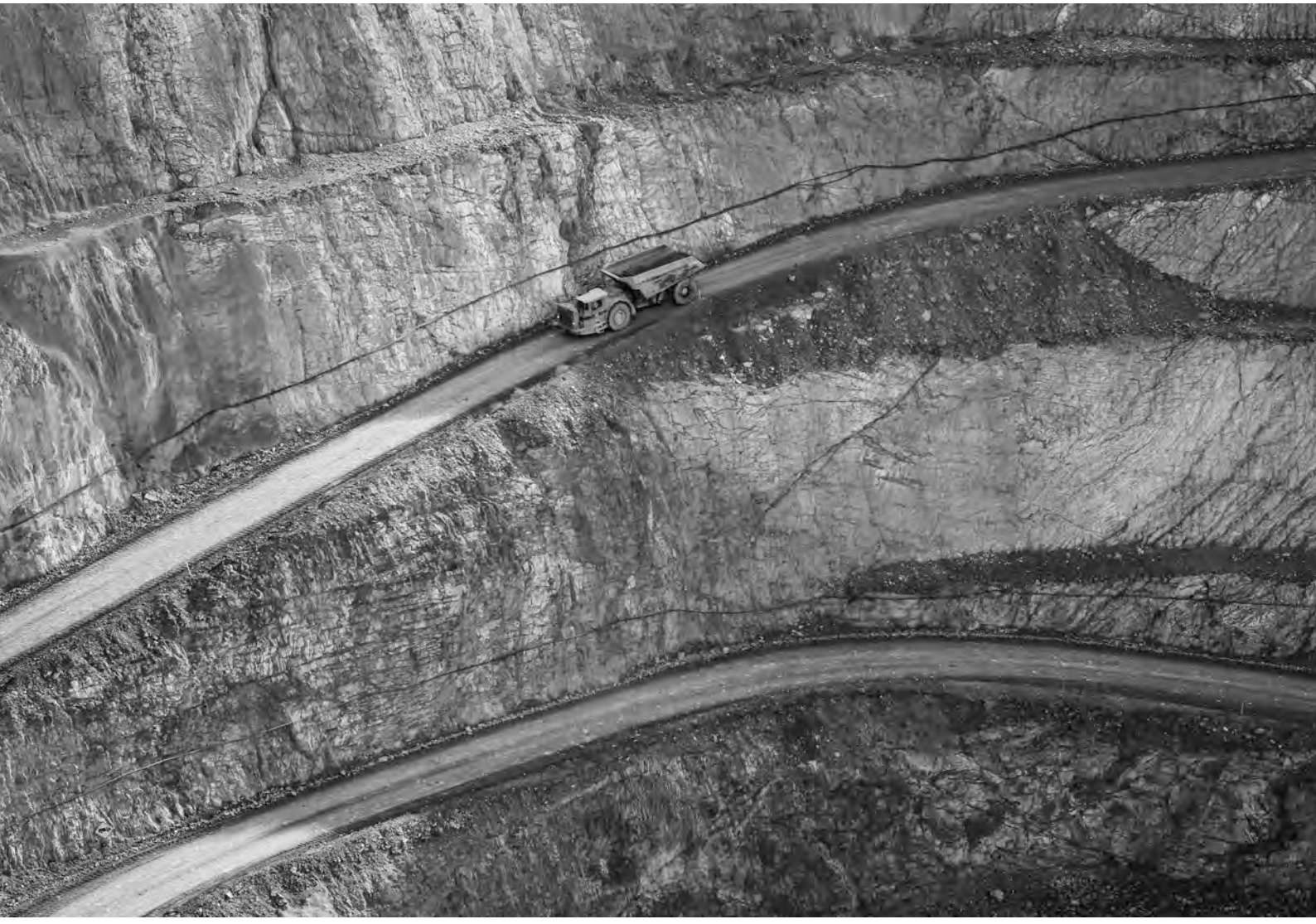
Appendix F - Part 6

Human health risk assessment



EMM
creating opportunities

aurelia
METALS Ltd.

Appendix C

Analytical results

	NA	Inorganics	Metals															
	Moisture Content	Gold	Antimony	Barium	Beryllium	Chromium (hexavalent)	Chromium (Trivalent)	Cadmium	Arsenic	Chromium (III+VI)	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	1	1	7	1	1	1	1	0.4	2	1	1	10	1	1	0.1	1	0.2	1
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil					500	3,600		900	3,000	3,600	240,000		1,500	60,000	730	6,000		400,000
NEPM 2013 Table 1A(1) HILs Rec C Soil					90	300		90	300		17,000		600	19,000	80	1,200		30,000
NEPM 2013 Table 1A(1) HILs Res A Soil					60	100		20	100	100	6,000		300	3,800	40	400		7,400

Sample Location	Field ID	Date																	
COB_001	COB_001_200409	9/04/2020	5.4	<5	<10	130	<2	<5	26	<0.4	50	26	370	27,000	190	300	0.1	17	0.4	300
COB_002	COB_002_200409	9/04/2020	<1	<5	<10	86	<2	<5	30	0.4	7.5	30	250	21,000	130	190	<0.1	11	0.3	360
COB_003	COB_003_200409	9/04/2020	4.1	<5	<10	45	<2	<5	39	<0.4	16	39	35	14,000	18	110	<0.1	6.8	<0.2	52
COB_004	COB_004_200409	9/04/2020	6.8	<5	<10	150	<2	<5	33	0.8	27	33	1,100	29,000	370	290	0.3	14	1.0	580
COB_005	COB_005_200407	7/04/2020	<1	<5	<10	52	<2	<1	14	<0.4	4.5	14	15	8,800	8.0	190	<0.1	8.2	<0.2	26
COB_006	COB_006_200407	7/04/2020	9.1	<5	<10	54	<2	<5	16	<0.4	13	16	62	11,000	29	110	<0.1	5.6	<0.2	76
COB_007	COB_007_200408	8/04/2020	2.0	<5	<10	540	<2	<1	30	<0.4	4.2	30	54	14,000	25	190	<0.1	40	<0.2	110
COB_008	COB_008_200407	7/04/2020	<1	<5	<10	31	<2	<1	11	<0.4	2.8	11	20	6,900	8.7	140	<0.1	5.8	<0.2	32
COB_009	COB_009_200407	7/04/2020	2.1	<5	<10	43	<2	<1	23	<0.4	4.4	23	150	27,000	26	120	<0.1	5.3	<0.2	120
COB_010	COB_010_200409	9/04/2020	17	<5	<10	65	<2	<20	23	0.8	6.6	23	120	30,000	70	180	<0.1	12	0.3	150
COB_011	COB_011_200407	9/04/2020	3.0	<5	<10	84	<2	<5	30	<0.4	5.0	30	77	12,000	25	240	<0.1	12	<0.2	62
COB_012A	COB_012A_200409	9/04/2020	3.8	<5	<10	44	<2	<50	23	<0.4	8.3	23	120	21,000	57	130	<0.1	8.9	<0.2	120
COB_013	COB_013_200407	7/04/2020	1.2	<5	<10	55	<2	<1	17	<0.4	2.9	17	42	16,000	25	130	<0.1	6.4	<0.2	33
COB_014	COB_014_200407	7/04/2020	30	<5	<10	50	<2	<1	33	<0.4	22	33	92	16,000	73	210	<0.1	8.8	<0.2	98
COB_015	COB_015_200409	9/04/2020	1.4	<5	<10	54	<2	<1	23	<0.4	2.8	23	55	15,000	22	63	<0.1	5.4	<0.2	78
COB_016	COB_016_200409	9/04/2020	6.7	<5	<10	60	<2	<1	27	<0.4	2.7	27	32	17,000	12	150	<0.1	14	<0.2	38
COB_017	COB_017_200407	7/04/2020	2.2	<5	<10	76	<2	<20	24	<0.4	5.5	24	120	18,000	31	150	<0.1	11	<0.2	120
COB_018	COB_018_200408	8/04/2020	15	<5	<10	57	<2	<5	27	<0.4	4.7	27	71	18,000	31	220	<0.1	11	<0.2	120
COB_019	COB_019_200407	7/04/2020	17	<5	<10	50	<2	<1	24	<0.4	5.1	24	46	15,000	14	160	<0.1	8.7	0.2	63
COB_020	COB_020_200407	7/04/2020	4.4	<5	<10	50	<2	<5	28	<0.4	5.0	28	92	16,000	31	300	<0.1	11	<0.2	140
COB_021	COB_021_200407	7/04/2020	3.1	<5	<10	16	<2	<5	17	<0.4	2.8	17	25	10,000	33	33	<0.1	<5	<0.2	79
COB_022	COB_022_200407	7/04/2020	2.8	<5	<10	51	<2	<5	23	<0.4	3.2	23	26	17,000	15	87	<0.1	9.1	<0.2	41
COB_023	COB_023_200407	7/04/2020	2.1	<5	<10	110	<2	<5	20	<0.4	4.9	20	73	23,000	26	290	<0.1	13	<0.2	72
COB_024	COB_024_200407	7/04/2020	2.0	<5	<10	42	<2	<5	20	<0.4	2.4	20	19	15,000	13	84	<0.1	11	<0.2	35
COB_025	COB_025_200409	9/04/2020	1.8	<5	<10	410	<2	<5	48	0.7	7.6	48	1,000	66,000	200	400	<0.1	39	0.6	780
COB_026	COB_026_200407	7/04/2020	6.4	<5	<10	100	<2	<5	23	<0.4	5.1	23	35	18,000	38	200	<0.1	10	<0.2	75
COB_027	COB_027_200409	9/04/2020	8.8	<5	<10	39	<2	<1	26	<0.4	4.4	26	67	16,000	32	100	<0.1	11	<0.2	65
COB_028	COB_028_200409	9/04/2020	1.9	<5	<10	150	<2	<1	14	<0.4	3.0	14	33	8,600	7.3	230	<0.1	16	<0.2	37
COB_029	COB_029_200409	9/04/2020	22	<5	<10	69	<2	<1	18	<0.4	5.2	18	140	17,000	80	130	<0.1	10	<0.2	190
COB_030	COB_030_200407	7/04/2020	3.7	<5	<10	61	<2	<1	14	<0.4	4.1	14	17	10,000	12	280	<0.1	9.5	<0.2	34
PGM_001	PGM_001_200408	8/04/2020	15	<5	<10	12	<2	<1	24	12	85	24	1,200	56,000	2,500	750	0.4	23	2.7	3,100
	QC200_200408	8/04/2020		<1	<7	6	<1	<1	20	2	82	20	720	69,000	400	410	<0.1	9	2	600
PGM_002	PGM_002_200408	8/04/2020	24	<5	10	15	<2	<1	42	15	100	42	840	100,000	2,800	820	1.1	19	6.2	4,100
PGM_003	PGM_003_200408	8/04/2020	1.9	<5	<10	79	<2	<1	37	<0.4	10	37	200	34,000	120	300	0.2	11	<0.2	44
PGM_004	PGM_004_200408	8/04/2020	13	<5	<10	180	<2	<1	27	<0.4	6.7	27	420	27,000	52	250	<0.1	9.2	0.2	60
PGM_005	PGM_005_200408	8/04/2020	1.2	<5	<10	18	<2	<1	35	5.4	180	35	30,000	160,000	3,600	980	0.9	23	24	2,100
	QC201_200408	8/04/2020		<1	<7	6	<1	<1	20	3	71	20	26,000	150,000	1,100	480	0.4	11	18	740
PGM_006	PGM_006_200409	9/04/2020	2.0	<5	<10	24	<2	<1	21	<0.4	2.8	21	12	15,000	7.6	69	<0.1	<5	<0.2	14
PGM_007	PGM_007_200408	8/04/2020	<1	<5	<10	1,100	<2	<5	20	<0.4	4.9	20	230	22,000	44	570	<0.1	7.6	0.2	60
	QC202_200408	8/04/2020		<1	<7	110	<1	<10	17	<0.4	<4	17	110	25,000	32	420	<0.1	6	<1	44
PGM_008	PGM_008_200408	8/04/2020	<1	<5	<10	28	<2	<5	27	<0.4	3.9	27	69	19,000	11	56	<0.1	7.7	<0.2	39
PGM_009	PGM_009_200408	8/04/2020	2.0	<5	<10	39	<2	<1	21	<0.4	21	21	140	21,000	95	170	<0.1	11	<0.2	69
	QC102_200408	8/04/2020	2.0	<5	<10	49	<2	<5	35	<0.4	8.3	35	57	19,000	62	170	<0.1	9.1	<0.2	50
PGM_010	PGM_010_200408	8/04/2020	<1	<5	<10	39	<2	<1	29	<0.4	7.0	29	51	19,000	48	130	<0.1	7.7	<0.2	41
PGM_011	PGM_011_200408	8/04/2020	1.2	<5	<10	47	<2	<1	36	<0.4	7.9	36	280	30,000	60	230	<0.1	13	<0.2	100
PGM_012	PGM_012_200409	9/04/2020	4.4	<5	<10	88	<2	<1	26	0.5	29	26	1,100	31,000	350	270	0.2	13	0.6	280
PGM_013	PGM_013_200408	8/04/2020	33	<5	<10	110	<2	<10	33	7.2	35	33	4,800	37,000	3,000	260	0.4	15	4.7	2,200
PGM_014	PGM_014_200408	8/04/2020	9.1	<5	<10	83	<2	<5	16	<0.4	190	16	570	48,000	320	350	0.5	19	1.0	140
	QC100_200408	8/04/2020	7.7	<5	<10	80	<2	<10	16	<0.4	230	16	630	25,000	360	390	0.6	18	0.6	150
PGM_015	PGM_015_200408	8/04/2020	1.3	<5	<10	74	<2	<10	15	<0.4	210	15	590	35,000	330	360	0.6	17	0.6	130
	QC101_200408	8/04/2020	2.1	<5	<10	45	<2	<5	30	<0.4	21	30	1,300	44,000	160	510	1.3	11	3.8	110
PGM_016	PGM_016_200409	9/04/2020	1.7	<10	<10	28	<2	<1	30	<0.4	3.1	30	33	16,000	7.7	110	< 0.1	6.5	< 0.2	19
PGM_017	PGM_017_200409	9/04/2020	1.4	<10	<10	91	<2	<1	21	<0.4	4.2	21	27	14,000	11	69	< 0.1	6.2	< 0.2	20

Appendix D

NATA laboratory certificates

#713570

CHAIN OF CUSTODY
Client: EMM Consulting Pty Ltd (Sydney)
Project: J190278 Cobar
PO: J190278 (Eurofins quote #200330EMM)
PM: Victoria Buchanan
Sampler: Lachlan Lewis (+61 401 638 848) and Andrew Badham
Results: ESdat format, send to vbuchanan@emmconsulting.com.au and llewis@emmconsulting.com.au and emmconsulting@esdat.net
Invoice: vbuchanan@emmconsulting.com.au and llewis@emmconsulting.com.au

Sample ID	Date	Matrix	SOIL Analysis: 8 Metals by ICP/AES: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg Additional metals by ICP/AES: Sb, Ba, Be, Fe, Mn, Ag Metals by ICP/MS: Au Hexavalent Chromium - Alkaline Digestion Trivalent Chromium	WATER Analysis: Metals – full suite	SWAB Analysis: TBA - hold
PGM_001_200408	8/4/2020	S	✓		
PGM_002_200408	8/4/2020	S	✓		
PGM_003_200408	8/4/2020	S	✓		
PGM_004_200408	8/4/2020	S	✓		
PGM_005_200408	8/4/2020	S	✓		
PGM_006_200409	9/4/2020	S	✓		
PGM_007_200408	8/4/2020	S +swab	✓		HOLD
PGM_008_200408	8/4/2020	S	✓		
PGM_009_200408	8/4/2020	S	✓		
PGM_010_200408	8/4/2020	S	✓		
PGM_011_200408	8/4/2020	S	✓		
PGM_012_200409	9/4/2020	S	✓		
PGM_013_200408	8/4/2020	S +swab	✓		HOLD
PGM_014_200408	8/4/2020	S	✓		
PGM_015_200408	8/4/2020	S	✓		
PGM_016_200409	9/4/2020	S	HOLD		
PGM_017_200409	9/4/2020	S	HOLD		
COB_001_200409	9/4/2020	S	✓		
COB_002_200409	9/4/2020	S	✓		
COB_003_200409	9/4/2020	S +swab	✓		HOLD
COB_004_200409	9/4/2020	S	✓		
COB_005_200407	7/4/2020	S +swab	✓		HOLD
COB_006_200407	7/4/2020	S	✓		
COB_007_200408	8/4/2020	S +swab	✓		HOLD
COB_008_200407	7/4/2020	S +swab	✓		HOLD
COB_009_200407	7/4/2020	S	✓		
COB_010_200409	9/4/2020	S	✓		
COB_011_200407	7/4/2020	S +swab	✓		HOLD
COB_012_200407	7/4/2020	S	HOLD		
COB_012a_200409	9/4/2020	S +swab	✓		HOLD

Suzanne Kong
9/4/2020
3:10PM

4.5 +0.4 CW1

CHAIN OF CUSTODY

Client: EMM Consulting Pty Ltd (Sydney)
Project: J190278 Cobar
PO: J190278 (Eurofins quote #200330EMM)
PM: Victoria Buchanan
Sampler: Lachlan Lewis (+61 401 638 848) and Andrew Badham
Results: ESdat format, send to vbuchanan@emmconsulting.com.au and llewis@emmconsulting.com.au and emmconsulting@esdat.net
Invoice: vbuchanan@emmconsulting.com.au and llewis@emmconsulting.com.au

Sample ID	Date	Matrix	SOIL Analysis: 8 Metals by ICP/AES: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg Additional metals by ICP/AES: Sb, Ba, Be, Fe, Mn, Ag Metals by ICP/MS: Au Hexavalent Chromium - Alkaline Digestion Trivalent Chromium	WATER Analysis: Metals – full suite	SWAB Analysis: TBA - hold
COB_013_200407	7/4/2020	S	✓		
COB_014_200407	7/4/2020	S	✓		
COB_015_200409	9/4/2020	S	✓		
COB_016_200409	9/4/2020	S	✓		
COB_017_200407	7/4/2020	S	✓		
COB_018_200408	8/4/2020	S	✓		
COB_019_200407	7/4/2020	S	✓		
COB_020_200407	7/4/2020	S	✓		
COB_021_200407	7/4/2020	S	✓		
COB_022_200407	7/4/2020	S	✓		
COB_023_200407	7/4/2020	S	✓		
COB_024_200407	7/4/2020	S	✓		
COB_025_200409	9/4/2020	S	✓		
COB_026_200407	7/4/2020	S	✓		
COB_027_200409	9/4/2020	S	✓		
COB_028_200409	9/4/2020	S +swab	✓		HOLD
COB_029_200409	9/4/2020	S	✓		
COB_030_200407	7/4/2020	S +swab	✓		HOLD
QC100_200408	8/4/2020	S	✓		
QC101_200408	8/4/2020	S	✓		
QC102_200408	8/4/2020	S	✓		
QC300_200407	7/4/2020	W		✓	
QC301_200408	8/4/2020	W		✓	
QC302_200409	9/4/2020	W		✓	

Note: Please relabel samples as follows:

old → new
COB_031 → COB_026
COB_032 → COB_027

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**EMM Consulting Pty Limited**
Contact name:	Victoria Buchanan
Project name:	COBAR
Project ID:	J190278
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Apr 14, 2020 3:10 PM
Eurofins reference:	**713570**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 8.9 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

COB_008_200407 swab sample not received - analysis cancelled. Samples received extra; COB_031_200407 (Swab), COB_018_200408 (Swab), and QC400 (Swab) - analysis on hold.

