

QUALITY CONTROL REPORT

Work Order	: EM2103113	Page	: 1 of 7
Client	: Dept for Environment & Water	Laboratory	: Environmental Division Melbourne
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Project	: HCHB	Date Samples Received	: 26-Feb-2021
Order number	: ----	Date Analysis Commenced	: 26-Feb-2021
C-O-C number	: ----	Issue Date	: 05-Mar-2021
Sampler	: JOSHUA CASTLE		
Site	: ----		
Quote number	: AD/052/20 V2		
No. of samples received	: 26		
No. of samples analysed	: 26		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratham	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument 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	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QC Lot: 3537366)									
EM2103113-001	Stony Well	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EM2103113-010	Tilley Swamp Drain U/S Morella	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3535125)									
EM2103075-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	584	642	9.38	0% - 20%
EM2103092-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1400	1410	0.998	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3535126)									
EM2103113-008	1.8km West of Salt Creek	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	100000	116000	14.6	0% - 20%
EM2103113-017	Bonneys	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	56400	56400	0.160	0% - 20%
EA045: Turbidity (QC Lot: 3536330)									
EM2103112-021	Anonymous	EA045: Turbidity	----	0.1	NTU	1.4	1.4	0.00	0% - 50%
EM2103112-031	Anonymous	EA045: Turbidity	----	0.1	NTU	0.6	0.6	0.00	No Limit
EA045: Turbidity (QC Lot: 3536331)									
EM2103113-009	3.2km South of Salt Creek (Land)	EA045: Turbidity	----	0.1	NTU	12.1	12.0	0.830	0% - 20%
EM2103113-020	Villa de Yumpa	EA045: Turbidity	----	0.1	NTU	18.4	18.1	1.64	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3536738)									
EM2103092-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	540	536	0.734	0% - 20%
		ED037-P: Total Alkalinity as CaCO ₃	----	1	mg/L	540	536	0.734	0% - 20%
EM2103113-001	Stony Well	ED037-P: Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	208	211	1.39	0% - 20%

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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 3536738) - continued									
EM2103113-001	Stony Well	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	208	211	1.39	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3536739)									
EM2103113-011	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	135	132	2.09	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	135	132	2.09	0% - 20%
EM2103117-001	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	13	12	0.00	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	13	12	0.00	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 3535867)									
EM2103113-011	Murray Mouth	ED045G: Chloride	16887-00-6	1	mg/L	10000	10100	0.382	0% - 20%
EM2103113-001	Stony Well	ED045G: Chloride	16887-00-6	1	mg/L	78800	86200	8.91	0% - 20%
EG052G: Silica by Discrete Analyser (QC Lot: 3535864)									
EM2103113-011	Murray Mouth	EG052G: Reactive Silica	----	0.05	mg/L	0.47	0.44	6.79	No Limit
EM2103113-001	Stony Well	EG052G: Reactive Silica	----	0.05	mg/L	2.38	2.38	0.00	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3535865)									
EM2103113-010	Tilley Swamp Drain U/S Morella	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2103113-001	Stony Well	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: 3537365)									
EM2103011-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.68	0.69	0.00	0% - 20%
EM2103113-003	South Policeman Point/Seagull Island	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: 3537367)									
EM2103113-014	Mark Point	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	0.00	No Limit
EM2103180-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3536323)									
EM2103111-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.3	2.5	5.64	0% - 20%
EM2103081-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.6	2.6	0.00	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3536325)									
EM2103113-004	Snipe Point	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.7	3.5	3.78	0% - 20%
EM2103113-012	US Tauwitschere	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.2	1.2	0.00	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3536324)									
EM2103111-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	13.6	14.0	3.28	0% - 20%
EM2103081-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	4.38	4.08	7.09	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3536326)									
EM2103113-004	Snipe Point	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.23	# 0.29	22.3	0% - 20%

