

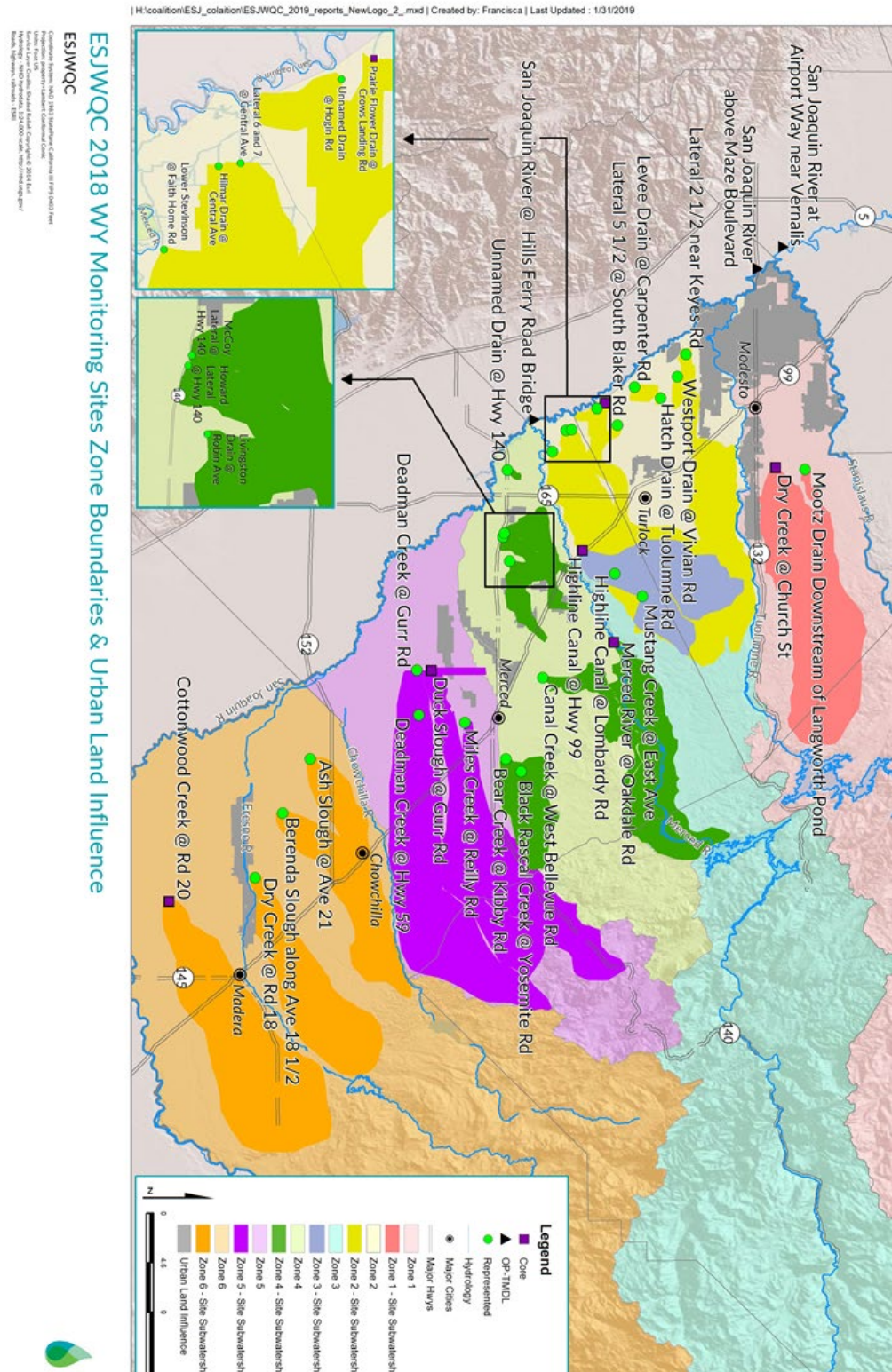


Field Collection and Laboratory Measurement Methods Presentation


Additional Handouts

ESJ Surface Water Quality Monitoring Program Review
January 7, 2020

East San Joaquin Water Quality Coalition – Map of Monitoring Locations for the 2018 WY (Slide 6)