Contact notes

If you have any questions with respect to these samples please contact:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Victoria Buchanan - vbuchanan@emmconsulting.com.au.

Note: A copy of these results will also be delivered to the general EMM Consulting Pty Limited email address.

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	PGM_001_200408	Apr 08, 2020		Soil	S20-Ap19182	X	X	X		X		X	X	X	X		X	X
2	PGM_002_200408	Apr 08, 2020		Soil	S20-Ap19183	X	X	X		X		X	X	X	X		X	X
3	PGM_003_200408	Apr 08, 2020		Soil	S20-Ap19184	X	X	X		X		X	X	X	X		X	X
4	PGM_004_200408	Apr 08, 2020		Soil	S20-Ap19185	X	X	X		X		X	X	X	X		X	X
5	PGM_005_200408	Apr 08, 2020		Soil	S20-Ap19186	X	X	X		X		X	X	X	X		X	X
6	PGM_006_200409	Apr 09, 2020		Soil	S20-Ap19187	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
7	PGM_007_200408	Apr 08, 2020		Soil	S20-Ap19188	X	X	X		X		X	X	X	X		X	X
8	PGM_008_200408	Apr 08, 2020		Soil	S20-Ap19189	X	X	X		X		X	X	X	X		X	X
9	PGM_009_200408	Apr 08, 2020		Soil	S20-Ap19190	X	X	X		X		X	X	X	X		X	X
10	PGM_010_200408	Apr 08, 2020		Soil	S20-Ap19191	X	X	X		X		X	X	X	X		X	X
11	PGM_011_200408	Apr 08, 2020		Soil	S20-Ap19192	X	X	X		X		X	X	X	X		X	X
12	PGM_012_200409	Apr 09, 2020		Soil	S20-Ap19193	X	X	X		X		X	X	X	X		X	X
13	PGM_013_200408	Apr 08, 2020		Soil	S20-Ap19194	X	X	X		X		X	X	X	X		X	X
14	PGM_014_200	Apr 08, 2020		Soil	S20-Ap19195	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	408																	
15	PGM_015_200408	Apr 08, 2020		Soil	S20-Ap19196	x	x	x		x		x	x	x	x		x	x
16	COB_001_200409	Apr 09, 2020		Soil	S20-Ap19197	x	x	x		x		x	x	x	x		x	x
17	COB_002_200409	Apr 09, 2020		Soil	S20-Ap19198	x	x	x		x		x	x	x	x		x	x
18	COB_003_200409	Apr 09, 2020		Soil	S20-Ap19199	x	x	x		x		x	x	x	x		x	x
19	COB_004_200409	Apr 09, 2020		Soil	S20-Ap19200	x	x	x		x		x	x	x	x		x	x
20	COB_005_200407	Apr 07, 2020		Soil	S20-Ap19201	x	x	x		x		x	x	x	x		x	x
21	COB_006_200407	Apr 07, 2020		Soil	S20-Ap19202	x	x	x		x		x	x	x	x		x	x

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
22	COB_007_200408	Apr 08, 2020		Soil	S20-Ap19203	X	X	X		X		X	X	X	X		X	X
23	COB_008_200407	Apr 07, 2020		Soil	S20-Ap19204	X	X	X		X		X	X	X	X		X	X
24	COB_009_200407	Apr 07, 2020		Soil	S20-Ap19205	X	X	X		X		X	X	X	X		X	X
25	COB_010_200409	Apr 09, 2020		Soil	S20-Ap19206	X	X	X		X		X	X	X	X		X	X
26	COB_012A_200409	Apr 09, 2020		Soil	S20-Ap19208	X	X	X		X		X	X	X	X		X	X
27	COB_013_200407	Apr 07, 2020		Soil	S20-Ap19209	X	X	X		X		X	X	X	X		X	X
28	COB_014_200407	Apr 07, 2020		Soil	S20-Ap19210	X	X	X		X		X	X	X	X		X	X
29	COB_015_200	Apr 09, 2020		Soil	S20-Ap19211	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	409																	
30	COB_016_200409	Apr 09, 2020		Soil	S20-Ap19212	x	x	x		x		x	x	x	x		x	x
31	COB_017_200407	Apr 07, 2020		Soil	S20-Ap19213	x	x	x		x		x	x	x	x		x	x
32	COB_018_200408	Apr 08, 2020		Soil	S20-Ap19214	x	x	x		x		x	x	x	x		x	x
33	COB_019_200407	Apr 07, 2020		Soil	S20-Ap19215	x	x	x		x		x	x	x	x		x	x
34	COB_020_200407	Apr 07, 2020		Soil	S20-Ap19216	x	x	x		x		x	x	x	x		x	x
35	COB_021_200407	Apr 07, 2020		Soil	S20-Ap19217	x	x	x		x		x	x	x	x		x	x
36	COB_022_200407	Apr 07, 2020		Soil	S20-Ap19218	x	x	x		x		x	x	x	x		x	x

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
37	COB_023_200407	Apr 07, 2020		Soil	S20-Ap19219	X	X	X		X		X	X	X	X		X	X
38	COB_024_200407	Apr 07, 2020		Soil	S20-Ap19220	X	X	X		X		X	X	X	X		X	X
39	COB_025_200409	Apr 09, 2020		Soil	S20-Ap19221	X	X	X		X		X	X	X	X		X	X
40	COB_026_200407	Apr 07, 2020		Soil	S20-Ap19222	X	X	X		X		X	X	X	X		X	X
41	COB_027_200409	Apr 09, 2020		Soil	S20-Ap19223	X	X	X		X		X	X	X	X		X	X
42	COB_028_200409	Apr 09, 2020		Soil	S20-Ap19224	X	X	X		X		X	X	X	X		X	X
43	COB_029_200409	Apr 09, 2020		Soil	S20-Ap19225	X	X	X		X		X	X	X	X		X	X
44	COB_030_200	Apr 07, 2020		Soil	S20-Ap19226	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	407																	
45	QC100_200408	Apr 08, 2020		Soil	S20-Ap19227	X	X	X		X		X	X	X	X		X	X
46	QC101_200408	Apr 08, 2020		Soil	S20-Ap19228	X	X	X		X		X	X	X	X		X	X
47	QC102_200408	Apr 08, 2020		Soil	S20-Ap19229	X	X	X		X		X	X	X	X		X	X
48	QC300_200407	Apr 07, 2020		Water	S20-Ap19230											X		
49	QC301_200408	Apr 08, 2020		Water	S20-Ap19231											X		
50	QC302_200409	Apr 09, 2020		Water	S20-Ap19232										X			
51	PGM_007_200408	Apr 08, 2020		Swab	S20-Ap19233						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
52	PGM_013_200408	Apr 08, 2020		Swab	S20-Ap19234						X							
53	COB_003_200409	Apr 09, 2020		Swab	S20-Ap19235						X							
54	COB_005_200407	Apr 07, 2020		Swab	S20-Ap19236						X							
55	COB_007_200408	Apr 08, 2020		Swab	S20-Ap19237						X							
56	COB_008_200407	Apr 07, 2020		Swab	S20-Ap19238				X									
57	COB_011_200407	Apr 07, 2020		Swab	S20-Ap19239						X							
58	COB_012A_200409	Apr 09, 2020		Swab	S20-Ap19240						X							
59	COB_028_200	Apr 09, 2020		Swab	S20-Ap19241						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	409																	
60	COB_030_200407	Apr 07, 2020		Swab	S20-Ap19242						X							
61	PGM_016_200409	Apr 09, 2020		Soil	S20-Ap19243						X							
62	PGM_017_200409	Apr 09, 2020		Soil	S20-Ap19244						X							
63	COB_012_200407	Apr 07, 2020		Soil	S20-Ap19245						X							
64	COB_011_200407	Apr 09, 2020		Soil	S20-Ap19246	X	X	X		X		X	X	X	X		X	X
65	COB_031_200407	Apr 07, 2020		Swab	S20-Ap19349						X							
66	COB_018_200408	Apr 07, 2020		Swab	S20-Ap19350						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
67	QC400_200409	Apr 09, 2020		Swab	S20-Ap19351						X							
Test Counts						48	48	48	1	48	15	48	48	48	49	2	48	48

EMM Consulting Pty Limited
Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Victoria Buchanan**

Report **713570-S**
Project name COBAR
Project ID J190278
Received Date Apr 14, 2020

Client Sample ID			**PGM_001_200408**	**PGM_002_200408**	**PGM_003_200408**	**PGM_004_200408**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19182**	**S20-Ap19183**	**S20-Ap19184**	**S20-Ap19185**
Date Sampled			**Apr 08, 2020**	**Apr 08, 2020**	**Apr 08, 2020**	**Apr 08, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Chromium (trivalent)	5	mg/kg	24	42	37	27
% Moisture	1	%	15	24	1.9	13
Heavy Metals						
Antimony	10	mg/kg	< 10	10	< 10	< 10
Arsenic	2	mg/kg	85	100	10	6.7
Barium	10	mg/kg	12	15	79	180
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	12	15	< 0.4	< 0.4
Chromium	5	mg/kg	24	42	37	27
Copper	5	mg/kg	1200	840	200	420
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	56000	100000	34000	27000
Lead	5	mg/kg	2500	2800	120	52
Manganese	5	mg/kg	750	820	300	250
Mercury	0.1	mg/kg	0.4	1.1	0.2	< 0.1
Nickel	5	mg/kg	23	19	11	9.2
Silver	0.2	mg/kg	2.7	6.2	< 0.2	0.2
Zinc	5	mg/kg	3100	4100	44	60

Client Sample ID			**PGM_005_200408**	**PGM_006_200409**	[G01]**PGM_007_200408**	[G01]**PGM_008_200408**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19186**	**S20-Ap19187**	**S20-Ap19188**	**S20-Ap19189**
Date Sampled			**Apr 08, 2020**	**Apr 09, 2020**	**Apr 08, 2020**	**Apr 08, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 5	< 5
Chromium (trivalent)	5	mg/kg	35	21	20	27
% Moisture	1	%	1.2	2.0	< 1	< 1

Client Sample ID			PGM_005_200408	PGM_006_200409	G01PGM_007_200408	G01PGM_008_200408
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ap19186	S20-Ap19187	S20-Ap19188	S20-Ap19189
Date Sampled			Apr 08, 2020	Apr 09, 2020	Apr 08, 2020	Apr 08, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	180	2.8	4.9	3.9
Barium	10	mg/kg	18	24	1100	28
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	5.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	35	21	20	27
Copper	5	mg/kg	30000	12	230	69
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	160000	15000	22000	19000
Lead	5	mg/kg	3600	7.6	44	11
Manganese	5	mg/kg	980	69	570	56
Mercury	0.1	mg/kg	0.9	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	23	< 5	7.6	7.7
Silver	0.2	mg/kg	24	< 0.2	0.2	< 0.2
Zinc	5	mg/kg	2100	14	60	39

Client Sample ID			PGM_009_200408	PGM_010_200408	PGM_011_200408	PGM_012_200409
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ap19190	S20-Ap19191	S20-Ap19192	S20-Ap19193
Date Sampled			Apr 08, 2020	Apr 08, 2020	Apr 08, 2020	Apr 09, 2020
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Chromium (trivalent)	5	mg/kg	21	29	36	26
% Moisture	1	%	2.0	< 1	1.2	4.4
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	21	7.0	7.9	29
Barium	10	mg/kg	39	39	47	88
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.5
Chromium	5	mg/kg	21	29	36	26
Copper	5	mg/kg	140	51	280	1100
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	21000	19000	30000	31000
Lead	5	mg/kg	95	48	60	350
Manganese	5	mg/kg	170	130	230	270
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Nickel	5	mg/kg	11	7.7	13	13
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	0.6
Zinc	5	mg/kg	69	41	100	280

Client Sample ID			[G01]PGM_013_200408	[G01]PGM_014_200408	[G01]PGM_015_200408	[G01]COB_001_200409
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19194**	**S20-Ap19195**	**S20-Ap19196**	**S20-Ap19197**
Date Sampled			**Apr 08, 2020**	**Apr 08, 2020**	**Apr 08, 2020**	**Apr 09, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 10	< 5	< 10	< 5
Chromium (trivalent)	5	mg/kg	33	16	15	26
% Moisture	1	%	33	9.1	1.3	5.4
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	35	190	210	50
Barium	10	mg/kg	110	83	74	130
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	7.2	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	33	16	15	26
Copper	5	mg/kg	4800	570	590	370
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	37000	48000	35000	27000
Lead	5	mg/kg	3000	320	330	190
Manganese	5	mg/kg	260	350	360	300
Mercury	0.1	mg/kg	0.4	0.5	0.6	0.1
Nickel	5	mg/kg	15	19	17	17
Silver	0.2	mg/kg	4.7	1.0	0.6	0.4
Zinc	5	mg/kg	2200	140	130	300

Client Sample ID			[G01]COB_002_200409	[G01]COB_003_200409	[G01]COB_004_200409	COB_005_200407
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19198**	**S20-Ap19199**	**S20-Ap19200**	**S20-Ap19201**
Date Sampled			**Apr 09, 2020**	**Apr 09, 2020**	**Apr 09, 2020**	**Apr 07, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 5	< 5	< 5	< 1
Chromium (trivalent)	5	mg/kg	30	39	33	14
% Moisture	1	%	< 1	4.1	6.8	< 1
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	7.5	16	27	4.5
Barium	10	mg/kg	86	45	150	52
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	0.4	< 0.4	0.8	< 0.4
Chromium	5	mg/kg	30	39	33	14
Copper	5	mg/kg	250	35	1100	15
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	21000	14000	29000	8800
Lead	5	mg/kg	130	18	370	8.0
Manganese	5	mg/kg	190	110	290	190
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1
Nickel	5	mg/kg	11	6.8	14	8.2
Silver	0.2	mg/kg	0.3	< 0.2	1.0	< 0.2
Zinc	5	mg/kg	360	52	580	26

Client Sample ID			[G01]COB_006_200407	COB_007_200408	COB_008_200407	COB_009_200407
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ap19202	S20-Ap19203	S20-Ap19204	S20-Ap19205
Date Sampled			Apr 07, 2020	Apr 08, 2020	Apr 07, 2020	Apr 07, 2020
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 5	< 1	< 1	< 1
Chromium (trivalent)	5	mg/kg	16	30	11	23
% Moisture	1	%	9.1	2.0	< 1	2.1
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	13	4.2	2.8	4.4
Barium	10	mg/kg	54	540	31	43
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	30	11	23
Copper	5	mg/kg	62	54	20	150
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	11000	14000	6900	27000
Lead	5	mg/kg	29	25	8.7	26
Manganese	5	mg/kg	110	190	140	120
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.6	40	5.8	5.3
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Zinc	5	mg/kg	76	110	32	120

Client Sample ID			[G01]COB_010_200409	[G01]COB_012A_200409	COB_013_200407	COB_014_200407
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ap19206	S20-Ap19208	S20-Ap19209	S20-Ap19210
Date Sampled			Apr 09, 2020	Apr 09, 2020	Apr 07, 2020	Apr 07, 2020
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 20	< 50	< 1	< 1
Chromium (trivalent)	5	mg/kg	23	23	17	33
% Moisture	1	%	17	3.8	1.2	30
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	6.6	8.3	2.9	22
Barium	10	mg/kg	65	44	55	50
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	0.8	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	23	23	17	33
Copper	5	mg/kg	120	120	42	92
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	30000	21000	16000	16000
Lead	5	mg/kg	70	57	25	73
Manganese	5	mg/kg	180	130	130	210
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	12	8.9	6.4	8.8
Silver	0.2	mg/kg	0.3	< 0.2	< 0.2	< 0.2
Zinc	5	mg/kg	150	120	33	98

