8	41.0	40.4	39.0	38.8	37.1	51.7	38.0	23
21	36.9	AT	35.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	35.7	43.2	41.9	39.8	39.0	39.2	39.4	38.2	38.8	33.2	30.4	35.6	31.5	30.7	33.6	33.9	43.2	35.9	23
22	38.1	AT	30.0	27.8	32.2	29.6	29.1	27.9	27.7	31.9	31.6	35.8	36.7	39.0	39.0	39.3	37.8	29.3	24.8	23.7	15.9	13.9	16.1	13.5	39.3	29.1	23
23	9.0	AT	17.5	14.4	11.7	16.0	17.7	17.6	18.7	27.1	27.8	34.8	39.0	38.2	37.8	38.0	32.5	26.0	22.6	22.1	24.8	22.8	22.5	21.3	39.0	24.3	23
24	19.5	AT	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	19.5	19.5	1
25	AN	AN	AN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN			0
26	AN	AN	AN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN			0
27	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN			0
28	AN	AT	23.9	21.0	17.6	19.9	16.0	24.0	27.6	29.7	29.3	30.9	33.8	36.4	32.0	30.5	28.0	26.6	28.0	31.4	28.4	28.0	28.5	28.2	36.4	27.2	22
29	28.0	AT	35.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	AV	32.3	35.8	36.6	37.6	39.5	40.1	39.2	38.6	37.5	34.1	33.1	27.9	27.3	25.8	40.1	34.0	21
30	24.8	AT	23.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24.7	28.2	31.3	32.3	32.9	32.7	33.4	31.0	29.4	27.0	28.1	17.7	11.5	8.1	7.9	33.4	24.6	23
Max	54.0		50.1	46.7	44.0	41.2	40.3	41.0	42.7	56.0	61.1	66.4	70.0	76.3	77.1	76.6	70.3	66.0	52.4	51.5	57.4	57.0	56.9	55.4	77.1		
Avg	38.9		36.7	35.1	34.2	33.4	32.1	31.9	33.6	40.1	43.7	48.5	51.7	54.8	56.3	56.6	49.8	37.1	36.3	39.6	40.4	40.7	39.3	38.6		41.3	
Count	26	0	26	26	26	26	26	26	25	25	26	26	26	26	26	26	26	26	26	26	26	26	26	26			596

Auto-cal in tolerance

Auto-cal out of tolerance

Auto-cal in tolerance

Objectives of Presentation

- Define Terms
- Data Validation Criteria and Tools
- Data Validation Process
- Data Submittal and follow up

Data Processing Terms-EPA QA Handbook

- Data Review
  - *“review of data as it proceeds from data collection in the field, as it is transmitted and stored in a database, and finally the transmission to AQS”*
- Data Validation
  - *“confirmation, through provision of objective evidence, that **specified requirements** have been fulfilled”*
- Data Verification
  - *“confirmation, through provision of objective evidence, that the particular requirements for a specific **intended use** are fulfilled”*

Data Validation Concept

- Bracketing data in time
- Use of meta-data
- Erroneous recordings Vs Out of Tolerance Conditions
- Three Levels of Review
- Document all

Current Date: 3/15/2019 9:02 AM

Monthly Report

Site Name:

June 2018

Avg Interval: 1 hour

Parameter: O3_SAMPLE_FLOW

Units: L/M

Method:

