APPENDIX 3 EIL CALCULATIONS

Inputs	
Select contaminant from list below	
As	
Below needed to calculate fresh and aged	
ACLs	
Polow pooded to coloulate freeh and area	
ABCs	
or for fresh ABCs only	
of for fresh Abos only	
or for aged ABCs only	

Out	puts		
Land use	Arsenic generic EILs		
	(mg contaminant/kg dry soil)		
	Fresh	Aged	
National parks and areas of high conservation value	20	40	
Urban residential and open public spaces	50	100	
Commercial and industrial	80	160	

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged
ACLs
Enter % clay (values from 0 to 100%)
4
Below needed to calculate fresh and aged
ADUS
Measured background concentration
(mg/kg) Leave blank if no measured value
(ing/kg). Leave blank in no measured value
or for freeh ABCe only
Enter iron content (agua regia method)
(values from 0 to 50%) to obtain estimate
of background concentration
7
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

I

Out	puts		
Land use	Cr III soil-s	pecific EILs	
	(mg contaminant/kg dry soil)		
	Fresh	Aged	
National parks and areas of high conservation value	110	100	
Urban residential and open public spaces	190	300	
Commercial and industrial	270	500	



n	١	٨	,	

Out	puts		
Land use	Cu soil-specific EILs		
	(mg contaminant/kg dry soil)		
	Fresh	Aged	
National parks and areas of high conservation value	70	85	
Urban residential and open public spaces	120	220	
Commercial and industrial	180	310	

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged
ACLs
Enter cation exchange capacity (silver
thiourea method) (values from 0 to 100
cmolc/kg dwt)
13
Below needed to calculate fresh and aged ABCs
Measured background concentration
(mg/kg). Leave blank if no measured value
(
or for fresh ABCs only
Enter from Content (aqua regia method)
of background concentration
7
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

2	a		

Out	puts	
Land use	Ni soil-sp	ecific EILs
	(mg contaminant	/kg dry soil)
	Fresh	Aged
National parks and areas of high conservation value	35	40
Urban residential and open public spaces	90	200
Commercial and industrial	150	350

Inputs	
Select contaminant from list below	
Pb	
Below needed to calculate fresh and aged	
ACLs	
Bolow pooded to calculate fresh and aged	
ABCs	
-	
or for fresh ABCs only	
of for fresh Abos only	
or for aged ABCs only	
or for agen Abos only	

Out	puts		
Land use	Lead generic EILs		
	(mg contaminant	/kg dry soil)	
	Fresh	Aged	
National parks and areas of high conservation value	110	470	
Urban residential and open public spaces	270	1100	
Commercial and industrial	440	1800	

Inputs
Select contaminant from list below
Zn Delew readed to celevite freeh and area
Below needed to calculate fresh and aged
Enter cation exchange capacity (silver
thiourea method) (values from 0 to 100
cmolc/kg dwt)
č ,
13
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.4
Below needed to calculate fresh and aged
ABCs
Measured background concentration
(md/kd). Leave blank if no measured value
(
(
or for fresh ABCs only
or for fresh ABCs only Enter iron content (aqua regia method)
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 7
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 7
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 7 or for aged ABCs only
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 7 or for aged ABCs only Enter State (or closest State)
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 7 or for aged ABCs only Enter State (or closest State) NSW
or for fresh ABCs only Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 7 or for aged ABCs only Enter State (or closest State) NSW Enter traffic volume (high or low)

low

Outputs								
Land use	Zn soil-sp	ecific EILs						
	(mg contaminant	/kg dry soil)						
	Fresh	Aged						
National parks and areas of high conservation value	80	190						
Urban residential and open public spaces	220	570						
Commercial and industrial	340	850						

APPENDIX 4 CALIBRATION CERTIFICATES



Certificate of Calibration

Revision Date: September 2014

Serial Number: <u>58027</u> Resolution: Shaping 20 <u>178.1</u>

 Model:
 XL3t 500
 Software:
 8.4J.14

 Escale:
 Shaping 20
 7.31
 Source:
 Tube

Date of Q.C.: <u>22-January-2021</u> Inspector: <u>Dave S</u> Calibration type: <u>Empirical</u>

60 second analysis time per filter, all switched on Elements that are in BLUE BOLD should be detected

Elements not in BLUE BOLD need not be detected but record if present

NIST HIGH 2710	Certified	Low	High	Measured	Err	Pass	<lod?< th=""></lod?<>
Ba	707	507	978	750.79	44.7	ОК	
Cs	107	0	400	66.34	9.93	ОК	
Te	NR	-300	300	103.85	35.58	ОК	
Sb	38.4	-100	110	50.1	11.87	OK	
Sn	NR	-100	100	68.46	15.1	OK	
Ag	35.3	0	60	36.47	5.46	OK	
Pd	NR	-70	70	4.99	7.46	OK	< LOD
Mo	19	0	30	18.83	5.37	OK	
Zr	NR	000	000	119.4	7.66		
Sr U	25	10	40	26.78	9.01	OK	
Rb	120	80	160	122.88	7.91	OK	
Th	13	-80	80	47.98	20.9	OK	
Pb	5532	5400	5832	5535.76	80.74	OK	
Se	NR 626	-30	30	-13.39	66.1	OK	< LOD
Ha	32.6	0	50	35.6	13.7	OK	
Au		-20	25	-4.9	12.1	OK	< LOD
Zn	6952	6700	7250	6897.2	113.5	OK	
W Cu	93	2700	400	107.4	91.5	OK	< LOD
Ni	14.3	0	105	57.80	38.44	OK	
Co	10	-270	270	-114.31	129.99	OK	< LOD
Fe	33800	30420	37180	36881.7	493.11	OK	
Mn	10100	9500	12000	9869.4	304.3	OK	
UF V	76.6	-100	300	94 94	23.01	OK	
Ti	2830	2260	3500	2738.68	148.73	OK	
Sc	8.7	-160	160	41.05	29.23	OK	< LOD
Ca	12500	8000	17000	10337.2	310.70	OK	
K S	21100	16100	26100	20173.3	584.76	OK	
	2400	- 1-0000	1-0000		1170.01	JA	
NIST LOW 2709	Certified	Low	High	Measured	Err	Pass	<lod?< td=""></lod?<>
Ba	968	638	1238	773.93	39.45	ОК	
Cs	5.3	-300	300	24.32	8.54	ОК	
Te	NR	-300	300	11.22	30.74	ОК	< LOD
Sb	7.9	-90	100	-2.63	9.98	OK	< LOD
Cd	0.38	-100	60	24.37	5.37	OK	<1.00
Ag	0.41	-40	40	-4.23	3.92	OK	< LOD
Pd	NR	-60	60	-0.87	6.41	OK	< LOD
Mo	2	-10	10	2.25	4.38	OK	< LOD
2r Sr	231	120	300	216.95	7.08	OK	
U	3	-80	80	2.81	7.76	OK	< LOD
Rb	96	76	115	80.10	5.28	OK	
In Ph	11	-80	80	14.58	4.90	OK	<1.00
Se	1.57	-30	30	-8.11	3.08	OK	<lod< td=""></lod<>
As	17.7	0	35	7.87	5.31	OK	< LOD
Hg	1.4	-10	10	6.8	6.2	OK	< LOD
Au	106	-15	15	-3.9	3.8	OK	< LOD
W	2	-80	80	26.52	37.16	OK	<1.0D
Cu	34.6	0	60	46.23	17.86	OK	
Ni	88	0	125	61.48	30.06	OK	
Co	13.4	-250	280	63.2	103.68	OK	< LOD
Mn	538	25000	700	29367.32	379.49 69.8	OK	
Cr	130	30	200	134.7	23.2	OK	
V	112	-300	400	147.6	47.4	OK	
Ti	3420	2700	4400	3532.2	149.7	OK	
Sc	NR 18000	-250	250	0.5	33.6	OK	< LOD
K	20300	15300	25300	18618.7	514.8	OK	
S	890	-150000	150000	1359.3	848.8	OK	
					_		
GBW 07411	Certified	Low	High	Measured	Err 42.01	Pass	<lod?< td=""></lod?<>
Cs	9	-457	457	41.69	9.59	OK	
Te	NR	-300	300	69.67	34.56	OK	
Sb	9	-80	100	21.32	11.36	OK	
Sin C.d	NR 28	-120	120	32 57	15.06	OK	
Aq	5	-35	47	7.17	4.65	OK	
Pď	NR	-60	60	-6.54	6.89	ОК	< LOD
Mo	2	-9	9	3.41	5.06	OK	< LOD
2r	192	25	359	197.95	6.47	OK	
U	3	-19	19	3.08	9.45	OK	< LOD
Rb	111	61	120	104.29	6.86	OK	
Th	13	-18	45	31.63	15.04	OK	
Se	1	-10	15	-14.91	5.17	OK	< LOD
As	205	127	283	173.88	44.57	OK	
Hg	0	-10	50	-1.50	9.71	OK	< LOD
Au	3900	-10	15	-3.55	8.47	OK	< LOD
W	7	-184	184	56.35	70.80	OK	< LOD
Cu	65	42	80	63.08	23.00	ОК	
Ni	24	-35	117	47.64	37.50	OK	< LOD
Co Fo	12	-232	232	26.86	13.74	OK	
Mn	9700	4561	10643	9657.5	298.6	OK	
Cr	60	-317	380	48.0	27.9	OK	
V	89	-325	380	157.4	60.9	OK	
Sc	4100 11	-300	300	4409.4	51.6	OK	<100
Ca		0	365000	30755.6	562.5	OK	
K		0	25000	17988.9	625.9	ОК	
<u> </u>		16000	16000	4000 1	10115	C ¹¹	