Client Sample ID			COB_015_200409	COB_016_200409	[G01]COB_017_200407	[G01]COB_018_200408
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19211**	**S20-Ap19212**	**S20-Ap19213**	**S20-Ap19214**
Date Sampled			**Apr 09, 2020**	**Apr 09, 2020**	**Apr 07, 2020**	**Apr 08, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 20	< 5
Chromium (trivalent)	5	mg/kg	23	27	24	27
% Moisture	1	%	1.4	6.7	2.2	15
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	2.8	2.7	5.5	4.7
Barium	10	mg/kg	54	60	76	57
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	23	27	24	27
Copper	5	mg/kg	55	32	120	71
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	15000	17000	18000	18000
Lead	5	mg/kg	22	12	31	31
Manganese	5	mg/kg	63	150	150	220
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.4	14	11	11
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Zinc	5	mg/kg	78	38	120	120

Client Sample ID			COB_019_200407	[G01]COB_020_200407	[G01]COB_021_200407	[G01]COB_022_200407
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19215**	**S20-Ap19216**	**S20-Ap19217**	**S20-Ap19218**
Date Sampled			**Apr 07, 2020**	**Apr 07, 2020**	**Apr 07, 2020**	**Apr 07, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 1	< 5	< 5	< 5
Chromium (trivalent)	5	mg/kg	24	28	17	23
% Moisture	1	%	17	4.4	3.1	2.8
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	5.1	5.0	2.8	3.2
Barium	10	mg/kg	50	50	16	51
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	28	17	23
Copper	5	mg/kg	46	92	25	26
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	15000	16000	10000	17000
Lead	5	mg/kg	14	31	33	15
Manganese	5	mg/kg	160	300	33	87
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.7	11	< 5	9.1
Silver	0.2	mg/kg	0.2	< 0.2	< 0.2	< 0.2
Zinc	5	mg/kg	63	140	79	41

Client Sample ID			[G01]COB_023_200407	[G01]COB_024_200407	[G01]COB_025_200409	[G01]COB_026_200407
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ap19219	S20-Ap19220	S20-Ap19221	S20-Ap19222
Date Sampled			Apr 07, 2020	Apr 07, 2020	Apr 09, 2020	Apr 07, 2020
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 5	< 5	< 5	< 5
Chromium (trivalent)	5	mg/kg	20	20	48	23
% Moisture	1	%	2.1	2.0	1.8	6.4
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	4.9	2.4	7.6	5.1
Barium	10	mg/kg	110	42	410	100
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.7	< 0.4
Chromium	5	mg/kg	20	20	48	23
Copper	5	mg/kg	73	19	1000	35
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	23000	15000	66000	18000
Lead	5	mg/kg	26	13	200	38
Manganese	5	mg/kg	290	84	400	200
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	13	11	39	10
Silver	0.2	mg/kg	< 0.2	< 0.2	0.6	< 0.2
Zinc	5	mg/kg	72	35	780	75

Client Sample ID			COB_027_200409	COB_028_200409	COB_029_200409	COB_030_200407
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ap19223	S20-Ap19224	S20-Ap19225	S20-Ap19226
Date Sampled			Apr 09, 2020	Apr 09, 2020	Apr 09, 2020	Apr 07, 2020
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 1	< 1	< 1	< 1
Chromium (trivalent)	5	mg/kg	26	14	18	14
% Moisture	1	%	8.8	1.9	22	3.7
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	4.4	3.0	5.2	4.1
Barium	10	mg/kg	39	150	69	61
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	26	14	18	14
Copper	5	mg/kg	67	33	140	17
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	16000	8600	17000	10000
Lead	5	mg/kg	32	7.3	80	12
Manganese	5	mg/kg	100	230	130	280
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	11	16	10	9.5
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Zinc	5	mg/kg	65	37	190	34

Client Sample ID			G01QC100_200408	G01QC101_200408	G01QC102_200408	G01COB_011_200407
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ap19227**	**S20-Ap19228**	**S20-Ap19229**	**S20-Ap19246**
Date Sampled			**Apr 08, 2020**	**Apr 08, 2020**	**Apr 08, 2020**	**Apr 09, 2020**
Test/Reference	LOR	Unit				
Chromium (hexavalent)	1	mg/kg	< 10	< 5	< 5	< 5
Chromium (trivalent)	5	mg/kg	16	30	35	30
% Moisture	1	%	7.7	2.1	2.0	3.0
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	< 10	< 10
Arsenic	2	mg/kg	230	21	8.3	5.0
Barium	10	mg/kg	80	45	49	84
Beryllium	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	30	35	30
Copper	5	mg/kg	630	1300	57	77
Gold	5	mg/kg	< 5	< 5	< 5	< 5
Iron	20	mg/kg	25000	44000	19000	12000
Lead	5	mg/kg	360	160	62	25
Manganese	5	mg/kg	390	510	170	240
Mercury	0.1	mg/kg	0.6	1.3	< 0.1	< 0.1
Nickel	5	mg/kg	18	11	9.1	12
Silver	0.2	mg/kg	0.6	3.8	< 0.2	< 0.2
Zinc	5	mg/kg	150	110	50	62

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chromium (speciated)			
Chromium (hexavalent)	Sydney	Apr 20, 2020	28 Days
- Method: In-house method E057.2			
Chromium (trivalent)	Sydney	Apr 20, 2020	28 Days
- Method: E043 /E057 Total Speciated Chromium			
Metals M8	Sydney	Apr 20, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Apr 20, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			
Heavy Metals	Sydney	Apr 20, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	PGM_001_200408	Apr 08, 2020		Soil	S20-Ap19182	X	X	X		X		X	X	X	X		X	X
2	PGM_002_200408	Apr 08, 2020		Soil	S20-Ap19183	X	X	X		X		X	X	X	X		X	X
3	PGM_003_200408	Apr 08, 2020		Soil	S20-Ap19184	X	X	X		X		X	X	X	X		X	X
4	PGM_004_200408	Apr 08, 2020		Soil	S20-Ap19185	X	X	X		X		X	X	X	X		X	X
5	PGM_005_200408	Apr 08, 2020		Soil	S20-Ap19186	X	X	X		X		X	X	X	X		X	X
6	PGM_006_200409	Apr 09, 2020		Soil	S20-Ap19187	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
7	PGM_007_200408	Apr 08, 2020		Soil	S20-Ap19188	X	X	X		X		X	X	X	X		X	X
8	PGM_008_200408	Apr 08, 2020		Soil	S20-Ap19189	X	X	X		X		X	X	X	X		X	X
9	PGM_009_200408	Apr 08, 2020		Soil	S20-Ap19190	X	X	X		X		X	X	X	X		X	X
10	PGM_010_200408	Apr 08, 2020		Soil	S20-Ap19191	X	X	X		X		X	X	X	X		X	X
11	PGM_011_200408	Apr 08, 2020		Soil	S20-Ap19192	X	X	X		X		X	X	X	X		X	X
12	PGM_012_200409	Apr 09, 2020		Soil	S20-Ap19193	X	X	X		X		X	X	X	X		X	X
13	PGM_013_200408	Apr 08, 2020		Soil	S20-Ap19194	X	X	X		X		X	X	X	X		X	X
14	PGM_014_200	Apr 08, 2020		Soil	S20-Ap19195	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	408																	
15	PGM_015_200408	Apr 08, 2020		Soil	S20-Ap19196	x	x	x		x		x	x	x	x		x	x
16	COB_001_200409	Apr 09, 2020		Soil	S20-Ap19197	x	x	x		x		x	x	x	x		x	x
17	COB_002_200409	Apr 09, 2020		Soil	S20-Ap19198	x	x	x		x		x	x	x	x		x	x
18	COB_003_200409	Apr 09, 2020		Soil	S20-Ap19199	x	x	x		x		x	x	x	x		x	x
19	COB_004_200409	Apr 09, 2020		Soil	S20-Ap19200	x	x	x		x		x	x	x	x		x	x
20	COB_005_200407	Apr 07, 2020		Soil	S20-Ap19201	x	x	x		x		x	x	x	x		x	x
21	COB_006_200407	Apr 07, 2020		Soil	S20-Ap19202	x	x	x		x		x	x	x	x		x	x

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
22	COB_007_200408	Apr 08, 2020		Soil	S20-Ap19203	X	X	X		X		X	X	X	X		X	X
23	COB_008_200407	Apr 07, 2020		Soil	S20-Ap19204	X	X	X		X		X	X	X	X		X	X
24	COB_009_200407	Apr 07, 2020		Soil	S20-Ap19205	X	X	X		X		X	X	X	X		X	X
25	COB_010_200409	Apr 09, 2020		Soil	S20-Ap19206	X	X	X		X		X	X	X	X		X	X
26	COB_012A_200409	Apr 09, 2020		Soil	S20-Ap19208	X	X	X		X		X	X	X	X		X	X
27	COB_013_200407	Apr 07, 2020		Soil	S20-Ap19209	X	X	X		X		X	X	X	X		X	X
28	COB_014_200407	Apr 07, 2020		Soil	S20-Ap19210	X	X	X		X		X	X	X	X		X	X
29	COB_015_200	Apr 09, 2020		Soil	S20-Ap19211	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	409																	
30	COB_016_200409	Apr 09, 2020		Soil	S20-Ap19212	x	x	x		x		x	x	x	x		x	x
31	COB_017_200407	Apr 07, 2020		Soil	S20-Ap19213	x	x	x		x		x	x	x	x		x	x
32	COB_018_200408	Apr 08, 2020		Soil	S20-Ap19214	x	x	x		x		x	x	x	x		x	x
33	COB_019_200407	Apr 07, 2020		Soil	S20-Ap19215	x	x	x		x		x	x	x	x		x	x
34	COB_020_200407	Apr 07, 2020		Soil	S20-Ap19216	x	x	x		x		x	x	x	x		x	x
35	COB_021_200407	Apr 07, 2020		Soil	S20-Ap19217	x	x	x		x		x	x	x	x		x	x
36	COB_022_200407	Apr 07, 2020		Soil	S20-Ap19218	x	x	x		x		x	x	x	x		x	x

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
37	COB_023_200407	Apr 07, 2020		Soil	S20-Ap19219	X	X	X		X		X	X	X	X		X	X
38	COB_024_200407	Apr 07, 2020		Soil	S20-Ap19220	X	X	X		X		X	X	X	X		X	X
39	COB_025_200409	Apr 09, 2020		Soil	S20-Ap19221	X	X	X		X		X	X	X	X		X	X
40	COB_026_200407	Apr 07, 2020		Soil	S20-Ap19222	X	X	X		X		X	X	X	X		X	X
41	COB_027_200409	Apr 09, 2020		Soil	S20-Ap19223	X	X	X		X		X	X	X	X		X	X
42	COB_028_200409	Apr 09, 2020		Soil	S20-Ap19224	X	X	X		X		X	X	X	X		X	X
43	COB_029_200409	Apr 09, 2020		Soil	S20-Ap19225	X	X	X		X		X	X	X	X		X	X
44	COB_030_200	Apr 07, 2020		Soil	S20-Ap19226	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	407																	
45	QC100_200408	Apr 08, 2020		Soil	S20-Ap19227	X	X	X		X		X	X	X	X		X	X
46	QC101_200408	Apr 08, 2020		Soil	S20-Ap19228	X	X	X		X		X	X	X	X		X	X
47	QC102_200408	Apr 08, 2020		Soil	S20-Ap19229	X	X	X		X		X	X	X	X		X	X
48	QC300_200407	Apr 07, 2020		Water	S20-Ap19230											X		
49	QC301_200408	Apr 08, 2020		Water	S20-Ap19231											X		
50	QC302_200409	Apr 09, 2020		Water	S20-Ap19232										X			
51	PGM_007_200408	Apr 08, 2020		Swab	S20-Ap19233						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
52	PGM_013_200408	Apr 08, 2020		Swab	S20-Ap19234						X							
53	COB_003_200409	Apr 09, 2020		Swab	S20-Ap19235						X							
54	COB_005_200407	Apr 07, 2020		Swab	S20-Ap19236						X							
55	COB_007_200408	Apr 08, 2020		Swab	S20-Ap19237						X							
56	COB_008_200407	Apr 07, 2020		Swab	S20-Ap19238				X									
57	COB_011_200407	Apr 07, 2020		Swab	S20-Ap19239						X							
58	COB_012A_200409	Apr 09, 2020		Swab	S20-Ap19240						X							
59	COB_028_200	Apr 09, 2020		Swab	S20-Ap19241						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	409																	
60	COB_030_200407	Apr 07, 2020		Swab	S20-Ap19242						X							
61	PGM_016_200409	Apr 09, 2020		Soil	S20-Ap19243						X							
62	PGM_017_200409	Apr 09, 2020		Soil	S20-Ap19244						X							
63	COB_012_200407	Apr 07, 2020		Soil	S20-Ap19245						X							
64	COB_011_200407	Apr 09, 2020		Soil	S20-Ap19246	X	X	X		X		X	X	X	X		X	X
65	COB_031_200407	Apr 07, 2020		Swab	S20-Ap19349						X							
66	COB_018_200408	Apr 07, 2020		Swab	S20-Ap19350						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
67	QC400_200409	Apr 09, 2020		Swab	S20-Ap19351						X							
Test Counts						48	48	48	1	48	15	48	48	48	49	2	48	48

