

19 April 2018



## Harvest Scientific Services Pty Ltd

Geotechnical Environmental & Resource Consultants

ABN 43 132 363 289

Mr M Collins  
Collins Construction Materials Pty Ltd  
214 MacArthur Road  
Elderslie NSW 2570

Dear Matt,

**Re: Environmental Monitoring – Spring Farm: Report 2018-4**

**Our Ref: 201019**

This is to confirm that groundwater sampling and dust monitoring at Spring Farm (see Appendix 1 for sample locations) has been carried out with the results summarised in Tables 1 and 2 respectively below.

### (a) Groundwater Monitoring

TABLE 1: SUMMARY OF GROUNDWATER MONITORING RESULTS.					
ANALYTE	VALUE	TARGET	DATE	TIME	TEMP
EC (uS/cm)	318 ( <i>Non-Saline</i> )	< 800 uS/cm	6 -4 -18	10.00 am	22°C
pH	5.43 ( <i>Moderately acidic</i> )	4 – 6.50			
Depth to Water Table (m) <sup>1</sup>	11.40	> 10 m			

**Notes:** 1. This value represents the depth to groundwater from the TOP OF THE STAND PIPE (670 mm above ground level); 2. Refer to **Appendix 2** for laboratory analysis results and monthly summary data 3 Refer to **Appendix 3** for quality control documentation.

The results indicate that groundwater is:

- *Non-saline* and is well below the nominated target of < 800uS/cm;
- *Moderately acidic* and falling within the nominated pH range of 4 – 6.50;
- At the limit of the target depth > 10 m.

### (b) Dust Monitoring

TABLE 2: SUMMARY OF DUST DEPOSITION MONITORING RESULTS.					
SAMPLING PERIOD	LOCATION	TOTAL INSOLUBLE MATTER <sup>1</sup> (G/M2/MONTH)	Ash or Mineral Content (g/m2/month)	COMMENT	EMP targets (Ash or Mineral Content)
MARCH 2018	1	0.60	NT	Pass	≤ 4g / m2 per month
	2	0.70	NT	Pass	
	3	7.80	7.20	Fail	

**Notes:** 1.Refer to **Appendix 1** for monitoring locations. 2. Refer to **Appendix 2** for laboratory analysis results and monthly summary data. Refer to **Appendix 3** for quality control documentation.

The results indicate that dust settlement at Station 3 failed to meet the EMP target of ≤ 4g/m<sup>2</sup> per month.

Yours faithfully,

Mart Rampe BSc (Applied Geology)  
Principal Consultant

All Correspondence to: PO Box 427 Narellan NSW 2567  
Unit 4, 20 Somerset Avenue NARELLAN NSW 2567  
www.harvestscientific.com.au  
Email: narellan@harvestscientific.com.au  
Tel: 02 4647 6177 • Fax: 02 4647 7332



## APPENDIX 1: Collins Spring Farm Monitoring Locations

MS 1: Dust      MS 2: Dust      MS 3: Dust

GW-1: Groundwater



## **APPENDIX 2: Laboratory Analytical Results and monthly summary data**

## CERTIFICATE OF ANALYSIS

**Work Order** : **EN1802437**  
**Client** : **HARVEST SCIENTIFIC SERVICES**  
**Contact** : MR MART RAMPE  
**Address** : PO BOX 427  
                   NARELLAN NSW, AUSTRALIA 2567  
**Telephone** : +61 02 4647 6177  
**Project** : COLLINS SPRING FARM  
**Order number** : 2018-4  
**C-O-C number** : ----  
**Sampler** : MART RAMPE  
**Site** : ----  
**Quote number** : EN/222/17  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Page** : 1 of 2  
**Laboratory** : Environmental Division Newcastle  
**Contact** :  
**Address** : 5/585 Maitland Road Mayfield West NSW Australia 2304  
  
**Telephone** : +61 2 4014 2500  
**Date Samples Received** : 09-Apr-2018 17:00  
**Date Analysis Commenced** : 10-Apr-2018  
**Issue Date** : 18-Apr-2018 18:08



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 Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### 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
Alison Graham	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



## 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 moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : 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  
 ^ = This result is computed from individual analyte detections at or above the level of reporting  
 ø = ALS is not NATA accredited for these tests.  
 ~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m<sup>2</sup>.mth as sampling data was provided by the client.

## Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST**  
 (Matrix: **AIR**)

Client sample ID

				<b>COLLINS 1</b> <b>7/03/18 - 6/04/18</b>	<b>COLLINS 2</b> <b>7/03/18 - 6/04/18</b>	<b>COLLINS 3</b> <b>7/03/18 - 6/04/18</b>	----	----
Client sampling date / time				06-Apr-2018 09:00	06-Apr-2018 09:00	06-Apr-2018 09:00	----	----
Compound	CAS Number	LOR	Unit	<b>EN1802437-001</b>	<b>EN1802437-002</b>	<b>EN1802437-003</b>	-----	-----
				Result	Result	Result	----	----
<b>EA120: Ash Content</b>								
Ash Content	----	0.1	g/m <sup>2</sup> .month	----	----	<b>7.2</b>	----	----
Ash Content (mg)	----	1	mg	----	----	<b>128</b>	----	----
<b>EA141: Total Insoluble Matter</b>								
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month	<b>0.6</b>	<b>0.7</b>	<b>7.8</b>	----	----
Total Insoluble Matter (mg)	----	1	mg	<b>10</b>	<b>13</b>	<b>137</b>	----	----

Period	TIM (g/m2/month)			Notes	Controls Implemented
	MS 1	MS 2	MS 3		
Feb-13	1.2	1.5	0.5	Introduction of Station 3	
Mar-13	0.6	1.1	2		
Apr-13	1.6	1.5	3.1*	*TIM exceedance	*Measured Ash Content
May-13	0.4	0.8	1.8		
Jun-13	0.7	1.3	1.7		
Jul-13	0.4	0.5	1.3		
Aug-13	0.4	0.2	0.4		
Sep-13	0.5	1.4	0.8		
Oct-13	0.7	1.2	1.1		
Nov-13	0.1	0.3	0.1		
Dec-13	1.7	1.1	1.2		
Jan-14	0.7	0.9	1		
Feb-14	0.8	1.9	0.7		
Mar-14	0.7	1.4	1.8		
Apr-14	0.4	2.1	0.6		
May-14	1.2	1.1	1.2	Cheyne Hudson takes over sampling and reporting	Mesh screens inserted to filter organic content
Jun-14	0.1	0.1	0.1		
Jul-14	0.4	0.4	0.8		
Aug-14	2	2*	**	*Funnel in jug smashed **Jug smashed.	
Sep-14	2.1	0.6	1.5		
Oct-14	1.8	0.9	1.6		
Nov-14	1.5	2.8	6.2*	*Site clean-up and mow on adjacent rental property	
Dec-14	2.2	2.2	1.6		
Jan-15	1.2	1.2	2		
Feb-15	1.7	0.9	2.3		
Mar-15	2.9	3.3	3.6		
Apr-15	6*	1.6	4.4	*New earthworks noted 50 metres from M1	*Monitor results May-15 due to new E1 extraction
May-15	1.5	0.9	0.9		
Jun-15	1.6	1.2	2.0		
Jul-15	1.9	0.8	1.5		
Aug-15	4.2*	1.1	2.5	*Expanded quarry area to within 20 m of M1.	*Relocation of Monitoring Sites 1 and 2 (September)
Sep-15	1.7	0.9	6.1*	*Expansion of nearby Spring Farm urban development	*Regular inspection monitor urban development activity.
Oct-15	3.9	4	6.4*	*Hot windy weather and nearby grass mowing	*Dust suppression irrigation
Nov-15	1.7	0.5	2.4		
Dec-15	3.5	2.4	5.3*	*Expansion of nearby Spring Farm urban development	*Regular inspection monitor urban development activity.
Jan-16	2	1	4.7*	*Expansion of nearby Spring Farm urban development	*Regular inspection monitor urban development activity.
Feb-16	1.5	1.1	1.9		
Mar-16	3.3	2.5	2.5		
Apr-16	1.2	1.8	2		
May-16	0.9	1.5	1.6		
Jun-16	2.7	3.6	3.2		
Jul-16	0.9	0.8	4		
Aug-16	0.5	3.3	0.8		
Sep-16	1.0	2.3	1.6		
Oct-16	1.2	0.7	1.8		
Nov-16	1.0	0.8	2.8		
Dec-16	1.6	2.6	11*	*Springs Road widening and very hot dry weather	
Jan-17	1.3	1.3	2.9		
Feb-17	1.0	0.9	2.1		
Mar-17	2.7	1.5	1.8		
Apr-17	0.6	0.4	2.9		
May-17	0.7	0.5	1.8		
Jun-17	1.2	0.6	1.3		
Jul-17	0.8	1.2	1.5		
Aug-17	0.3	1.3	2.2		
Set - 17	1.0	1.6	4.3	High vegetable (leaves)and organic (bugs) content in all samples	
Oct-17	1.7	2.8	2.2		
Nov-17	0.9	1.5	4.6	High vegetable (leaves)and organic (bugs) content in all samples	
Dec-17	0.6	1.2	2.3		
Jan-18	1.3	2.0	2.8		
Feb-18	0.5	1.9	5.6	Very hot and dry month	
Mar-18	0.6	0.7	7.2	Very hot and dry month and at times windy	