SiO2 (Blank)	Expected**	Low	High	Measured	Frr	Page	
Ba	0	-200	200	-51.62	29.91	0K	
Ce	0	-260	260	-11 24	7 15	OK	<lod< td=""></lod<>
Te	0	-200	200	2.05	26.09	OK	
1e Sh	0	-220	220	-2.05	20.00	OK	
Sn	0	-120	70	-2.29	-0.63	OK	< LOD
Cd	0	-120	50	-0.63	-0.03	OK	<1.0D
An	0	-30	30	-0.45	3.42	OK	<100
Pd	0	-50	50	-7.38	5.28	OK	< LOD
Mo	0	-10	10	1.79	3.44	OK	< LOD
Zr	0	-10	10	1.04	2.03	ок	< LOD
Sr	0	-10	10	-2.02	1.27	OK	< LOD
U	0	-10	10	1.44	3.71	OK	< LOD
Rb	<210	-10	210	0.3	1.5	OK	< LOD
Th	0	-10	10	-1.49	2.65	OK	< LOD
Pb	0	-10	10	-2.69	4.75	OK	< LOD
Se	0	-20	20	-7.97	2.08	OK	< LOD
As	0	-10	10	0.16	3.48	OK	< LOD
Hg	0	-10	10	1.13	4.22	OK	< LOD
Au	0	-10	10	-0.85	5.04		
W	0	-60	60	-17.24	25.51	OK	
Cu	0	-00	20	-7.10	11 47	OK	<100
Ni	0	-70	70	-3.66	18.81	OK	< LOD
Co	0	-50	50	10.52	11.75	OK	< LOD
Fe	0	-50	50	24.42	24.31	OK	< LOD
Mn	0	-100	300	-4.34	26.65	ОК	< LOD
Cr	0	-120	120	-1.18	10.03	ок	< LOD
V	0	-160	160	-1.44	8.2	OK	< LOD
Ti	0	-700	700	20.26	19.81	OK	< LOD
Sc	0	-100	100	-0.67	2.84	OK	< LOD
Ca	0	-2000	2000	8.49	18.84	OK	< LOD
к	0	-3000	3000	22.65	59.66	OK	< LOD
S	0	-140000	140000	54.49	252.46	OK	< LOD
				1	_	-	1 .
RCRA	Expected**	Low	High	Measured	Err	Pass	<lod?< td=""></lod?<>
Ba				617.83	43.17		
Cs				64.1	9.73		
Te				93.04	34.99		
Sb	0	0	0	27.56	12.3		
Sn	0	0	0	71.83	15.91		
Cd	500	400	600	513.41	13.01	OK	
Ag	500	400	600	515.93	12.21	OK	
Pd				22.32	8.89		
Mo				-0.98	4.92		
Zr				237.69	8.29		
Sr	NA			189.08	7.31	-	
U	NA			4.56	8.72		
Th	11/4			15.37	7.86		
Ph	500	400	600	486.81	27.88	OK	
Se	500	400	600	508.08	20.02	OK	
As	500	400	600	442.62	26.36	OK	
Ha	NA			5.37	8.26		
Au				-4.51	15.21		
Zn	NA			36.41	14.1		
W				57.53	45.16		
Cu	NA			38.47	20.27		
Ni	NA			54.52	36.45		
Co	NA			210.39	148.51		
Fe	NA			49329.11	539.57		
NIN (NA 500			827.95	102.55		
	500			400.56	52.15		
V Ti				2954 77	167.52		
Sc.				28.81	47.17		
Ca				31567.24	513.3		
ĸ				19100.98	578.1		
S				1934.88	1053.81		
·	·	·					
DL1a	Certified	Low	Hiah	Measured	Err	Pass	<lod?< td=""></lod?<>
Ba	ND			214.82	33.44		
Cs	ND			-1.08	7.71		
Te	ND			-10.6	27.91		
Sb	ND			-7.93	9.07		
Sn	ND			4.64	11.55		
Cd	ND			-4.42	4.93		
Ag	ND			-4.45	3.57		
Pd				-4.09	5.75		
710				4.99	4.17		
21 Sr				13 92	+.03		
	116	93	140	113 78	10.99	0K	1
Rb	ND			94.05	5.97	JI	
Th	76	60	92	66.57	7.24	ОК	1
Pb	ND			58.15	9.12		
Se	ND			-11.50	2.71		
As	ND			-2.38	6.61		1
Hg	ND			5.2	5.4		
Au	ND			0.8	4.1		
Zn	ND			23.25	10.13		
W	ND			15.20	31.72		
Cu	ND	-		9.45	13.95		-
Ni	ND			19.13	23.59		
0	ND 0000			/0.48	44.85		
Mo	3000			0024.24 40.0	37.2		
ivin Cr				49.0	31.2		
V	ND	-	-	28.4	20.6		1
Ťi	900			949.3	63.4		1
Sc	ND	l		7.0	9.7		1
Ca	3000			2401.7	120.0		
Ca K	3000 2000			2401.7 23718.5	120.0 403.9		



Certificate of Calibration

Serial Number: <u>58027</u> Resolution: Shaping 20 <u>178.1</u>

 Model:
 XL3t 500
 Software:
 8.4J.14

 Escale:
 Shaping 20
 7.31
 Source:
 Tube

Date of Q.C.: <u>22-January-2021</u> Inspector: <u>Dave S</u> Calibration type: <u>Empirical</u>

60 second analysis time per filter, all switched on

Elements that are in BLUE BOLD should be detected

Elements not in BLUE BOLD need not be detected but record if present

TILLA	Certified	Low	High	Measured	Err	Pass	<1.002
Ba	395	195	610	448 11	39.28	OK	10001
Cs	12	-300	300	37.27	8 94	OK	
Te	NR	-300	300	48.51	32.21	OK	
Sb	1	-100	100	16.94	10.56	OK	
Sn	NR	-100	100	55.54	13.64	OK	
Cd	NR	-70	70	1.7	5.73	OK	< LOD
Ag	NR	-50	50	0.15	4.18	OK	< LOD
Pd	NR	-60	60	-5.62	6.48	OK	< LOD
Mo	16	0	30	11.88	5.09	OK	
Zr	385	185	585	402.11	9.5	OK	
Sr	109	50	150	115.98	5.48	OK	
U	5	-20	20	-2.79	9.39	OK	< LOD
Rb	161	100	210	161.85	7.40	OK	
Th	17.4	-40	70	50.73	7.38	OK	
Pb	50	28	70	31.37	8.81	OK	
Se	NR	-15	15	-9.89	3.98	OK	< LOD
As	111	80	140	114.35	10.49	OK	
Hg	NR	-15	15	2.5	8.2	OK	< LOD
Au		-10	10	4.7	5.6	OK	< LOD
Zn	70	45	95	45.14	13.63	OK	
W	204	130	270	222.50	50.02	OK	
Cu	237	200	280	236.48	26.83	OK	
Ni	17	-50	90	31.02	30.51	OK	< LOD
Co	8	-300	300	41.28	117.09	OK	< LOD
Fe	39700	29700	49700	35744.54	430.61	OK	
Mn	490	300	600	384.3	72.6	OK	
Cr	53	-50	150	52.9	21.6	OK	
V	67	-150	<u>2</u> 50	77.7	48.1	OK	
Ti	4840	3870	5808	4669.3	162.0	OK	
Sc	10	-150	150	12.4	23.6	OK	< LOD
Ca	NR			7323.6	260.9		
K	NR			25681.0	618.5		
S	800	-130000	130000	1292.8	867.4	OK	<1.00

This certificate is issued in accordance with Thermo Fisher Scientific factory specifications.
The measurements were found to be within specification limits at the time of calibration.
This certificate is valid for 2 years from the date of calibration.

