STUDY REPORT W&AR-01
WATER QUALITY ASSESSMENT

ATTACHMENT B

FIELD QUALITY ASSURANCE DOCUMENTATION

3.0 Series 5, and 5X Sonde Functional Test Data Sheet

Section A:

Service Request # 312222835	Customer Rental	Date Started 07-25-12
Housing Serial # R49422	Embedded Serial# R49422	Additional Driver Firmware:
Technician HL	Model: Datasonde 5 (circled) Minisonde 5X (circled) Pipesonde	

Customer Display Information

I/D	DOM	Baud Rate	Security	SDI	TTY
Parameter	Time	Temp	pH	Spcond	Sal
Units		°C	units	mS/cm	ppt
Parameter	Turb	LDO%	LDO	Depth	Batt
Units	SC	Sat	mg/l	meters	Volts

For Sonde with Depth – Coefficients

A:	B:	C:	D:
E:	F:	G:	H:
I:	J:	SER:	

FLUOROMETER OFFSETS

1ST	X10:	X1:
2ND	X10:	X1:

For Sonde with TDG or PAR – Coefficients

A:	B:	C:	D:
Local:	Ref:		

Performance, Test and Evaluation

Current MPL Rev-- 543	pH Electrolyte & Teflon Junction Replaced- Yes No (circled) NA	DO membrane Replaced Yes No (circled) NA
Upgrade to MPL Rev-- N/A		
Lenses cleaned - Yes (circled) No NA	RTC Battery Replaced Yes (circled) No	Desiccant Replaced - Yes (circled) No

Section B:

	Submission Day / Y / N / PT&E / Upgrade	Submission Day / Y / N / PT&E / Upgrade	Submission Day / Y / N / PT&E / Upgrade
Customer Observations Verified	✓		
Set Time and Date	✓		
Verified all hardware updates as current	✓		
Total current draw. (Circle all that apply) MPL PCB 40mA SC Turbidity 20mA LDO 70mA 4Beam Turbidity 10mA Flourometers: 1st 30mA 2nd 30mA 3rd 30mA PAR 10mA (Optimal Values not to exceed +20mA overall.)	120 mA		
Current draw of circulator. (20 mA max. beyond previous values.)	N/A		
Operation of self cleaning motor verified—	P F NA (circled)	P F NA	P F NA
Audio functions correctly	P (circled) F	P F	P F
RTC sleep/wake-up test.	P (circled) F	P F	P F
Temp probe test at room temperature. 24.35 °C	24.34		
DO 100% sat integrity window verified at +50 mmHg over current bp. (Clark Cell only)	P F NA (circled)	P F NA	P F NA

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DO 100% saturation calibration verified- local – (+/- 0.2 mg/l Clark Cell) (+/- 0.1 mg/l LDO)	N/A		
Scale Factor. (1.5 to 0.5) (LDO only)			
Conductivity zero (air) calibration verified - (+/- .005mS)	0.0		
Conductivity calibration verified – (+/-.2 mS) 12.856 mS/cm / 47.6 mS/cm	12.86		
Conductivity 1.412mS linearity verified –(+/-.15 mS)	1.396		
Conductivity .100mS verified – (+/-.005 mS)	.102		
pH 7 buffer calibration verified– (+/- .2 pH)	N/A		
pH slope calibration verified at _____ units.			
ORP calibration verified at _____ ° C (+/- 20 mV)			
Turbidity - Calibration accepted & verified with DI Water (0.0 +/-0.7 NTU)			
Turbidity - Calibration accepted & verified at (100.0 +/- 1 NTU) with Hach StablCal	N/A		
Turbidity - Linearity verified with 40 NTU Hach StablCal – (+/- 4 NTU)			
Depth zero calibration verified – (.02 meters)	0.0		
Depth Check verified – (+/- 0.03 meters)- Tank depth	pass		