## CERTIFICATE OF ANALYSIS

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**Client** : **HARVEST SCIENTIFIC SERVICES**  
**Contact** : MR MART RAMPE  
**Address** : PO BOX 427  
                   NARELLAN NSW, AUSTRALIA 2567  
**Telephone** : +61 02 4647 6177  
**Project** : COLLINS SPRING FARM  
**Order number** : 2018-4  
**C-O-C number** : ----  
**Sampler** : MART RAMPE  
**Site** : ----  
**Quote number** : EN/222/17  
**No. of samples received** : 1  
**No. of samples analysed** : 1

**Page** : 1 of 2  
**Laboratory** : Environmental Division Sydney  
**Contact** : Customer Services ES  
**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164  
  
**Telephone** : +61-2-8784 8555  
**Date Samples Received** : 06-Apr-2018 15:30  
**Date Analysis Commenced** : 06-Apr-2018  
**Issue Date** : 09-Apr-2018 12:10



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Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW



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 LOR = Limit of reporting  
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 ~ = Indicates an estimated value.

## Analytical Results

Sub-Matrix: **WATER**  
 (Matrix: **WATER**)

Client sample ID

				<b>COLLINS GW 1</b>	----	----	----	----
Client sampling date / time				06-Apr-2018 09:00	----	----	----	----
Compound	CAS Number	LOR	Unit	<b>ES1809961-001</b>	-----	-----	-----	-----
Result					----	----	----	----
<b>EA005P: pH by PC Titrator</b>								
pH Value	----	0.01	pH Unit	<b>5.43</b>	----	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	<b>318</b>	----	----	----	----