Standards are traceable to National Institute of Standards & Technology (NIST) standards. ** - Not Certified

A started Signed:

Dave Scattergood Service Manager

NIST2780	Certified	Low	High	Measured	Err	Pass	<lod?< th=""></lod?<>				
Ba	993	844	1142	1056.68	44.82	OK					
Cs	13	-10	100	70.44	9.64	OK					
Te		0	150	141.75	34.8	OK					
Sb	160	100	250	173.39	12.61	OK					
Sn		-20	100	80.01	14.78	OK					
Cd	12.1	5	30	15.28	6.29	OK					
Ag	27	0	120	31.88	5.19	OK					
Pd		-15	15	-0.14	7.04	OK	< LOD				
Mo	11	0	20	9.02	5.04	ОК					
Zr	176	131	220	183.95	7.98	ОК					
Sr	217	195	239	229.58	8.09	ОК					
U	4	-20	20	11.25	11.27	ОК	< LOD				
Rb	175	140	210	162.39	8.29	ОК					
Th	12	0	55	48.17	19.46	ОК					
Pb	5770	4904	6635	5148.08	74.58	ОК					
Se	5	-10	10	-14.68	5.98	ОК	< LOD				
As	48.8	0	90	1.74	57.24	ОК	< LOD				
Hg						-15	15	1.6	9.4	ОК	< LOD
Au		-20	20 20	2.1	10.5	ОК	< LOD				
Zn	2570	1800	3340	2100.81	60.42	ОК					
W		-100	100	56.17	59.16	ОК	< LOD				
Cu	Cu 215.5	215.5	151	280	179.58	27.06	ОК				
Ni		-100	100	13.87	33.10	ОК	< LOD				
Co		-200	200	81.65	105.37	ОК	< LOD				
Fe	27840	22272	33408	25021.21	382.99	ОК					
Mn	462	415	508	420.4	77.5	ОК					
Cr		0	70	57.6	19.7	ОК					
V	268	150	<u>3</u> 50	264.7	53.9	ОК					
Ti	6990	6291	7689	6707.9	175.2	ОК					
Sc	23	3	33	6.1	13.3	OK	< LOD				
Ca	1950	1000	3000	1705.4	162.3	ОК					
ĸ	33800	30420	37180	34015.2	631.6	ОК					
S	12630	5000	15000	11083.6	1312.2	OK					

APPENDIX 5 BORE LOGS

	R	Α	M	B	se	Ĺ	L		E	BOREHOL	E NUMBER GWO PAGE 1 OF
CL PR	ient Ojec	 Dej	partn JMBE	nent	of Re 3180	egiona)0119:	<u>I NSW</u> 3	1	_ PROJECT NAME _Capta _ PROJECT LOCATION _C	iins Flat Lead Mar Captains Flat, NS\	nagement Plan V
DA DR EQ HO	TE S ILLIN UIPM DLE S	TART IG CO IENT IZE _	TED ONTR <u>Sol</u> 0.1n	7/6 RAC lid F	6/21 TOR light /	<u>Stra</u>	tacore	COMPLETED _7/6/21	R.L. SURFACE <u>847.183</u> SLOPE <u>90°</u> HOLE LOCATION <u>72140</u> LOGGED BY <u>TJF</u>	D 8 2.01E,6058259.2 C	ATUM _ m mAHD EARING 23N HECKED BY _SM
Method	Water	Well Detail:	F s (r	RL I n)	Depth (m)	Graphic Log	Classification Symbol	Material Des	scription	Samples Tests Remarks	Additional Observations
	I I I I I I I I I I I I I I I I I I I		84 84 84	7 7 6 5	() 			FILL; silty CLAY, dark brown, soft, minor moist CLAY; natural, light brown with orange m CLAY; natural, orange-brown, high plasti	sand and gravels, high plasticity, nottles, firm, high plasticity, moist icity, hard, moist	GW01_0.0, XRF 93ppm GW01_0.1, XRF 229ppm GW01_0.2, XRF 355ppm GW01_0.3, XRF 399ppm GW01_0.4, XRF 101ppm GW01_0.5, XRF 97ppm GW01_1.0, XRF 123ppm GW01_2.0, XRF 280ppm	
			84	3				CLAY; natural, brown, very hard, minor g sands (weathered bedrock)	ravels, dry, low plasticity, minor	GW01_3.0, XRF 504ppm GW01_4.0, XRF 308ppm	
			84	1	- 5 - - 6 - - - - - 7			CLAY; natural, with silt, brown, soft, low p	plasticity, moist to wet		
		<u> </u>	84	.0	8			Borehole GW01 terminated at 7m			

VI IV DE SI IV þ Ľ ζ

	R	A	ME	30	٦	L		E	BOREHO	LE NUMBER GW02 PAGE 1 OF 7
			artmer IBER	<u>nt of R</u> 318		al NSW	1	PROJECT NAME Capta	ins Flat Lead Ma	anagement Plan
DA		STARTE	ED 7	/6/21	00110	0	COMPLETED 7/6/21	R.L. SURFACE 843.612		DATUM m mAHD
DR	ILLI			CTOR	Stra	tacore	Pty Ltd	SLOPE 90°		BEARING
EC	UIPI	MENT _	Solid	Flight	Auger			HOLE LOCATION _721525	5.593E, 605867	5.09N
нс	DLE	SIZE _0).1m					LOGGED BY		CHECKED BY SM
NC	TES	š								
Method	Water	Well D <u>etai</u> ls	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descr	iption	Samples Tests Remarks	Additional Observations
							FILL; silty SAND, brown, loose, moist, low p	plasticity silts, rootlets, medium	GW03_0.0, XRI 607ppm	-
				-			CLAY; natural, brown, moist, with sands an	d minor gravel, high plasticity,	GW03_0.1, XRI mqq168	=
			843	-			CLAY: natural, brown, moist, high plasticity	. soft	GW03_0.2, XRI 385ppm	=
				-				,	GW03_0.3, XRI 247ppm	=
	T		}	1					GW03_0.4, XRI 214ppm	=
	SW								GW03_0.5, XRI 361ppm	=
									GW03_1.0, XRI 354ppm	=
			842				CLAY; natural, brown with orange/grey mot	tling, soft, high plasticity, wet		
			÷							
				2					GW03_2.0, XRI 422ppm	=
	┸		1	-			CLAY; natural, light brown, with silts, soft, lo	ow plasticity, moist-wet		
				-						
			841	-						
			·	3					GW03 30 XR	=
			•						426ppm	
				-						
			. 840	-						
				-						
				4						
							Borehole GW02 terminated at 4m			
			839							
				5						
					1					
				-	4					
			838	-	4					
				-	4					
				6	-					
				-	-					
				-	-					
			837	-	-					
				-	-					
				7	-					
				-	-					
				-	-					
			<u>83</u> 6	-	-					
				-	-					
	1			8						

	R	RA	N	1 E	30	L	L		E	BOREHOL	E NUMBER GW03 PAGE 1 OF 1	
CL PR		T _ <u>D</u>	epa UM	rtmer BER	nt of R 318	egiona	al NSV 13	1	PROJECT NAME Capta	ins Flat Lead Mar Captains Flat, NS\	nagement Plan	
DA DF	TE	STAR ING C		D _7	/6/21 CTOR	Stra	atacore	COMPLETED _7/6/21	R.L. SURFACE 845.113 SLOPE 90°	D	ATUM _ m mAHD EARING	
EG HC NC		MENT SIZE	_0.	Solid 1m	Flight	Auger			HOLE LOCATION 721499.01E,6058470.421N LOGGED BY			
Method	Water	We	= is	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Des	cription	Samples Tests Remarks	Additional Observations	
É			:• 	(11) 845	(11)			FILL; silty CLAY, dark brown, soft, minor moist	sand and gravels, high plasticity,	GW02_0.0, XRF 518ppm, D1 XRF	Minor asphalt and concrete fragments, no odour	
					-			FILL; CLAY, brown, with minor gravels ar	nd sand, firm, high plasticity, moist	453ppm GW02_0.1, XRF 8791ppm	Minor asphalt and concrete fragments, no odour	
				944	- - <u>1</u>			CLAY; natural, light brown, with minor gra	avel, dry, high plasticity, hard	GW02_0.2, XRF 2372ppm GW02_0.3, XRF 7519ppm GW02_0.4, XRF 1609ppm		
				044	-			CLAY; natural, red-brown, high plasticity,	hard, dry	GW02_0.5, XRF 5188ppm GW02_1.0, XRF 1972ppm		
	SWLI∕			843	_ 					GW02_2.0, XRF 2481ppm		
					-			CLAY; natural, brown, very hard, minor g sands (weathered bedrock)	ravels, dry, low plasticity, minor			
				842	<u>3</u> - -					GW02_3.0, XRF 284ppm		
	V			<u>84</u> 1								
				<u>84</u> 0	- - 5 -			CLAY; light brown, with silts, soft, low pla	sticity, moist-wet			
				<u>83</u> 9	- <u>6</u> -							
				<u>83</u> 8	- <u>7</u> 	-		Borehole GW03 terminated at 6.5m				
					8							