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	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: 3536326) - continued									
EM2103113-012	US Tauwitchere	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.06	45.6	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3535866)									
EM2103113-010	Tilley Swamp Drain U/S Morella	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2103113-001	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: 3537505)									
EM2103113-001	Stony Well	EP002: Dissolved Organic Carbon	----	1	mg/L	44	43	0.00	0% - 20%
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 3538832)									
EM2103113-006	Morella Basin @ Gauge	EP002: Dissolved Organic Carbon	----	1	mg/L	26	26	0.00	0% - 20%
EM2103113-015	Long Point	EP002: Dissolved Organic Carbon	----	1	mg/L	6	6	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 3537504)									
EM2102895-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.00	No Limit
EM2103111-006	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	38	41	8.11	0% - 20%
EP005: Total Organic Carbon (TOC) (QC Lot: 3538833)									
EM2103113-006	Morella Basin @ Gauge	EP005: Total Organic Carbon	----	1	mg/L	28	28	0.00	0% - 20%
EM2103113-016	Noonameena	EP005: Total Organic Carbon	----	1	mg/L	16	16	0.00	0% - 50%



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**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 3537366)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	105	81.1	124
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3535125)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.4	91.0	110
				<10	293 mg/L	101	91.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3535126)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	104	91.0	110
				<10	293 mg/L	99.3	91.0	110
EA045: Turbidity (QCLot: 3536330)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	102	88.1	110
EA045: Turbidity (QCLot: 3536331)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	103	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 3536738)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	103	85.0	116
ED037P: Alkalinity by PC Titrator (QCLot: 3536739)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	85.0	116
ED045G: Chloride by Discrete Analyser (QCLot: 3535867)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	85.0	115
				<1	1000 mg/L	113	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 3535864)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	107	78.9	118
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3535865)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	107	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3537365)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	111	90.0	117
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3537367)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	111	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3536323)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	100	70.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3536325)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	103	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3536324)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	99.1	71.9	114



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3536326)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	97.8	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3535866)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	92.7	119
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3537505)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	96.4	83.0	115
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3538832)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	93.8	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 3537504)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	94.4	81.2	110
EP005: Total Organic Carbon (TOC) (QCLot: 3538833)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	96.9	81.2	110
EP008: Chlorophyll (QCLot: 3540140)								
EP008B: Chlorophyll b	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 3540148)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	87.2	70.0	130
EP008: Pheophytin a	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 3540149)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	100	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**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 3537366)							
EM2103113-002	North Jacks Point	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	76.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3535867)							
EM2103113-002	North Jacks Point	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG052G: Silica by Discrete Analyser (QCLot: 3535864)							
EM2103113-002	North Jacks Point	EG052G: Reactive Silica	----	5 mg/L	82.4	80.0	120
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3535865)							
EM2103113-002	North Jacks Point	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	99.2	80.0	114



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3537365)							
EM2103011-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	84.7	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3537367)							
EM2103113-015	Long Point	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	85.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3536323)							
EM2103087-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3536325)							
EM2103113-005	Morella Basin @ Outlet Regulator	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	82.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3536324)							
EM2103087-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3536326)							
EM2103113-005	Morella Basin @ Outlet Regulator	EK067G: Total Phosphorus as P	----	1 mg/L	100	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3535866)							
EM2103113-002	North Jacks Point	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	91.4	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3537505)							
EM2103113-003	South Policeman Point/Seagull Island	EP002: Dissolved Organic Carbon	----	100 mg/L	114	75.0	117
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3538832)							
EM2103113-007	Salt Creek Outlet	EP002: Dissolved Organic Carbon	----	500 mg/L	110	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 3537504)							
EM2103092-005	Anonymous	EP005: Total Organic Carbon	----	100 mg/L	109	76.6	125
EP005: Total Organic Carbon (TOC) (QCLot: 3538833)							
EM2103113-007	Salt Creek Outlet	EP005: Total Organic Carbon	----	100 mg/L	94.9	76.6	125