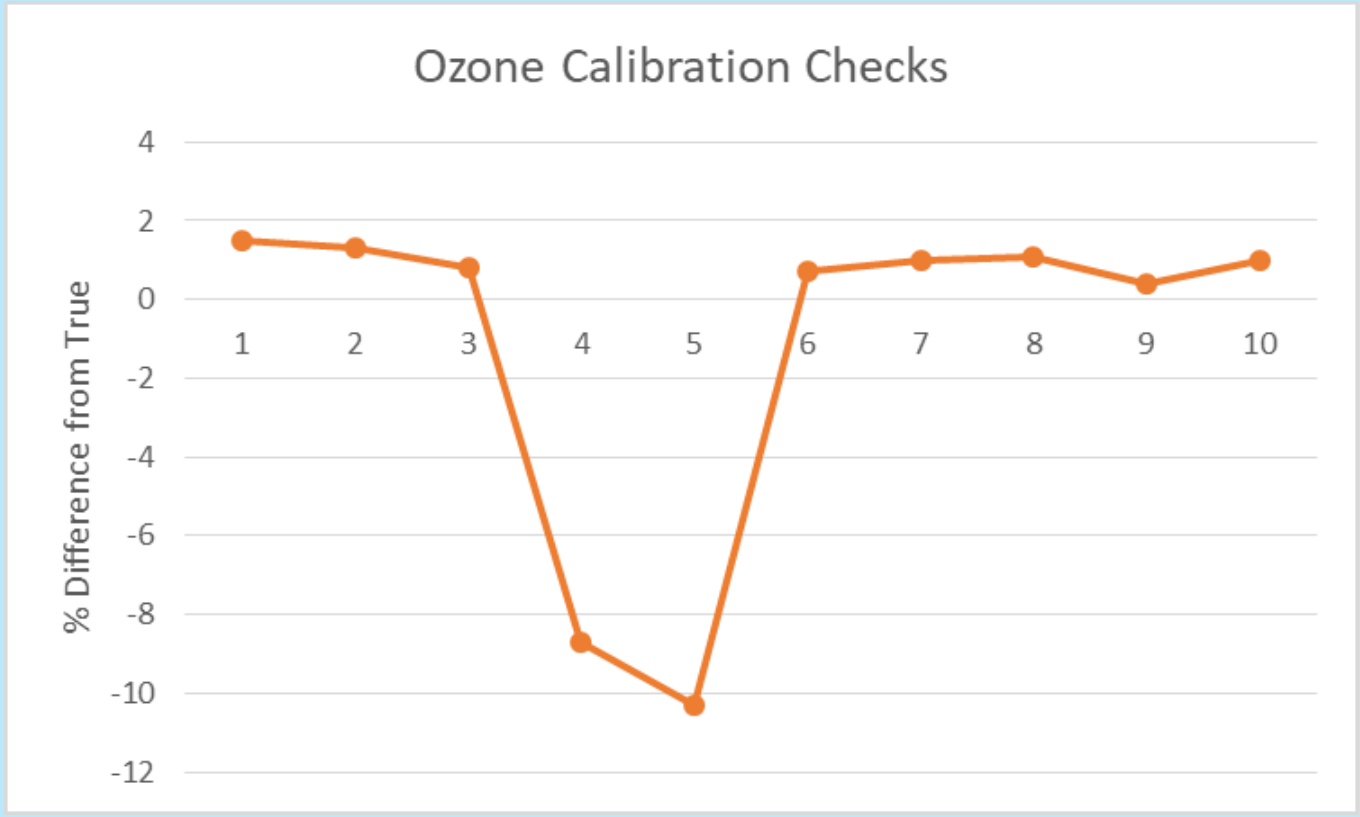
Hours

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Summary		
																									Max	Avg	RDS
01	795.81	794.38	796.13	797.08	797.59	800.32	800.83	801.78	801.87	802.98	802.03	799.63	798.94	796.55	795.53	793.09	792.47	792.01	794.98	795.12	795.36	798.16	797.52	797.35	802.98	797.40	24
02	797.49	797.05	797.89	798.25	799.30	800.28	800.65	801.89	803.66	803.38	801.49	799.45	796.76	794.04	793.44	792.01	790.65	790.39	791.80	793.13	793.96	794.81	795.02	793.61	803.66	796.68	24
03	794.19	793.09	794.58	793.23	792.88	794.25	795.73	797.83	798.52	799.62	797.47	796.05	795.09	792.73	791.52	790.52	788.87	788.70	791.07	792.65	792.24	793.13	792.83	791.86	799.62	793.69	24
04	791.18	789.87	790.43	791.25	792.29	793.68	795.85	798.44	799.38	800.57	800.42	798.11	794.50	793.16	792.00	792.33	793.96	792.82	792.96	793.49	795.06	796.56	797.42	798.46	800.57	794.76	24
05	797.55	797.23	797.16	798.06	800.86	804.38	805.97	806.34	806.43	806.12	807.60	807.92	806.11	802.84	800.03	795.98	795.34	794.26	791.19	791.91	791.67	791.64	792.54	792.71	807.92	799.24	24
06	792.19	792.26	793.93	794.41	797.90	800.08	799.48	799.66	800.26	801.69	804.18	803.33	800.55	800.73	799.68	796.28	793.40	790.38	789.58	789.57	790.53	790.18	790.03	790.39	804.18	795.86	24
07	789.93	789.65	790.58	793.03	795.42	798.03	799.75	800.95	802.38	802.33	800.43	799.14	797.88	795.85	793.68	792.25	789.92	789.92	789.71	791.75	792.09	793.67	793.27	792.42	802.38	794.75	24
08	792.64	791.40	792.62	794.08	797.49	801.18	802.89	801.27	800.31	799.87	798.26	798.39	796.68	795.98	793.68	790.36	788.59	788.36	787.98	789.03	790.57	790.23	791.30	791.18	802.89	794.35	24
09	791.46	791.43	790.68	790.73	791.04	792.73	794.28	797.75	800.02	799.85	798.89	799.06	795.78	793.83	791.20	790.22	787.30	786.93	785.73	785.19	786.88	788.24	786.45	786.33	800.02	791.75	24
10	787.48	786.78	786.23	788.23	789.31	790.70	792.18	794.93	794.51	794.06	793.28	790.83	789.08	788.18	785.19	783.41	783.12	783.48	783.77	785.37	786.78	787.19	786.72	788.23	794.93	788.29	24
11	788.38	787.73	788.23	788.99	793.00	795.19	794.58	794.50	795.77	796.78	798.59	797.93	795.73	793.35	790.43	792.60	784.95	782.08	782.07	783.58	785.49	786.95	786.65	785.99	798.59	790.40	24
12	787.45	787.07	788.05	789.74	794.70	799.05	799.56	799.54	798.88	800.13	800.78	799.18	799.08	795.78	794.58	791.13	791.03	789.96	787.91	788.23	790.53	791.28	792.63	791.64	800.78	793.66	24
13	790.42	789.80	788.68	788.73	794.00	797.31	797.49	799.73	800.08	797.95	797.77	798.37	795.52	794.73	792.13	790.98	789.66	787.03	788.30	790.38	790.01	789.57	789.17	789.08	800.08	792.79	24
14	787.99	786.23	786.28	787.84	789.63	790.09	793.33	795.18	796.48	797.33	798.67	796.06	796.63	794.85	791.96	788.76	785.99	785.57	785.65	786.10	787.68	787.71	787.24	786.79	798.67	790.42	24
15	786.98	784.99	785.74	787.61	788.31	791.32	793.86	798.07	800.46	802.44	804.73	805.45	807.83	808.44	808.83	810.17	811.02	811.05	812.73	814.89	815.68	813.69	812.74	812.03	815.68	802.88	24