RAMBOLL CLIENT _ Department of Regional NSW _____ PROJECT NAME _ Captains Flat Lead Management Plan

BOREHOLE NUMBER GW04

PAGE 1 OF 1

PROJECT NUMBER 318001193

PROJECT LOCATION Captains Flat, NSW

DATE STARTED	8/7/21	COMPLETED	8/7/21	R.L. SURFACE	843.287	DATUM	m mAHD
						-	

DRILLING CONTRACTOR _Stratacore Pty Ltd _____ SLOPE _90° _____ BEARING _---

EQUIPMENT Hand Auger, Solid Flight Auger HOLE LOCATION 721592.472E,6058721.95N

LOGGED BY ______ CHECKED BY __SM___

HOLE SIZE 0.1m NOTES

M		res								
	Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	-	▼ SWL		<u>84</u> 3	- - - 1 - - -			FILL; silty SAND, dark brown, loose, medium grained low plasticity silts, moist, minor gravels and rootlets present CLAY; natural, light brown with orange mottles, firm, high plasticity, moist	GW04_0.0, XRF 46ppm GW04_0.1, XRF 2420ppm GW04_0.2, XRF 36354ppm GW04_0.3, XRF 903ppm GW04_0.4, XRF 27ppm GW04_0.5, XRF 40ppm GW04_1.0, XRF 67ppm	Bricks, glass, concrete, asphalt fragments, no odour
9/8/21 T	-			<u>84</u> 1 <u>84</u> 0	2 - - 3 - - - - - - 4			CLAY; natural, light brown, with silt, soft, low plasticity, moist to wet	GW04_2.0, XRF 21ppm	
T JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 1				<u>83</u> 9 <u>83</u> 8				Borehole GW04 terminated at 4m		
BOREHOLE / TEST PIT 318001193 CAPTAINS FL/				<u>83</u> 7 <u>83</u> 6	- - - - - - - - - 8					

		and the						E	BOREHOL	E NUMBER GW05
	R	AN	1 E	3 C	Ĺ	L				PAGE 1 OF 1
CL	ENT	Depa	rtmen	t of Re	egiona	INSW	1	PROJECT NAME Capta	ins Flat Lead Mar	nagement Plan
PR	OJE		BER	3180	00119	3			Captains Flat, NSV	V
DA	TES	TARTE	D 8	/7/21			COMPLETED 8/7/21	R.L. SURFACE 842.663	D	ATUM _ m mAHD
DR	ILLII		TRAC	CTOR	Stra	tacore	Pty Ltd	SLOPE _90°	В	EARING
EQ	UIPN		Hand	Auger	, Solid	Flight	Auger	HOLE LOCATION 72158	1.24E,6058874.2	57N
HO	LES		.1m					LOGGED BY TJF	c	HECKED BY SM
NO	TES									
Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Des	cription	Samples Tests Remarks	Additional Observations
					***		FILL; silty SAND, dark brown, loose, med moist, minor gravels and rootlets present	lium grained low plasticity silts,	GW05_0.0, XRF 63ppm	Minor glass fragments, no odour
	SWLI		<u>84</u> 2				CLAY; natural, light brown with orange m	ottlings, firm, high plasticity, moist	GW05_0.1, XRF 148ppm GW05_0.2, XRF 173ppm GW05_0.3, XRF 167ppm GW05_0.4, XRF 7ppm GW05_0.5, XRF	No observed contamination
			841						7ppm GW05_1.0, XRF 45ppm	No observed contamination
			840	3			Borehole GW05 terminated at 3m			
			839	4						
			<u>83</u> 8	- - 5 -						
			837	- - 6 -						
			836							
			<u>83</u> 5							

	R	A	ME	30	L	L		E	BOREHO	LE NUMBER GWO PAGE 1 OF
CLIE PRO	JE	De CT NI	partmer JMBER	<u>nt of R</u> 318	<u>egiona</u> 00119	al NSW 13		PROJECT NAME Capta	ains Flat Lead M Captains Flat, N	anagement Plan SW
DAT DRIL EQU HOL	E S LIP IPN E S ES	STAR NG CO MENT SIZE	TED _8 ONTRA _Hand _0.1m	3/7/21 CTOR	_Stra	atacore	COMPLETED _8/7/21 Pty Ltd Auger	R.L. SURFACE <u>845.889</u> SLOPE <u>90°</u> HOLE LOCATION <u>72171</u> LOGGED BY <u>TJF</u>	4.924E,605894	DATUM _ m mAHD BEARING 9.036N CHECKED BY _SM
Method	Water	Wel Detail	I RL Is (m)	Depth (m)	Graphic Log	Classification Symbol	Material Desc	ription	Samples Tests Remarks	Additional Observations
	SWL		<u>84</u> 5 <u>84</u> 4 <u>84</u> 3				FILL; silty SAND, dark brown, loose, medi moist, minor gravels and rootlets present Silty CLAY; natural, light brown-grey with orang moist CLAY; natural, brown, hard-very hard, mir minor sands	um grained, low plasticity silts, plasticity, moist ge mottling, firm, high plasticity, nor gravels, dry, low plasticity,	GW06_0.0, XR 64ppm, D2 XR 46ppm GW06_0.1, XR 129ppm GW06_0.2, XR 210ppm GW06_0.3, XR 63ppm GW06_0.4, XR 15ppm GW06_0.5, XR 19ppm GW06_1.0, XR 14ppm	F F F F F F

		845		moist	GW06_0.2, XRF 210ppm GW06_0.3, XRF 63ppm GW06_0.4_XRF	
				CLAY; natural, brown, hard-very hard, minor gravels, dry, low plasticity, minor sands	15ppm GW06_0.5, XRF 19ppm GW06_10_XRF	
	▼				14ppm	
	SV	844	2			
		<u>84</u> 3				
		· · · · · · · · · · · · · · · · · · ·				
1000	_	. <u>84</u> 2	4	CLAY; natural, light brown, with silt, soft, low plasticity, moist-wet		
		•				
		· · · · · · · · · · · · · · · · · · ·				
			5			
		· . · . · .				
		· . 				
			-	Borehole GW06 terminated at 6m		
0000		839	7			
		838	8			

	R	AN	1 F	30	1	1_		E	BOREHOL	E NUMBER GW07 PAGE 1 OF 2
CLI	ENT	- <u>Depa</u> CT NUN	rtmer	n <u>t of Re</u> 3180	egiona)0119	<u>ıl NSW</u> 3	N	PROJECT NAME <u>Capta</u>	ins Flat Lead Mar Captains Flat, NSV	nagement Plan
DA	TES	STARTE	D _8	/7/21			COMPLETED <u>8/7/21</u>	R.L. SURFACE 857.513	D	ATUM _ m mAHD
		NG CON			<u>Stra</u>	<u>Itacore</u>	e Pty Ltd	SLOPE <u>90°</u>	B	EARING
HO	LES	SIZE <u>0</u>	.1m	Auger,	, 3010	i Fiight		LOGGED BY	<u> </u>	
NO	TES						1			
Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Desci	iption	Samples Tests Remarks	Additional Observations
							FILL; sandy CLAY, brown, high plasticity, s rootlets present	oft, medium grained sands, moist, /	GW07_0.0, XRF 52ppm	
			857				FILL; sandy CLAY, light brown-orange, low	plasticity, fine sands, hard, dry	GW07_0.1, XRF 1552ppm GW07_0.2, XRF	
					$\widetilde{\prime\prime\prime\prime}$		CLAY; natural, brown, high plasticity, firm-l	hard, dry	1578ppm GW07_0.3, XRF	
) ()		- 1					GW07_0.4, XRF 1509ppm	
									GW07_0.5, XRF 1886ppm	
			856	_					GW07_1.0, XRF 548ppm	
							Silty CLAY; natural, dark brown, high plast	icity, soft, moist		
				2					GW07_2.0, XRF	
									3393ppm	
) ()	855							
		5								
				3					GW07_3.0, XRF	
									2707ppm	
			854							
				4						
				_						
			853							
				5					GW07_5.0, XRF 1664ppm	
			<u>85</u> 2							
				6						
			851							
			850							
				8						

