QUALITY CONTROL REPORT

Work Order	: **EM2017172**	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	: 02-Oct-2020
Order number	: ----	Date Analysis Commenced	: 02-Oct-2020
C-O-C number	: ----	Issue Date	: 09-Oct-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: 3292041)									
EM2017029-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	8740	8830	1.06	0% - 20%
EM2017156-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1600	1480	8.13	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3292043)									
EM2017172-009	Tilley Swamp Drain U/S Morella	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	8150	7780	4.63	0% - 20%
EM2017194-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	558	552	0.901	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3293956)									
EM2017156-012	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	22500	22500	0.0445	0% - 20%
EM2017172-010	Murray Mouth	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	12700	12500	1.62	0% - 20%
EA045: Turbidity (QC Lot: 3290276)									
EM2017122-001	Anonymous	EA045: Turbidity	----	0.1	NTU	51.2	51.4	0.390	0% - 20%
EM2017160-002	Anonymous	EA045: Turbidity	----	0.1	NTU	0.2	0.2	0.00	No Limit
EA045: Turbidity (QC Lot: 3290277)									
EM2017172-007	1.8km west of Salt Creek	EA045: Turbidity	----	0.1	NTU	9.0	9.1	1.77	0% - 20%
EM2017172-016	Bonneys	EA045: Turbidity	----	0.1	NTU	3.8	4.0	4.13	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3292188)									
EM2017029-002	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	605	607	0.322	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	605	607	0.322	0% - 20%
EM2017172-006	Salt Creek Outlet	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	227	226	0.455	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	227	226	0.455	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: 3292189)									
EM2017228-012	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	2	1	61.7	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	2	1	61.7	No Limit
EM2017221-002	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	268	268	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	268	268	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3290250)									
EM2017163-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	6	6	0.00	No Limit
EM2017098-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1690	1760	3.93	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3290255)									
EM2017172-010	Murray Mouth	ED045G: Chloride	16887-00-6	1	mg/L	7740	7760	0.304	0% - 20%
EM2017172-018	Parnka Point	ED045G: Chloride	16887-00-6	1	mg/L	42500	39400	7.56	0% - 20%
EG052G: Silica by Discrete Analyser (QC Lot: 3290253)									
EM2017172-001	Stony Well	EG052G: Reactive Silica	----	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM2017172-018	Parnka Point	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: 3292604)									
EM2017172-001	Stony Well	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EM2017172-010	Murray Mouth	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	0.06	0.06	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3290248)									
EM2017098-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.21	0.21	0.00	0% - 20%
EM2017163-005	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: 3290254)									
EM2017172-008	3.2km south of Salt Creek (land)	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2017172-016	Bonneys	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: 3292603)									
EM2017170-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.26	0.26	0.00	0% - 20%
EM2017172-006	Salt Creek Outlet	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: 3292605)									
EM2017172-017	McGrath Flat North	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2017221-003	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.07	0.07	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3293446)									
EM2017172-001	Stony Well	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.7	3.8	0.00	0% - 20%
EM2017172-010	Murray Mouth	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.6	16.5	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3293445)									
EM2017172-001	Stony Well	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.05	1.02	2.32	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 (%)*
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3293445) - continued									
EM2017172-010	Murray Mouth	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3290251)									
EM2017172-008	3.2km south of Salt Creek (land)	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2017163-005	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.00	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3290256)									
EM2017172-016	Bonneys	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: 3292881)									
EM2017163-004	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	3	3	0.00	No Limit
EM2017172-015	Noonameena	EP002: Dissolved Organic Carbon	----	1	mg/L	14	14	0.00	0% - 50%
EP005: Total Organic Carbon (TOC) (QC Lot: 3292880)									
EM2017074-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	5100	5090	0.314	0% - 20%
EM2017172-009	Tilley Swamp Drain U/S Morella	EP005: Total Organic Carbon	----	1	mg/L	8	7	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: 3292041)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.0	93.7	107
				<10	293 mg/L	107	90.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3292043)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	97.0	93.7	107
				<10	293 mg/L	98.6	90.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3293956)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.1	93.7	107
				<10	293 mg/L	94.2	90.0	110
EA045: Turbidity (QCLot: 3290276)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	102	88.1	110
EA045: Turbidity (QCLot: 3290277)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	100	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 3292188)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	94.3	88.0	112
ED037P: Alkalinity by PC Titrator (QCLot: 3292189)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.4	88.0	112
ED045G: Chloride by Discrete Analyser (QCLot: 3290250)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	85.0	122
				<1	1000 mg/L	104	85.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 3290255)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	85.0	122
				<1	1000 mg/L	108	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 3290253)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	104	78.9	128
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3292604)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	105	81.1	124
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3290248)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.7	90.9	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3290254)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	103	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3292603)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	117

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
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3292605)								
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: 3293446)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	95.1	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3293445)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	108	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3290251)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	111	92.7	119
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3290256)								
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: 3292881)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	94.0	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 3292880)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	95.4	81.2	109
EP008: Chlorophyll (QCLot: 3294293)								
EP008B: Chlorophyll b	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 3294298)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	91.3	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: 3290250)							
EM2017098-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3290255)							
EM2017172-011	US Tauwitchere	ED045G: Chloride	16887-00-6	400 mg/L	126	70.0	130
EG052G: Silica by Discrete Analyser (QCLot: 3290253)							
EM2017172-002	North Jacks Point	EG052G: Reactive Silica	----	5 mg/L	88.4	80.0	120
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3292604)							
EM2017172-002	North Jacks Point	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	99.8	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3290248)							

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: 3290248) - continued							
EM2017104-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	93.5	80.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3290254)							
EM2017172-009	Tilley Swamp Drain U/S Morella	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	99.6	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3292603)							
EM2017170-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	86.6	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3292605)							
EM2017172-018	Parnka Point	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	75.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3293446)							
EM2017172-002	North Jacks Point	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	109	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3293445)							
EM2017172-002	North Jacks Point	EK067G: Total Phosphorus as P	----	1 mg/L	78.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3290251)							
EM2017104-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	105	79.0	123
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3290256)							
EM2017172-017	McGrath Flat North	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	112	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3292881)							
EM2017163-005	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	101	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 3292880)							
EM2017172-001	Stony Well	EP005: Total Organic Carbon	----	100 mg/L	106	80.0	114