16	808.88	805.06	804.25	805.39	806.17	807.47	810.86	812.84	812.94	814.10	815.66	815.32	814.43	809.65	805.36	801.30	798.02	797.61	799.12	798.08	799.60	798.39	797.63	796.73	815.66	805.62	24
17	796.43	795.43	795.96	798.08	798.10	800.65	801.72	803.15	803.41	803.13	802.57	801.63	800.79	799.29	797.13	796.37	796.18	797.00	797.65	797.21	798.32	799.98	801.18	800.94	803.41	799.26	24
18	801.16	801.13	800.25	801.42	803.33	804.38	805.81	806.91	808.45	806.53	807.24	805.93	804.14	803.85	801.85	801.35	799.20	800.03	800.83	801.26	802.65	803.83	802.98	803.89	808.45	803.27	24
19	803.04	801.60	802.08	802.21	802.21	805.01	807.37	809.28												301.27	803.53	803.38	802.92	802.38	811.90	803.92	24
20	801.31	800.09	801.22	802.59	803.07	805.53	808.45	811.29												301.47	805.04	804.88	804.99	806.17	812.07	805.41	24
21	803.98	801.74	803.02	804.08	805.82	808.67	810.29	812.78	813.68	814.18	813.76	810.18	807.50	807.93	806.06	803.97	801.42	800.26	799.84	801.44	802.08	801.89	800.44	799.71	814.18	805.61	24
22	797.89	796.80	798.31	800.03	802.28	803.73	804.86	806.16	806.93	805.96	804.47	805.28	803.23	801.70	798.01	795.29	791.28	789.52	786.37	746.81	509.02	462.48	449.68	441.53	806.93	741.98	24
23	435.70	430.04	426.50	423.81	422.05	420.64	418.66	415.73	412.17	409.18	407.33	404.72	401.33	400.02	397.99	395.42	393.83	391.91	389.56	388.33	387.41	385.96	384.60	383.00	435.70	405.25	24
24	382.09	379.72	378.46	377.78	376.59	375.76	375.23	374.61	373.18	372.66	370.94	370.09	368.85	367.42	365.89	364.71	363.25	361.48	361.23	359.13	359.37	359.03	358.25	357.98	382.09	368.90	24
25	357.53	356.50	356.03	355.34	354.63	353.69	353.27	351.73	349.38	347.33	348.18	347.23	346.77	343.80	342.84	343.65	341.43	341.56	341.55	341.32	340.96	340.49	340.69	339.58	357.53	347.31	24
26	340.08	338.81	338.59	338.94	338.08	336.68	335.26	333.37	331.56	330.98	330.33	327.63	326.40		815.28	809.97	807.53	807.06	807.22	807.13	805.82	808.39	808.94	809.22	815.28	540.58	23
27	807.87	805.63	805.39	805.15	806.43	808.71	809.68	814.13	817.18	817.64	819.50	817.92	816.64	814.87	811.85											310.11	24
28	805.15	802.69	802.39	802.23	803.20	804.70	806.99	810.39	813.07	814.51	815.72	813.53	811.26	810.25	806.10											805.62	24
29	801.33	801.33	802.25	803.25	805.53	807.52	807.56	810.63	812.97	814.06	813.23	813.26	811.58	810.54	810.45	810.12	807.27	808.02	808.39	810.03	808.45	809.28	811.00	811.29	814.06	808.72	24
30	810.58	809.10	808.97	811.34	812.71	814.13	815.14	816.29	817.70	818.15	820.76	819.60	816.36	815.48	814.69	812.51	809.52	809.59	808.77	809.44	810.34	811.28	811.23	811.09	820.76	813.12	24
Max	810.58	809.10	808.97	811.34	812.71	814.13	815.14	816.29	817.70	818.15	820.76	819.60	816.64	815.48	815.28	812.51	811.02	811.05	812.73	814.89	815.68	813.69	812.74	812.03	820.76		
Avg	740.81	739.49	739.70	740.43	741.80	743.53	744.59	745.91	746.49	746.47	746.50	745.29	743.70	756.43	756.48	754.67	752.86	752.18	752.15	751.38	744.21	743.03	742.44	741.96		746.34	
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30			719