	R	A	ME	30	L	L		E	BOREHO	PAGE 2 OF 2
.				4 . 4 P					ing Flatter 111	
	IENT	CT NUN	artmer //BER	<u>1t of R</u> 318	egiona 00119	a <u>i NSW</u> 3	l	PROJECT NAME _ Capta	uns Flat Lead M Captains Flat. N	anagement Plan SW
		STARTE	א ח =	/7/21			COMPLETED 8/7/21	RI SURFACE 857 513		
					Stra	tacore	Ptv Ltd	SLOPE 90°		BEARING
EC	UIP		Hand	Auge	r, Solic	l Flight	Auger	HOLE LOCATION _72201	2.677E,605934	4.143N
нс	DLE S	SIZE _C).1m				-	LOGGED BY		CHECKED BY SM
NC	DTES			1	1		1		1	1
Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Des	cription	Samples Tests Remarks	Additional Observations
							Silty CLAY; natural, dark brown, high plas	sticity, soft, moist (continued)		
			. 849	-			CLAY; natural, light brown, with silt, soft, potentially weathered bedrock	low plasticity, dry, bands of harder		
				-						
				9						
				-						
			· <u>84</u> 8							
				1 <u>0</u>						
				-						
			847	-						
				-						
			}	11						
			:							
			. 846	_						
				-						
				1 <u>2</u>						
				-						
			845	-						
				-						
			:	13						
				-						
				-						
			. 844	-						
				-						
				1 <u>4</u>						
				-						
			843	-						
				15						
				-	-		borenole GVVU/ terminated at 15m			
			842	-	-					
				-	-					
				16	-					

	R	2		1 E	3 C	Ĺ	L		E	BOREHOL	E NUMBER GW08 PAGE 1 OF 2
CL PR	IEN ⁻ OJE	Т <u>[</u> СТ	Depa NUN	rtmer	nt of R	egiona 00119	II NSW	/ P	ROJECT NAMECaptai	ins Flat Lead Mar aptains Flat, NS\	nagement Plan
DA	TE	STA	RTE	D 8	/7/21			COMPLETED _8/7/21 R.L	SURFACE _ 866.233	D	DATUM _ m mAHD
DR	ILLI	NG	CON	ITRAC	CTOR	Stra	tacore	Pty Ltd SL	OPE _90°	B	BEARING
EQ	UIPI	MEN	IT _	Hand	Auger	r, Solid	l Flight	Auger HO	LE LOCATION _721818	3.20E,6058557.8	9N
HO		SIZE		.1m				L0	GGED BY	C	SHECKED BY SM
NO		<u> </u>									
Method	Water	W De	/ell	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	ı	Samples Tests Remarks	Additional Observations
			Š	866	_			FILL; silty SAND, brown, medium grained, low p moist, dense, rootlets present	plasticity silts, minor gravel,	GW08_0.0, XRF 774ppm	
					-			Sandy CLAY; natural, light brown, medium plast firm, dry	ticity, medium grained sands,	2144ppm GW08_0.2, XRF	
				ł	-			CLAY; natural, light brown, high plasticity, firm,	dry	2364ppm GW08_0.3, XRF	
					-					1252ppm GW08_0.4, XRF 2386ppm	
				865						GW08_0.5, XRF 1303ppm	
					_	Į		CLAY; natural, brown-grey with orange mottles,	firm-hard, dry, high plasticity	GW08_1.0, XRF 1710ppm	
				}	-						
				}	-					GW/08 20 XRE	
					2					1262ppm, D3 XRF 1318ppm	
				<u>86</u> 4	-						
					_						
					3						
				<u>86</u> 3	-						
					-			Weathered BEDROCK; natural, sandy CLAY, ve fine sands, dry	ery hard, red, low plasticity,		
					-	K					
					4						
				862	_						
					-	\otimes					
					-						
				1	-						
					5	\gg				GW08_5.0, XRF 53ppm	
				861	-	\bigotimes					
						K					
					-						
					6						
				<u>86</u> 0	-						
					-						
					-						
					7	\gg					
				859		X					
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KAMBULL		PAGE 2 OF 2
CLIENT Department of Regional NSW PROJECT NUMBER 318001193	PROJECT NAME Captains F	Flat Lead Management Plan
DRILLING CONTRACTOR Stratacore Ptv I td	SI OPE 90°	BEARING
EQUIPMENT Hand Auger. Solid Flight Auger	HOLE LOCATION 721818.20	E.6058557.89N
HOLE SIZE _ 0.1m	LOGGED BYTJF	CHECKED BY _ SM
NOTES		
Materia Materia Materia Materia Materia Materia Materia Materia	al Description	Samples Tests Additional Observations Remarks
Weathered BEDROCK; natural, san fine sands, dry (continued)	ndy CLAY, very hard, red, low plasticity,	
856 - 11 - 855 - 11 - 855 - 12 - 854 - 13 - 853 - 13 - 853 - 14 - 852 - 15 - 851 - 15 - 851 - - -		

RAMBOLL

BOREHOLE NUMBER GW09 D

PAGE 1 OF 2

CLIENT _ Department of Regional NSW _____ PROJECT NAME _ Captains Flat Lead Management Plan

PROJECT NUMBER _______

PROJECT LOCATION Captains Flat, NSW

 DATE STARTED
 9/6/21
 R.L. SURFACE
 846.559
 DATUM
 m mAHD

DRILLING CONTRACTOR Stratacore Pty Ltd SLOPE 90° BEARING ---

EQUIPMENT Solid Flight Auger, Air Hammer HOLE LOCATION 721264.48E,6059134.67N

HOLE SIZE 0.1m LOGGED BY _TJF CHECKED BY _SM

NOTES _____

Method	Water	We Det:	ell ails	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
SFA	SWL ▲		AN AN AN AN AN AN	<u>84</u> 6	- - - 1			FILL; gravelly CLAY, brown, high plasticity, soft, coarse gravels, fine sands, moist Sandy CLAY; natural, light brown, low plasticity, firm, minor gravels, fine sands, dry CLAY; natural, light brown, high plasticity, hard-very hard, dry, minor sands and gravels	GW09_0.0, XRF 36ppm GW09_0.1, XRF15ppm GW09_0.2, XRF 7ppm GW09_0.3, XRF <lod GW09_0.4, XRF <lod GW09_0.5, XRF <lod GW09_1.0, XRF</lod </lod </lod 	
	_		NANYANA NANA	<u>84</u> 5 <u>84</u> 4	- - 2 - - - - 3			BEDROCK; natural, conglomerate, CLAY, brown, with gravels, very hard, dry Becoming softer, moist	14ppm	
D AUSTRALIA.GDT 19/8/21 Air Hammer	-		KAN KAN KAN KAN	<u>84</u> 3 <u>84</u> 2				Becoming very hard (shale), light brown 		
001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STI				<u>84</u> 1 <u>84</u> 0	<u>5</u> <u>6</u> 			Becoming grey		
BOREHOLE / TEST PIT 318				<u>83</u> 9	<u>7</u> - - 8					

CLENT Descriment of Regional NSW PROJECT NAME Captains Flat Lead Management Plan PROJECT NUMBER: 31001103 PROJECT LOCATION Captains Flat Lead Management Plan DATE STARTED: 9/021 COMPLETED: 9/021 DATE STARTED: 9/021 COMPLETED: 9/021 DATE STARTED: 9/021 SLOPE 9/2 DELING CONTRACTOR Strategore Phylid LOGGED BY TUP CHECKED BY SM CHECKED BY SM DITES Stormag reviscontinue VIEW Revision Stormag reviscontinue Stormag reviscontinue Stormag reviscontinue Stormag reviscontinue <th></th> <th>R</th> <th></th> <th>Ч E</th> <th>3 C</th> <th>Ĺ</th> <th>L</th> <th></th> <th>BO</th> <th>REHOLE</th> <th>PAGE 2 OF 2</th>		R		Ч E	3 C	Ĺ	L		BO	REHOLE	PAGE 2 OF 2
DATE STARTED 9/6/21 COMPLETED 9/6/21 RL SURFACE 9/6/20 DATUM mmm-HD DRULING CONTRACTOR Statucore PLV Ld SLOPE 90° BEARING	CI	LIEN ROJE	T _ Depa	artmer IBER	n <u>t of R</u> 318	egiona 00119	<u>II NSW</u> 3	1	PROJECT NAME Capta	ains Flat Lead N Captains Flat. N	/anagement Plan
NOTE CodeD BY UP CodeD BY UP CodeD BY Surrow 1	D/ Di E(ATE RILLI QUIP	STARTE	D 9 ITRAC	/6/21 CTOR Flight	_Stra Auger	tacore , Air Ha	COMPLETED _9/6/21 Pty Ltd ammer	R.L. SURFACE <u>846.559</u> SLOPE <u>90°</u> HOLE LOCATION <u>72126</u>	4.48E,6059134	DATUMm mAHD BEARING 4.67N
Vol Vol R. Open Secure Secure Secure Addition Observations Vol Vol R. Open Secure Secure Remains Addition Observations Vol Vol R. Open Secure Secure <t< th=""><th></th><th></th><th>SIZE _0 S</th><th>.1m</th><th></th><th></th><th></th><th></th><th> LOGGED BYIJF</th><th></th><th>CHECKED BY SM</th></t<>			SIZE _0 S	.1m					LOGGED BYIJF		CHECKED BY SM
Percentage Becoming gray (continued) 9 9 <th>Method</th> <th>Water</th> <th>Well Details</th> <th>RL (m)</th> <th>Depth (m)</th> <th>Graphic Log</th> <th>Classification Symbol</th> <th>Material E</th> <th>Description</th> <th>Samples Tests Remarks</th> <th>Additional Observations</th>	Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material E	Description	Samples Tests Remarks	Additional Observations
	Air Hammer			838 837 836 836 834 834 833 833 833	(,,,)			Becoming grey (continued) Borehole GW09_D terminated at 15m			

