

Electronic Site Documentation

The image shows an open spiral-bound notebook with two blank pages. Each page is ruled with blue horizontal lines. A red vertical line is drawn on the left side of each page, and a red horizontal line is drawn at the top. The top right corner of each page is labeled "Date:". At the bottom of each page, there are two labels: "Verified By:" and "Sign:". The notebook is bound in the center with a black spiral binding.

Joel Craig
Craig Environmental Consulting
2024 PQAO Training

Purpose/Use of Site Documentation

If it wasn't documented, it didn't happen

- Document all field activities.
- Used to validate data from the site.
- Used to track equipment maintenance/history.

Security Concerns and Meeting U.S.EPA Requirements

- “Authentication of entries”
- Embedded calculations checked prior to use then locked to prevent unintended changes.
- Password protection to positively identify person making entry.
- Regular Back-up.
- Method for deleting, flagging, or modifying erroneous entries.
- See US U.S. EPA QA Manual Vol II Appendix J for additional guidance.

Why Electronic Site Documentation

- Simplify entries in the field.
- Improve Efficiency.
- Improve Accuracy.



How to Develop an Electronic Site Documentation System

- Each Organization will want specifics tailored to their operation and procedures.
- Ease in modifying system as U.S. EPA requirements change.
- Must select an approach that the organization has staff with skills to support.
- Record all instrument meta-data on data system, eliminating the need to manually record on documents.

Simplest Approaches

- Automated Excel to PDF
- “Grid” style Excel

Nipomo Regional Park Monitoring Station			
Beta Attenuation Monitor - PM10			
Full Calibration Worksheet			
Date	9/13/10		
Tech	jsc		
Delta Cal S/N	803.00		
Delta Cal Cert Date	5/18/10		
Leak Check Flow (<1.0 lpm)			
As found lpm	0.3		
Final lpm			
Atmospheric Temp. (+/- 2.0 deg C)			
As found	17.6		
Actual	17		
Difference (Deg C)	0.6	0.0	0.0
Final	17.0000		
% Diff.	0.0	0.0	0.0
Barometric Pressure (+/- 10 mm)			
As found	750.0000		
Actual	749.00	0.00	0.00
Diff.	1.0000	0.0000	0.0000
Final	749.0000		
Diff.	0.0000	0.0000	0.0000
Flow Calibration (+/- 2%)			
15.0 lpm actual	15.08		
% Diff	0.5%	-100.0%	-100.0%
18.4 lpm actual	18.4		
% Diff	0.2%	-100.0%	-100.0%
16.7 lpm actual	16.8		
% Diff	0.4%	-100.0%	-100.0%
Average % Diff.	0.4%	-100.0%	-100.0%
Flow Verification in operate mode (lpm)			
	16.7		6
% Diff.	-0.1%	-100.0%	-100.0%