Pump failing, falls below MFG specification

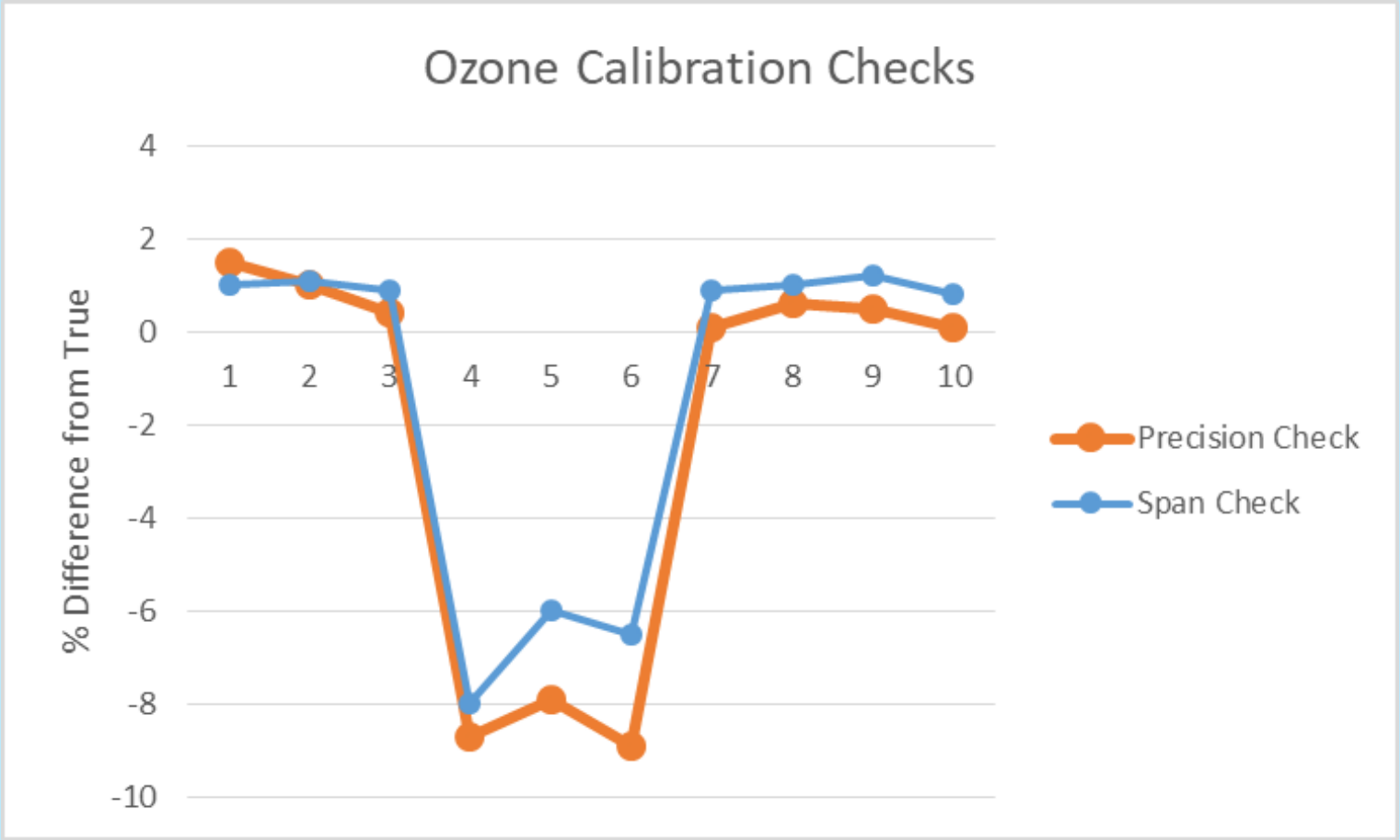
Pump repaired, Calibration performed

Data Bracketing Example #1



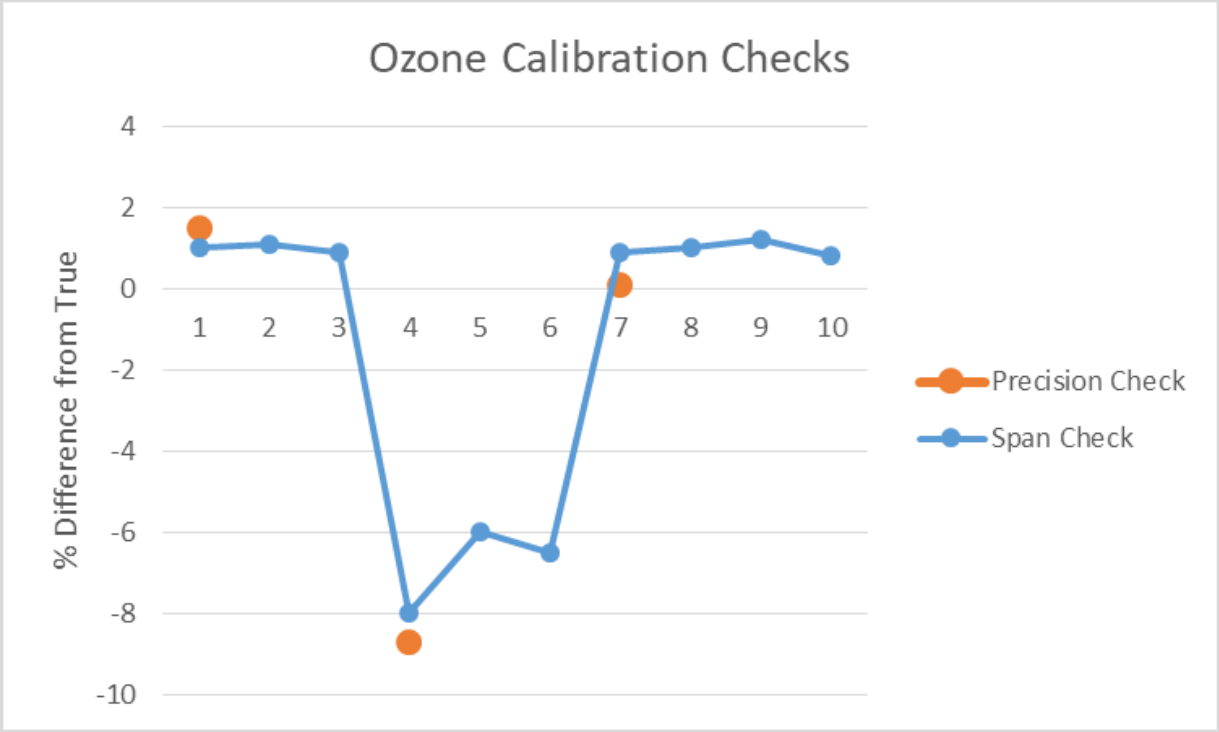
- Check 4 and 5 out of tolerance
- All data from end of Check 3 to Check 6 is invalid. *note unless compelling evidence shows that Cal system was bad. May be able to save data from 3-6.