RAMBOLL

BOREHOLE NUMBER GW09_S

PAGE 1 OF 1

CLIENT Department of Regional NSW

NOTES

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED _9/6/21 COMPLETED _9/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING
EQUIPMENT Hand Auger, Solid Flight Auger	HOLE LOCATION	
HOLE SIZE _ 0.1m	LOGGED BY	CHECKED BY SM

Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) Well D (m) GW09_0.0, XRF 36ppm GW09_0.1, XRF15ppm GW09_0.2, XRF 7ppm FILL; gravelly CLAY, brown, high plasticity, soft, coarse gravels, fine sands, moist Sandy CLAY; natural, light brown, low plasticity, firm, minor gravels, fine sands, dry V CLAY; natural, light brown, high plasticity, hard-very hard, dry, minor sands 7ppm GW09_0.3, XRF and gravels GW09_0.3, XRF <LOD GW09_0.4, XRF <LOD GW09_0.5, XRF <LOD GW09_1.0, XRF 14ppm SWL BEDROCK; natural, conglomerate, CLAY, brown, with gravels, very hard, 0 dry T 2 þ 0 Becoming softer, moist 0 _ ° 0 0 0 0 000 3 0 Becoming very hard (shale), light brown , 0 0 4 0 0 þ 0 Borehole GW09 S terminated at 4.2m 5 6 7 8

Wate	
RL (m) <u>86</u> 5	
Depth (m) - - - - - - - - - - - - - - - - - - -	-
Grap	
Sym	
FILL; gravelly CLAY, dark brown, high palstic (sand, gravels Sandy CLAY; natural, brown, high plasticity, minor gravels, firm CLAY; natural, red-brown, high plasticity, firm sands BEDROCK; natural, red-brown, conglomerat	
city, soft, moist, medium grained moist, medium grained sands, n, moist, minor gravels and	
GW10_0.0, XRF 1468ppm GW10_0.1, XRF 21ppm GW10_0.2, XRF 28ppm GW10_0.3, XRF 27ppm GW10_0.4, XRF 27ppm GW10_0.5, XRF 27ppm GW10_0.5, XRF 23ppm	27ppm

	R	A	ME	3 C	Ĺ	L		E	BOREHC	DLE NUMBER GW10 PAGE 2 OF 2
			artmer	1t of R	egiona	al NSW	1	PROJECT NAME _Capta	ains Flat Lead M	lanagement Plan sw
DA DF EQ	ATE (RILLI QUIPI DLE (STARTE NG CON MENT _ SIZE _0	ED 9 NTRAC Hand	/6/21 CTOR Auger	Stra	atacore	COMPLETED 9/6/21 Pty Ltd Auger	R.L. SURFACE 865.981 SLOPE 90° HOLE LOCATION 72089 LOGGED BY TJF	6.58E,6058791	DATUM _ m mAHD BEARING .96N CHECKED BY _ SM
NC	DTES									
Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Des	cription	Samples Tests Remarks	Additional Observations
┢							SHALE; natural, grey (continued)			
			. <u>85</u> 7	- - <u>9</u> -						
			. <u>85</u> 6	- - 10 -			Borehole GW10 terminated at 10m			
			<u>85</u> 5	- - 1 <u>1</u> -	-					
			<u>85</u> 4	- 1 <u>2</u>	-					
			<u>85</u> 3	- 1 <u>3</u>	-					
			<u>85</u> 2	- - 1 <u>4</u>	-					
			851	1 <u>5</u>	-					
			850	- _ 16	-					

BOREHOLE NUMBER SAQP10-BH01

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CLIENT Department of Regional NSW

PROJECT NAME _ Captains Flat Lead Management Plan

PROJECT NUMBER 318001193	PROJECT LOCATION Captains Flat, NSW		
DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM	
DRILLING CONTRACTOR Stratacore Pty Ltd	_ SLOPE _ <u>90</u> °	BEARING	
EQUIPMENT _ Push Tube	HOLE LOCATION		
HOLE SIZE 0.1m	LOGGED BYF	CHECKED BY SM	

NOTES _

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
SOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21	Wat		$\begin{array}{c} \text{Depth} \\ (m) \end{array} \\ - \\ - \\ - \\ - \\ 1 \\ - \\ - \\ - \\ - \\ -$		Syn	FILL: gravely CLAY, light brown, low plasticity, fine gravels and medium grained sands, moist Sity CLAY; natural, dark brown, high plasticity, fine sands (minor), moist, firm CLAY; natural, light brown, firm, high plasticity, moist Becoming harder with depth Borehole SAQP10-BH01 terminated at 1.5m	SAQP10-BH01_0.0 XRF 6324ppm SAQP10-BH01_0.25 XRF 1758ppm SAQP10-BH01_0.75 XRF 293ppm SAQP10-BH01_1.0 XRF 182ppm SAQP10-BH01_1.25 XRF 52ppm SAQP10-BH01_1.5 XRF 99ppm	

BOREHOLE NUMBER SAQP10-BH02

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CLIENT __Department of Regional NSW PROJECT NUMBER __318001193 PROJECT NAME <u>Captains Flat Lead Management Plan</u> PROJECT LOCATION <u>Captains Flat, NSW</u>

DATE STARTED 10/6/21 COMPLETED 10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BYF	CHECKED BY SM
NOTES		

Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP10-BH02_0.0 XRF 497ppm SAQP10-BH02_0.25 XRF 2252ppm, D7 XRF 1820ppm SAQP10-BH02_0.5 XRF 2200ppm SAQP10-BH02_0.75 XRF 1773ppm SAQP10-BH02_1.0 XRF 71ppm SAQP10-BH02_1.25 XRF 60ppm SAQP10-BH02_1.5 XRF 92ppm Sandy SILT; brown, medium grained sands, low plasticity, minor gravels, soft, moist, rootlets Gravelly CLAY; orange-brown, high plasticity, medium grained gravels and sands, moist, firm Silty CLAY; natural, brown, high palsticity, soft, silts, moist 1 CLAY; light brown with grey and orange mottles, high plasticity, firm, moist Borehole SAQP10-BH02 terminated at 1.5m 2 3 4 5 6 7 8

RAMBOLL PAGE 1 OF 1 _____ CLIENT Department of Regional NSW PROJECT NAME Captains Flat Lead Management Plan PROJECT NUMBER 318001193 PROJECT LOCATION Captains Flat, NSW DATE STARTED 10/6/21 COMPLETED 10/6/21 R.L. SURFACE DATUM _____ BEARING _---DRILLING CONTRACTOR Stratacore Pty Ltd SLOPE 90° HOLE LOCATION EQUIPMENT Push Tube LOGGED BY __TJF______ CHECKED BY _SM HOLE SIZE 0.1m NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP10-BH03_0.0 XRF 262ppm SAQP10-BH03_0.25 XRF 360ppm FILL; silty SAND, dark brown, loose, low plasticity silts, minor gravels, rootlets, moist SAQP10-BH03_0.5 XRF 586ppm, D8 XRF 362ppm SAQP10-BH03_0.75 XRF 4LOD CLAY; natural, light brown with orange and grey mottles, firm, silts, moist, tree roots present SAQP10-BH03_1.0 XRF <LOD SAQP10-BH03_1.25 XRF <LOD CLAY; light grey with orange mottles, high plasticity, firm, moist SAQP10-BH03 1.5 Borehole SAQP10-BH03 terminated at 1.5m XRF <LOD 2 3 4 5 6 7 8