More Advanced Approaches

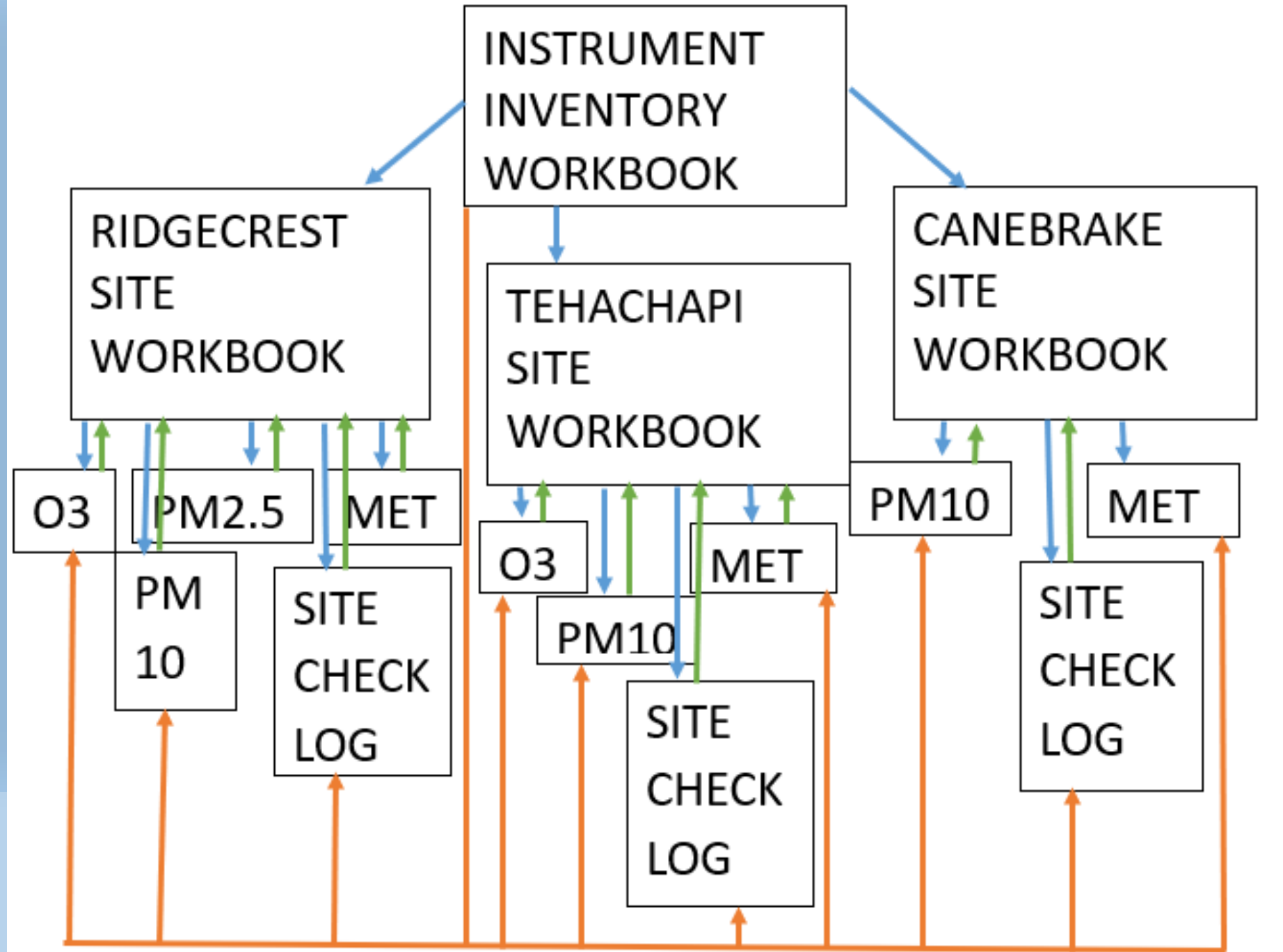
- “Forms Approach”
- True database

DATA RETRIVAL FORM					
EKAPCD					
Ridgecrest Air Monitoring Station					
OZONE MULTI-POINT CALIBRATION DOCUMENT					
	Make	Model	S/N	Slope	Intercept
Analyzer	TAPI	T400	5933	1.02	1.2
Calibrator	TAPI	T703	810	0.995	-0.559
Certification Slope/Incpt		1	0	Cert. Date.	05/09/23
Operator	npd	Time Begin	12:19	Full Range	
Date	05/24/23	Time End	1:24	AS IS	
CALIBRATION DATA					
	Calibrator	TRUE	Analyzer		
	Response	OZONE	Response	% Diff	Stability
Zero	-0.9	0	0.1	N/A	0.3
Point #1 ~400ppb	400.1	400.1	405.6	1.4%	0.5
Point #2 ~250ppb	175.5	175.5	177.5	1.1%	0.3
Point #3 ~150ppb	69.4	69.4	70.8	2.0%	0.4
Point #4 ~70ppb	34.3	34.3	35.7	4.1%	0.2
COMMENT	NO COMMENT WAS ENTERED				
CALIBRATION TOLERANCE PASSES					
Slope	0.9878663				
Intercept	-0.406283				
Correlation	0.9999963				

CERT TYPE
Level2

Linearity
Check
(<2%/1.5pp
b from best
fit)

Eastern Kern APCD Excel "Forms" System



Eastern Kern APCD System Details

- Data saved in hidden tables in Excel workbook and authenticated by PDF of each entry form.
- Automated entry for many fields.
- Instrument Location Workbooks provides history of all instrument movements.

EKAPCD
Canebrake Air Monitoring Station
MASTER SITE WORKBOOK---LOGGED IN AS jsc

General Site Operation		Meteorological Sensors		Particulate Sampler	
TASK	Days Till Due	TASK	Days Till Due	EBAM PLUS-PM10	
Site Check	5	Sonic Anemometer Calibration	167	TASK	Days Till Due
Site Check and Log Workbook				QC Check	5
				Full Calibration	36
				Zero Background Check	56
				Replace Filter Tape	20
				Clean Internal of Nozzle	32
				Replace Pump Muffler	136
				TASK	Last Performed
Rebuild Vacuum Pump	09/21/20				

[EBAM+ Workbook](#)

YOU ARE LOGGED IN AS jsc

Save and Exit

Click to Log Out

Click to Log In

Click to Change Password

Eastern Kern APCD System Details

- Standards Certifications are linked to all other workbooks with hyperlink to actual certification document.
- Field workbooks maintain data based on site, but other workbooks are used to compile data based on specific instrument.
- BAM flow QC checks automatically generate AQS strings.