Data Bracketing Example #2



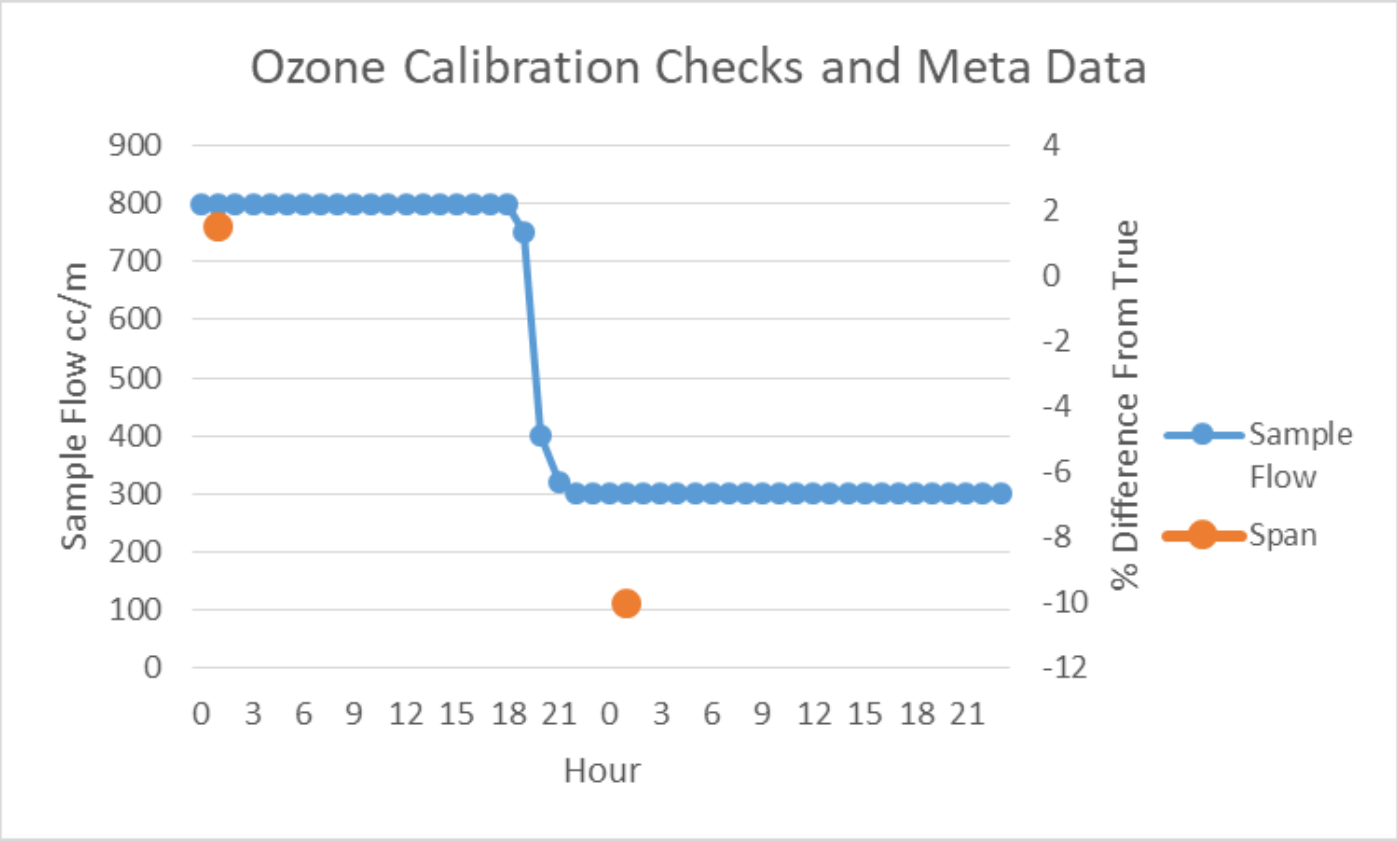
- Precision out of tolerance Check 4-6
- Span only out of tolerance Check 4
- Data invalid from Check 3 to Check 7

Data Bracketing Example #3



- Precision and Span out of tolerance Check 4
- Span back in tolerance Check 5,6
- Data invalid from Check 1 through Check 7

Data Bracketing Example #4



- Ozone Span in tolerance Day 1 HR01, Out of tolerance Day 2 HR01
- Sample Flow in tolerance Day 1 HR00-19, Out of tolerance Day 1 HR20
- Data only needs to be invalidated back to Day 1 HR20

Sources of Data Validation Criteria

- Appendix D Templates
- QAPP/SOP
- Instrument Manual
- Common Sense

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Table A.7-2a System Quality Objectives – VCAPCD O_3 Monitoring Program

Requirement	Frequency	Acceptance Criteria	40 CFR Reference	QA Guidance Reference
Reporting Units	All data	ppm	Part 50.9 and 50.10	None
Detection Limit Lower DL	All data	0.001 ppm	Part 53.23b	1.2
Upper Conc. Limit	All data	0.5 ppm	Part 50 Appendix D, Sec. 5.2.3	None
Data Completeness	Quarterly	At least 75%	Part 50, App. I, Sec. 2	EPA QA Volume II: Appendix D
Instrument Shelter				
Temperature	All Data	5-40 ° C (strive for 20-30 ° C)	None	Equivalence Specifications/Manual
Analyzer Calibration				
Zero/Span Calibration Check–Level I 1 pt. QC (precision)	Zero/Level 1 Span-Every other day 1 pt. QC-Every other day	Zero <+ 3.1 ppb Span <+ 7.1% (adjust at 5%) One Pt. QC <+ 7.1% (adjust at 5%)	None	EPA QA Volume II: Appendix D