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Antimony	mg/kg	< 10			10	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Gold	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	117			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	107			70-130	Pass	
Arsenic	%	106			70-130	Pass	
Barium	%	104			70-130	Pass	
Beryllium	%	105			70-130	Pass	
Cadmium	%	108			70-130	Pass	
Chromium	%	107			70-130	Pass	
Copper	%	106			70-130	Pass	
Gold	%	108			70-130	Pass	
Iron	%	104			70-130	Pass	
Lead	%	108			70-130	Pass	
Manganese	%	105			70-130	Pass	
Mercury	%	110			70-130	Pass	
Nickel	%	107			70-130	Pass	
Silver	%	104			70-130	Pass	
Zinc	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	S20-Ap19188	CP	%	104			70-130	Pass	
Arsenic	S20-Ap19188	CP	%	103			70-130	Pass	
Beryllium	S20-Ap19188	CP	%	97			70-130	Pass	
Cadmium	S20-Ap19188	CP	%	107			70-130	Pass	
Chromium	S20-Ap19188	CP	%	109			70-130	Pass	
Copper	S20-Ap19188	CP	%	99			70-130	Pass	
Lead	S20-Ap19188	CP	%	119			70-130	Pass	
Manganese	S20-Ap19188	CP	%	87			70-130	Pass	
Mercury	S20-Ap19188	CP	%	114			70-130	Pass	
Nickel	S20-Ap19188	CP	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Silver	S20-Ap19188	CP	%	110			70-130	Pass	
Zinc	S20-Ap19188	CP	%	116			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	S20-Ap19193	CP	%	119			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	S20-Ap19204	CP	%	119			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	S20-Ap19220	CP	%	100			70-130	Pass	
Arsenic	S20-Ap19220	CP	%	99			70-130	Pass	
Barium	S20-Ap19220	CP	%	107			70-130	Pass	
Beryllium	S20-Ap19220	CP	%	95			70-130	Pass	
Cadmium	S20-Ap19220	CP	%	96			70-130	Pass	
Chromium	S20-Ap19220	CP	%	105			70-130	Pass	
Copper	S20-Ap19220	CP	%	103			70-130	Pass	
Lead	S20-Ap19220	CP	%	103			70-130	Pass	
Manganese	S20-Ap19220	CP	%	109			70-130	Pass	
Mercury	S20-Ap19220	CP	%	102			70-130	Pass	
Nickel	S20-Ap19220	CP	%	103			70-130	Pass	
Silver	S20-Ap19220	CP	%	98			70-130	Pass	
Zinc	S20-Ap19220	CP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	S20-Ap19229	CP	%	91			70-130	Pass	
Arsenic	S20-Ap19229	CP	%	88			70-130	Pass	
Barium	S20-Ap19229	CP	%	80			70-130	Pass	
Beryllium	S20-Ap19229	CP	%	89			70-130	Pass	
Cadmium	S20-Ap19229	CP	%	91			70-130	Pass	
Chromium	S20-Ap19229	CP	%	83			70-130	Pass	
Mercury	S20-Ap19229	CP	%	92			70-130	Pass	
Nickel	S20-Ap19229	CP	%	87			70-130	Pass	
Silver	S20-Ap19229	CP	%	92			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ap27244	NCP	%	13	14	6.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	S20-Ap19187	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	S20-Ap19187	CP	mg/kg	2.8	2.8	1.0	30%	Pass	
Barium	S20-Ap19187	CP	mg/kg	24	21	14	30%	Pass	
Beryllium	S20-Ap19187	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-Ap19187	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ap19187	CP	mg/kg	21	20	7.0	30%	Pass	
Copper	S20-Ap19187	CP	mg/kg	12	11	11	30%	Pass	
Gold	S20-Ap19187	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Iron	S20-Ap19187	CP	mg/kg	15000	10000	35	30%	Fail	Q15
Lead	S20-Ap19187	CP	mg/kg	7.6	6.8	10	30%	Pass	
Manganese	S20-Ap19187	CP	mg/kg	69	63	9.0	30%	Pass	
Mercury	S20-Ap19187	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ap19187	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Silver	S20-Ap19187	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Zinc	S20-Ap19187	CP	mg/kg	14	12	16	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	S20-Ap19192	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	S20-Ap19198	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	S20-Ap19198	CP	mg/kg	7.5	7.0	6.0	30%	Pass	
Barium	S20-Ap19198	CP	mg/kg	86	88	2.0	30%	Pass	
Beryllium	S20-Ap19198	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-Ap19198	CP	mg/kg	0.4	0.4	1.0	30%	Pass	
Chromium	S20-Ap19198	CP	mg/kg	30	28	5.0	30%	Pass	
Copper	S20-Ap19198	CP	mg/kg	250	230	7.0	30%	Pass	
Iron	S20-Ap19198	CP	mg/kg	21000	21000	4.0	30%	Pass	
Lead	S20-Ap19198	CP	mg/kg	130	130	3.0	30%	Pass	
Manganese	S20-Ap19198	CP	mg/kg	190	180	6.0	30%	Pass	
Mercury	S20-Ap19198	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ap19198	CP	mg/kg	11	10	8.0	30%	Pass	
Silver	S20-Ap19198	CP	mg/kg	0.3	0.3	2.0	30%	Pass	
Zinc	S20-Ap19198	CP	mg/kg	360	340	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	S20-Ap19202	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	S20-Ap19209	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	S20-Ap19209	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	S20-Ap19209	CP	mg/kg	2.9	3.2	9.0	30%	Pass	
Barium	S20-Ap19209	CP	mg/kg	55	62	12	30%	Pass	
Beryllium	S20-Ap19209	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-Ap19209	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ap19209	CP	mg/kg	17	20	13	30%	Pass	
Copper	S20-Ap19209	CP	mg/kg	42	48	13	30%	Pass	
Gold	S20-Ap19209	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Iron	S20-Ap19209	CP	mg/kg	16000	13000	22	30%	Pass	
Lead	S20-Ap19209	CP	mg/kg	25	20	22	30%	Pass	
Manganese	S20-Ap19209	CP	mg/kg	130	140	11	30%	Pass	
Mercury	S20-Ap19209	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ap19209	CP	mg/kg	6.4	7.2	12	30%	Pass	
Silver	S20-Ap19209	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Zinc	S20-Ap19209	CP	mg/kg	33	36	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	S20-Ap19219	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	S20-Ap19219	CP	mg/kg	4.9	5.8	16	30%	Pass	
Barium	S20-Ap19219	CP	mg/kg	110	120	14	30%	Pass	
Beryllium	S20-Ap19219	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-Ap19219	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ap19219	CP	mg/kg	20	24	18	30%	Pass	
Copper	S20-Ap19219	CP	mg/kg	73	89	20	30%	Pass	
Gold	S20-Ap19219	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Iron	S20-Ap19219	CP	mg/kg	23000	18000	24	30%	Pass	
Lead	S20-Ap19219	CP	mg/kg	26	31	15	30%	Pass	
Manganese	S20-Ap19219	CP	mg/kg	290	350	19	30%	Pass	
Mercury	S20-Ap19219	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Nickel	S20-Ap19219	CP	mg/kg	13	14	14	30%	Pass	
Silver	S20-Ap19219	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Zinc	S20-Ap19219	CP	mg/kg	72	83	14	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	S20-Ap19224	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	S20-Ap19228	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	S20-Ap19228	CP	mg/kg	21	19	7.0	30%	Pass	
Barium	S20-Ap19228	CP	mg/kg	45	44	3.0	30%	Pass	
Beryllium	S20-Ap19228	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-Ap19228	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ap19228	CP	mg/kg	30	28	6.0	30%	Pass	
Copper	S20-Ap19228	CP	mg/kg	1300	1200	7.0	30%	Pass	
Iron	S20-Ap19228	CP	mg/kg	44000	55000	24	30%	Pass	
Lead	S20-Ap19228	CP	mg/kg	160	150	5.0	30%	Pass	
Manganese	S20-Ap19228	CP	mg/kg	510	470	7.0	30%	Pass	
Mercury	S20-Ap19228	CP	mg/kg	1.3	1.3	4.0	30%	Pass	
Nickel	S20-Ap19228	CP	mg/kg	11	11	6.0	30%	Pass	
Silver	S20-Ap19228	CP	mg/kg	3.8	3.7	4.0	30%	Pass	
Zinc	S20-Ap19228	CP	mg/kg	110	110	5.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

EMM Consulting Pty Limited
Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Victoria Buchanan**

Report **713570-W**
Project name COBAR
Project ID J190278
Received Date Apr 14, 2020

Client Sample ID			**QC300_200407**	**QC301_200408**	**QC302_200409**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins Sample No.			**S20-Ap19230**	**S20-Ap19231**	**S20-Ap19232**
Date Sampled			**Apr 07, 2020**	**Apr 08, 2020**	**Apr 09, 2020**
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	0.001	mg/L	-	-	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	-
Cadmium	0.0002	mg/L	-	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	-
Chromium	0.001	mg/L	-	-	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	-
Copper	0.001	mg/L	-	-	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	-
Lead	0.001	mg/L	-	-	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	-
Mercury	0.0001	mg/L	-	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	-
Nickel	0.001	mg/L	-	-	< 0.001
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001	-
Zinc	0.005	mg/L	-	-	< 0.005
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Apr 21, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Apr 14, 2020	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	PGM_001_200408	Apr 08, 2020		Soil	S20-Ap19182	X	X	X		X		X	X	X	X		X	X
2	PGM_002_200408	Apr 08, 2020		Soil	S20-Ap19183	X	X	X		X		X	X	X	X		X	X
3	PGM_003_200408	Apr 08, 2020		Soil	S20-Ap19184	X	X	X		X		X	X	X	X		X	X
4	PGM_004_200408	Apr 08, 2020		Soil	S20-Ap19185	X	X	X		X		X	X	X	X		X	X
5	PGM_005_200408	Apr 08, 2020		Soil	S20-Ap19186	X	X	X		X		X	X	X	X		X	X
6	PGM_006_200409	Apr 09, 2020		Soil	S20-Ap19187	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
7	PGM_007_200408	Apr 08, 2020		Soil	S20-Ap19188	X	X	X		X		X	X	X	X		X	X
8	PGM_008_200408	Apr 08, 2020		Soil	S20-Ap19189	X	X	X		X		X	X	X	X		X	X
9	PGM_009_200408	Apr 08, 2020		Soil	S20-Ap19190	X	X	X		X		X	X	X	X		X	X
10	PGM_010_200408	Apr 08, 2020		Soil	S20-Ap19191	X	X	X		X		X	X	X	X		X	X
11	PGM_011_200408	Apr 08, 2020		Soil	S20-Ap19192	X	X	X		X		X	X	X	X		X	X
12	PGM_012_200409	Apr 09, 2020		Soil	S20-Ap19193	X	X	X		X		X	X	X	X		X	X
13	PGM_013_200408	Apr 08, 2020		Soil	S20-Ap19194	X	X	X		X		X	X	X	X		X	X
14	PGM_014_200	Apr 08, 2020		Soil	S20-Ap19195	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	408																	
15	PGM_015_200408	Apr 08, 2020		Soil	S20-Ap19196	x	x	x		x		x	x	x	x		x	x
16	COB_001_200409	Apr 09, 2020		Soil	S20-Ap19197	x	x	x		x		x	x	x	x		x	x
17	COB_002_200409	Apr 09, 2020		Soil	S20-Ap19198	x	x	x		x		x	x	x	x		x	x
18	COB_003_200409	Apr 09, 2020		Soil	S20-Ap19199	x	x	x		x		x	x	x	x		x	x
19	COB_004_200409	Apr 09, 2020		Soil	S20-Ap19200	x	x	x		x		x	x	x	x		x	x
20	COB_005_200407	Apr 07, 2020		Soil	S20-Ap19201	x	x	x		x		x	x	x	x		x	x
21	COB_006_200407	Apr 07, 2020		Soil	S20-Ap19202	x	x	x		x		x	x	x	x		x	x

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
22	COB_007_200408	Apr 08, 2020		Soil	S20-Ap19203	X	X	X		X		X	X	X	X		X	X
23	COB_008_200407	Apr 07, 2020		Soil	S20-Ap19204	X	X	X		X		X	X	X	X		X	X
24	COB_009_200407	Apr 07, 2020		Soil	S20-Ap19205	X	X	X		X		X	X	X	X		X	X
25	COB_010_200409	Apr 09, 2020		Soil	S20-Ap19206	X	X	X		X		X	X	X	X		X	X
26	COB_012A_200409	Apr 09, 2020		Soil	S20-Ap19208	X	X	X		X		X	X	X	X		X	X
27	COB_013_200407	Apr 07, 2020		Soil	S20-Ap19209	X	X	X		X		X	X	X	X		X	X
28	COB_014_200407	Apr 07, 2020		Soil	S20-Ap19210	X	X	X		X		X	X	X	X		X	X
29	COB_015_200	Apr 09, 2020		Soil	S20-Ap19211	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	409																	
30	COB_016_200409	Apr 09, 2020		Soil	S20-Ap19212	x	x	x		x		x	x	x	x		x	x
31	COB_017_200407	Apr 07, 2020		Soil	S20-Ap19213	x	x	x		x		x	x	x	x		x	x
32	COB_018_200408	Apr 08, 2020		Soil	S20-Ap19214	x	x	x		x		x	x	x	x		x	x
33	COB_019_200407	Apr 07, 2020		Soil	S20-Ap19215	x	x	x		x		x	x	x	x		x	x
34	COB_020_200407	Apr 07, 2020		Soil	S20-Ap19216	x	x	x		x		x	x	x	x		x	x
35	COB_021_200407	Apr 07, 2020		Soil	S20-Ap19217	x	x	x		x		x	x	x	x		x	x
36	COB_022_200407	Apr 07, 2020		Soil	S20-Ap19218	x	x	x		x		x	x	x	x		x	x

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
37	COB_023_200407	Apr 07, 2020		Soil	S20-Ap19219	X	X	X		X		X	X	X	X		X	X
38	COB_024_200407	Apr 07, 2020		Soil	S20-Ap19220	X	X	X		X		X	X	X	X		X	X
39	COB_025_200409	Apr 09, 2020		Soil	S20-Ap19221	X	X	X		X		X	X	X	X		X	X
40	COB_026_200407	Apr 07, 2020		Soil	S20-Ap19222	X	X	X		X		X	X	X	X		X	X
41	COB_027_200409	Apr 09, 2020		Soil	S20-Ap19223	X	X	X		X		X	X	X	X		X	X
42	COB_028_200409	Apr 09, 2020		Soil	S20-Ap19224	X	X	X		X		X	X	X	X		X	X
43	COB_029_200409	Apr 09, 2020		Soil	S20-Ap19225	X	X	X		X		X	X	X	X		X	X
44	COB_030_200	Apr 07, 2020		Soil	S20-Ap19226	X	X	X		X		X	X	X	X		X	X

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	407																	
45	QC100_200408	Apr 08, 2020		Soil	S20-Ap19227	X	X	X		X		X	X	X	X		X	X
46	QC101_200408	Apr 08, 2020		Soil	S20-Ap19228	X	X	X		X		X	X	X	X		X	X
47	QC102_200408	Apr 08, 2020		Soil	S20-Ap19229	X	X	X		X		X	X	X	X		X	X
48	QC300_200407	Apr 07, 2020		Water	S20-Ap19230											X		
49	QC301_200408	Apr 08, 2020		Water	S20-Ap19231											X		
50	QC302_200409	Apr 09, 2020		Water	S20-Ap19232										X			
51	PGM_007_200408	Apr 08, 2020		Swab	S20-Ap19233						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
52	PGM_013_200408	Apr 08, 2020		Swab	S20-Ap19234						X							
53	COB_003_200409	Apr 09, 2020		Swab	S20-Ap19235						X							
54	COB_005_200407	Apr 07, 2020		Swab	S20-Ap19236						X							
55	COB_007_200408	Apr 08, 2020		Swab	S20-Ap19237						X							
56	COB_008_200407	Apr 07, 2020		Swab	S20-Ap19238				X									
57	COB_011_200407	Apr 07, 2020		Swab	S20-Ap19239						X							
58	COB_012A_200409	Apr 09, 2020		Swab	S20-Ap19240						X							
59	COB_028_200	Apr 09, 2020		Swab	S20-Ap19241						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
	409																	
60	COB_030_20040 7	Apr 07, 2020		Swab	S20-Ap19242						X							
61	PGM_016_20040 9	Apr 09, 2020		Soil	S20-Ap19243						X							
62	PGM_017_20040 9	Apr 09, 2020		Soil	S20-Ap19244						X							
63	COB_012_20040 7	Apr 07, 2020		Soil	S20-Ap19245						X							
64	COB_011_20040 7	Apr 09, 2020		Soil	S20-Ap19246	X	X	X		X		X	X	X	X		X	X
65	COB_031_20040 7	Apr 07, 2020		Swab	S20-Ap19349						X							
66	COB_018_20040 8	Apr 07, 2020		Swab	S20-Ap19350						X							

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: COBAR
Project ID: J190278

Order No.: J190278
Report #: 713570
Phone: (07) 3648 1200
Fax:

Received: Apr 14, 2020 3:10 PM
Due: Apr 21, 2020
Priority: 5 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	CANCELLED	Gold	HOLD	Iron	Manganese	Silver	Metals M8	Metals M8 filtered	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271										X								
Sydney Laboratory - NATA Site # 18217						X	X	X	X		X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
67	QC400_200409	Apr 09, 2020		Swab	S20-Ap19351						X							
Test Counts						48	48	48	1	48	15	48	48	48	49	2	48	48

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			70-130	Pass	
Arsenic (filtered)	%	92			70-130	Pass	
Cadmium	%	102			70-130	Pass	
Cadmium (filtered)	%	95			70-130	Pass	
Chromium	%	100			70-130	Pass	
Chromium (filtered)	%	98			70-130	Pass	
Copper	%	100			70-130	Pass	
Copper (filtered)	%	100			70-130	Pass	
Lead	%	100			70-130	Pass	
Lead (filtered)	%	103			70-130	Pass	
Mercury	%	113			70-130	Pass	
Mercury (filtered)	%	99			70-130	Pass	
Nickel	%	101			70-130	Pass	
Nickel (filtered)	%	99			70-130	Pass	
Zinc	%	101			70-130	Pass	
Zinc (filtered)	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S20-Ap19543	NCP	%	110			70-130	Pass	
Cadmium (filtered)	S20-Ap19543	NCP	%	99			70-130	Pass	
Chromium (filtered)	S20-Ap19543	NCP	%	97			70-130	Pass	
Copper (filtered)	S20-Ap19543	NCP	%	88			70-130	Pass	
Lead (filtered)	S20-Ap19543	NCP	%	92			70-130	Pass	
Mercury (filtered)	S20-Ap19543	NCP	%	109			70-130	Pass	
Nickel (filtered)	S20-Ap19543	NCP	%	88			70-130	Pass	
Zinc (filtered)	S20-Ap19543	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ap17988	NCP	%	80			70-130	Pass	
Cadmium	S20-Ap17988	NCP	%	78			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	S20-Ap17988	NCP	%	79			70-130	Pass	
Copper	S20-Ap17988	NCP	%	79			70-130	Pass	
Lead	S20-Ap17988	NCP	%	78			70-130	Pass	
Mercury	S20-Ap17988	NCP	%	75			70-130	Pass	
Nickel	S20-Ap17988	NCP	%	80			70-130	Pass	
Zinc	S20-Ap17988	NCP	%	81			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

20/4/20

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 · BRISBANE 2 Byth Street Stafford QLD 4053 · GLADSTONE 46 Callemondah Drive Clinton QLD 4680 · MACKAY 78 Harbour Road Mackay QLD 4740 · MELBOURNE 2-4 Westall Road Springvale VIC 3171 · MUDGEE 1/29 Sydney Road Mudgee NSW 2850 · NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 · NOWRA 4/13 Geary Place North Nowra NSW 2541 · PERTH 10 Hod Way Malaga WA 6090 · SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 · TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 · WOLLONGONG 1/19-21 Ralph Black Dr, North Wollongong NSW 2500

CLIENT: EMM Consulting	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No (N/A)
OFFICE: SYD			Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
PROJECT: J190278 PROJECT NO.:	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	Random Sample Temperature on Receipt: 5.3 °C
PURCHASE ORDER: "	COUNTRY OF ORIGIN:	COC: (1) 2 3 4 5 6 7	Other comment:
PROJECT MANAGER: Victoria Buchanan CONTACT PH:		OF: (1) 2 3 4 5 6 7	

SAMPLER: Lachlan Lewis + Andrew Badham SAMPLER MOBILE: 0401 638 848	RELINQUISHED BY: L Lewis	RECEIVED BY: Sep	RELINQUISHED BY:	RECEIVED BY: JUSTIN
COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):				
Email Reports to (will default to PM if no other addresses are listed):	DATE/TIME: 14/4/20	DATE/TIME: 14/4/20 1430	DATE/TIME:	DATE/TIME: 14/4/20 7pm
Email Invoice to (will default to PM if no other addresses are listed):				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).			Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	8 Metals	Sb, Ba, Be, Fe, Mn, Ag, Au	Cr III Cr VI	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1 1	QC200_200408	8/4/20	S			X	X	X	
2 2	QC201_200408	"	S			X	X	X	
3 3	QC202_200408	"	S			X	X	X	
				TOTAL					

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 241680
Date Received: 27/04/2020
Time Received: 16:40
Received by: MT 16.9
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Environmental Division
Sydney
Work Order Reference
ES2012549
Telephone: + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

#AU04_Enviro_Sample_NSW

To: Alena Bounkeua
Subject: RE: *2 day TAT additional* - Report 713570 : Site COBAR (J190278)

From: Lachlan Lewis [mailto:llewis@emmconsulting.com.au]
Sent: Tuesday, 19 May 2020 8:25 AM
To: Alena Bounkeua
Cc: Victoria Buchanan
Subject: RE: Eurofins FINAL Test Results, Invoice - Report 713570 : Site COBAR (J190278)
Importance: High

EXTERNAL EMAIL*

Hi Alena,

I just called the lab about putting some samples on 48 hour TAT and was told to send you an email.