Example of Chain of Custody form:



MLJ
ENVIRONMENTAL

AQUA-Science CHAIN-OF-CUSTODY RECORD

Client Name: MLJ Environmental				Address: 1480 Drew Ave #130, Davis, CA 95618			
Sampled By: M. Bunk, D. Leire				Phone: (530) 756-5200			
Project Manager: Michael Johnson				Fax: (530) 756-5225			
Project Name: East San Joaquin Water Quality Coalition							

Sample Identification	Sample Date	Sample Time	Sample Matrix	Number	Type	Preservative	Acute Ceriodaphnia dubia	Acute Pimephales promelas	Chronic Selenastrum capricornutum	SAMPLE COMMENTS
545XDCAR-GR	11/12/19	9:50	FW	4	1-G Amber Glass	Ice	X		X	Ceriodaphnia and Selenastrum only 4 30
535XMCARR-GR	11/12/19	11:20	FW	4	1-G Amber Glass	Ice	X		X	Ceriodaphnia and Selenastrum only 30
535CCAWBR-GR	11/12/19	12:40	FW	4	1-G Amber Glass	Ice	X		X	Ceriodaphnia and Selenastrum only 3 20
535CCAWBR-GR2	11/12/19	12:40	FW	4	1-G Amber Glass	Ice	X		X	Ceriodaphnia and Selenastrum only 3 20

Comments:

Please fax signed and completed COC to MLJ Environmental:
(530) 756-5225, or email to mbundock@mljenvironmental.com

Relinquished By		Relinquished By	
Signature	Matthew Bunk	Signature	
Print Name	Matthew Bunk	Print Name	
Organization	MLJ Environmental	Organization	
Date	11/12/19	Date	
Time	16:45	Time	
Received By		Received By	
Signature		Signature	
Print Name	Kala McIntyre	Print Name	
Organization	Aqua Science	Organization	
Date	11/12/19	Date	
Time	16:45	Time	

Matrix codes: SED = sediment, FW = freshwater, WW = wastewater, STRMW = stormwater

Team 2: Pg 1 of 1

AquaSci COCs 2 of 2

Example of Field Sheet:

ESJWQC		Field Data Sheet: Water Sampling (EventType = WQ)		Entered in d-base (initial/date) <u>JW 11/13/19</u> double checker: <u>MB 11/14/19</u>																			
Station Name: Dry Creek @ Rd 18		StationID: 545XDCARE		Arrival Time: <u>09:22</u> Agency: MLJ Environmental																			
Project ID: ESJ_WY20_Q1		DATE (mm/dd/yyyy): <u>11/12/2019</u>		SAMPLE TIME: <u>9:50</u> Protocol: MLJ-LLC FieldSOP 03/13/08																			
Group: Fall2 2020 C, M		Purpose/Failure: <u>WaterChem</u> <u>WaterTox</u> <u>FieldMeasure</u> <u>Habitat</u>		Departure Time: <u>10:18</u>																			
Personnel: <u>M. Boudock, D. Levine</u>																							
SAMPLE LOCATION: Bank, Thalweg, <u>Midchannel</u> , Open Water		Geometry Data																					
Details: WQ/Tox		Lat (dd.ddddd) Long (dd.ddddd)																					
OCCUPATION METHOD: <u>Walk-in</u> , Bridge, Other		Target: 36.9818 -120.22056																					
STARTING BANK: <u>LB</u> , <u>RB</u> , NA		Actual: <u>36.98197</u> <u>-120.22056</u>																					
STREAM WIDTH (ft/m): <u>6.2</u>		WATER DEPTH (ft/m): <u>0.71</u>																					
HYDRO-MODIFICATION: None, Bridge, Pipes, Concrete Channel, <u>Grade Control</u> , Culvert, Pumpsta, Other		GPS Model: MLJ-LLC Garmin GRSMA6 Datum: <u>NAD83</u> Accuracy (ft): <u>9</u>																					
HYDROMODLOC: <u>US</u> / <u>PS</u> / NA																							
WATER SAMPLES																							
Lab Chem/Tox Method: <u>Water</u> Grab Position in Water Column: Subsurface Depth: 0.1 m																							
SAMPLE TYPE: <u>Grab</u> , Integrated																							
DEVICE: Individual collection by hand, By pole, UCD 3L PTFE, Other																							
ALL SAMPLES																							
Habitat Method: Not Applicable																							
COLOR - SAMPLEWATER: <u>Colorless</u> , Green, Yellow, Brown, Other DOMINANT SUBSTRATE: <u>Concrete</u> , Cobble, Gravel, Sand, Mud, Unk., Other *OBSERVED FLOW: NA, Dry Waterbody Bed, No Observed Flow, Isolated Pool, 0.1 - 1 cfs, 1 - 5 cfs, <u>5 - 20 cfs</u> , 20 - 50 cfs, 50 - 200 cfs, >200cfs *ODOR - HABITAT: <u>None</u> , Sulfides, Sewage, Petroleum, Mixed, Organic, Manure, Other ODOR - SAMPLEWATER: <u>None</u> , Sulfides, Sewage, Petroleum, Mixed, Organic, Manure, Other OTHER PRESENCE: <u>Vascular</u> , Nonvascular, OilySheen, Foam, Trash, None, Other *PICTURE CODE: 1 NE, 2 SW, <u>3</u> , 4 Picture Name: 545XDCARE_Fall2_111219_... *PRECIPITATION: <u>None</u> , Foggy, Drizzle, Rain, Snow *PRECIPITATION (last 24 hrs): Unknown, <1", >1", <u>None</u> *SKY CODE: <u>Clear</u> , Partly Cloudy, Overcast, Fog, Hazy WADEABILITY: <u>Wadeable</u> / Non-Wadeable WATER CLARITY: Clear (see bottom), Cloudy (>4" vis), Murky (<4" vis) *WIND DIRECTION (from): circle direction in compass at right <u>XX</u> *WIND SPEED: <u>Calm</u> , Light Breeze, Gusty				Field Results Sample Type: <u>FieldMeasure</u> Method: <u>Field</u> Depth: 0.1 m Position in Column: Subsurface Air Temp (Celsius): <u>18.1</u> Water Temp (Celsius): <u>2.4</u> SC (uS/cm): <u>66.8</u> DO (mg/L): <u>6.74</u> pH: <u>7.43</u> YSI Meter ID: <u>#8</u> Calculated Site Discharge (cfs): <u>7.28</u>																			
November Management Plan Monitoring for Copper.																							
Discharge <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Interval Midpoint (meters or feet)</th> <th>Interval Depth (meters or feet)</th> <th>Velocity</th> </tr> </thead> <tbody> <tr> <td>1 1.03</td> <td>1.6</td> <td>0.2 or 0.6 0.13</td> </tr> <tr> <td>2 2.06</td> <td>2.4</td> <td>0.2 or 0.6 0.19</td> </tr> <tr> <td>3 3.12</td> <td>2.0</td> <td>0.2 or 0.6 0.19</td> </tr> <tr> <td>4 4.15</td> <td>3.0</td> <td>0.2 or 0.6 0.18</td> </tr> <tr> <td>5 5.18</td> <td>2.65</td> <td>0.2 or 0.6 0.20</td> </tr> </tbody> </table>				Interval Midpoint (meters or feet)	Interval Depth (meters or feet)	Velocity	1 1.03	1.6	0.2 or 0.6 0.13	2 2.06	2.4	0.2 or 0.6 0.19	3 3.12	2.0	0.2 or 0.6 0.19	4 4.15	3.0	0.2 or 0.6 0.18	5 5.18	2.65	0.2 or 0.6 0.20	Method: <u>wading / bridge</u> Left Edge Water (LEW) <u>6.2</u> Meter Units: <u>ft/s</u> m/s Right Edge Water (REW) <u>0</u> Discharge (cfs): <u>7.28</u> Discharge calculated by (date and initials): <u>JW 11/13/19</u> Double checked by (date and initials): <u>MB 11/13/19</u> If depth is greater than 0.76 m (2.5 ft): sample at 0.2 and 0.8 below water surface To set wading rod: 0.2 = Hx2 0.8 = H/2	
Interval Midpoint (meters or feet)	Interval Depth (meters or feet)	Velocity																					
1 1.03	1.6	0.2 or 0.6 0.13																					
2 2.06	2.4	0.2 or 0.6 0.19																					
3 3.12	2.0	0.2 or 0.6 0.19																					
4 4.15	3.0	0.2 or 0.6 0.18																					
5 5.18	2.65	0.2 or 0.6 0.20																					
				To Take Discharge in a Culvert, the Culvert Opening Must Be Circular Diameter (D): _____ Water Depth (H): _____ Top of Sediment to Top of Culvert (S): _____ Sed. Depth (D-S): _____ Velocity @ 0.2H: _____ Velocity @ 0.6H: _____ Velocity @ 0.8H: _____																			

