QUALITY CONTROL REPORT

Work Order	: **EM2012826**	Page	: 1 of 7
Client	: **Dept for Environment & Water**	Laboratory	: Environmental Division Melbourne
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Project	: HCHB Sampling	Date Samples Received	: 23-Jul-2020
Order number	: ----	Date Analysis Commenced	: 24-Jul-2020
C-O-C number	: ----	Issue Date	: 03-Aug-2020
Sampler	: JOSHUA CASTLE		
Site	: ----		
Quote number	: AD/052/20 V2		
No. of samples received	: 19		
No. of samples analysed	: 19		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratnam	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Laboratory Coordinator	WRG Subcontracting, Springvale, VIC

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3167193)									
EM2012825-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	444	372	17.8	0% - 20%
EM2012826-005	Morella Creek @ gauge	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	10700	9690	9.92	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3167194)									
EM2012826-016	Bonneys	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	53900	47800	11.9	0% - 20%
EM2012829-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	70900	73000	2.89	0% - 20%
EA045: Turbidity (QC Lot: 3161284)									
EM2012793-004	Anonymous	EA045: Turbidity	----	0.1	NTU	0.6	0.7	0.00	No Limit
EM2012825-004	Anonymous	EA045: Turbidity	----	0.1	NTU	15.6	15.6	0.00	0% - 20%
EA045: Turbidity (QC Lot: 3161285)									
EM2012826-006	Salt Creek Outlet	EA045: Turbidity	----	0.1	NTU	7.4	7.3	0.00	0% - 20%
EM2012826-015	Noonameena	EA045: Turbidity	----	0.1	NTU	2.8	2.9	0.00	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3170345)									
EM2012792-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	92	92	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	92	92	0.00	0% - 20%
EM2012818-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2380	2340	1.41	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	2380	2340	1.41	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3170346)									
EM2012826-010	Murray Mouth	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	130	129	0.843	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 3170346) - continued									
EM2012826-010	Murray Mouth	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	130	129	0.843	0% - 20%
EM2012836-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	103	99	3.80	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	103	99	3.80	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3160056)									
EM2012826-006	Salt Creek Outlet	ED045G: Chloride	16887-00-6	1	mg/L	48500	49100	1.30	0% - 20%
EM2012685-032	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	8400	8400	0.0470	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3160060)									
EM2012826-018	Parnka Point	ED045G: Chloride	16887-00-6	1	mg/L	31400	31000	1.04	0% - 20%
EG052G: Silica by Discrete Analyser (QC Lot: 3160057)									
EM2012826-011	US Tauwitchere	EG052G: Reactive Silica	----	0.05	mg/L	0.31	0.34	7.89	No Limit
EM2012826-001	Stony Well	EG052G: Reactive Silica	----	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QC Lot: 3174493)									
EM2012826-001	Stony Well	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EM2012826-010	Murray Mouth	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	0.07	0.07	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3160054)									
EM2012826-007	1.8km west of Salt Creek	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2012685-032	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3160059)									
EM2012829-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2012826-018	Parnka Point	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3161945)									
EM2012826-001	Stony Well	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.01	0.00	No Limit
EM2012826-010	Murray Mouth	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3161953)									
EM2012826-012	DS Tauwitchere	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EM2012836-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.02	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3166464)									
EM2010907-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.5	2.5	0.00	0% - 20%
EM2012792-012	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3166467)									
EM2012826-004	Snipe Point	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.1	4.1	0.00	0% - 20%
EM2012826-013	Mark Point	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.4	1.4	0.00	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3166465)									
EM2010907-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.65	1.66	0.756	0% - 20%
EM2012792-012	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.04	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3166466)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3166466) - continued									
EM2012826-004	Snipe Point	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.64	3.41	6.55	0% - 20%
EM2012826-013	Mark Point	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.05	0.07	33.4	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3160058)									
EM2012826-010	Murray Mouth	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2012826-001	Stony Well	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 3169905)									
EM2012826-001	Stony Well	EP002: Dissolved Organic Carbon	----	1	mg/L	21	20	0.00	0% - 20%
EM2012826-010	Murray Mouth	EP002: Dissolved Organic Carbon	----	1	mg/L	<1	<1	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 3169906)									
EM2012826-001	Stony Well	EP005: Total Organic Carbon	----	1	mg/L	25	25	0.00	0% - 20%
EM2012826-010	Murray Mouth	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.00	No Limit
EP008: Chlorophyll (QC Lot: 3167357)									
EM2012826-001	Stony Well	EP008B: Chlorophyll b	----	1	mg/m³	<1	<1	0.00	No Limit
EM2012826-010	Murray Mouth	EP008B: Chlorophyll b	----	1	mg/m³	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3167193)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.2	93.7	107
				<10	293 mg/L	97.6	90.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3167194)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	100	93.7	107
				<10	293 mg/L	108	90.0	110
EA045: Turbidity (QCLot: 3161284)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	102	88.1	110
EA045: Turbidity (QCLot: 3161285)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	103	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 3170345)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	88.0	112
ED037P: Alkalinity by PC Titrator (QCLot: 3170346)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	88.0	112
ED045G: Chloride by Discrete Analyser (QCLot: 3160056)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	85.0	122
				<1	1000 mg/L	100	85.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 3160060)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.1	85.0	122
				<1	1000 mg/L	101	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 3160057)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	101	78.9	128
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3174493)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	101	81.1	124
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3160054)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	100	90.9	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3160059)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3161945)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	117
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3161953)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3166464)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3166464) - continued								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	85.8	70.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3166467)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	83.9	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3166465)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	99.5	71.9	114
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3166466)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	103	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3160058)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	114	92.7	119
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3169905)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	90.4	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 3169906)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	90.7	81.2	109
EP008: Chlorophyll (QCLot: 3167357)								
EP008B: Chlorophyll b	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 3167362)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	91.4	70.0	130
EP008: Pheophytin a	----	1	mg/m³	<1	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED045G: Chloride by Discrete Analyser (QCLot: 3160056)							
EM2012814-019	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3160060)							
EM2012826-019	Villa de Yumpa	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG052G: Silica by Discrete Analyser (QCLot: 3160057)							
EM2012826-002	North Jacks Point	EG052G: Reactive Silica	----	5 mg/L	102	80.0	120
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3174493)							
EM2012826-002	North Jacks Point	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	99.2	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3160054)							
EM2012814-019	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	82.0	80.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3160059)							
EM2012826-019	Villa de Yumpa	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	101	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3161945)							
EM2012826-002	North Jacks Point	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	78.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3161953)							
EM2012826-013	Mark Point	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	94.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3166464)							
EM2012792-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	85.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3166467)							
EM2012826-005	Morella Creek @ gauge	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	93.0	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3166465)							
EM2012792-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	95.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3166466)							
EM2012826-005	Morella Creek @ gauge	EK067G: Total Phosphorus as P	----	1 mg/L	84.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3160058)							
EM2012826-002	North Jacks Point	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	110	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3169905)							
EM2012826-002	North Jacks Point	EP002: Dissolved Organic Carbon	----	100 mg/L	112	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 3169906)							
EM2012826-002	North Jacks Point	EP005: Total Organic Carbon	----	100 mg/L	113	80.0	114