Could we please request sieving (250 um) and analysis (8 metals, Sb, Ba, Be, Fe, Mn, Ag, Au, CrIII/CrIV) of two samples on hold: PGM_016 and PGM_017? (48 hour TAT required)

Thank you,

Lachlan Lewis
Environmental Scientist

T 02 9493 9577
M 0401 638 848
www.emmconsulting.com.au

From: AlenaBounkeua@eurofins.com <AlenaBounkeua@eurofins.com>
Sent: Wednesday, 22 April 2020 12:57 PM
To: Victoria Buchanan <vbuchanan@emmconsulting.com.au>
Cc: emmconsulting@esdat.net; Lachlan Lewis <llewis@emmconsulting.com.au>
Subject: Eurofins FINAL Test Results, Invoice - Report 713570 : Site COBAR (J190278)

Please find attached results and invoice for your project in the subject header.

Kind Regards

Alena Bounkeua
Analytical Services Manager

Eurofins | Environment Testing
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 2 9900 8414
Mobile: +61 429 365 410
Email: AlenaBounkeua@eurofins.com
Website: environment.eurofins.com.au

EnviroNote 1098 - Melbourne PFAS Accreditation
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	EMM Consulting Pty Ltd
Attention	Lachlan Lewis

Sample Login Details

Your reference	J190278
Envirolab Reference	241680
Date Sample Received	27/04/2020
Date Instructions Received	27/04/2020
Date Results Expected to be Reported	04/05/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.9
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Antimony	Barium	Beryllium	Iron	Manganese	Silver	Gold*	Hexavalent Cr
QC200_200408	✓	✓	✓	✓	✓	✓	✓	✓
QC201_200408	✓	✓	✓	✓	✓	✓	✓	✓
QC202_200408	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**EMM Consulting Pty Limited**
Contact name:	Victoria Buchanan
Project name:	ADDITIONAL - COBAR
Project ID:	J190278
COC number:	Not provided
Turn around time:	2 Day
Date/Time received:	May 19, 2020 8:25 AM
Eurofins reference:	**720296**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Victoria Buchanan - vbuchanan@emmconsulting.com.au.

Note: A copy of these results will also be delivered to the general EMM Consulting Pty Limited email address.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 241680

Client Details

Client	EMM Consulting Pty Ltd
Attention	Lachlan Lewis
Address	188 Normanby Rd, SOUTHBANK, VIC, 3006

Sample Details

Your Reference	**J190278**
Number of Samples	3 Soil
Date samples received	27/04/2020
Date completed instructions received	27/04/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	04/05/2020
Date of Issue	04/05/2020
Reissue Details	This report replaces R00 created on 04/05/2020 due to: revised report with additional results.

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jaimie Loa-Kum-Cheung, Metals Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

Acid Extractractable metals in soil				
Our Reference		241680-1	241680-2	241680-3
Your Reference	UNITS	QC200_200408	QC201_200408	QC202_200408
Date Sampled		08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	30/04/2020	30/04/2020	30/04/2020
Date analysed	-	30/04/2020	30/04/2020	30/04/2020
Antimony	mg/kg	<7	<7	<7
Barium	mg/kg	6	6	110
Beryllium	mg/kg	<1	<1	<1
Iron	mg/kg	69,000	150,000	25,000
Manganese	mg/kg	410	480	420
Silver	mg/kg	2	18	<1
Gold*	mg/kg	<1	<1	<1
Arsenic	mg/kg	82	71	<4
Cadmium	mg/kg	2	3	<0.4
Chromium	mg/kg	20	20	17
Copper	mg/kg	720	26,000	110
Mercury	mg/kg	<0.1	0.4	<0.1
Nickel	mg/kg	9	11	6
Lead	mg/kg	400	1,100	32
Zinc	mg/kg	600	740	44

Hexavalent Cr				
Our Reference		241680-1	241680-2	241680-3
Your Reference	UNITS	QC200_200408	QC201_200408	QC202_200408
Date Sampled		08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil
Hexavalent Chromium, Cr^{6+}	mg/kg	<1	<1	<10
Trivalent Cr	mg/kg	20	20	17

Method ID	Methodology Summary
Inorg-024	Hexavalent Chromium (Cr6+) - determined colourimetrically. Waters samples are filtered on receipt prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.

QUALITY CONTROL: Acid Extractractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/04/2020	[NT]	[NT]	[NT]	[NT]	30/04/2020	[NT]
Date analysed	-			30/04/2020	[NT]	[NT]	[NT]	[NT]	30/04/2020	[NT]
Antimony	mg/kg	7	Metals-020	<7	[NT]	[NT]	[NT]	[NT]	104	[NT]
Barium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Beryllium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Iron	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
Manganese	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Silver	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Gold*	mg/kg	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Hexavalent Cr					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Hexavalent Chromium, Cr^{6+}	mg/kg	1	Inorg-024	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Trivalent Cr	mg/kg	1	Inorg-024	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Samples sieved through 250um sieve before analysis.

MISC_INORG_CRVI: Hexavalent Chromium PQL has been raised due to matrix interferences, samples were diluted and reanalysed however same results were achieved.

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: ADDITIONAL - COBAR
Project ID: J190278

Order No.: J190278
Report #: 720296
Phone: (07) 3648 1200
Fax:

Received: May 19, 2020 8:25 AM
Due: May 21, 2020
Priority: 2 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	Gold	Iron	Manganese	Silver	Metals M8	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271									X						
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	PGM_016_200409	Apr 09, 2020		Soil	S20-My26854	X	X	X	X	X	X	X	X	X	X
2	PGM_017_200409	Apr 09, 2020		Soil	S20-My26855	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2

eurofins | Environment Testing

Certificate of Analysis

EMM Consulting Pty Limited
Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Victoria Buchanan**

Report **720296-S**
Project name ADDITIONAL - COBAR
Project ID J190278
Received Date May 19, 2020

Client Sample ID			G01**PGM_016_200409**	G01**PGM_017_200409**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**S20-My26854**	**S20-My26855**
Date Sampled			**Apr 09, 2020**	**Apr 09, 2020**
Test/Reference	LOR	Unit		
Chromium (hexavalent)	1	mg/kg	< 1	< 1
Chromium (trivalent)	5	mg/kg	30	21
% Moisture	1	%	1.7	1.4
Heavy Metals				
Antimony	10	mg/kg	< 10	< 10
Arsenic	2	mg/kg	3.1	4.2
Barium	10	mg/kg	28	91
Beryllium	2	mg/kg	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	30	21
Copper	5	mg/kg	33	27
Gold	5	mg/kg	< 10	< 10
Iron	20	mg/kg	16000	14000
Lead	5	mg/kg	7.7	11
Manganese	5	mg/kg	110	69
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	6.5	6.2
Silver	0.2	mg/kg	< 0.2	< 0.2
Zinc	5	mg/kg	19	20

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chromium (speciated)			
Chromium (hexavalent)	Sydney	May 20, 2020	28 Days
- Method: In-house method E057.2			
Chromium (trivalent)	Sydney	May 19, 2020	28 Days
- Method: E043 /E057 Total Speciated Chromium			
Metals M8	Sydney	May 20, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	May 19, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			
Heavy Metals	Sydney	May 20, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: EMM Consulting Pty Limited
Address: Ground Floor, 20 Chandos Street
St Leonards
NSW 1590

Project Name: ADDITIONAL - COBAR
Project ID: J190278

Order No.: J190278
Report #: 720296
Phone: (07) 3648 1200
Fax:

Received: May 19, 2020 8:25 AM
Due: May 21, 2020
Priority: 2 Day
Contact Name: Victoria Buchanan

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Antimony	Barium	Beryllium	Gold	Iron	Manganese	Silver	Metals M8	Chromium (speciated)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271									X						
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	PGM_016_200409	Apr 09, 2020		Soil	S20-My26854	X	X	X	X	X	X	X	X	X	X
2	PGM_017_200409	Apr 09, 2020		Soil	S20-My26855	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Antimony	mg/kg	< 10			10	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Gold	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	72			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	103			70-130	Pass	
Arsenic	%	102			70-130	Pass	
Barium	%	101			70-130	Pass	
Beryllium	%	101			70-130	Pass	
Cadmium	%	101			70-130	Pass	
Chromium	%	103			70-130	Pass	
Copper	%	106			70-130	Pass	
Lead	%	104			70-130	Pass	
Manganese	%	104			70-130	Pass	
Mercury	%	107			70-130	Pass	
Nickel	%	106			70-130	Pass	
Silver	%	104			70-130	Pass	
Zinc	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	S20-My24666	NCP	%	114			70-130	Pass	
Arsenic	S20-My24666	NCP	%	115			70-130	Pass	
Barium	S20-My27973	NCP	%	122			70-130	Pass	
Beryllium	S20-My24666	NCP	%	106			70-130	Pass	
Cadmium	S20-My24666	NCP	%	119			70-130	Pass	
Chromium	S20-My24666	NCP	%	100			70-130	Pass	
Copper	S20-My24666	NCP	%	99			70-130	Pass	
Lead	S20-My27973	NCP	%	102			70-130	Pass	
Manganese	S20-My27973	NCP	%	108			70-130	Pass	
Mercury	S20-My24666	NCP	%	90			70-130	Pass	
Nickel	S20-My24666	NCP	%	106			70-130	Pass	
Silver	S20-My24666	NCP	%	117			70-130	Pass	
Zinc	S20-My27973	NCP	%	116			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	S20-My26854	CP	mg/kg	< 1	< 1	<1	30%	Pass	
% Moisture	S20-My26854	CP	%	1.7	1.9	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	S20-My21688	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	S20-My21688	NCP	mg/kg	20	12	50	30%	Fail	Q15
Barium	S20-My21688	NCP	mg/kg	52	67	24	30%	Pass	
Beryllium	S20-My21688	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-My21688	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My21688	NCP	mg/kg	38	36	7.0	30%	Pass	
Copper	S20-My21688	NCP	mg/kg	16	12	27	30%	Pass	
Lead	S20-My21688	NCP	mg/kg	16	15	5.0	30%	Pass	
Manganese	S20-My21688	NCP	mg/kg	38	49	25	30%	Pass	
Mercury	S20-My21688	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My21688	NCP	mg/kg	7.6	7.2	4.0	30%	Pass	
Silver	S20-My21688	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Zinc	S20-My21688	NCP	mg/kg	19	18	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix E

QAQC report

DATA QUALITY ASSURANCE AND QUALITY CONTROL REPORT

Project number:	J190278	**Site(s):**	Cobar
Client:	Aurelia Metals Ltd	**Matrix type:**	Soil
Samples collected:	COB_001_200409, COB_002_200409, COB_003_200409, COB_004_200409, COB_005_200407, COB_006_200407, COB_007_200408, COB_008_200407, COB_009_200407, COB_010_200409, COB_011_200407, COB_012_200407, COB_012A_200409, COB_013_200407, COB_014_200407, COB_015_200409, COB_016_200409, COB_017_200407, COB_018_200408, COB_019_200407, COB_020_200407, COB_021_200407, COB_022_200407, COB_023_200407, COB_024_200407, COB_025_200409, COB_026_200407, COB_027_200409, COB_028_200409, COB_029_200409, COB_030_200407, COB_031_200407, PGM_001_200408, PGM_002_200408, PGM_003_200408, PGM_004_200408, PGM_005_200408, PGM_006_200409, PGM_007_200408, PGM_008_200408, PGM_009_200408, PGM_010_200408, PGM_011_200408, PGM_012_200409, PGM_013_200408, PGM_014_200408, PGM_015_200408, PGM_016_200409, PGM_017_200409, QC100_200408, QC101_200408, QC102_200408, QC200_200408, QC201_200408, QC202_200408, QC300_200407, QC301_200408, QC302_200409, QC400_200409		
Matrix type:	Soil	**Laboratory:**	Eurofins (Primary) Envirolab (Secondary)
Sampling event:	Phase 1	**Lab reference:**	713570-S (Eurofins) 241680 (Envirolab)
Validation by:	Y Cheong	**Date:**	07/05/2020
Verification by:	C Murphy	**Date:**	19/05/2020

Field QA/QC	
Sampling personnel	Soil sampling was conducted by L Lewis from 07 April to 09 April 2020.
Sampling Methodology	Soil sampling was conducted with dust pan and brush.
Chain of Custody (COC)	Chain of custody documents were completed by EMM (L Lewis).
Analysis Request	Laboratory analysis request and sample receipt notification reviewed and approved by EMM.
Field Blanks (QC400)	One field blank was collected as part of this assessment from a swab of the motel shower screen. However, it was not analysed as no swab samples were analysed.
Rinsate Blanks *(QC300, QC301, QC302)*	Rinsate blank samples were collected at a frequency of one per day of sampling (three in total). The rinsate sample was collected from a dust pan and brush or via direct hand grab. Concentrations reported below the LOR for all analytes tested.
Trip Blanks	No trip blanks were included in this sampling event.
Trip Spikes	No trip spikes were analysed as part of this assessment.
Intra-laboratory duplicates *(QC100, QC101, QC102)* Interlaboratory duplicates (*QC200, QC201, QC202)*	Intra- and inter-laboratory field duplicate samples were collected at a minimum frequency of one per twenty primary samples (three of each in total for 49 primary samples collected).
Handling and preservation	All samples were received at the laboratories in appropriate sample containers. Samples were received preserved with attempt to chill at the primary laboratory with a recorded temperature of 8.9°C which is outside the recommended range (< 6°C). However, it is noted that the Contaminants of Potential Concern (CoPC) are not particularly prone to thermal desorption, so this is not expected to have a significant implication on data quality. Additionally, the samples were received appropriately preserved and were extracted within holding times. Inter-laboratory samples arrived at the secondary laboratory at an elevated temperature with an ice pack noted (16.9°Cthat the samples were received by another laboratory (ALS

DATA QUALITY ASSURANCE AND QUALITY CONTROL REPORT

Project number:	J190278	**Site(s):**	Cobar
Client:	Aurelia Metals Ltd	**Matrix type:**	Soil
Samples collected:	COB_001_200409, COB_002_200409, COB_003_200409, COB_004_200409, COB_005_200407, COB_006_200407, COB_007_200408, COB_008_200407, COB_009_200407, COB_010_200409, COB_011_200407, COB_012_200407, COB_012A_200409, COB_013_200407, COB_014_200407, COB_015_200409, COB_016_200409, COB_017_200407, COB_018_200408, COB_019_200407, COB_020_200407, COB_021_200407, COB_022_200407, COB_023_200407, COB_024_200407, COB_025_200409, COB_026_200407, COB_027_200409, COB_028_200409, COB_029_200409, COB_030_200407, COB_031_200407, PGM_001_200408, PGM_002_200408, PGM_003_200408, PGM_004_200408, PGM_005_200408, PGM_006_200409, PGM_007_200408, PGM_008_200408, PGM_009_200408, PGM_010_200408, PGM_011_200408, PGM_012_200409, PGM_013_200408, PGM_014_200408, PGM_015_200408, PGM_016_200409, PGM_017_200409, QC100_200408, QC101_200408, QC102_200408, QC200_200408, QC201_200408, QC202_200408, QC300_200407, QC301_200408, QC302_200409, QC400_200409		
Matrix type:	Soil	**Laboratory:**	Eurofins (Primary) Envirolab (Secondary)
Sampling event:	Phase 1	**Lab reference:**	713570-S (Eurofins) 241680 (Envirolab)
Validation by:	Y Cheong	**Date:**	07/05/2020
Verification by:	C Murphy	**Date:**	19/05/2020

Environmental) prior to their forwarding to Eurofins. The interim laboratory was unable to complete the required analysis and forwarded the samples following a sample extraction, which occurred before the inability to analyse the samples as required was communicated by the interim laboratory. It is noted that the inter-laboratory samples arrived at Eurofins on the 27 April 2020, 19 days after the samples were collected from the field. However, it is noted that the CoPC are not particularly prone to thermal desorption, so this is not expected to have a significant implication on data quality. Additionally, the inter-laboratory samples were received appropriately preserved and were extracted within holding times.

Laboratory QA/QC	
Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by Eurofins | Environment Testing (primary lab) and Envirolab Services Pty Ltd (secondary lab), both National Association of Testing Authorities (NATA) accredited laboratories.
Frequency of laboratory QC	The laboratories reported a sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, with the exception of: - Laboratory duplicates were not assessed for samples submitted to Envirolab; - Surrogate spikes were not assessed for samples submitted to Envirolab; and - Surrogate spikes were not assessed for samples submitted to Eurofins. As the samples passed all other laboratory QC, the lack of assessment of surrogate spikes for primary samples and surrogate spikes and laboratory duplicates for duplicate samples is not anticipated to affect the interpretation of the results.
Method Blank	Method blank concentrations were not detected above the LOR for all analytes.
Laboratory duplicate RPDs	Laboratory duplicate (LD) Relative Percentage Differences (RPD) (where reported) were within control limits for all analytes, with the exception of iron in one lab duplicate (Lab ID S20-Ap19187) which had an RPD of 35%, marginally above the RPD acceptance limit of 30%.
Laboratory control spike recovery	LCS recoveries were within control limits.