Analytical parameters, containers, preservation and holding time requirements.
(Slide 13)

	Analytical Parameter	Sample Volume	Sample Container	Initial Preservation/Holding Requirements	Holding Time
Physical Parameters	Total Suspended Solids	2000 mL	1x 2000 mL Polyethylene	Store at <6°C	7 Days
	Turbidity	2000 mL			7 Days
	Total Dissolved Solids	500 mL	1x 500 mL Polyethylene	Store at 4°C	7 days
	Total Organic Carbon	120 mL	3x 40 mL Amber glass VOA with PTFE-lined cap	Preserve with HCl, store at <6°C	28 Days
Nutrients	Ammonia and Nitrate-Nitrite as N	500 mL	1x 500 mL Polyethylene	Store at <6°C, preserve to pH < 2 with H ₂ SO ₄	28 Days
	Soluble Orthophosphate	2000 mL	1x 2000 mL Polyethylene	Store at <6°C	48 Hours
Metals	Metals/Trace Elements, Hardness	500 mL	1x 500 mL Polyethylene	Filter as necessary; Store at <6°C, preserve to pH ≤ 2 with HNO ₃	180 Days
Pathogens	E. coli	150 mL	1x 150 mL Polyethylene	Preserved with Na ₂ S ₂ O ₃ , store at <8 °C	24 Hours
Pesticides	Pesticides	1 L	2x 1 L Amber Glass Jar	Store at <6°C; extract within 7 days	40 Days
	Paraquat	500 mL	1x 500 mL polyethylene		21 Days
	Glyphosate	80 mL	2x 40 mL Amber glass VOA with PTFE-lined cap		6 Months
Water and Sediment Column Toxicity	Aquatic Toxicity	3 Gallons	3x 1 Gallon Amber Glass Jar	Store at <6°C; freeze (-20°C) within 2 weeks	36 Hours
	Sediment Toxicity	2 L	2x 1L Clear Glass Jar	Store at <6°C, do not freeze	14 Days
	Sediment Grain Size	8 oz.	1x 250 mL Glass Jar		28 Days

	Analytical Parameter	Sample Volume	Sample Container	Initial Preservation/Holding Requirements	Holding Time
	Sediment Total Organic Carbon	8 oz.	1x 250 mL Glass Jar	Store at <6°C (not frozen), analyze or freeze (-20C) within 28 days	28 Days (not frozen) 12 Months (frozen)
	Sediment Chemistry	8 oz.	1x 250 mL Amber Glass Jar	Store at <6°C (not frozen), freeze within 48 hours	12 Months
	Sediment Total Solids	8 oz.	1x 250 mL Glass Jar	Store at <6°C	7 Days

List of constituents, matrix, laboratory and analytical method. Sorted by Analytical Group.