FLOW/TEMPERATURE/PRESSURE STANDARDS

S/N	Latest Cert	Make	Model	Cert Date1	Cert Date2	Cert Date3	Cert Date4	Cert Date5	Cert Date6	Cert Date7
251	7/28/2022	BGI	Delta Cal	7/16/2018	2/19/2020	3/4/2021	7/28/2022	NO FILE NAME	NO FILE NAME	NO FILE NAME
193396	1/24/2023	Alicat	FP-25	1/9/2019	1/15/2020	1/20/2021	1/14/2022	1/24/2023	NO FILE NAME	NO FILE NAME
202539	5/3/2023	Alicat	FP-25	4/23/2019	4/22/2020	4/20/2021	4/25/2022	5/3/2023	NO FILE NAME	NO FILE NAME

WIND SPEED MOTOR STANDARDS

S/N	Latest Cert	Make	Model	Cert Date1	Cert Date2	Cert Date3	Cert Date4	Cert Date5	Cert Date6	Cert Date7
CA4969	11/22/2022	RM Young	18802	11/3/2021	11/22/2022	NO FILE NAME	NO FILE NAME	NO FILE NAME	NO FILE NAME	NO FILE NAME

OZONE LEVEL 2 AND LEVEL 3 STANDARDS

S/N	Latest Cert	Make	Model	Cert Date1	Slope1	Incpt1	Cert Date2	Slope2	Incpt2	Cert Date3
810	5/8/2023	TAPI	T703	5/4/2021	1	0	5/4/2022	1	0	5/8/2023
822	11/2/2023	TAPI	T703	7/7/2020	0.9904	0.578	12/21/2020	0.9958	0.509	9/10/2021

SONIC WIND SENSOR CALIBRATION

S/N	Latest Cert	Make	Model	Cert Date1	Cert Date2	Cert Date3	Cert Date4	Cert Date5	Cert Date6	Cert Date7
4023	12/7/2022	RM YOUNG	86000	9/17/2019	10/29/2020	8/6/2021	12/7/2022	NO FILE NAME	NO FILE NAME	NO FILE NAME
4717	9/20/2023	RM YOUNG	86000	6/19/2020	7/22/2021	8/16/2022	9/20/2023	NO FILE NAME	NO FILE NAME	NO FILE NAME
3908	11/8/2022	RM YOUNG	86000	8/2/2019	12/9/2020	9/14/2021	11/8/2022	NO FILE NAME	NO FILE NAME	NO FILE NAME
4024	6/14/2023	RM YOUNG	86000	9/17/2019	8/21/2020	4/20/2021	5/17/2022	6/14/2023	NO FILE NAME	NO FILE NAME

Example Forms

EKAPCD

Monthly Quality Control Maintenance Check Sheet

MetOne BAM 1020 PM10 Air Sampler

Site Name: Ridgecrest

Month: 2

Year: 2021

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/VSSC 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: 11/24/2020
 6) Annual: Zero BKG/SDEV: -0.0014 / 0.002 Last BKG: 12/23/2020
 Inlet Cleaned: 11/24/2020

Date:	2/16/2021	Standard Used		SAMPLER	
Time Begin:	1:12	S/N	193396	BAM 1020	
Time End:	1:44	Make/Model	Alicat	S/N	
Operator:	da	Cert. Date	01/20/21	U12346	
	Sampler	Standard	Difference-True	Difference-Design	Control Limits
Flow Rate	16.65	16.75	-0.6%	0.3%	+/-4% true +/-5% design
Ambient Temp.	17.8	17.99	-0.19		+/-2 Deg C
Ambient Pressure	695	693.8	1.2		+/-10 mmHg
Leak Check	0.66				<1.0 l/m
Date:	2/4/2021	Standard Used		SAMPLER	
Time Begin:	13:32	S/N	193396	BAM 1020	
Time End:	13:50	Make/Model	Alicat	S/N	
Operator:	npd	Cert. Date	01/20/21	U12346	
	Sampler	Standard	Difference-True	Difference-Design	Control Limits
Flow Rate	16.68	16.76	-0.5%	0.4%	+/-4% true +/-5% design
Ambient Temp.	15.3	16.05	-0.75		+/-2 Deg C
Ambient Pressure	702	702.7	-0.7		+/-10 mmHg
Leak Check	0.64				<1.0 l/m

PASS

PASS

EKAPCD

Ridgecrest Monitoring Station

Particulate Sampler QC Flow Check-RETRIEVE AND DELETE FORM

Date:	12/5/2023	Standard Used		Sampler	
Time Begin:	12:35	S/N	193396	BAM 1020	
Time End:	13:03	Make/Model	Alicat/FP-25	U12346	
Operator:	npd	Cert. Date	1/24/2023	PM10	
			Difference From Standard	Control Limits	Difference From Design
Flow Rate	16.73	16.71	0.1%	+/- 4% from True +/-5% Design	0.1%
Ambient Temperature	20	19.75	0.25	+/-2 Deg C	
Ambient Pressure	704	704.4	-0.4	+/-10 mmHg	
Leak Check	0.48			<1.0 l/m	

COMMENT

Changed tape. Accidentally press Cal while on AT (Ambient Temperature) during flow check on PM10 Bam. Made sure everything was correct and moved on-

Pass/Fail PASS

RECORD IS LISTED AS VALID

QA | I | Flow Rate Verification | 0575 | 06 | 029 | 0018 | 81102 | 1 | 20210216 | 1 | 122 | 118 | 16.65 | 16.75 |

QA | I | Flow Rate Verification | 0575 | 06 | 029 | 0018 | 81102 | 1 | 20210204 | 1 | 122 | 118 | 16.68 | 16.76 |

QUESTIONS?

CONTACT INFORMATION:

Joel Craig

Craig Environmental Consulting

craigairmonitoring@att.net

805-712-5701