QUALITY CONTROL REPORT

Work Order	: **EM2015594**	Page	: 1 of 7
Client	: **Dept for Environment & Water**	Laboratory	: Environmental Division Melbourne
Contact	: Mr FRANK MANGERUCA	Contact	: Kieren Burns
Address	: GPO BOX 2834 ADELAIDE SA, AUSTRALIA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: HCHB	Date Samples Received	: 10-Sep-2020
Order number	: ----	Date Analysis Commenced	: 10-Sep-2020
C-O-C number	: ----	Issue Date	: 16-Sep-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
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: 3252324)									
EM2015454-015	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	367	360	1.92	0% - 20%
EM2015535-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4590	4680	1.90	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3252326)									
EM2015594-003	DS Tauwitchere	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	688	673	2.20	0% - 20%
EM2015594-012	North Jacks Point	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	86700	87500	0.907	0% - 20%
EA045: Turbidity (QC Lot: 3250146)									
EM2015588-001	Anonymous	EA045: Turbidity	----	0.1	NTU	3.2	3.2	0.00	0% - 20%
EM2015594-008	McGrath Flat North	EA045: Turbidity	----	0.1	NTU	5.7	5.8	2.42	0% - 20%
EA045: Turbidity (QC Lot: 3250147)									
EM2015594-019	Tilley Swamp Drain U/S Morella	EA045: Turbidity	----	0.1	NTU	1.8	1.8	0.00	0% - 50%
ED037P: Alkalinity by PC Titrator (QC Lot: 3250811)									
EM2015583-002	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	13	# 30	77.1	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	14	# 7	66.2	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	28	# 37	28.7	0% - 20%
EM2015576-001	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	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.00	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 3250816)									
EM2015594-009	Parnka Point	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	189	192	1.91	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 3250816) - continued									
EM2015594-009	Parnka Point	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	189	192	1.91	0% - 20%
EM2015596-001	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	665	675	1.54	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	44	42	4.99	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	709	717	1.15	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3250340)									
EM2015609-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	9120	9260	1.46	0% - 20%
EM2015594-001	Murray Mouth	ED045G: Chloride	16887-00-6	1	mg/L	4840	4720	2.61	0% - 20%
EG052G: Silica by Discrete Analyser (QC Lot: 3250337)									
EM2015594-011	Stony Well	EG052G: Reactive Silica	----	0.05	mg/L	<0.10	<0.10	0.00	No Limit
EM2015594-001	Murray Mouth	EG052G: Reactive Silica	----	0.05	mg/L	0.44	0.47	5.97	No Limit
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QC Lot: 3256003)									
EM2015594-001	Murray Mouth	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	0.15	0.16	6.66	No Limit
EM2015594-010	Villa de Yumpa	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3250338)									
EM2015594-010	Villa de Yumpa	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2015594-001	Murray Mouth	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.03	0.03	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3256002)									
EM2015594-001	Murray Mouth	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.07	0.00	No Limit
EM2015594-010	Villa de Yumpa	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3252393)									
EM2015455-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	0.9	0.00	0% - 50%
EM2015541-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.7	2.7	0.00	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3252395)									
EM2015594-006	Noonameena	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.9	2.0	0.00	0% - 20%
EM2015594-015	Morella Creek @ gauget	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.7	1.8	0.00	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3252392)									
EM2015455-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.05	28.6	No Limit
EM2015541-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.05	0.05	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3252394)									
EM2015594-006	Noonameena	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.09	0.10	0.00	No Limit
EM2015594-015	Morella Creek @ gauget	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.05	28.6	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3250339)									
EM2015594-010	Villa de Yumpa	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2015594-001	Murray Mouth	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: 3250802)									
EM2015594-001	Murray Mouth	EP002: Dissolved Organic Carbon	----	1	mg/L	8	8	0.00	No Limit
EM2015594-010	Villa de Yumpa	EP002: Dissolved Organic Carbon	----	1	mg/L	26	26	0.00	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 (%)*
EP005: Total Organic Carbon (TOC) (QC Lot: 3250803)									
EM2015594-001	Murray Mouth	EP005: Total Organic Carbon	----	1	mg/L	9	9	0.00	No Limit
EM2015594-010	Villa de Yumpa	EP005: Total Organic Carbon	----	1	mg/L	30	31	0.00	0% - 20%
EP008: Chlorophyll (QC Lot: 3257111)									
EM2015594-001	Murray Mouth	EP008B: Chlorophyll b	----	1	mg/m³	<1	<1	0.00	No Limit
EM2015594-010	Villa de Yumpa	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: 3252324)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.3	93.7	107
				<10	293 mg/L	110	90.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3252326)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	102	93.7	107
				<10	293 mg/L	99.0	90.0	110
EA045: Turbidity (QCLot: 3250146)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	102	88.1	110
EA045: Turbidity (QCLot: 3250147)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	102	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 3250811)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	98.8	88.0	112
ED037P: Alkalinity by PC Titrator (QCLot: 3250816)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	101	88.0	112
ED045G: Chloride by Discrete Analyser (QCLot: 3250340)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	85.0	122
				<1	1000 mg/L	101	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 3250337)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	106	78.9	128
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3256003)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	104	81.1	124
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3250338)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	106	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3256002)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3252393)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	91.2	70.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3252395)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	104	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3252392)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	82.2	71.9	114
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3252394)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	84.0	71.9	114

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
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3250339)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	113	92.7	119
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3250802)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	98.3	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 3250803)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	100	81.2	109
EP008: Chlorophyll (QCLot: 3257111)								
EP008B: Chlorophyll b	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 3257126)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	112	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: 3250340)							
EM2015594-002	US Tauwitchere	ED045G: Chloride	16887-00-6	400 mg/L	111	70.0	130
EG052G: Silica by Discrete Analyser (QCLot: 3250337)							
EM2015594-002	US Tauwitchere	EG052G: Reactive Silica	----	5 mg/L	102	80.0	120
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3256003)							
EM2015594-002	US Tauwitchere	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	112	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3250338)							
EM2015594-002	US Tauwitchere	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	94.1	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3256002)							
EM2015594-002	US Tauwitchere	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	94.4	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3252393)							
EM2015455-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	98.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3252395)							
EM2015594-007	Bonneys	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	116	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3252392)							
EM2015455-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	84.7	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3252394)							

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*
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3252394) - continued							
EM2015594-007	Bonneys	EK067G: Total Phosphorus as P	----	1 mg/L	84.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3250339)							
EM2015594-002	US Tauwitchere	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	98.2	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3250802)							
EM2015594-002	US Tauwitchere	EP002: Dissolved Organic Carbon	----	100 mg/L	109	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 3250803)							
EM2015594-002	US Tauwitchere	EP005: Total Organic Carbon	----	100 mg/L	107	80.0	114