DATA QUALITY ASSURANCE AND QUALITY CONTROL REPORT

Project number:	J190278	**Site(s):**	Cobar
Client:	Aurelia Metals Ltd	**Matrix type:**	Soil
Samples collected:	COB_001_200409, COB_002_200409, COB_003_200409, COB_004_200409, COB_005_200407, COB_006_200407, COB_007_200408, COB_008_200407, COB_009_200407, COB_010_200409, COB_011_200407, COB_012_200407, COB_012A_200409, COB_013_200407, COB_014_200407, COB_015_200409, COB_016_200409, COB_017_200407, COB_018_200408, COB_019_200407, COB_020_200407, COB_021_200407, COB_022_200407, COB_023_200407, COB_024_200407, COB_025_200409, COB_026_200407, COB_027_200409, COB_028_200409, COB_029_200409, COB_030_200407, COB_031_200407, PGM_001_200408, PGM_002_200408, PGM_003_200408, PGM_004_200408, PGM_005_200408, PGM_006_200409, PGM_007_200408, PGM_008_200408, PGM_009_200408, PGM_010_200408, PGM_011_200408, PGM_012_200409, PGM_013_200408, PGM_014_200408, PGM_015_200408, PGM_016_200409, PGM_017_200409, QC100_200408, QC101_200408, QC102_200408, QC200_200408, QC201_200408, QC202_200408, QC300_200407, QC301_200408, QC302_200409, QC400_200409		
Matrix type:	Soil	**Laboratory:**	Eurofins (Primary) Envirolab (Secondary)
Sampling event:	Phase 1	**Lab reference:**	713570-S (Eurofins) 241680 (Envirolab)
Validation by:	Y Cheong	**Date:**	07/05/2020
Verification by:	C Murphy	**Date:**	19/05/2020

Matrix spike recovery	Matrix spike (MS) recoveries were within control limits.
Surrogate spike recovery	Surrogate spike recoveries (where reported) were within control limits.
Data Validation	
Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random check of the laboratory results identified no anomalies between the electronic data, the laboratory reports, and tables generated by EMM.
Limits of Reporting (LOR)	LORs were sufficiently low to enable assessment against adopted guideline criteria.
Intra-laboratory duplicate RPDs *(QC100, PGM_014_200408)* *(QC101, PGM_015_200408)* *(QC102, PGM_009_200408)*	Intra-laboratory duplicates RPDs were reported within control limits specified within the SAQP (≤50%) with the exception of the following: - QC100 (primary sample: PGM_014_200408): iron (63%). - QC101 (primary sample: PGM_015_200408): arsenic (164%), copper (75%), lead (69%), mercury (74%) and silver (145%). - QC102 (primary sample: PGM_009_200408): arsenic (87%), copper (84%). As per the SAQP, 80% of the compounds tested fall within the control limits (≤50%). For the inter-laboratory duplicates, 76% of the compounds tested fall within the control limits. Exceedances of the RPD are attributed to soil heterogeneity. For RPD exceedances of arsenic in QC102/PGM_009, copper and mercury concentrations were below the adopted assessment criteria by 1-2 order of magnitudes, confirming the absence of impacts. Concentrations of iron, which does not have criteria, were within the same order of magnitude. As a conservative measure, the highest reported concentrations have been used in the assessment.
Inter-laboratory duplicate RPDs (*QC200, PGM_001_200408)* (*QC201, PGM_005_200408)* (*QC202, PGM_007_200408)* For RPD exceedances of arsenic and lead, ##.	Intra-laboratory duplicates RPDs were reported within control limits specified within the SAQP (≤50%) with the exception of the following: - QC200 (primary sample: PGM_001_200408): cadmium (143%), copper (50%), lead (145%), manganese (59%), mercury (120%), nickel (88%) and zinc (135%). - - QC201 (primary sample: PGM_005_200408): arsenic (87%), barium (100%), chromium (trivalent) (55%), cadmium (57%), chromium (III+VI) (55%), lead (106%), manganese (68%), nickel (71%) and zinc (96%).

DATA QUALITY ASSURANCE AND QUALITY CONTROL REPORT

Project number:	J190278	**Site(s):**	Cobar
Client:	Aurelia Metals Ltd	**Matrix type:**	Soil
Samples collected:	COB_001_200409, COB_002_200409, COB_003_200409, COB_004_200409, COB_005_200407, COB_006_200407, COB_007_200408, COB_008_200407, COB_009_200407, COB_010_200409, COB_011_200407, COB_012_200407, COB_012A_200409, COB_013_200407, COB_014_200407, COB_015_200409, COB_016_200409, COB_017_200407, COB_018_200408, COB_019_200407, COB_020_200407, COB_021_200407, COB_022_200407, COB_023_200407, COB_024_200407, COB_025_200409, COB_026_200407, COB_027_200409, COB_028_200409, COB_029_200409, COB_030_200407, COB_031_200407, PGM_001_200408, PGM_002_200408, PGM_003_200408, PGM_004_200408, PGM_005_200408, PGM_006_200409, PGM_007_200408, PGM_008_200408, PGM_009_200408, PGM_010_200408, PGM_011_200408, PGM_012_200409, PGM_013_200408, PGM_014_200408, PGM_015_200408, PGM_016_200409, PGM_017_200409, QC100_200408, QC101_200408, QC102_200408, QC200_200408, QC201_200408, QC202_200408, QC300_200407, QC301_200408, QC302_200409, QC400_200409		
Matrix type:	Soil	**Laboratory:**	Eurofins (Primary) Envirolab (Secondary)
Sampling event:	Phase 1	**Lab reference:**	713570-S (Eurofins) 241680 (Envirolab)
Validation by:	Y Cheong	**Date:**	07/05/2020
Verification by:	C Murphy	**Date:**	19/05/2020

- QC202 (primary sample: PGM_007_200408): barium (164%), copper (71%), lead (32%) and zinc (31%).

As per the SAQP, 80% of the compounds tested fall within the control limits (≤50%). For the inter-laboratory duplicates, 61% of the compounds tested fall within the control limits.

Exceedances of the RPD are attributed to soil heterogeneity. It is noted that for all compounds, with the exception of iron, concentrations were higher in the results reported by the primary laboratory than those reported by the secondary laboratory. This indicates that concentrations reported by the primary laboratory are conservative.

Chromatograms

N/A

Comments

Based on EMM's review, it is considered that an acceptable degree of QAQC information has been collected and reported in accordance with EMM and the laboratory internal standard operating procedures. The assessment of field and laboratory QA/QC data indicated that the reported analytical results are representative of the conditions at the sample locations analysed and that the overall quality of the data produced is considered to be acceptably reliable for the purpose of this investigation. Despite the minor variations/outliers summarised above, the laboratory data are considered to provide and appropriate level of confidence in the accuracy, comparability, completeness and precision of the analytical results, and are considered suitable for interpretive use.

				Metals								
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Manganese	Mercury	Nickel	Zinc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.4	1	1	1	1	0.1	1	1
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil				3,000	900	3,600	240,000	1,500	60,000	730	6,000	400,000
NEPM 2013 Table 1A(1) HILs Rec C Soil				300	90		17,000	600	19,000	80	1,200	30,000
NEPM 2013 Table 1A(1) HILs Res A Soil				100	20	100	6,000	300	3,800	40	400	7,400
Lab Report Number	**Field ID**	**Date**	**Matrix Type**									
713570	**PGM_001_200408**	**8/04/2020**	**soil**	85	12	24	1,200	2,500	750	0.4	23	3,100
241680	**QC200_200408**	**8/04/2020**	**soil**	82	2	20	720	400	410	<0.1	9	600
RPD				4	143	18	50	145	59	120	88	135
713570	**PGM_005_200408**	**8/04/2020**	**soil**	180	5.4	35	30,000	3,600	980	0.9	23	2,100
241680	**QC201_200408**	**8/04/2020**	**soil**	71	3	20	26,000	1,100	480	0.4	11	740
RPD				87	57	55	14	106	68	77	71	96
713570	**PGM_007_200408**	**8/04/2020**	**soil**	4.9	<0.4	20	230	44	570	<0.1	7.6	60
241680	**QC202_200408**	**8/04/2020**	**soil**	<4	<0.4	17	110	32	420	<0.1	6	44
RPD				20	0	16	71	32	30	0	24	31
713570	**PGM_009_200408**	**8/04/2020**	**soil**	21	<0.4	21	140	95	170	<0.1	11	69
713570	**QC102_200408**	**8/04/2020**	**soil**	8.3	<0.4	35	57	62	170	<0.1	9.1	50
RPD				87	0	50	84	42	0	0	19	32
713570	**PGM_014_200408**	**8/04/2020**	**soil**	190	<0.4	16	570	320	350	0.5	19	140
713570	**QC100_200408**	**8/04/2020**	**soil**	230	<0.4	16	630	360	390	0.6	18	150
RPD				19	0	0	10	12	11	18	5	7
713570	**PGM_015_200408**	**8/04/2020**	**soil**	210	<0.4	15	590	330	360	0.6	17	130
713570	**QC101_200408**	**8/04/2020**	**soil**	21	<0.4	30	1,300	160	510	1.3	11	110
RPD				164	0	67	75	69	34	74	43	17

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL)**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

	Metals															
	Cadmium	Cadmium (filtered)	Arsenic	Arsenic (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.0002	0.0002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.005	0.005
Field ID	**Date**															
QC300_200407	**7/04/2020**		<0.0002		<0.001		<0.001		<0.001		<0.001		<0.0001		<0.001		<0.005
QC301_200408	**8/04/2020**		<0.0002		<0.001		<0.001		<0.001		<0.001		<0.0001		<0.001		<0.005
QC302_200409	**9/04/2020**	<0.0002		<0.001		<0.001		<0.001		<0.001		<0.0001		<0.001		<0.005	

Appendix F

Bioaccessibility report

University of South Australia

Determination of Pb and As Bioaccessibility in Impacted Soil

Prepared for: EMM Consulting Pty Ltd
Ground Floor, 20 Chandos St,
St Leonards, NSW, 2065

Attention: Victoria Buchanan
Telephone: 0404 052 041
Email: vbuchanan@emmconsulting.com.au

Prepared by: Dr Albert Juhasz
Future Industries Institute
University of South Australia
Mawson Lakes Boulevard
Mawson Lakes, SA 5095

Telephone: 08 8302 5045
Facsimile: 08 8302 3057
Email: Albert.Juhasz@unisa.edu.au

Date of issue: 21 May 2020

Table of Contents

INTRODUCTION

This report was prepared for EMM Consulting Pty Ltd to assess lead and arsenic bioaccessibility in impacted soil. The bioaccessibility testing was conducted at the Future Industries Institute, based at the Mawson Lakes Campus of the University of South Australia (UniSA). UniSA's Flagship Institute focuses on building knowledge and capacity in core research strengths of physical chemistry and environmental science and management. The Institute has four distinct yet inter-related strands: Minerals and Resources; Energy and Advanced Manufacturing; Environmental Science and Engineering; and Bioengineering and Nanomedicine. The Institute aggregates and builds upon existing expertise and infrastructure from the Ian Wark Research Institute, the Mawson Institute and the Centre for Environmental Risk Assessment and Remediation. The vision for the Future Industries Institute aligns strongly with South Australian and National economic and research priorities by building a critical mass of trans-disciplinary research capacity focused on pressing real-world challenges.

OBJECTIVES

The objective of this assessment was to:

- Assess the concentration of lead and arsenic in the < 2 mm and < 250 μm soil particle size fractions;
- Assess lead and arsenic bioaccessibility in the < 250 μm soil particle size fraction using the gastric phase of the SBRC assay;
- Assess lead bioaccessibility in the < 250 μm soil particle size fraction using the intestinal phase of the SBRC assay; and
- Calculate lead relative bioaccessibility in the < 250 μm soil particle size fraction.

OUTCOMES AND DELIVERABLES

The expected outcome from this assessment was:

- A report assessing the bioaccessibility of lead and arsenic in soil. The report was to include:
    - Assessment of lead and arsenic concentration in the < 2 mm and < 250 μm soil particle size fractions;
    - Assessment of lead arsenic bioaccessibility in the < 250 μm soil particle size fractions using an vitro method;
    - Methodology procedures; and
    - QA/QC protocols

PROJECT BACKGROUND

Soil testing was initiated at the invitation of EMM Consulting Pty Ltd for an assessment of lead and arsenic bioaccessibility in impacted soil. Human exposure to a contaminant may be through a number of pathways including inhalation, dermal absorption and ingestion. For many metal contaminants, the most significant metal exposure pathway is via soil ingestion. Generally, soil ingestion results from the accidental or, in the case of children less than 5 years old, the incidental ingestion of soil (< 250 µm particle size fraction) via hand-to-mouth contact (Basta et al., 2001). In assessing contaminant exposure, it is often assumed that the contaminant is 100% bioaccessible / bioavailable, however, there is growing evidence to suggest that contaminant bioaccessibility / bioavailability in soil may be less than 100%. Therefore, incorporation of metal bioaccessibility / bioavailability may reduce the uncertainty in estimating exposure associated with the incidental ingestion of contaminated soil.

Contaminant bioaccessibility may be estimated using *in vitro* assays that simulate processes that occur in the human body that lead to the release of contaminants from the soil matrix. A frequently used assay for the determination of contaminant bioaccessibility is the Solubility Bioaccessibility Research Consortium (SBRC) method (Kelly *et al.,* 2002). The gastric phase of this method (termed the Simplified Bioaccessibility Extraction Test [SBET] for arsenic or the Relative Bioavailability Leaching Procedure [RBALP] for lead) has been correlated to *in vivo* arsenic and lead relative bioavailability when determined using juvenile swine (Juhasz *et al*., 2007; USEPA 2007).

FINDINGS

Total lead and arsenic concentration for each sample is shown in Tables 1 and 2 while bioaccessibility results are shown in Tables 3-5 (lead) and 6-7 (arsenic).

Lead

- Total lead concentration in the < 2 mm soil particle size fraction ranged from 3.5 (COB005) to 1125 mg kg^{-1} (PGM005) (Table 1). In the < 250 µm soil particle size fraction, total lead concentration ranged from 8.0 (COB030) to 2000 mg kg^{-1} (PGM005) (Table 1).

- Lead bioaccessibility determined using gastric phase extraction (SBRC-G) ranged from 19.0 (PGM005) to 65.7% (COB010; Tables 3 and 5).

- When assays parameters were modified to reflect intestinal phase conditions (SBRC-I), lead bioaccessibility was reduced considerably, presumably as a result of re-adsorption of lead onto soil particles and / or precipitation at the neutral intestinal phase pH. Intestinal phase lead bioaccessibility was 2.9, 5.9 and 6.0% for COB001, COB010 and PGM005 respectively; percent values could not be calculated for other samples as Pb concentrations in intestinal phase solutions were below the level of reporting (Tables 4 and 5).

- For COB001, COB010 and PGM005, lead relative bioaccessibility (Rel-SBRC-I) was 27.6, 56.5 and 58.0% respectively. This value was calculated by adjusting the solubility of lead from contaminated soil by the solubility of lead acetate at the corresponding intestinal phase pH value (Table 5).

- Lead bioaccessibility for QC1 was elevated, however, it was within a suitable gastric phase extraction range for this reference material.

Arsenic

- Total arsenic concentration in the < 2 mm soil particle size fraction ranged from <4.0 (COB005, COB030) to 77.5 mg kg^{-1} (PGM005) (Table 2). In the < 250 µm soil particle size fraction, total arsenic concentration ranged from <4.0 (COB030) to 120 mg kg^{-1} (PGM005) (Table 2).

- Percent arsenic bioaccessibility for COB001 and PGM005 was 3.3 and 3.8% respectively; values could not be calculated for other COB samples as As concentrations in gastric phase solutions were below the level of reporting (Tables 6 and 7).

- Gastric phase arsenic bioaccessibility for QC1 was within a suitable range for this reference material.

Table 1. Total Pb concentration in the < 2 mm and < 250 µm soil particle size fractions.

Soil	ID #	< 2 mm soil particle size fraction		Sample #	< 250 µm soil particle size fraction	
		Pb (mg kg^{-1})	Mean Pb (mg kg^{-1})		Pb (mg kg^{-1})	Mean Pb (mg kg^{-1})
COB001	COB001-2A	85		COB001-250A	140	
	COB001-2B	60	72.5	COB001-250B	140	140
COB005	COB005-2A	4		COB005-250A	22	
	COB005-2B	3	3.5	COB005-250B	8	15.0
COB006	COB006-2A	14		COB006-250A	10	
	COB006-2B	13	13.5	COB006-250B	20	15.0
COB010	COB010-2A	83		COB010-250A	69	
	COB010-2B	64	73.5	COB010-250B	68	68.5
COB018	COB018-2A	28		COB018-250A	29	
	COB018-2B	28	28.0	COB018-250B	29	29.0
COB030	COB030-2A	5		COB030-250A	8	
	COB030-2B	4	4.5	COB030-250B	8	8.0
PGM005	PGM005-2A	1300		PGM005-250A	2100	
	PGM005-2B	950	1125	PGM005-250B	1900	2000

Table 2. Total As concentration in the < 2 mm and < 250 µm soil particle size fractions.