CRITICAL CRITERIA-OZONE		
Monitor	NA	*Meets requirements listed in FRM/FEM designation*
One Point QC Check Single analyzer	*Every 14 days*	< ±7.1% (percent difference) or < ±1.5 ppb difference whichever is greater
Zero/span check	Every 14 days	Zero drift < ± 3.1 ppb (24 hr) < ± 5.1 ppb (>24hr-14 day) Span drift < ± 7.1 %

OPERATIONAL CRITERIA -OZONE		
Shelter Temperature Range	Daily (hourly values)	20.0 to 30.0° C. (Hourly avg) or per manufacturers specifications if designated to a wider temperature range
Shelter Temperature Control	Daily (hourly values)	< 2.1° C SD over 24 hours
Shelter Temperature Device Check	Every 182 days and 2/ calendar year	<± 2.1° C of standard

SYSTEMATIC CRITERIA-OZONE		
Standard Reporting Units	*All data*	*ppm (final units in AQS)*
Rounding convention for design value calculation	*All routine concentration data*	*3 places after decimal with digits to right truncated*
Completeness (seasonal)	*3-Year Comparison*	*> 90% (avg) daily max available in ozone season with min of 75% in any one year.*
	8- hour average	*≥75% of hourly averages for the 8-hour (6 of 8 hours)*
	Valid Daily Max	*> 75% of the 24, valid 8 hour averages (18 of 24 8-hour averages*

Tools Used in Data Review/Validation

- Site/Monitor Documents-Logs and Monthly QC Forms
- Auto-cal Results
- QC Checks
- Multi-point Calibrations
- Audit Results
- AQDA/CAN documents
- Automated Data Screening
- Comparison to nearby sites
- Diurnal trends, expected results and parameters relationships (PM2.5 shouldn't be higher than PM10)
- Visualize Data

Santa Barbara County APCD

Monthly Quality Control Maintenance Check Sheet

MetOne BAM 1020 PM10 Air Sampler

Site Name:	Goleta	Month:	8
BAM S/N:	J6136	Year:	2017

Operator Instructions:

1) Daily checks:Review station data system values for correct operation of BAM

2) Weekly checks: Check filter tape & replace when necessary (approx 2 months/roll)

3) Bi-weekly checks: Perform BAM flow/temp./pressure/leak check

4) Monthly Checks: Complete and submit this Monthly QC Maintenance Check Sheet.