BOREHOLE NUMBER SAQP10-BH03

BOREHOLE NUMBER SAQP10-BH04

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CLIENT Department of Regional NSW

 PROJECT NAME
 Captains Flat Lead Management Plan

 PROJECT LOCATION
 Captains Flat, NSW

 PROJECT NUMBER _318001193
 PROJECT LOCATION _Captains Flat, NSW

 DATE STARTED _10/6/21
 COMPLETED _10/6/21
 R.L. SURFACE ______ DATUM ______

 DRILLING CONTRACTOR _Stratacore Pty Ltd
 SLOPE _90°
 BEARING _--

 EQUIPMENT _Push Tube
 HOLE LOCATION _
 HOLE LOCATION _

 HOLE SIZE _0.1m
 LOGGED BY _TJF
 CHECKED BY _SM

NOTEO

	OIE	ES							
Method		Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
Γ				_			FILL; silty SAND, dark brown, loose, mediu grained, low plasticity silts, rootlets, moist	SAQP10-BH04_0.0 XRF 94ppm SAOP10-BH04_0.2	
				-			Gravelly CLAY; natural, red-brown, firm, fine gravels, medium plasticity, medium grained sands, moist	SAQP10-BH04_0.2 XRF 51ppm SAQP10-BH04_0.5 XRF 63ppm SAQP10-BH04_0.7 XRF 65ppm	5
		╸		1				SAQP10-BH04_1.0 XRF 62ppm	
		-		-			Sandy CLAY; natural, brown, very soft, fine-medium grained sands, wet	SAQP10-BH04_1.25 XRF 183ppm	5
	+	-			///////////////////////////////////////		Borehole SAQP10-BH04 terminated at 1.5m	SAQP10-BH04_1.5 XRF 28ppm	
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BOREHOLE NUMBER SAQP11-BH01

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CLIENT _ Department of Regional NSW

PROJECT NUMBER 318001193

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED 10/6/21 COMPLETED 10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING
EQUIPMENT Push Tube	HOLE LOCATION	
HOLE SIZE _ 0.1m	LOGGED BY	CHECKED BY SM

NOTES

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				B	.e		Samples	
				<u> </u>	. ai	Material Description	Teete	Additional Observations
R	L _			ie ie	ĭ≣īo	Material Description	Tesis	Additional Observations
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<u>e</u>	-Sa	RL	Deptn	j.a	ž ä			
2	>	(m)	(m)	0	00			
				XXXX		FILL silty CLAY light brown high plasticity silts present soft minor fien gravel and	SAQP11-BH01 0.0	
				\boxtimes		and moist	XRF 2473ppm	
			-	łXXX		Sand, moise	D4 XRF	
				<i>}}};</i>		Sandy CLAV, not real light brown with grow mattles, high plasticity moist firm and fine	1862nnm	
			-	<i>\$/////</i>		Sandy CLAT, natural, light brown with grey moties, high plasticity, moist, him-soit, line	SAOD11 BU01 0.2	5
						sands	VDF 4000mmm	5
			-	<i>\/////</i>			ARF 4909ppm	
				<u> /////</u>			SAQP11-BH01_0.5	
						CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands	XRF 4584ppm	
							SAQP11-BH01 0.7	5
			1			CLAY; natural, red with grey mottles, high plasticity, hard, moist	XRF 1769nnm	
						Borehole SAOP11-BH01 terminated at 1m	SAOP11_BH01_1	
							VDE 197nnm	
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RAMBOLL PAGE 1 OF 1 CLIENT Department of Regional NSW PROJECT NAME Captains Flat Lead Management Plan PROJECT NUMBER 318001193 PROJECT LOCATION Captains Flat, NSW DATE STARTED 10/6/21 COMPLETED 10/6/21 R.L. SURFACE DATUM DRILLING CONTRACTOR Stratacore Pty Ltd **SLOPE** <u>90°</u> _____ BEARING _---EQUIPMENT Push Tube HOLE LOCATION LOGGED BY TJF CHECKED BY SM HOLE SIZE 0.1m NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP11-BH02_0.0 XRF 4612ppm SAQP11-BH02_0.25 XRF 4274ppm FILL; gravelly CLAY, orange-brown, firm, medium grained sands, well graded gravels, moist SAQP11-BH02_0.5 XRF 4421ppm CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands SAQP11-BH02 0.75 XRF 442ppm SAQP11-BH02_1.0 XRF 651ppm CLAY; natural, red with grey mottles, high plasticity, hard, moist Borehole SAQP11-BH02 terminated at 1m 2 3 4 5 6 7

BOREHOLE NUMBER SAQP11-BH02

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/2

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PAGE 1 OF 1 CLIENT _ Department of Regional NSW _____ PROJECT NAME Captains Flat Lead Management Plan PROJECT NUMBER 318001193 PROJECT LOCATION Captains Flat, NSW DATE STARTED 10/6/21 COMPLETED 10/6/21 R.L. SURFACE DATUM DRILLING CONTRACTOR Stratacore Pty Ltd **SLOPE** <u>90°</u> _____ BEARING _---EQUIPMENT Push Tube HOLE LOCATION LOGGED BY _TJF _____ CHECKED BY _SM HOLE SIZE 0.1m NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP11-BH03_0. XRF 12489ppm, FILL; gravelly CLAY, orange-brown, firm, medium grained sands, well graded gravels, moist XRF 12489ppm, D5 6797ppm SAQP11-BH03_0.25 XRF 5787ppm SAQP11-BH03_0.5 XRF 7204ppm SAQP11-BH03_0.75 XRF 1564ppm SAQP11-BH03_0.75 CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands SAQP11-BH03_1.0 XRF 1220ppm 1 Borehole SAQP11-BH03 terminated at 1m 2 3 4 5 6 7 8

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

BOREHOLE NUMBER SAQP11-BH03

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BOREHOLE NUMBER SAQP11-BH04

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CLIENT Department of Regional NSW

PROJECT NAME Captains Flat Lead Management Plan

PROJECT NUMBER 318001193	PROJECT LOCATION Captains Flat, N	JSW
DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE <u>90°</u>	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM

NOTES

	_	_							
lethod	later		RL	Depth	iraphic Log	lassification ymbol	Material Description	Samples Tests Remarks	Additional Observations
2	5	5 ((m)	(m)	0 XXXX	ပတ	FILL sitty CLAY dark brown soft minor sand high plasticity moist rootlets	SAQP11-BH04 0.0	
				_				XRF 3211ppm SAQP11-BH04_0.2	5
				_			CLAY; natural, light brown with orange mottles, firm, high plasticity, moist	XRF 214ppm SAQP11-BH04_0.5	
				_				SAQP11-BH04_0.7	5
				1				XRF 124ppm SAQP11-BH04_1.0	
				_			Borehole SAQP11-BH04 terminated at 1m	XRF 171ppm	
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BOREHOLE NUMBER SAQP11-BH05

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CLIENT Department of Regional NSW

PROJECT NAME Captains Flat Lead Management Plan

PROJECT NUMBER 318001193

PROJECT LOCATION Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM

NOTES

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Method	Malloa	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
Γ				_			FILL; silty CLAY, dark brown, soft, minor sand, high plasticity, moist, rootlets	SAQP11-BH05_0.0 XRF 2201ppm SAQP11-BH05_0.2 XRF 295ppm SAQP11-BH05_0.5	5
				-			CEAT, natural, light brown with orange moties, linn, ligh plasacity, moist	XRF 150ppm SAQP11-BH05_0.7 XRF 294ppm	5
							Borehole SAQP11-BH05 terminated at 1m	SAQP11-BH05_1.0 XRF 394ppm	
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BOREHOLE NUMBER SAQP11-BH06

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CLIENT Department of Regional NSW

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

PROJECT NUMBER _318001193

PROJECT NAME Captains Flat Lead Management Plan PROJECT LOCATION Captains Flat, NSW

R.L. SURFACE	DATUM
SLOPE _90°	BEARING
HOLE LOCATION	
LOGGED BY	CHECKED BY SM
	R.L. SURFACE SLOPE 90° HOLE LOCATION LOGGED BY TJF

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP11-BH06_0.0 XRF 444ppm SAQP11-BH06_0.25 XRF 2397ppm SAQP11-BH06_0.5 VDF C2577e_0 FILL; sandy CLAY, brown, high plasticity, firm, with medium grained sands and gravels, moist FILL; gravelly CLAY, orange, high plasticity, fine gravels, medium grained sands, XRF 62577ppm moist, hard CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands SAQP11-BH06 0.75 XRF 363ppm SAQP11-BH06_1.0 XRF 761ppm 1 CLAY; natural, red with grey mottles, high plasticity, hard, moist Borehole SAQP11-BH06 terminated at 1m 2 3 4 5 6 7 8
BOREHOLE NUMBER SAQP11-BH07