Group	Constituent	Matrix	Analyzing Laboratory	Analytical Method
Pesticides	Glyphosate	Surface Water	NCL	EPA 547M
	Paraquat	Surface Water	NCL	EPA 549.2M
	Ziram	Surface Water	NCL	EPA 630
	Chlorothalonil	Surface Water	APPL	EPA 8081A
	Endosulfan I	Surface Water	APPL	EPA 8081A
	Endosulfan II	Surface Water	APPL	EPA 8081A
	Iprodione	Surface Water	APPL	EPA 8081A
	Oxyfluorfen	Surface Water	APPL	EPA 8081A
	Atrazine	Surface Water	APPL	EPA 8141A
	Chlorpyrifos	Surface Water	APPL	EPA 8141A
	Diazinon	Surface Water	APPL	EPA 8141A
	Dimethoate	Surface Water	APPL	EPA 8141A
	Malathion	Surface Water	APPL	EPA 8141A
	Pendimethalin	Surface Water	APPL	EPA 8141A
	Simazine	Surface Water	APPL	EPA 8141A
	Trifluralin	Surface Water	APPL	EPA 8141A
	Dichlorophenoxyacetic Acid, 2,4-	Surface Water	APPL	EPA 8151A
	Chloropicrin	Surface Water	NCL	EPA 8260BM
	Bifenthrin	Surface Water	Caltest	EPA 8270M_NCI
	Cyfluthrin, total	Surface Water	Caltest	EPA 8270M_NCI
	Cyhalothrin, Total lambda-	Surface Water	Caltest	EPA 8270M_NCI
	Cypermethrin, Total	Surface Water	Caltest	EPA 8270M_NCI
	Esfenvalerate/Fenvalerate, Total	Surface Water	Caltest	EPA 8270M_NCI
	Fenpropathrin	Surface Water	Caltest	EPA 8270M_NCI
	Permethrin, Total	Surface Water	Caltest	EPA 8270M_NCI
	Carbaryl	Surface Water	APPL	EPA 8321A
	Diuron	Surface Water	APPL	EPA 8321A
	Imidacloprid	Surface Water	APPL	EPA 8321A
	Methiocarb	Surface Water	APPL	EPA 8321A
	Methomyl	Surface Water	APPL	EPA 8321A
	Oryzalin	Surface Water	APPL	EPA 8321A
	Ethalfuralin	Surface Water	NCL	NCL ME 321
	Acetamiprid	Surface Water	NCL	NCL ME 340

Group	Constituent	Matrix	Analyzing Laboratory	Analytical Method
	Clothianidin	Surface Water	NCL	NCL ME 340
	Cyprodinil	Surface Water	NCL	NCL ME 340
	Flumioxazin	Surface Water	NCL	NCL ME 340
	Pyraclostrobin	Surface Water	NCL	NCL ME 340
Physical Parameters	Flow	Surface Water	Field Measure	USGS R2Cross Streamflow Method
	pH	Surface Water	Field Measure	EPA 150.1
	Specific Conductivity	Surface Water	Field Measure	EPA 120.1
	Dissolved Oxygen	Surface Water	Field Measure	SM 4500-O
	Temperature	Surface Water	Field Measure	SM 2550
	Turbidity	Surface Water	Caltest	EPA 180.1
	Total Suspended Solids	Surface Water	Caltest	SM 2540 D
Inorganics	Hardness	Surface Water	Caltest	SM2340C
	Dissolved Organic Carbon	Surface Water	Caltest	SM 5310 B
	Total Organic Carbon	Surface Water	Caltest	SM 5310 B
Bacteria	E. coli	Surface Water	Caltest	SM 9223 B
Toxicity	Water Column Toxicity	Surface Water	AQUA-Science	EPA 821-R-02-012
		Surface Water	AQUA-Science	EPA 821-R-02-013
	Sediment Toxicity	Sediment	AQUA-Science ¹	EPA 600/R-99-064
Metals	Arsenic	Surface Water	Caltest	EPA 200.8 (ICPMS)
	Boron	Surface Water	Caltest	EPA 200.8 (ICPMS)
	Cadmium	Surface Water	Caltest	EPA 200.8 (ICPMS Collision Cell)
	Copper	Surface Water	Caltest	
	Lead	Surface Water	Caltest	
	Molybdenum	Surface Water	Caltest	
	Nickel	Surface Water	Caltest	
	Selenium	Surface Water	Caltest	EPA 200.8 (ICPMS)
	Zinc	Surface Water	Caltest	EPA 200.8 (ICPMS)