>Thoroughly clean both PM2.5 SSC/VSCC and PM10 Inlets

>Check pump exit exhaust tubing and replace when needed

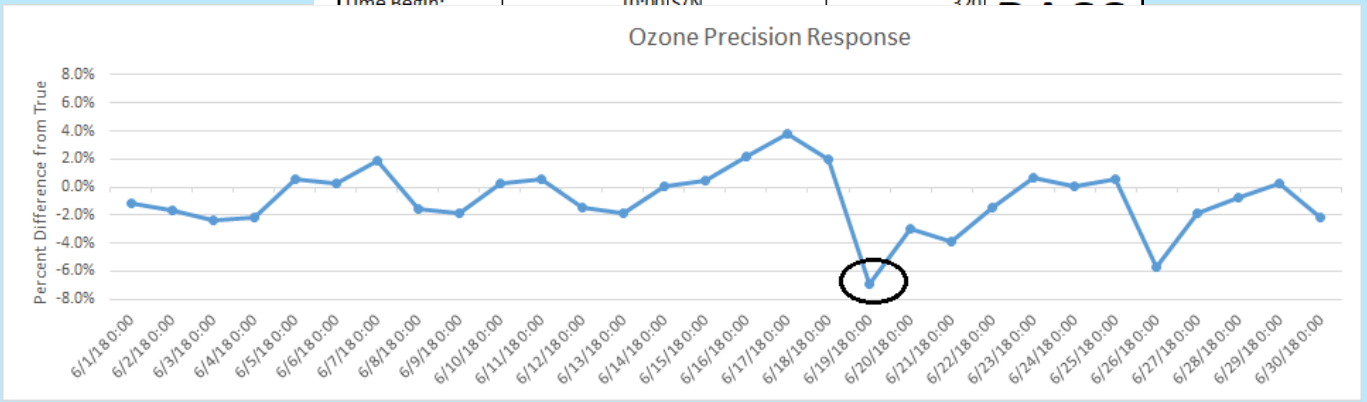
>Download and submit data from BAM-1020

5) 6 Month calibration last performed: 8/1/2017

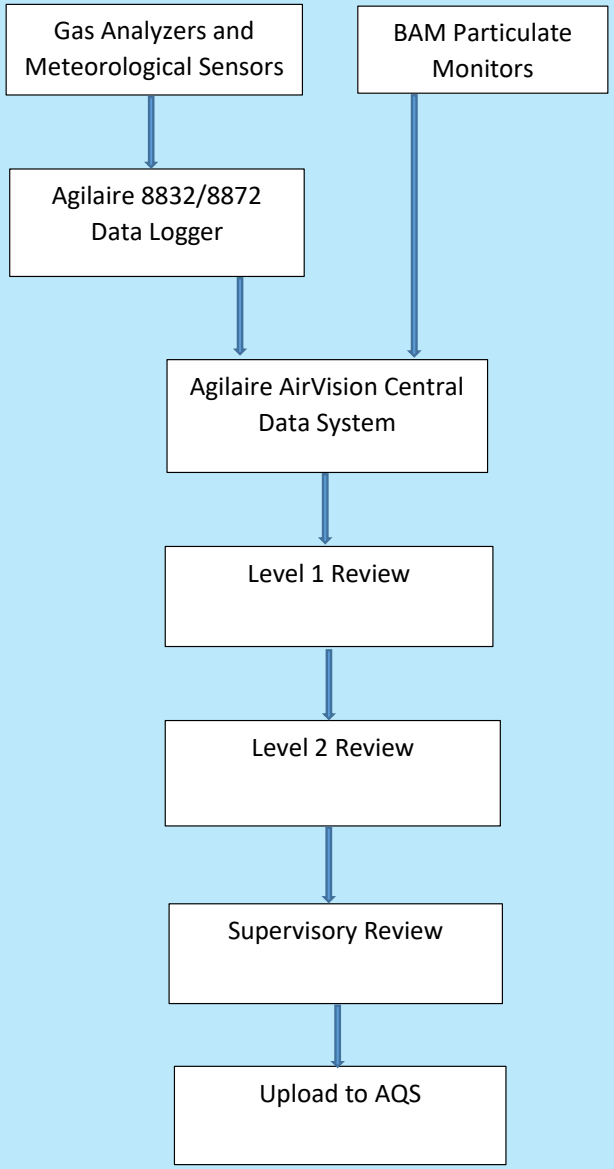
6) Annual: Zero BKG: 0.003069 mg/m3 Last BKG: 11/17/2016

Inlet Cleaned: 5/4/2017

Date:	8/28/2017	Standard Used		PASS
Time Begin:	10:00	S/N	320	
Time End:	11:00	Make/Model	Delta Cal	
Operator:	??	Cert. Date	10/12/16	
	Sampler	Standard	Difference	Control Limits
Flow Rate	16.7	16.5	0.2	16.00 to 17.34 l/m
Ambient Temp.	21.5	21.3	0.2	+/-2 Deg C
Ambient Pressure	757	757	0	+/-10 mmHg
Leak Check	0.3			<1.0 l/m
Date:	8/14/2017	Standard Used		
Time Begin:	10:00	S/N	320	



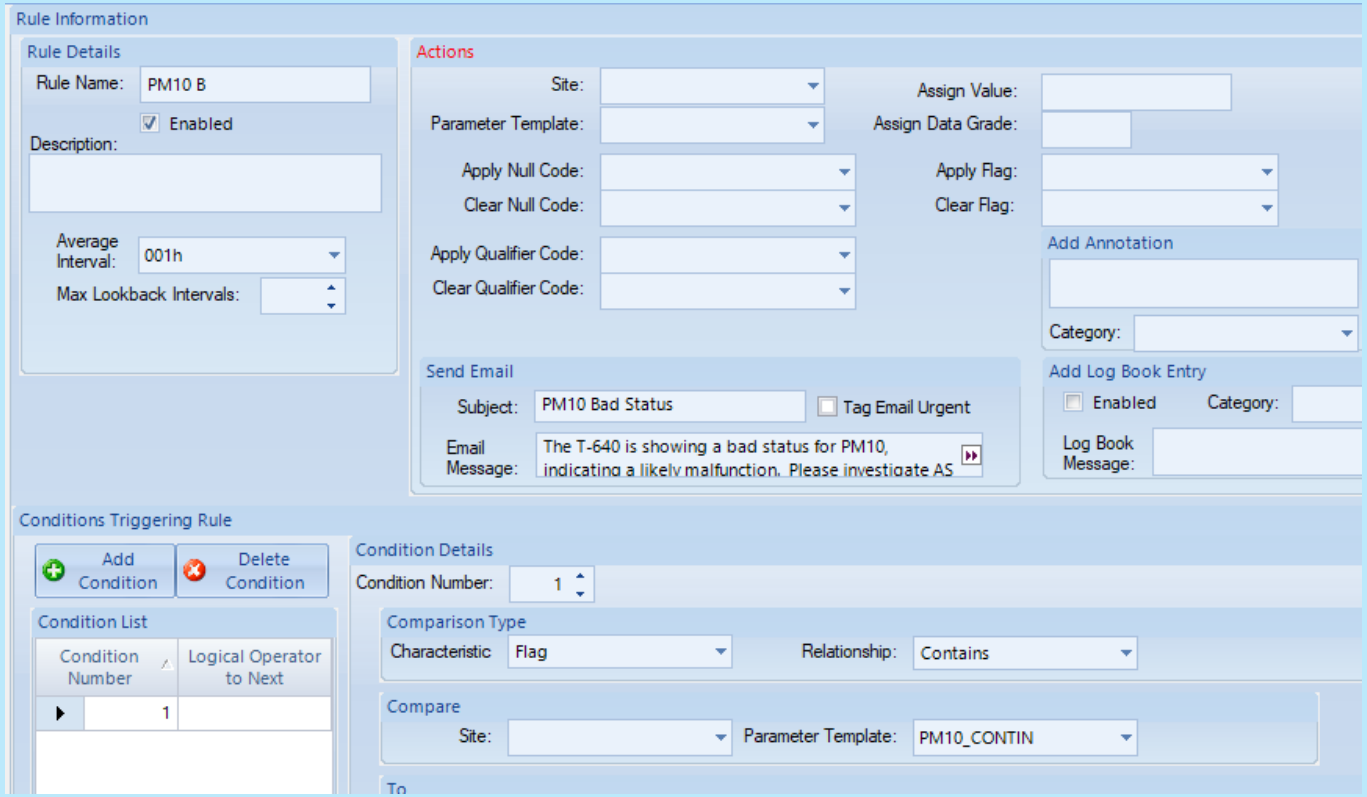
Data Review/Validation Process-Overview



- **Level 1- Identify erroneous readings and out of tolerance conditions.**
- **Level 2- Review Level 1 work. Perform data verification.**
- **Level 3 – Review previous levels work. Focus on high values/standard exceedances.**