Specific Ion Low C mV / High C mV	Specific Ion Low C mV / High C mV	Specific Ion Low C mV / High C mV
N03- calibration verified	P F (NA)	P F NA	P F
NH4+ calibration verified	P F (NA)	P F NA	P F
Cl- calibration verified	P F (NA)	P F NA	P F
Chlorophyll 'a' calibration verified	P F (NA)	P F NA	P F
Rhodamine 'wt' calibration verified	P F (NA)	P F NA	P F
Blue-green Algae calibration verified	P F (NA)	P F NA	P F
PAR calibration verified	P F (NA)	P F NA	P F
TDG calibration verified (+/- 2 mmHg)	P F (NA)	P F NA	P F
Logging/Sensor Stability Test	(P) F	P F	P F
pH linearity verified at ____ units: (+/- 0.20 units)	✓		
Battery pack setup and checked	(P) F NA	P F NA	P F
Hydras3 LT Communications verified, unused slots deactivated.	✓		
Display, Baud Rate, Communications mode settings returned as received.	(Yes) No	Yes No	Yes No

Calibrated Test Equipment Used –

Description	X-number
Power Supply	X- 7208
DVM Digital Multimeter	X- 7210

Section C. Final Check-off Prior to Submitting for Estimate –

Exterior is clean ✓	
Storage cup filled with pH 4. buffer ✓	Hach Business System updated ✓
	Date Completed 07-26-12

3.0

Quanta and Quanta G Functional Test Sheet

Section A:

Service Request # 312222835	Customer Rental	Serial # QT5747
Technician HL	Model Type (Quanta) Quanta G	Date Started 07-25-12

Performance, Test and Evaluation

Current MPL Rev. 3.1 / Upgrade to MPL Rev N/A	DO membrane installed (Yes) No NA	PH Electrolyte and Teflon Junction installed - (Yes) No NA
Lenses cleaned (Yes) No NA	Desiccant installed (Yes) No NA	Turbidity Firmware Rev.

Section B:

	Submission Day ✓	Submission __ Day ____	Submission __ Day ____
Verified customer's observations	Y / N PT&E / Upgrade	Y / N PT&E / Upgrade	Y / N PT&E / Upgrade
Verified proper operation of circulator	(Y) / N / NA	Y / N / NA	Y / N / NA
Temp probe test at room temperature 21.35 °C	21.34		
pH 7 Buffer calibration verified (+/- .2 pH)	7.0		
pH slope calibration verified at ____ units.	10.02		
Conductivity calibration verified (+/-.2mS/cm) 12.856 mS/cm / 47.6 mS/cm	12.86		
ORP calibration verified at ____ degrees C (+/-20 mV)	N/A		
Conductivity .100 mS linearity verified– (+/- .005 mS)	.102		
Conductivity 1.412 mS linearity verified – (+/- .15 mS)	1.413		
DO 100% sat integrity window verified at +50 mmHg above current bp.	(P) / F / NA	P / F / NA	P / F / NA
DO 100% saturation calibration verified – local (+/- .5%)	634		
Turbidity calibration verified in DI water 0.0-(+/-.5NTU)	0.0		
4 Beam Turbidity calibrated at 100 NTU (+/- 1 NTU) Dilute Formazin verified against "in-house" 2100P	99.8		
4 Beam Turbidity linearity verified at 40 NTU with Dilute Formazin verified against "in-house" 2100P (+/- 10% of reading.)	40.2		
Depth calibration verified – (+/- .02 meters)	N/A		
Depth check – (+/- .1 meters)	N/A		
Logging/Sensor Stability Test	P / F / NA	P / F / NA	P / F / NA
pH linearity verified at ____ units. (+/- 0.20 units)			

Calibrated Test Equipment Used –

Description	X-number
DVM Multimeter	X- N/A

Section C. Final Check-off Prior to Submitting for Estimate -

Exterior is clean ✓	Hach Business System updated ORP
Storage cup filled with pH 4 buffer ✓	**Date Completed** 07-26-12

Don Pedro
2012 Sampling and Analysis

DATA REVIEW AND VERIFICATION CHECKLIST

This checklist should be used to document data review verification of data generated through implementation of the FERC-approved study plan.