Group	Constituent	Matrix	Analyzing Laboratory	Analytical Method
Nutrients	Nitrate + Nitrite (as N)	Surface Water	Caltest	EPA 353.2
	Nitrate + Nitrite (as N)	Groundwater	Caltest	EPA 353.2
	Total Ammonia	Surface Water	Caltest	SM 4500-NH3C
	Soluble Orthophosphate	Surface Water	Caltest	SM 4500-P E
Sediment	Bifenthrin	Sediment	Caltest	GCIS/NCI/SIM
	Cyfluthrin	Sediment	Caltest	GCIS/NCI/SIM
	Cypermethrin	Sediment	Caltest	GCIS/NCI/SIM
	Deltamethrin: Tralomethrin	Sediment	Caltest	GCIS/NCI/SIM
	Esfenvalerate	Sediment	Caltest	GCIS/NCI/SIM
	Lambda-Cyhalothrin	Sediment	Caltest	GCIS/NCI/SIM
	Permethrin	Sediment	Caltest	GCIS/NCI/SIM
	Fenpropathrin	Sediment	Caltest	GCIS/NCI/SIM
	Chlorpyrifos	Sediment	Caltest	GCIS/NCI/SIM
	Piperonyl Butoxide	Sediment	Caltest	GCIS/NCI/SIM
	Total Organic Carbon	Sediment	Caltest ²	EPA 9060
	Grain Size	Sediment	Caltest ²	Plumb, 1981, GS



Data Management Presentation

Additional Handouts

ESJ Surface Water Quality Monitoring Program Review
January 7, 2020

E. Monitoring Report

The Monitoring Report shall be submitted by 1 May every year, with the first report due 1 May 2014, except for report components 17, 18, and 19 which will be due 1 July of each year. The report shall cover the monitoring periods from the previous hydrologic water year. A hydrologic water year is defined as 1 October through 30 September. The report shall include the following components:

1. Signed transmittal letter;
2. Title page;
3. Table of contents;
4. Executive summary;
5. Description of the third-party geographical area;
6. Monitoring objectives and design;
7. Sampling site/monitoring well descriptions and rainfall records for the time period covered under the Monitoring Report;
8. Location map(s) of sampling sites/monitoring wells, crops and land uses;
9. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
10. Discussion of data relative to water quality objectives, and water quality management plan milestones, where applicable;
11. Sampling and analytical methods used;
12. Summary of Quality Assurance Evaluation results (as identified in the most recent version of the third-party's approved QAPP for Precision, Accuracy and Completeness);
13. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
14. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and for surface water related pesticide use information;
15. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
16. Evaluation of monitoring data to identify spatial trends and patterns;
17. INMP Summary Report Evaluation;
18. Summary of management practice information collected as part of Farm Evaluations;
19. Summary comparison of township Groundwater Protection Targets and actual value achieved for each township;
20. Summary of mitigation monitoring;
21. Summary of education and outreach activities;
22. Conclusions and recommendations.

Table 1. List of QA Project Plan Elements

Group A. Project Management	Group B. Data Generation and Acquisition	Group C. Assessment and Oversight
A1 Title and Approval Sheet	B1 Sampling Process Design (Experimental Design)	C1 Assessments and Response Actions
A2 Table of Contents	B2 Sampling Methods	C2 Reports to Management
A3 Distribution List	B3 Sample Handling and Custody	
A4 Project/Task Organization	B4 Analytical Methods	Group D. Data Validation and Usability
A5 Problem Definition and Background	B5 Quality Control	D1 Data Review, Verification, and Validation
A6 Project/Task Description	B6 Instrument/Equipment Testing, Inspection, and Maintenance	D2 Verification and Validation Methods
A7 Quality Objectives and Criteria	B7 Instrument/Equipment Calibration and Frequency	D3 Reconciliation with User Requirements
A8 Special Training/Certifications	B8 Inspection/Acceptance of Supplies and Consumables	
A9 Documentation and Records	B9 Non-direct Measurements	
	B10 Data Management	