GROUNDWATER MONITORING STATION GW-1: COLLINS SITE						
Date	Time	Temp. (°C)	EC (uS/cm)	pH	Depth to Water Table (m) from top of stand pipe	Comments
10-03-09	15:30	N/A	528	< 6.2	11.59	pH was measured using a QUIKCHEK pH test strip.
01-04-09	11:00	N/A	533	< 6.2	11.50	pH was measured using a Eutech pH 5+ meter
01-05-09	10:35	N/A	533	< 6.2	11.50	
01-06-09	10:25	17.3	541	4.79	11.50	
24-06-09	10:20	17	542	4.53	11.50	
31-07-09	9:05	17.3	598	4.98	11.59	
31-08-09	9:07	17.6	610	4.81	11.60	
30-09-09	9:45	18	619	4.71	11.59	
30-10-09	9:45	18.5	621	4.75	11.47	
27-11-09	8:00	19	~	4.73	11.47	
04-01-10	9:50	18.5	634	4.73	11.51	
02-02-10	9:45	18.7	641	4.78	11.52	
01-03-10	9:50	18.1	635	4.67	11.56	
31-03-10	9:15	18.2	639	4.74	11.56	
30-04-10	9:15	17.8	640	4.76	11.56	
01-06-10	10:40	18.1	640	4.66	11.56	
30-06-10	9:30	16.4	614	5.17	11.56	
02-08-10	10:40	17.4	639	4.64	11.56	
01-09-10	9:30	18.6	641	4.82	11.56	
05-10-10	15:50	19.3	651	4.61	11.56	
05-11-10	15:30	18.5	657	5.12	11.36	
07-12-10	9:50	19	670	5.09	11.32	
23-12-10	12:30	19.5	952	5.12	11.32	
01-02-11	12:00	20.3	657	5.17	11.39	
01-04-11	11:00	18.7	778	5.01	11.39	
29-04-11	11:30	18.3	745	5.12	11.39	
30-05-11	10:30	17	777	5.64	11.39	
01-07-11	16:30	16.5	763	5.27	11.39	
29-07-11	15:30	18.5	775	~	11.29	
01-09-11	15:30	18.8	851	4.64	11.29	
04-10-11	13:00	18.4	847	4.66	11.29	
28-10-11	15:30	19.5	846	4.48	11.29	
01-12-11	8:30	17.9	896	4.51	11.35	
23-12-11	9:45	18.8	793	4.49	11.35	
01-02-12	16:15	18.9	782	4.48	11.35	
28-02-12	8:30	18.7	806	4.42	11.35	
30-03-12	15:30	19.7	775	4.52	10.77	
30-04-12	14:30	18.9	772	4.59	10.77	
31-05-12	12:30	19	744	4.55	10.78	
08-07-12	10:30	17.5	784	4.46	10.90	
02-08-12	8:00	13.2	769	4.53	11.05	
03-09-12	15:30	19.3	759	4.66	11.20	
29-09-12	15:00	19.2	799	4.67	11.47	
01-11-12	15:00	19.8	786	4.67	11.30	
03-12-12	13:00	19.1	769	4.81	11.69	
28-12-12	14:30	19.1	767	4.69	11.69	
31-01-13	11:30	19.2	789	4.82	11.40	Prolonged period of heavy rain.
04-03-13	9:30	19.1	757	4.78	11.09	
03-04-13	N/A	N/A	756	5.24	11.21	New site personnel (Simon Winter).
03-05-13	9:30	N/A	620	4.40	11.17	Commenced laboratory analysis of pH and EC
03-06-13	15:05	N/A	670	4.80	11.20	
03-07-13	15:00	N/A	690	4.30	10.85	
02-08-13	15:00	N/A	700	5.10	10.80	
03-09-13	14:30	23	700	4.40	11.05	
03-10-13	12:05	16	680	4.40	11.15	
04-11-13	11:25	18	640	4.80	11.35	
03-12-13	10:30	23	690	4.70	11.28	
09-01-14	14:00	19	670	4.80	11.49	
04-02-14	9:45	24	680	4.60	11.49	
07-03-14	9:55	21	545	4.60	11.50	
04-04-14	10:05	20	700	4.90	11.37	
06-05-14	10:00	16	690	4.80	11.37	
03-06-14	12:15	18	652	5.26	11.47	
02-07-14	11:45	17	688	5.54	11.55	
06-08-14	11:45	20	648	5.94	11.60	New site personnel (Cheyne Hudson).
09-09-14	11:45	21	636	5.30	11.30	Commenced laboratory analysis of pH and EC at ALSE
08-10-14	11:30	20	628	5.40	11.45	
13-11-14	11:30	22	609	5.74	11.50	
03-12-14	12:00	30	598	5.84	11.50	
09-01-15	12:00	30	601	5.68	11.45	
11-02-15	11:45	28	588	5.43	11.45	
10-03-15	12:00	22	581	5.79	11.45	
08-04-15	11:00	20	573	5.13	11.40	
07-05-15	11:00	20	527	5.26	11.20	Sampling undertaken by M Rampe
10-06-15	9:00	15	507	5.28	11.20	
06-07-15	10:00	10	500	4.96	11.20	
07-08-15	10:00	12	480	5.58	11.45	
03-09-15	9:00	11	417	5.75	11.25	
08-10-15	9:00	16	423	5.15	11.50	
06-11-15	9:00	22	456	5.26	11.45	
07-12-15	10:00	23	434	5.25	11.50	
04-01-16	11:00	20	409	5.00	11.50	
05-02-16	10:45	22	410	5.61	11.60	
03-03-16	9:00	23	399	5.23	11.60	

06-04-16	9:00	23	359	5.03	11.40	
05-05-16	12:30	22	363	5.77	11.50	
03-06-16	2:00	18	377	5.47	11.60	
04-07-16	12.30	13	372	5.32	10.70	
03-08-16	10.00	12	261	6.84	10.70	
05-09-16	10.00	12	250	5.62	10.40	
01-10-16	10.00	12	252	6.16	10.50	
01-11-16	8.00	11	296	5.93	10.70	
01-12-16	8.00	12	352	5.63	10.70	
06-01-17	11.00	21	363	5.45	10.70	
03-02-17	8.30	22	334	5.53	11.10	
03-03-17	8.30	23	361	5.25	11.10	
04-04-17	8.30	16	392	5.46	10.80	
01-05-17	10.30	16	294	6.09	10.70	
01-06-17	8.00	8	373	5.12	11.00	
03-07-17	8.00	2	356	5.63	10.90	
01-08-17	9.00	12	346	6.00	11.00	
04-09-17	9.00	12	352	5.63	11.00	
10-10-17	8.00	16	349	5.57	11.10	
06-11-17	9.00	16	326	5.06	11.00	
05-12-17	9.00	18	304	5.42	11.20	
11-01-18	9.00	22	305	5.72	11.10	
07-02-18	10.00	25	303	4.94	11.40	
07-03-18	9	20	302	4.86	11.40	
06-04-18	10	22	318	5.43	11.40	

