

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: EM2216763</b>	<b>Page</b>	<b>: 1 of 5</b>
<b>Client</b>	<b>: Dept for Environment &amp; Water</b>	<b>Laboratory</b>	<b>: Environmental Division Melbourne</b>
<b>Contact</b>	<b>: DARCY MORRIS</b>	<b>Contact</b>	<b>: Kieren Burns</b>
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<b>Project</b>	<b>: HCHB Monitoring Program</b>	<b>Date Samples Received</b>	<b>: 01-Sep-2022</b>
<b>Order number</b>	<b>: -</b>	<b>Date Analysis Commenced</b>	<b>: 02-Sep-2022</b>
<b>C-O-C number</b>	<b>: 41793</b>	<b>Issue Date</b>	<b>: 09-Sep-2022</b>
<b>Sampler</b>	<b>: Bryce Drechsler, DARCY MORRIS</b>		
<b>Site</b>	<b>: HCHB Boat 30/31st August</b>		
<b>Quote number</b>	<b>: AD/052/20 V2</b>		
<b>No. of samples received</b>	<b>: 10</b>		
<b>No. of samples analysed</b>	<b>: 10</b>		



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	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, 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 moisture content, insufficient sample (reduced weight employed) or matrix interference.

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 (%)	Acceptable RPD (%)
<b>EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QC Lot: 4559796)</b>									
EM2216763-001	Murray Mouth	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.0	No Limit
EM2216763-010	1.8km west of Salt Creek	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.0	No Limit
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4561737)</b>									
EM2216764-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	951	937	1.5	0% - 20%
EM2216817-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	13000	13100	0.7	0% - 20%
EM2216829-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	351	342	2.6	0% - 20%
EM2216685-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4910	4850	1.2	0% - 20%
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4564623)</b>									
EM2216763-003	Parnka Point	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	54900	56800	3.5	0% - 20%
EM2216764-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6950	7020	1.0	0% - 20%
EM2216817-008	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4620	4740	2.6	0% - 20%
EM2216871-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	288	275	4.4	0% - 20%
<b>EA045: Turbidity (QC Lot: 4557550)</b>									
EM2216763-001	Murray Mouth	EA045: Turbidity	----	0.1	NTU	65.4	67.5	3.2	0% - 20%
EM2216763-010	1.8km west of Salt Creek	EA045: Turbidity	----	0.1	NTU	12.7	12.4	2.4	0% - 20%
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 4565013)</b>									
EM2216764-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	66	67	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	66	67	0.0	0% - 20%
EM2216493-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	204	196	4.0	0% - 20%

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 Project : HCHB Monitoring Program



Sub-Matrix: <b>WATER</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 4565013) - continued</b>									
EM2216493-005	Anonymous	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	204	196	4.0	0% - 20%
<b>ED045G: Chloride by Discrete Analyser (QC Lot: 4556430)</b>									
EM2216763-009	Salt Creek Outlet	ED045G: Chloride	16887-00-6	1	mg/L	30900	30500	1.2	0% - 20%
EM2216763-001	Murray Mouth	ED045G: Chloride	16887-00-6	1	mg/L	4680	4580	2.1	0% - 20%
<b>EG052G: Silica by Discrete Analyser (QC Lot: 4556428)</b>									
EM2216764-001	Anonymous	EG052G: Reactive Silica	----	0.05	mg/L	2.94	3.02	2.5	0% - 20%
EM2216763-001	Murray Mouth	EG052G: Reactive Silica	----	0.05	mg/L	2.72	2.73	0.0	0% - 20%
<b>EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4556429)</b>									
EM2216763-010	1.8km west of Salt Creek	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2216763-001	Murray Mouth	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.01	0.0	No Limit
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4559797)</b>									
EM2216763-001	Murray Mouth	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.06	0.0	No Limit
EM2216763-010	1.8km west of Salt Creek	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4558551)</b>									
EM2216763-001	Murray Mouth	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	0.9	0.0	No Limit
EM2216763-010	1.8km west of Salt Creek	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.2	4.4	31.6	No Limit
<b>EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4558552)</b>									
EM2216763-001	Murray Mouth	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.04	0.0	No Limit
EM2216763-010	1.8km west of Salt Creek	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.15	0.35	80.1	No Limit
<b>EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4558487)</b>									
EM2216763-001	Murray Mouth	EP002: Dissolved Organic Carbon	----	1	mg/L	9	9	0.0	No Limit
EM2216763-010	1.8km west of Salt Creek	EP002: Dissolved Organic Carbon	----	1	mg/L	28	29	0.0	0% - 50%
<b>EP005: Total Organic Carbon (TOC) (QC Lot: 4558495)</b>									
EM2216763-001	Murray Mouth	EP005: Total Organic Carbon	----	1	mg/L	8	7	0.0	No Limit
EM2216763-010	1.8km west of Salt Creek	EP005: Total Organic Carbon	----	1	mg/L	35	34	3.4	0% - 50%



## Method Blank (MB) and Laboratory Control Sample (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 Sample (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	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 4559796)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	92.7	81.1	124
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4561737)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.8	91.0	110
				<10	2440 mg/L	104	81.6	118
				<10	293 mg/L	105	91.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4564623)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	104	91.0	110
				<10	2440 mg/L	108	81.6	118
				<10	293 mg/L	104	91.0	110
EA045: Turbidity (QCLot: 4557550)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	101	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 4565013)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	93.0	85.0	116
ED045G: Chloride by Discrete Analyser (QCLot: 4556430)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	85.0	115
				<1	1000 mg/L	106	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 4556428)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	97.3	78.9	118
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4556429)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4559797)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4558551)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	73.2	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4558552)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	96.7	71.9	114
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4558487)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	96.3	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 4558495)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	98.9	81.2	110
EP008: Chlorophyll (QCLot: 4563687)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	111	70.0	130
EP008: Pheophytin a	----	1	mg/m³	<1	----	----	----	----



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low      High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP008: Chlorophyll (QCLot: 4563689)								
EP008B: Chlorophyll b	----	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				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%)	
Sample ID				Concentration	MS	Low	High
Method: Compound				CAS Number			
<b>EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 4559796)</b>							
EM2216763-002	Mark Point	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	100	70.0	130
<b>ED045G: Chloride by Discrete Analyser (QCLot: 4556430)</b>							
EM2216763-002	Mark Point	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
<b>EG052G: Silica by Discrete Analyser (QCLot: 4556428)</b>							
EM2216763-002	Mark Point	EG052G: Reactive Silica	----	5 mg/L	89.7	80.0	120
<b>EK057G: Nitrite as N by Discrete Analyser (QCLot: 4556429)</b>							
EM2216763-002	Mark Point	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	97.0	80.0	114
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4559797)</b>							
EM2216763-002	Mark Point	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	90.8	70.0	130
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4558551)</b>							
EM2216763-002	Mark Point	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	103	70.0	130
<b>EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4558552)</b>							
EM2216763-002	Mark Point	EK067G: Total Phosphorus as P	----	1 mg/L	96.4	70.0	130
<b>EP002: Dissolved Organic Carbon (DOC) (QCLot: 4558487)</b>							
EM2216763-002	Mark Point	EP002: Dissolved Organic Carbon	----	200 mg/L	99.4	75.0	117
<b>EP005: Total Organic Carbon (TOC) (QCLot: 4558495)</b>							
EM2216763-002	Mark Point	EP005: Total Organic Carbon	----	200 mg/L	104	76.6	125