Automated Data Screening

- High, Low, rate of change, stuck values, more advanced between sites
- Not a substitute for manual review process
- Helpful in screening for real-time data
- Quick notification of a problem with email alarm

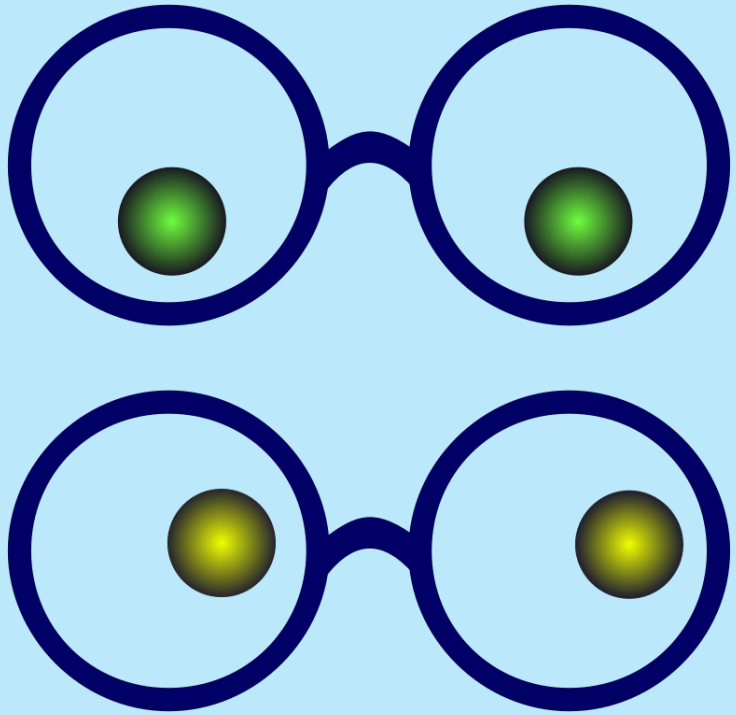


Level 1 Data Review

- Most important step
- Should be performed by someone involved with site operations (site tech)
- Identify missing, erroneous data values
- Out of tolerance conditions and time period
- Can apply null and other qualifier codes
- Need to document all actions taken

Level 2 Data Review

- Data Verification-Ensure QC tasks performed per QAPP/SOP
- Review all Level 1 work/action by “second set of eyes”
- QC check review if not performed by Level 1
- Calculate data statistics such as high, low, NAAQS/State Standard exceeds
- Compare to other nearby sites data
- Reach consensus with Level 1 reviewer on any differences in review



Level 3 Data Review

- Typically performed by management
- Review data completeness
- Review high values and/or standard exceeds
- Approve upload to AQS

SANTA BARBARA COUNTY APCD LEVEL 3 DATA REVIEW AND VALIDATION

Month	Year	IT/Monitoring Supervisor

TASK	OK?
1) Note the highest hourly value on each final monthly report.	
2) Note each hourly value on the appropriate final monthly report that exceeds the value to trigger a standards exceedance based on hourly values.	
3) Note each day's hourly values on the appropriate final monthly report that exceeds the value to trigger a standards exceedance based on 24 hour average values.	
4) Generate 8 hour running average reports for ozone and carbon monoxide. Note any values triggering a standards exceedance based on 8 hour average values.	
5) Review the chart (gaseous pollutants only) for each noted period identified in steps 1-4 above.	
6) Review PM10 and PM2.5 hourly values for each noted period identified in steps 1-4 above in the AirVision average editor.	
7) Review gas pollutant calibration control charts to ensure that the noted periods are bracketed in time by valid calibration checks within allowable tolerance.	
8) Review PM10/2.5 verification/calibration records to ensure that the noted periods are bracketed in time by valid verifications/calibrations within allowable tolerance.	
9) If any parts of this review indicates possible errors in the data set, discuss with the Level 1 and 2 reviewers, reach a consensus and make the appropriate corrections. Document these corrections by annotating the data in AirVision.	
10) If any corrections to the data set were made, re-generate hourly AQS files and replace the old files with the corrected files.	
11) Submit all hourly and QA AQS files to AQS. Confirm the upload was successful.	
AQS Upload Performed by:	
AQS Upload Completion Date:	

Figure 7- Level 3 Monthly Data Review Check Sheet

AQS Data Submittal and Review

- AQS Submittal Process
- Review of data once in AQS
  - Quarterly
    - *AMP256 – Data Quality Indicator*
    - *AMP350 – Raw Data*
    - *AMP430 – Data Completeness*
  - Annual
    - *AMP600- Certification Evaluation*

Data is Validated by Bracketing in Time with QC or Calibration Checks

- Documentation (logs, QC forms, etc)
- Data Review, Validation, and Verification Terms
- Validation Criteria and Tools
- Three Level Data Review Process
- Data Submittal and Review

Resources

- EPA/CARB
- Quality Documents
- I am always willing to Discuss Ideas

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