Soil	ID #	< 2 mm soil particle size fraction		Sample #	< 250 µm soil particle size fraction	
		As (mg kg^{-1})	Mean As (mg kg^{-1})		As (mg kg^{-1})	Mean As (mg kg^{-1})
COB001	COB001-2A	21		COB001-250A	32	
	COB001-2B	16	18.5	COB001-250B	29	30.5
COB005	COB005-2A	<4		COB005-250A	13	
	COB005-2B	<4	<4	COB005-250B	5	9.0
COB006	COB006-2A	7		COB006-250A	5	
	COB006-2B	7	7.0	COB006-250B	11	8.0
COB010	COB010-2A	7		COB010-250A	7	
	COB010-2B	6	6.5	COB010-250B	6	6.5
COB018	COB018-2A	4		COB018-250A	5	
	COB018-2B	5	4.5	COB018-250B	5	5.0
COB030	COB030-2A	<4		COB030-250A	<4	
	COB030-2B	<4	<4	COB030-250B	<4	<4
PGM005	PGM005-2A	110		PGM005-250A	110	
	PGM005-2B	45	77.5	PGM005-250B	130	120

Table 3. Lead bioaccessibility in contaminated soils determined using gastric phase extraction (SBRC-G).

Soil	Sample #	ICP-MS Pb (mg l^{-1})	Soil:Solution Ratio	Dilution	Gastric Phase Pb Bioaccessibility (mg kg^{-1})	Mean Gastric Phase Pb Bioaccessibility (mg kg^{-1})
COB001	COB001 G-A	0.060	100	10	60	
	COB001 G-B	0.060	100	10	60	60
COB005	COB005-G1	0.005	100	10	5.0	
	COB005-G2	0.006	100	10	6.0	5.5
COB006	COB006-G1	0.005	100	10	5.0	
	COB006-G2	0.006	100	10	6.0	5.5
COB010	COB010-G1	0.046	100	10	46	
	COB010-G2	0.044	100	10	44	45.0
COB018	COB018-G1	0.015	100	10	15	
	COB018-G2	0.015	100	10	15	15.0
COB030	COB030-G1	0.005	100	10	5.0	
	COB030-G2	0.005	100	10	5.0	5.0
PGM005	PGM005 G-A	0.370	100	10	370	
	PGM005 G-B	0.390	100	10	390	380
QC1†	QC1-G1*	6.1	100	10	6100	
	QC1-G1Ω	5.1	100	10	5100	5600
QC2‡	QC2-G1*	0.001	-	-	0.001	
	QC2-G1Ω	0.001	-	-	0.001	0.001

†QC1 comprised of a lead-contaminated (6400 mg Pb kg^{-1}) reference soil.
‡QC2 comprised of SBRC gastric phase solution without soil addition (assay blank).
*Data reported on 30/4/2020
ΩData reported on 20/5/2020

Table 4. Lead bioaccessibility in contaminated soils determined using intestinal phase extraction (SBRC-I).

Soil	Sample #	ICP-MS Pb (mg l^{-1})	Soil:Solution Ratio	Dilution	Intestinal Phase Pb Bioaccessibility (mg kg^{-1})	Mean Intestinal Phase Pb Bioaccessibility (mg kg^{-1})
COB001	COB001 I-A	0.004	100	10	4.0	
	COB001 I-B	0.004	100	10	4.0	4.0
COB005	COB005-I1	<0.001	100	10	<1.0	
	COB005-I2	<0.001	100	10	<1.0	<1.0
COB006	COB006-I1	<0.001	100	10	<1.0	
	COB006-I2	<0.001	100	10	<1.0	<1.0
COB010	COB010-I1	0.004	100	10	4.0	
	COB010-I2	0.004	100	10	4.0	4.0
COB018	COB018-I1	<0.001	100	10	<1.0	
	COB018-I2	<0.001	100	10	<1.0	<1.0
COB030	COB030-I1	<0.001	100	10	<1.0	
	COB030-I2	<0.001	100	10	<1.0	<1.0
PGM005	PGM005 I-A	0.130	100	10	130	
	PGM005 I-B	0.110	100	10	110	120
QC1†	QC1-I*	1.30	100	10	1300	
	QC1-IΩ	0.860	100	10	860	1080
QC2‡	QC2-I*	0.012	-	-	0.012	
	QC2-IΩ	0.005	-	-	0.005	0.009

†QC1 comprised of a lead-contaminated (6400 mg Pb kg^{-1}) reference soil.
‡QC2 comprised of SBRC gastric phase solution without soil addition (assay blank).
*Data reported on 30/4/2020
ΩData reported on 20/5/2020

Table 5. Total lead concentration and bioaccessible lead in contaminated soils (< 250 µm soil particle size fraction).

Soil	Total Pb (mg kg^{-1})	In vitro Phase	Pb Bioacc. (mg kg^{-1})	Pb Bioacc.‡ (%)
COB001	140	SBRC-G	60	42.9
		SBRC-I	4.0	2.9
		Rel-SBRC-I*	38.7	27.6
COB005	15.0	SBRC-G	5.5	36.7
		SBRC-I	<1.0	<6.7
		Rel-SBRC-I*	-†	-
COB006	15.0	SBRC-G	5.5	36.7
		SBRC-I	<1.0	<6.7
		Rel-SBRC-I	-	-
COB010	68.5	SBRC-G	45.0	65.7
		SBRC-I	4.0	5.9
		Rel-SBRC-I	38.7	56.5
COB018	29.0	SBRC-G	15.0	51.7
		SBRC-I	<1.0	<3.4
		Rel-SBRC-I	-	-
COB030	8.0	SBRC-G	5.0	62.5
		SBRC-I	<1.0	<12.5
		Rel-SBRC-I	-	-
PGM005	2000	SBRC-G	380	19.0
		SBRC-I	120	6.0
		Rel-SBRC-I	1160	58.0
QC1$^{\Omega}$	6400	SBRC-G	5600	87.5

‡Percentage lead bioaccessibility following gastric or gastrointestinal phase extraction was calculated by dividing the bioaccessible lead (SBRC-G or SBRC-I) by the total lead concentration multiplied by 100.

†Not determined

*Lead relative bioaccessibility was calculated by adjusting the solubility of lead from contaminated soil by the solubility of lead acetate at the corresponding intestinal phase pH value.

$^{\Omega}$Lead bioaccessibility for the QC1 soil was elevated, however, it was within a suitable gastric phase extraction range for this reference material.

Table 6. Arsenic bioaccessibility in contaminated soils determined using gastric phase extraction (SBRC-G).

Soil	Sample #	ICP-MS As (mg l^{-1})	Soil:Solution Ratio	Dilution	Gastric Phase As Bioaccessibility (mg kg^{-1})	Mean Gastric Phase As Bioaccessibility (mg kg^{-1})
COB001	COB001 G-A	0.001	100	10	1.0	
	COB001 G-B	0.001	100	10	1.0	1.0
COB005	COB005-G1	<0.001	100	10	<1.0	
	COB005-G2	<0.001	100	10	<1.0	<1.0
COB006	COB006-G1	<0.001	100	10	<1.0	
	COB006-G2	<0.001	100	10	<1.0	<1.0
COB010	COB010-G1	<0.001	100	10	<1.0	
	COB010-G2	<0.001	100	10	<1.0	<1.0
COB018	COB018-G1	<0.001	100	10	<1.0	
	COB018-G2	<0.001	100	10	<1.0	<1.0
COB030	COB030-G1	<0.001	100	10	<1.0	
	COB030-G2	<0.001	100	10	<1.0	<1.0
PGM005	PGM005 G-A	0.004	100	10	4.0	
	PGM005 G-B	0.005	100	10	5.0	4.5
QC1†	QC1-G*	0.19	100	10	190	
	QC1-G$^{\Omega}$	0.15	100	10	150	170
QC2‡	QC2-G*	<0.001	-	-	<0.001	
	QC2-G$^{\Omega}$	<0.001	-	-	<0.001	<0.001

†QC1 comprised of an arsenic-contaminated (740 mg As kg^{-1}) reference soil.
‡QC2 comprised of SBRC gastric phase solution without soil addition (assay blank).
*Data reported on 30/4/2020
$^{\Omega}$Data reported on 20/5/2020

Table 7. Total arsenic concentration and bioaccessible arsenic in contaminated soils (< 250 µm soil particle size fraction).

Soil	Arsenic		
	Total (mg kg^{-1})	Bioaccessible (mg kg^{-1})	Bioaccessible (%)‡
COB001	30.5	1.0	3.3
COB005	9.0	<1.0	<11.0
COB006	8.0	<1.0	<12.5
COB010	6.5	<1.0	<15.4
COB018	5.0	<1.0	<20.0
COB030	<4.0	<1.0	nd†
PGM005	120	4.5	3.8
QC1	740	170	23.0Ω

‡Percentage arsenic bioaccessibility following gastric phase extraction was calculated by dividing bioaccessible arsenic (SBRC-G) by the total arsenic concentration multiplied by 100.

†Not determined.

•Arsenic bioaccessibility for the QC1 soil was within a suitable range for this reference material for SBRC-G.

REFERENCES

Basta, N. T., Rodriguez, R. R., Casteel, S. W. (2001). Bioavailability and risk of arsenic exposure by the soil ingestion pathway. *In* W T Frankenberger Jr (ed): *Environmental Chemistry of Arsenic*. Marcel Dekker, New York, 2001, 117-139.

Kelly, M. E., Brauning, S. E., Schoof, R. A., Ruby, M. V. (2002). Assessing oral bioavailability of metals in soils. Batelle Memorial Institute, Ohio. pp 75-78.

Juhasz, A. L., Smith, E., Weber, J., Rees, M., Rofe, A., Kuchel, T., Sansom, L., Naidu, R. (2007). Comparison of in vivo and in vitro methodologies for the assessment of arsenic bioavailability in contaminated soils. *Chemosphere* **69**: 961-966.

USEPA (2007). *Estimation of relative bioavailability of lead in soil and soil-like material using in vivo and in vitro methods*; OSWER 9285.7-77, EPA: Washington, DC, 2007

CONFIDENTIALITY

We acknowledge the confidential nature of the results of this project and will treat the results and project reports with appropriate confidentiality and security.

APPENDIX 1 - METHODOLOGY

Soil samples

Samples supplied by EMM Consulting Pty Ltd were oven-dried at 105°C for 24 hours and sieved to obtain 2 soil particle size fractions; < 2 mm and < 250 µm. The < 250 µm soil particle size fraction was used to assess arsenic bioaccessibility.

Assessment of total Pb and As concentration in the < 2 mm and < 250 µm soil particle size fractions

Total lead and arsenic concentration in the < 2 mm and < 250 µm soil fractions were determined by EnviroLab. A copy of the EnviroLab analytical report is included in Appendix 3.

Assessment of Pb and As bioaccessibility in the < 250 µm soil particle size fraction

A frequently used assay for the determination of contaminant bioaccessibility is the Solubility Bioaccessibility Research Consortium (SBRC) method (Kelly *et al*., 2002). The gastric phase of this method (termed the Relative Bioavailability Leaching Procedure [RBALP] for lead) has been correlated to *in vivo* lead relative bioavailability when determined using juvenile swine (USEPA 2007). Contaminated soil and gastric solution (30.03 g l^{-1} glycine adjusted to pH 1.5 with concentrated HCl) were combined in polyethylene screw cap flasks at a soil:solution ratio of 1:100. The pH was noted then the flasks were incubated at 37°C, 40 rpm on a Ratek suspension mixer. After 1 hour incubation, the pH was determined and gastric phase samples (10 ml) were collected, filtered through 0.45 µm filters and analysed by ICP-MS by EnviroLab.

Following gastric phase dissolution, the gastric solution was modified to the intestinal phase by adjusting the pH from 1.5 to 6.5-7.0 using 5 or 50% NaOH and by the addition of bovine bile (1750 mg l^{-1}) and porcine pancreatin (500 mg l^{-1}). After a further 4 hours incubation, intestinal phase samples (10 ml) were collected, filtered through 0.45 µm filters and analysed by ICP-MS. Gastric and intestinal phase extractions were performed in duplicate for each soil sample. Arsenic bioaccessibility was calculated by dividing the gastric phase extractable arsenic by the total soil arsenic concentration. Lead bioaccessibility was calculated by dividing the gastric or intestinal phase extractable lead by the total soil lead concentration. Lead relative bioaccessibility was determined by adjusting the dissolution of lead from contaminated soils by the solubility of lead acetate at the corresponding pH value. All extracts were analysed by ICP-MS by ALS EnviroLab; a copy of the EnviroLab analytical report is included in Appendix 3.

QA/QC procedures

EnviroLab conducted the analysis for total and bioaccessible arsenic concentrations for all samples. EnviroLab is a NATA accredited laboratory for the chemical testing of environmental materials. Quality Control results are reported in Appendix 2. Two additional samples were included in bioaccessibility assays for quality assurance and quality control. The samples consisted of:

a. QC1 – Arsenic/lead-contaminated (740 mg As kg^{-1}, 6400 mg Pb kg^{-1}) reference soil.
b. QC2 – SBRC solution without soil addition (assay blank).

APPENDIX 2 – CHAIN OF CUSTODY FORMS

CHAIN OF CUSTODY FORM - Client

[Copyright and Confidential]

ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 | sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 9317 2505 | lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Client: Future Industries Institute, University of South Australia	Client Project Name/Number/Site etc (ie report title): EMM Pb_As
Contact Person: Albert Juhasz	
Project Mgr: Albert Juhasz	PO No.:
Sampler: Albert Juhasz	Envirolab Quote No. : 20SA003
Address: Future Industries Institute, University of South Australia Mawson Lakes Campus, SA, 5095	Date results required: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 08 8302 5045 Mob: 0418 818 121	Additional report format: esdat / equis /
Email: Albert.Juhasz@unisa.edu.au	Lab Comments:

Sample Information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Total As	Total Pb													Provide as much information about the sample as you can
1	COB005 2A		28/04/2020	soil	1	1													Samples are dried and sieved
2	COB005 2B		28/04/2020	soil	1	1													
3	COB005 250A		28/04/2020	soil	1	1													
4	COB005 250B		28/04/2020	soil	1	1													
5	COB006 2A		28/04/2020	soil	1	1													
6	COB006 2B		28/04/2020	soil	1	1													
7	COB006 250A		28/04/2020	soil	1	1													
8	COB006 250B		28/04/2020	soil	1	1													
9	COB010 2A		28/04/2020	soil	1	1													
10	COB010 2B		28/04/2020	soil	1	1													
11	COB010 250A		28/04/2020	soil	1	1													
12	COB010 250B		28/04/2020	soil	1	1													

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

ENVIROLAB
Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500

Job No: 20878
Date Received: 28/4/20
Time Received: 6:45
Received By: GS
Temp: Cool/Ambient 12.1
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (Company):		Received by (Company): ELS	*Lab Use Only*
Print Name:	Albert Juhasz	Print Name: Alex Stanly	Job number: / Cooling: Ice / Ice pack / None
Date & Time:	28/04/2020	Date & Time: 28/4/2020	Temperature: / Security seal: Intact / Broken / None
Signature:		Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

CHAIN OF CUSTODY FORM - Client

ENVIROLAB GROUP
National phone number 1300 424 344 .

