

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1807820</b>	<b>Page</b>	: 1 of 5
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<b>Project</b>	: ----	<b>Date Samples Received</b>	: 15-Mar-2018
<b>Order number</b>	: ----	<b>Date Analysis Commenced</b>	: 16-Mar-2018
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 23-Mar-2018
<b>Sampler</b>	: ----		
<b>Site</b>	: ----		
<b>Quote number</b>	: BLANKET QUOTE		
<b>No. of samples received</b>	: 8		
<b>No. of samples analysed</b>	: 8		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
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### General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 1505553)</b>									
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EA002: pH Value	----	0.1	pH Unit	7.6	7.6	0.00	0% - 20%
ES1807964-002	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.5	5.4	2.39	0% - 20%
<b>EA010: Conductivity (QC Lot: 1505554)</b>									
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	66	68	2.84	0% - 20%
ES1807964-002	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	377	404	6.91	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1505332)</b>									
ES1807820-002	NATIVE GROVE SITE 2 0-100MM	EA055: Moisture Content	----	1	%	4.1	3.8	8.72	No Limit
ES1807824-005	Anonymous	EA055: Moisture Content	----	1	%	20.5	20.9	1.96	0% - 20%
<b>ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1512572)</b>									
ES1807708-003	Anonymous	ED006: Exchangeable Sodium Percent	----	0.2	%	13.3	13.3	0.00	0% - 20%
		ED006: Exchangeable Calcium	----	0.2	meq/100g	1.9	1.9	0.00	No Limit
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	7.3	7.3	0.00	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	1.4	1.4	0.00	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	10.6	10.6	0.00	0% - 20%
		ED006: Exchangeable Aluminium	----	0.2	meq/100g	<0.2	<0.2	0.00	No Limit
ES1807977-011	Anonymous	ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	<0.2	0.00	No Limit
		ED006: Exchangeable Calcium	----	0.2	meq/100g	14.9	14.7	1.52	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	1.0	1.1	0.00	No Limit
		ED006: Exchangeable Potassium	----	0.2	meq/100g	0.5	0.5	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	<0.2	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1512572) - continued</b>									
ES1807977-011	Anonymous	ED006: Cation Exchange Capacity	----	0.2	meq/100g	16.5	16.3	0.936	0% - 20%
		ED006: Exchangeable Aluminium	----	0.2	meq/100g	<0.2	<0.2	0.00	No Limit
<b>ED007: Exchangeable Cations (QC Lot: 1512562)</b>									
ES1807708-006	Anonymous	ED007: Exchangeable Sodium Percent	----	0.1	%	19.6	19.6	0.00	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	3.0	3.0	0.00	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	4.6	4.5	2.66	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	1.9	1.9	0.00	0% - 50%
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	9.8	9.5	2.89	0% - 20%
		ED007: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
ES1807820-004	NATIVE GROVE SITE 4 0-100MM	ED007: Exchangeable Sodium Percent	----	0.1	%	6.3	6.3	0.00	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	0.5	0.4	0.00	No Limit
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.9	0.8	0.00	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.1	0.1	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	1.6	1.6	0.00	0% - 50%
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 1505552)</b>									
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.4	0.7	46.6	No Limit
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 1500234)</b>									
ES1807411-022	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	40	70	54.2	No Limit
ES1807820-008	NATIVE GROVE SITE 4 150-600MM	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	200	180	12.2	No Limit
<b>EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 1500233)</b>									
ES1807411-022	Anonymous	EK067G: Total Phosphorus as P	----	2	mg/kg	139	143	2.23	0% - 20%
ES1807820-008	NATIVE GROVE SITE 4 150-600MM	EK067G: Total Phosphorus as P	----	2	mg/kg	115	# 175	41.3	0% - 20%
<b>EK072: Phosphate Sorption Capacity (QC Lot: 1501540)</b>									
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EK072: Phosphate Sorption Capacity	----	250	mg P sorbed/kg	2150	2110	1.85	No Limit
		EK072: Phosphate Sorption Index	----	1	mgkg-1/log10ug L-1	121	124	2.00	0% - 20%
<b>EP004: Organic Matter (QC Lot: 1501383)</b>									
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EP004: Total Organic Carbon	----	0.5	%	1.4	1.4	0.00	No Limit
ES1807880-003	Anonymous	EP004: Total Organic Carbon	----	0.5	%	0.8	0.8	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EA010: Conductivity (QCLot: 1505554)</b>								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.5	92	108
<b>ED006: Exchangeable Cations on Alkaline Soils (QCLot: 1512572)</b>								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	2.5 meq/100g	91.2	80	110
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	4.17 meq/100g	91.1	80	110
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	1.28 meq/100g	99.2	80	110
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	2.17 meq/100g	93.4	80	110
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Aluminium	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	----	----	----	----
<b>ED007: Exchangeable Cations (QCLot: 1512562)</b>								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	102	76	120
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	103	75	115
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	110	80	120
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	97.7	80	120
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1505552)</b>								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	106	88	118
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1500234)</b>								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	88.3	72	106
				<20	100 mg/kg	85.6	70	122
				<20	500 mg/kg	97.0	74	118
<b>EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1500233)</b>								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	91.2	76	108
				<2	44.2 mg/kg	98.4	70	118
				<2	100 mg/kg	105	78	116
<b>EP004: Organic Matter (QCLot: 1501383)</b>								
EP004: Total Organic Carbon	----	0.5	%	<0.5	1.363 %	93.2	81	99

## 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: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1505552)</b>							
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	95.7	70	130
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1500234)</b>							
ES1807411-022	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	103	70	130
<b>EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1500233)</b>							
ES1807411-022	Anonymous	EK067G: Total Phosphorus as P	----	100 mg/kg	87.6	70	130
<b>EP004: Organic Matter (QCLot: 1501383)</b>							
ES1807820-001	NATIVE GROVE SITE 1 0-100MM	EP004: Total Organic Carbon	----	0.54 %	84.3	70	130