GENERAL

- [X] For each sample event, samples have been collected and analyzed at all locations and for all analyses specified in the study plan. Two day sites
- [X] For each sample and analyses, the project file contains records field notes, chain-of-custody, and analytical results, including quality assurance documenation (hardcopy and electronic)

FIELD DATA

- [X] Field notes and/or data sheets include date, time of sample collection, field sampling staff, time arrived at site, time left site, site identification, description of site conditions (weather), field parameters, ~~reservoir level or flow information (measured or estimated)~~, sample collection procedures, and call-out quality assurance samples collected. If mistakes are found on the field data sheet, changes can be made by crossing out the mistake and marking the change with a date of change, initials, and reason for change. N/A not in Study Plan
- [X] Documentation of field equipment calibration is in the fieldnotes and/or project records.
- [X] Field data entered into Excel, have been checked by a second-party. S. Bunger

LABORATORY REPORT

- [X] Field duplicates, blanks, and rinsates were submitted to the laboratory at the frequency specified in the study plan.
- [X] Any constituents found in blanks or rinsates are discussed in the final report.
- [X] Any duplicate concentrations that differ by more than 10% are discussed in the final report.
- [X] Samples were received by the laboratory intact and analyzed within method and/or study specified holding times.
- [X] On laboratory reports, sample IDs, analyses, reporting/detection limits, units, column labels, footnotes, and titles are accurate. Have lab re-issue report with corrections if there are inconsistencies.
- [X] Check that non-detects are always reported in the same manner using consistent notation. For example, either "ND" or "<." Have lab re-issue report with corrections if there are inconsistencies.
- [X] If observed, "J" qualified data and/or elevated detection limits are discussed in the final report.