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 | sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 9317 2505 | lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Client: Future Industries Institute, University of South Australia	Client Project Name/Number/Site etc (le report title): EMM Pb_As
Contact Person: Albert Juhasz	
Project Mgr: Albert Juhasz	PO No.:
Sampler: Albert Juhasz	Envirolab Quote No. : 20SA003
Address: Future Industries Institute, University of South Australia, Mawson Lakes Campus, SA, 5095	Date results required: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 08 8302 5045 Mob: 0418 818 121	Additional report format: esdat / equis /
Email: Albert.Juhasz@unisa.edu.au	Lab Comments:

Sample Information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or Information	Depth	Date sampled	Type of sample	Total As	Total Pb														Provide as much information about the sample as you can
13	COB018 2A		28/04/2020	soil	1	1														Samples are dried and sieved
14	COB018 2B		28/04/2020	soil	1	1														
15	COB018 250A		28/04/2020	soil	1	1														
16	COB018 250B		28/04/2020	soil	1	1														
17	COB030 2A		28/04/2020	soil	1	1														
18	COB030 2B		28/04/2020	soil	1	1														
19	COB030 250A		28/04/2020	soil	1	1														
20	COB030 250B		28/04/2020	soil	1	1														
21																				
22																				
23																				

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):		Received by (Company): ES	*Lab Use Only*
Print Name:	Albert Juhasz	Print Name: Alex Stenta	Job number: / Cooling: Ice / Ice pack / None
Date & Time:	28/04/2020	Date & Time: 28/4/2020	Temperature: / Security seal: Intact / Broken / None
Signature:		Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

CHAIN OF CUSTODY FORM - Client

[Copyright and Confidential]

ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 | sydney@envirolab.com.au

Porth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 9317 2505 | lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Client: Future Industries Institute, University of South Australia	Client Project Name/Number/Site etc (ie report title): EMM Pb_As
Contact Person: Albert Juhasz	
Project Mgr: Albert Juhasz	PO No.:
Sampler: Albert Juhasz	Envirolab Quote No. : 20SA003
Address: Future Industries Institute, University of South Australia Mawson Lakes Campus, SA, 5095	Date results required: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 08 8302 5045 Mob: 0418 818 121	Additional report format: esdat / equis /
Email: Albert.Juhasz@unisa.edu.au	Lab Comments:

Sample Information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Dissolved As (ICP-MS)	Dissolved Pb (ICP-MS)													Provide as much information about the sample as you can
21	COB005 G1		28/04/2020	water	1	1													Samples have been filtered
22	COB005 G2		28/04/2020	water	1	1													(0.45 um) and are ICP ready
23	COB005 I1		28/04/2020	water	-	1													
24	COB005 I2		28/04/2020	water	-	1													0.1 M nitric acid matrix
25	COB006 G1		28/04/2020	water	1	1													
26	COB006 G2		28/04/2020	water	1	1													
27	COB006 I1		28/04/2020	water	-	1													
28	COB006 I2		28/04/2020	water	-	1													
29	COB010 G1		28/04/2020	water	1	1													
30	COB010 G2		28/04/2020	water	1	1													
31	COB010 I1		28/04/2020	water	-	1													
32	COB010 I1		28/04/2020	water	-	1													

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):		Received by (Company): ELS	*Lab Use Only*
Print Name:	Albert Juhasz	Print Name: Alex Stanta	Job number: / Cooling: Ice / Ice pack / None
Date & Time:	28/04/2020	Date & Time: 28/4/2020	Temperature: / Security seal: Intact / Broken / None
Signature:		Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

CHAIN OF CUSTODY FORM - Client

[Copyright and Confidential]

ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 | sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 9317 2505 | lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Client: Future Industries Institute, University of South Australia	Client Project Name/Number/Site etc (ie report title): EMM Pb_As
Contact Person: Albert Juhasz	
Project Mgr: Albert Juhasz	PO No.:
Sampler: Albert Juhasz	Envirolab Quote No. : 20SA003
Address: Future Industries Institute, University of South Australia, Mawson Lakes Campus, SA, 5095	Date results required: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 08 8302 5045 Mob: 0418 818 121	Additional report format: esdat / equis /
Email: Albert.Juhasz@unisa.edu.au	Lab Comments:

Sample Information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or Information	Depth	Date sampled	Type of sample	Dissolved As (ICP-MS)	Dissolved Pb (ICP-MS)														Provide as much information about the sample as you can
33	COB018 G1		28/04/2020	water	1	1														Samples have been filtered
34	COB018 G2		28/04/2020	water	1	1														(0.45 um) and are ICP ready
35	COB018 I1		28/04/2020	water	-	1														
36	COB018 I2		28/04/2020	water	-	1														0.1 M nitric acid matrix
37	COB030 G1		28/04/2020	water	1	1														
38	COB030 G2		28/04/2020	water	1	1														
39	COB030 I1		28/04/2020	water	-	1														
40	COB030 I2		28/04/2020	water	-	1														
41	QC1-G		28/04/2020	water	1	1														
42	QC1-I		28/04/2020	water	1	1														
43	QC2-G		28/04/2020	water	1	1														
44	QC2-I		28/04/2020	water	1	1														

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):	Received by (Company): ECS	*Lab Use Only*	
Print Name: Albert Juhasz	Print Name: Alex Stanton	Job number:	Cooling: Ice / Ice pack / None
Date & Time: 28/04/2020	Date & Time: 28/4/2020	Temperature:	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

CHAIN OF CUSTODY FORM - Client

ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 | sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 9317 2505 | lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Client: Future Industries Institute, University of South Australia	Client Project Name/Number/Site etc (ie report title): EMM Pb_As 2
Contact Person: Albert Juhasz	
Project Mgr: Albert Juhasz	PO No.:
Sampler: Albert Juhasz	Envirolab Quote No. : 20SA003
Address: Future Industries Institute, University of South Australia Mawson Lakes Campus, SA, 5095	Date results required: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 08 8302 5045 Mob: 0418 818 121	Additional report format: esdat / equis /
Email: Albert.Juhasz@unisa.edu.au	Lab Comments:

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Total As	Total Pb														Provide as much information about the sample as you can
1	COB001 2A		14/05/2020	soil	1	1														Samples are dried and sieved
2	COB001 2B		14/05/2020	soil	1	1														
3	COB001 250A		14/05/2020	soil	1	1														
4	COB001 250B		14/05/2020	soil	1	1														
5	PGM005 2A		14/05/2020	soil	1	1														
6	PGM005 2B		14/05/2020	soil	1	1														
7	PGM005 250A		14/05/2020	soil	1	1														
8	PGM005 250B		14/05/2020	soil	1	1														

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):	Received by (Company): ECS	*Lab Use Only*
Print Name: Albert Juhasz	Print Name: GS	Job number: 21051 / Cooling: Ice / Ice pack / None
Date & Time: 14/05/2020	Date & Time: 15/5/20 9:30	Temperature: 6.4 / Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

CHAIN OF CUSTODY FORM - Client

[Copyright and Confidential]

ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
✆ 02 9910 6200 | ✉ sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
✆ 08 9317 2505 | ✉ lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
✆ 03 9763 2500 | ✉ melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
✆ 08 7087 6800 | ✉ adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
✆ 07 3266 9532 | ✉ brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
✆ 08 8967 1201 | ✉ darwin@envirolab.com.au

Client: Future Industries Institute, University of South Australia	Client Project Name/Number/Site etc (ie report title): EMM Pb_As 2
Contact Person: Albert Juhasz	
Project Mgr: Albert Juhasz	PO No.:
Sampler: Albert Juhasz	Envirolab Quote No. : 20SA003
Address: Future Industries Institute, University of South Australia Mawson Lakes Campus, SA, 5095	Date results required: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 08 8302 5045 Mob: 0418 818 121	Additional report format: esdat / equis /
Email: Albert.Juhasz@unisa.edu.au	Lab Comments:

Sample Information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Dissolved As (ICP-MS)	Dissolved Pb (ICP-MS)													Provide as much information about the sample as you can
9	COB001 G-A		14/05/2020	water	1	1													Samples have been filtered
10	COB001 G-B		14/05/2020	water	1	1													(0.45 um) and are ICP ready
11	COB001 I-A		14/05/2020	water	-	1													
12	COB001 I-B		14/05/2020	water	-	1													0.1 M nitric acid matrix
13	PGM005 G-A		14/05/2020	water	1	1													
14	PGM005 G-B		14/05/2020	water	1	1													
15	PGM005 I-A		14/05/2020	water	-	1													
16	PGM005 I-B		14/05/2020	water	-	1													
17	QC1-G		14/05/2020	water	1	1													
18	QC1-I		14/05/2020	water	1	1													
19	QC2-G		14/05/2020	water	1	1													
20	QC2-I		14/05/2020	water	1	1													

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):		Received by (Company):	*Lab Use Only*
Print Name:	Albert Juhasz	Print Name:	Job number: / Cooling: Ice / Ice pack / None
Date & Time:	14/05/2020	Date & Time:	Temperature: / Security seal: Intact / Broken / None
Signature:		Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

APPENDIX 3 – ANALYTICAL RESULTS AND QA/QC

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 20878

Client Details

Client	Future Industries Institute - University of SA
Attention	Albert Juhasz
Address	Future Industries Institute, X Building, MAWSON LAKES, SA, 5095

Sample Details

Your Reference	**EMM_Pb_As**
Number of Samples	20 Soil, 24 Water
Date samples received	29/04/2020
Date completed instructions received	29/04/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	05/05/2020
Date of Issue	30/04/2020
Reissue Details	This report supersedes 20878_R00 due to change in sample ID.

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris De Luca, Operations Manager

Authorised By

Pamela Adams, Laboratory Manager

Metal in soil						
Our Reference		20878-1	20878-2	20878-3	20878-4	20878-5
Your Reference	UNITS	COB005 2A	COB005 2B	COB005 250A	COB005 250B	COB006 2A
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	30/04/2020	30/04/2020	30/04/2020	30/04/2020	30/04/2020
Lead	mg/kg	4	3	22	8	14
Arsenic	mg/kg	<4	<4	13	5	7

Metal in soil						
Our Reference		20878-6	20878-7	20878-8	20878-9	20878-10
Your Reference	UNITS	COB006 2B	COB006 250A	COB006 250B	COB010 2A	COB010 2B
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	30/04/2020	30/04/2020	30/04/2020	30/04/2020	30/04/2020
Lead	mg/kg	13	10	20	83	64
Arsenic	mg/kg	7	5	11	7	6

Metal in soil						
Our Reference		20878-11	20878-12	20878-13	20878-14	20878-15
Your Reference	UNITS	COB010 250A	COB010 250B	COB018 2A	COB018 2B	COB018 250A
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	30/04/2020	30/04/2020	30/04/2020	30/04/2020	30/04/2020
Lead	mg/kg	69	68	28	28	29
Arsenic	mg/kg	7	6	4	5	5

Metal in soil						
Our Reference		20878-16	20878-17	20878-18	20878-19	20878-20
Your Reference	UNITS	COB018 250B	COB030 2A	COB030 2B	COB030 250A	COB030 250B
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	30/04/2020	30/04/2020	30/04/2020	30/04/2020	30/04/2020
Lead	mg/kg	29	5	4	8	8
Arsenic	mg/kg	5	<4	<4	<4	<4

HM in water - dissolved						
Our Reference		20878-21	20878-22	20878-23	20878-24	20878-25
Your Reference	UNITS	COB005 G1	COB005 G2	COB005 I1	COB005 I2	COB006 G1
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	<1	<1	[NA]	[NA]	<1
Lead-Dissolved	µg/L	5	6	<1	<1	5

HM in water - dissolved						
Our Reference		20878-26	20878-27	20878-28	20878-29	20878-30
Your Reference	UNITS	COB006 G2	COB006 I1	COB006 I2	COB010 G1	COB010 G2
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	<1	[NA]	[NA]	<1	<1
Lead-Dissolved	µg/L	6	<1	<1	46	44

HM in water - dissolved						
Our Reference		20878-31	20878-32	20878-33	20878-34	20878-35
Your Reference	UNITS	COB010 I1	COB010 I2	COB018 G1	COB018 G2	COB018 I1
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	[NA]	[NA]	<1	<1	[NA]
Lead-Dissolved	µg/L	4	4	15	15	<1

HM in water - dissolved						
Our Reference		20878-36	20878-37	20878-38	20878-39	20878-40
Your Reference	UNITS	COB018 I2	COB030 G1	COB030 G2	COB030 I1	COB030 I2
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	[NA]	<1	<1	[NA]	[NA]
Lead-Dissolved	µg/L	<1	5	5	<1	<1

HM in water - dissolved					
Our Reference		20878-41	20878-42	20878-43	20878-44
Your Reference	UNITS	QC1-G	QC1-I	QC2-G	QC2-I
Date Sampled		28/04/2020	28/04/2020	28/04/2020	28/04/2020
Type of sample		Water	Water	Water	Water
Date prepared	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020	29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	190	130	<1	<1
Lead-Dissolved	µg/L	6,100	1,300	1	12

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.

QUALITY CONTROL: Metal in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	20878-7
Date digested	-			29/04/2020	1	29/04/2020	29/04/2020		29/04/2020	29/04/2020
Date analysed	-			30/04/2020	1	30/04/2020	30/04/2020		30/04/2020	30/04/2020
Lead	mg/kg	1	Metals-020 ICP-AES	<1	1	4	3	29	101	101
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	1	<4	<4	0	103	102

QUALITY CONTROL: Metal in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date digested	-			[NT]	11	29/04/2020	29/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	30/04/2020	30/04/2020		[NT]	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	[NT]	11	69	64	8	[NT]	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	[NT]	11	7	7	0	[NT]	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	20878-23
Date prepared	-			29/04/2020	22	29/04/2020	29/04/2020		29/04/2020	29/04/2020
Date analysed	-			29/04/2020	22	29/04/2020	29/04/2020		29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	22	<1	<1	0	120	106
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	22	6	6	0	113	87

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	20878-42
Date prepared	-			[NT]	32	29/04/2020	29/04/2020		29/04/2020	29/04/2020
Date analysed	-			[NT]	32	29/04/2020	29/04/2020		29/04/2020	29/04/2020
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	[NT]	41	190	170	11	103	76
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	[NT]	32	4	4	0	98	#

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	41	29/04/2020	29/04/2020		[NT]	[NT]
Date analysed	-			[NT]	41	29/04/2020	29/04/2020		[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	[NT]	41	6100	5600	9	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

METALS: # Percent recovery is not possible to report due to the high concentration of Lead in the sample/s. However an acceptable recovery was obtained for the LCS.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 21051

Client Details

Client	Future Industries Institute - University of SA
Attention	Albert Juhasz
Address	Future Industries Institute, X Building, MAWSON LAKES, SA, 5095

Sample Details

Your Reference	**EMM Pb_As 2**
Number of Samples	8 Soil, 12 Water
Date samples received	15/05/2020
Date completed instructions received	15/05/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	21/05/2020
Date of Issue	20/05/2020

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris De Luca, Operations Manager

Authorised By

Pamela Adams, Laboratory Manager

Metal in soil						
Our Reference		21051-1	21051-2	21051-3	21051-4	21051-5
Your Reference	UNITS	COB001 2A	COB001 2B	COB001 250A	COB001 250B	PGM005 2A
Date Sampled		14/05/2020	14/05/2020	14/05/2020	14/05/2020	14/05/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020
Date analysed	-	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
Lead	mg/kg	85	60	140	140	1,300
Arsenic	mg/kg	21	16	32	29	110

Metal in soil				
Our Reference		21051-6	21051-7	21051-8
Your Reference	UNITS	PGM005 2B	PGM005 250A	PGM005 250B
Date Sampled		14/05/2020	14/05/2020	14/05/2020
Type of sample		Soil	Soil	Soil
Date digested	-	19/05/2020	19/05/2020	19/05/2020
Date analysed	-	20/05/2020	20/05/2020	20/05/2020
Lead	mg/kg	950	2,100	1,900
Arsenic	mg/kg	45	110	130

HM in water - dissolved						
Our Reference		21051-9	21051-10	21051-11	21051-12	21051-13
Your Reference	UNITS	COB001 G-A	COB001 G-B	COB001 I-A	COB001 I-B	PGM005 G-A
Date Sampled		14/05/2020	14/05/2020	14/05/2020	14/05/2020	14/05/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/05/2020	18/05/2020	18/05/2020	18/05/2020	18/05/2020
Date analysed	-	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020
Arsenic-Dissolved	µg/L	1	1	[NA]	[NA]	4
Lead-Dissolved	µg/L	60	60	4	4	370

HM in water - dissolved						
Our Reference		21051-14	21051-15	21051-16	21051-17	21051-18
Your Reference	UNITS	PGM005 G-B	PGM005 I-A	PGM005 I-B	QC1-G	QC1-I
Date Sampled		14/05/2020	14/05/2020	14/05/2020	14/05/2020	14/05/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/05/2020	18/05/2020	18/05/2020	18/05/2020	18/05/2020
Date analysed	-	19/05/2020	19/05/2020	19/05/2020	19/05/2020	19/05/2020
Arsenic-Dissolved	µg/L	5	[NA]	[NA]	150	130
Lead-Dissolved	µg/L	390	130	110	5,100	860

HM in water - dissolved			
Our Reference		21051-19	21051-20
Your Reference	UNITS	QC2-G	QC2-I
Date Sampled		14/05/2020	14/05/2020
Type of sample		Water	Water
Date prepared	-	18/05/2020	18/05/2020
Date analysed	-	19/05/2020	19/05/2020
Arsenic-Dissolved	µg/L	<1	<1
Lead-Dissolved	µg/L	1	5

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.

QUALITY CONTROL: Metal in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	21051-5
Date digested	-			19/05/2020	4	19/05/2020	19/05/2020		19/05/2020	19/05/2020
Date analysed	-			20/05/2020	4	20/05/2020	20/05/2020		20/05/2020	20/05/2020
Lead	mg/kg	1	Metals-020 ICP-AES	<1	4	140	140	0	96	71
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	4	29	32	10	104	75

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	21051-10
Date prepared	-			18/05/2020	9	18/05/2020	18/05/2020		18/05/2020	18/05/2020
Date analysed	-			19/05/2020	9	19/05/2020	19/05/2020		19/05/2020	19/05/2020
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	9	1	1	0	115	99
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	9	60	61	2	110	111

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	18/05/2020	18/05/2020		[NT]	[NT]
Date analysed	-			[NT]	19	19/05/2020	19/05/2020		[NT]	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	[NT]	19	<1	<1	0	[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	[NT]	19	1	<1	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

ASIA PACIFIC OFFICES

BRISBANE
Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CANBERRA
GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN
Unit 5, 21 Parap Road
Parap NT 0820
Australia
T: +61 8 8998 0100
F: +61 8 9370 0101

GOLD COAST
Level 2, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY
21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE
Suite 2, 2 Domville Avenue
Hawthorn VIC 3122
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE
10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

PERTH
Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

SYDNEY
2 Lincoln Street
Lane Cove NSW 2066
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TOWNSVILLE
Level 1, 514 Sturt Street
Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

TOWNSVILLE SOUTH
12 Cannan Street
Townsville South QLD 4810
Australia
T: +61 7 4772 6500

WOLLONGONG
Level 1, The Central Building
UoW Innovation Campus
North Wollongong NSW 2500
Australia
T: +61 404 939 922

AUCKLAND
68 Beach Road
Auckland 1010
New Zealand
T: +64 27 441 7849

NELSON
6/A Cambridge Street
Richmond, Nelson 7020
New Zealand
T: +64 274 898 628