## **APPENDIX 3: Laboratory Quality Control Documentation**

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: EN1802437</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Client</b>	<b>: HARVEST SCIENTIFIC SERVICES</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: MR MART RAMPE</b>	<b>Contact</b>	<b>:</b>
<b>Address</b>	<b>: PO BOX 427 NARELLAN NSW, AUSTRALIA 2567</b>	<b>Address</b>	<b>: 5/585 Maitland Road Mayfield West NSW Australia 2304</b>
<b>Telephone</b>	<b>: +61 02 4647 6177</b>	<b>Telephone</b>	<b>: +61 2 4014 2500</b>
<b>Project</b>	<b>: COLLINS SPRING FARM</b>	<b>Date Samples Received</b>	<b>: 09-Apr-2018</b>
<b>Order number</b>	<b>: 2018-4</b>	<b>Date Analysis Commenced</b>	<b>: 10-Apr-2018</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 18-Apr-2018</b>
<b>Sampler</b>	<b>: MART RAMPE</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: EN/222/17</b>		
<b>No. of samples received</b>	<b>: 3</b>		
<b>No. of samples analysed</b>	<b>: 3</b>		



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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

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alison Graham	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



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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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**





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### ***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.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

### ***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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**
-

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EN1802437	Page	: 1 of 4
Client	: HARVEST SCIENTIFIC SERVICES	Laboratory	: Environmental Division Newcastle
Contact	: MR MART RAMPE	Telephone	: +61 2 4014 2500
Project	: COLLINS SPRING FARM	Date Samples Received	: 09-Apr-2018
Site	: ----	Issue Date	: 18-Apr-2018
Sampler	: MART RAMPE	No. of samples received	: 3
Order number	: 2018-4	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

### Summary of Outliers

#### Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **AIR**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content							
Dust Gauge - Copper Sulfate (EA120) COLLINS 3 - 7/03/18 - 6/04/18	06-Apr-2018	----	----	----	16-Apr-2018	03-Oct-2018	✔
EA141: Total Insoluble Matter							
Dust Gauge - Copper Sulfate (EA141) COLLINS 1 - 7/03/18 - 6/04/18, COLLINS 3 - 7/03/18 - 6/04/18	06-Apr-2018	----	----	----	16-Apr-2018	03-Oct-2018	✔



*Quality Control Parameter Frequency Compliance*

- No Quality Control data available for this section.



**Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited dust.



## QUALITY CONTROL REPORT

**Work Order** : **ES1809961**

**Page** : 1 of 3

**Client** : **HARVEST SCIENTIFIC SERVICES**

**Laboratory** : Environmental Division Sydney

**Contact** : MR MART RAMPE

**Contact** : Customer Services ES

**Address** : PO BOX 427  
NARELLAN NSW, AUSTRALIA 2567

**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164

**Telephone** : +61 02 4647 6177

**Telephone** : +61-2-8784 8555

**Project** : COLLINS SPRING FARM

**Date Samples Received** : 06-Apr-2018

**Order number** : 2018-4

**Date Analysis Commenced** : 06-Apr-2018

**C-O-C number** : ----

**Issue Date** : 09-Apr-2018

**Sampler** : MART RAMPE

**Site** : ----

**Quote number** : EN/222/17

**No. of samples received** : 1

**No. of samples analysed** : 1



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



## 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: **WATER**

				<b>Laboratory Duplicate (DUP) Report</b>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
<b>EA005P: pH by PC Titrator (QC Lot: 1549894)</b>									
ES1809961-001	COLLINS GW 1	EA005-P: pH Value	----	0.01	pH Unit	5.43	5.29	2.61	0% - 20%
<b>EA010P: Conductivity by PC Titrator (QC Lot: 1549893)</b>									
ES1809961-001	COLLINS GW 1	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	318	312	1.61	0% - 20%
ES1809937-005	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	812	814	0.250	0% - 20%



## 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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit			Result	LCS	Low
EA010P: Conductivity by PC Titrator (QCLot: 1549893)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2000 µS/cm	107	95	113

## 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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1809961	Page	: 1 of 4
Client	: HARVEST SCIENTIFIC SERVICES	Laboratory	: Environmental Division Sydney
Contact	: MR MART RAMPE	Telephone	: +61-2-8784 8555
Project	: COLLINS SPRING FARM	Date Samples Received	: 06-Apr-2018
Site	: ----	Issue Date	: 09-Apr-2018
Sampler	: MART RAMPE	No. of samples received	: 1
Order number	: 2018-4	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

### Summary of Outliers

#### Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) COLLINS GW 1	06-Apr-2018	----	----	----	06-Apr-2018	06-Apr-2018	✓
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) COLLINS GW 1	06-Apr-2018	----	----	----	06-Apr-2018	04-May-2018	✓





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	1	5	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Conductivity by PC Titrator	EA010-P	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Conductivity by PC Titrator	EA010-P	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)