Table B-1. Rinstate and Trip Blank Water Quality Data--Summer 2012

Analyte	*Sample ID*	Method Detection Limit	Reporting Limit	FIELD BLANK-1		METHOD BLANK-1		FIELD BLANK-3		METHOD BLANK-3		RINSATE-1		FIELD BLANK-2		METHOD BLANK-2		177261-8		177261-8	
	Date			8/21/2012		--		8/22/2012		--		8/22/2012		8/23/2012		--		8/23/2012		8/23/2012	
	Sample Type			Field Blank		Method Blank		Field Blank		Method Blank		Rinsate		Field Blank		Method Blank		Original		Duplicate	
	latitude/longitude			Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes
	Units	--	--	737842	4195595	--		--		732763	4183297	732763	4183297	727608	4176308	727608	4176308	727341	4174879	727341	4174879
Basic Water Quality, Inorganic Ions, and Nutrients																					
Alkalinity, Total (as $CaCO_3$)	mg/L	0.85	1.0	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	12.5		12.5	
Ammonia (as N)	mg/L	0.094	0.10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.10	ND	0.10	ND
Calcium	mg/L	0.0118	0.10	0.0286	J	0.1	ND	0.038	J	0.1	ND	0.0466	J	0.0819	J	0.1	ND	2.83		2.74	
Carbon, Dissolved Organic	mg/L	0.021	0.50	0.78	B	0.18	J	0.45	B,J	0.19	J	0.47	B,J	0.29	J	0.5	ND	3.6		3.6	
Carbon, Total Organic	mg/L	0.026	0.50	0.34	B,J	0.12	J	0.42	B,J	0.17	J	0.39	B,J	0.28	J	0.5	ND	3.4		3.4	
Chloride	mg/L	0.24	1.0	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	0.74	J	0.71	J
Hardness, Total	mg/L	0.99	2.0	2	ND	2	ND	2	ND	2	ND	2	ND	2	ND	2	ND	11		11	
Magnesium	mg/L	0.00336	0.10	0.00543	J	0.1	ND	0.00483	J	0.1	ND	0.00361	J	0.0123	J	0.1	ND	1.25		1.25	
Nitrate (as N)	mg/L	0.037	0.10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.047	J	0.063	J
Nitrite (as N)	mg/L	0.016	0.10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.10	ND	0.10	ND
o-Phosphate (as P)	mg/L	0.031	0.10	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.10	ND	0.10	ND
Phosphorus, Total	mg/L	0.022	0.10	0.037	J	0.1	ND	0.027	J	0.1	ND	0.052	J	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Potassium	mg/L	0.103	0.50	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.535		0.534	
Sodium	mg/L	0.103	0.50	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.398	J	0.5	ND	1.93		1.81	
Solids, Total Dissolved	mg/L	0.82	1.0	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	30		27	
Solids, Total Suspended	mg/L	0.95	1.0	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1.0	ND	1.0	ND
Total Kjeldahl Nitrogen	mg/L	0.46	0.50	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.5	ND	0.50	ND	0.50	ND
Pesticides																					
Aldrin	µg/L	0.0016	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Alpha-BHC	µg/L	0.0017	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Beta-BHC	µg/L	0.0039	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Chlordane	µg/L	0.0052	0.025	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND
Chlorpyrifos	µg/L	0.0024	0.005	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Delta-BHC	µg/L	0.0016	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Diazinon	µg/L	0.0029	0.0050	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Dieldrin	µg/L	0.0016	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Endosulfan I	µg/L	0.0015	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Endosulfan II	µg/L	0.0016	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Endrin	µg/L	0.0016	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Gamma-BHC	µg/L	0.0023	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Heptachlor	µg/L	0.0018	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Heptachlor Epoxide	µg/L	0.0017	0.010	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Toxaphene	µg/L	0.023	0.12	0.12	ND	0.12	ND	0.12	ND	0.12	ND	0.12	ND	0.12	ND	0.12	ND	0.12	ND	0.12	ND
Total Metals Concentrations																					
Arsenic	µg/L	0.04	0.15	0.15	ND	--		0.05	J	--		0.06	J	0.05	J	--		0.26		0.27	
Cadmium	µg/L	0.003	0.02	0.02	ND	--		0.02	ND	--		0.003	J	0.02	ND	--		0.004	J	0.003	J
Copper	µg/L	0.01	0.1	0.02	J	--		0.02	J	--		0.87		0.02	J	--		0.49		0.48	
Iron	µg/L	0.6	10	0.8	J	--		10	ND	--		2	J	10	ND	--		19		18	
Lead	µg/L	0.003	0.04	0.04	ND	--		0.04	ND	--		0.010	J	0.04	ND	--		0.005	J	0.006	J
Mercury	ng/L	0.08	0.5	0.5	ND	--		0.16	J	--		27.4		0.08	ND	--		0.34	J	0.28	J
Methyl Mercury	ng/L	0.026	0.05	0.05	ND	--		0.05	ND	--		0.436		0.05	ND	--		0.05	ND	0.05	ND
Selenium	µg/L	0.31	0.6	0.6	ND	--		0.6	ND	--		0.6	ND	0.6	ND	--		0.6	ND	0.6	ND
Silver	µg/L	0.002	0.02	0.02	ND	--		0.02	ND	--		0.02	ND	0.02	ND	--		0.002	J	0.02	ND
Zinc	µg/L	0.03	0.2	0.13	J	--		0.19	J	--		1.07		0.08	J	--		0.19	J	0.18	J
Dissolved Metals Concentrations																					
Arsenic	µg/L	0.04	0.15	0.4	J	--		0.06	J	--		0.04	J	0.05	J	--		0.27		0.24	
Cadmium	µg/L	0.003	0.02	0.02	ND	--		0.02	ND	--		0.02	ND	0.02	ND	--		0.02	ND	0.02	ND
Copper	µg/L	0.01	0.1	0.04	J	--		0.06	J	--		0.45		0.05	J	--		0.47		0.46	
Iron	µg/L	0.6	10	10	ND	--		10	ND	--		0.6	J	10	ND	--		4	J	3	J
Lead	µg/L	0.003	0.04	0.04	ND	--		0.04	ND	--		0.04	ND	0.04	ND	--		0.04	ND	0.04	ND
Methyl Mercury	ng/L	0.026	0.05	0.05	ND	--		0.05	ND	--		0.26		0.5	ND	--		0.05	ND	0.05	ND
Silver	µg/L	0.002	0.02	0.02	ND	--		0.02	ND	--		0.02	ND	0.05	ND	--		0.02	ND	0.02	ND
Zinc	µg/L	0.03	0.2	0.11	J	--		0.20		--		0.91		0.09	J	--		0.29		0.27	

--	Laboratory methods do not include method blanks specific to water quality study metals analyses.
B	Analyte was present in the associated method blank.
FB	Field Blank
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ND	Analyte included in the analysis, but not detected at the reporting limit.