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CLIENT Department of Regional NSW

PROJECT NUMBER ______318001193

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR _ Stratacore Pty Ltd	SLOPE _90°	BEARING
EQUIPMENT _ Push Tube		
HOLE SIZE _0.1m	LOGGED BY	CHECKED BY SM

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP11-BH07_0.0 XRF 2058ppm SAQP11-BH07_0.25 XRF 2725ppm FILL; silty CLAY, dark brown, soft, minor sand, high plasticity, moist, rootlets CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands SAQP11-BH07_0.5 XRF 352ppm SAQP11-BH07_0.75 XRF 133ppm CLAY; natural, red with grey mottles, high plasticity, hard, moist SAQP11-BH07_1.0 XRF 233ppm 1 Borehole SAQP11-BH07 terminated at 1m 2 3 4 5 6 7 8

BOREHOLE NUMBER SAQP11-BH08

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CLIENT Department of Regional NSW PROJECT NUMBER 318001193

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

 PROJECT NAME
 Captains Flat Lead Management Plan

 PROJECT LOCATION
 Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE <u>90°</u>	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE _ 0.1m	LOGGED BY	CHECKED BY _SM

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP11-BH08_0.0 XRF 735ppm SAQP11-BH08_0.25 XRF 1316ppm SAQP11-BH08_0.5 XRF 6013ppm FILL; sandy CLAY, light brown, soft, fine gravels, medium grained sands, moist, high plasticity FILL; sandy CLAY, red-brown, soft, fine gravels, medium grained sands, moist, high plasticity CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands SAQP11-BH08_0.75 XRF 3463ppm SAQP11-BH08_1.0 XRF 4504ppm 1 Borehole SAQP11-BH08 terminated at 1m 2 3 4 5 6 7 8

BOREHOLE NUMBER SAQP11-BH09	9
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CLIENT Department of Regional NSW

PROJECT NUMBER 318001193

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PROJECT LOCATION Captains Flat, NSW

PROJECT NAME Captains Flat Lead Management Plan

DATE STARTED 10/6/21 COMPLETED 10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR	SLOPE <u>90°</u>	BEARING
EQUIPMENT Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM

NO	TES	i						
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
Metho	Wate	RL (m)	Depth (m)	Graph	Class Symbol	FILL: silty CLAY, dark brown, soft, minor sands and gravels, high plasticity, moist CLAY; natural, light brown with orange mottles, firm, high plasticity, moist Borehole SAQP11-BH09 terminated at 1m	Remarks SAQP11-BH09_0.0 XRF 986ppm SAQP11-BH09_0.5 XRF 98ppm SAQP11-BH09_0.7 XRF 93ppm SAQP11-BH09_1.0 XRF 160ppm	
			8					

BOREHOLE NUMBER SAQP11-BH10

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CLIENT Department of Regional NSW

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

PROJECT NAME Captains Flat Lead Management Plan
PROJECT LOCATION Captains Flat, NSW

PROJECT NUMBER	PROJECT LOCATION Captains Flat, NSW			
DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM		
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING		
EQUIPMENT _ Push Tube	HOLE LOCATION			
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM		

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL (m) Depth (m) SAQP11-BH10_0.0 XRF 611ppm SAQP11-BH10_0.25 XRF 70ppm SAQP11-BH10_0.5 XRF 113ppm FILL; silty CLAY, dark brown, soft, minor sands and gravels, high plasticity, moist CLAY; natural, light brown with orange mottles, firm, high plasticity, moist SAQP11-BH10_0.75 XRF 74ppm SAQP11-BH10_1.0 XRF 80ppm 1 Borehole SAQP11-BH10 terminated at 1m 2 3 4 5 6 7 8

RAMBOLL

BOREHOLE NUMBER SAQP13-BH01

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CLIENT _ Department of Regional NSW _____ PROJECT NAME _ Captains Flat Lead Management Plan

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

PROJECT LOCATION Captains Flat, NSW

PROJECT NUMBER 318001193
 DATE STARTED
 10/6/21
 COMPLETED
 10/6/21
 R.L. SURFACE
 DATUM
 DRILLING CONTRACTOR Stratacore Pty Ltd SLOPE 90° BEARING ---EQUIPMENT Push Tube HOLE LOCATION HOLE SIZE 0.1m LOGGED BY _____ CHECKED BY __SM NOTES

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				Бо-	ation		Samples	
Aethod	Vater	RL	Depth	Braphic I	Slassifica Symbol	Material Description	Tests Remarks	Additional Observations
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				XXXX		FILL; silty SAND, brown, loose, medium grained, low plasticity silts, moist, rootlets	SAQP13-BH01-0.0	
				\times		FILL sandy CLAY reworked natural light brown fine-medium grained sands high	XRF 1444ppm	
				\times		plsticity, moist, firm-soft	SAQP13-BH0125	
			_	\times			XRF 7020ppm	
						CLAY; natural, brown, high plasticity, soft, moist-wet, minor fine sands	SAQP13-BH015	
			_				XRF 392ppm	
							SAQP13-BH0175	
			-			CLAV: natural rad with gray mattles, high plasticity, hard, maist	XRF 245ppm	
			1			CLAT, Haturai, red with grey motiles, high plasticity, hard, moist	SAOP13-BH01-1 0	
			-			Borehole SAQP13-BH01 terminated at 1m	XRF 189ppm	
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BOREHOLE NUMBER SAQP13-BH02

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CLIENT Department of Regional NSW

PROJECT NAME _ Captains Flat Lead Management Plan

PROJECT NUMBER 318001193	PROJECT LOCATION Captains Flat, NSW		
DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM	
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE _90°	BEARING	
EQUIPMENT Push Tube	HOLE LOCATION		
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM	

NOTES

Method	Water	RL (m)	D	0epth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
EST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA. GDT 19/8/21 Method	Water	RL		2 = 1	Graphic Lo	Classificati	FILL: sandy CLAY, brown, high plasticity, moist, medium grained sands, gravels, Fracelity, CLAY, light brown, high plasticity, moist, medium grained sands, fine gravels CLAY, light brown with grey/orange mottles, high plasticity, firm-hard, moist Borehole SAQP13-BH02 terminated at 1m	Samples Tests Remarks SAQP13-BH02_0.0 XRF 117ppm SAQP13-BH02_0.2 XRF 118ppm SAQP13-BH02_0.7 XRF 94ppm SAQP13-BH02_1.0 XRF 68ppm	Additional Observations
BOREHOLE				- _ 8					

BOREHOLE NUMBER SAQP13-BH03

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R	A	M	В	U	L	L

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CLIENT Department of Regional NSW

PROJECT NUMBER 318001193

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED 10/6/21 COMPLETED 10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY _SM

NOTES

Mathod	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
/ TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21	Water	RL (m)	Depth (m) - - - - - - - - - - - - - - - - - - -	Graphic Log	Classification	FILL: gravelly CLAY, light brown, coarse gravels, low plasticity, soft, moist, medium FIL: gravelly CLAY, red, well graved gravels, medium plasticity, firm, moist, medium CLAY: natural, light brown with grey mottles, high plasticity, firm, moist Borehole SAQP13-BH03 terminated at 1m	Samples Tests Remarks SAQP13_0.0 XRF 975ppm, D6 XRF 1175ppm SAQP13_0.25 XRF 1865ppm SAQP13_0.75 XRF 3216ppm SAQP13_1.0 XRF 107ppm	Additional Observations Minor brick fragments, some shale fragments Minor brick fragments, some shale fragments Minor brick fragments, some shale fragments
BOREHC			8					

RAMBOLL

BOREHOLE NUMBER SAQP13-BH04

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CLIENT Department of Regional NSW

PROJECT NUMBER 318001193

PROJECT NAME <u>Captains Flat Lead Management Plan</u> PROJECT LOCATION <u>Captains Flat, NSW</u>

 DATE STARTED _10/6/21 ______ COMPLETED _10/6/21 ______
 R.L. SURFACE _______ DATUM _______

 DRILLING CONTRACTOR _Stratacore Pty Ltd _______
 SLOPE _90° _______
 BEARING ________

 EQUIPMENT _Push Tube _______
 HOLE LOCATION ________
 CHECKED BY _SM ______

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/2

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP13-BH04_0.0 XRF 700ppm SAQP13-BH04_0.25 XRF6138ppm FILL; gravelly CLAY, light brown, coarse gravels, low plasticity, soft, moist, medium grained sands FILL; gravelly CLAY, red, well graved gravels, medium plasticity, firm, moist, medium SAQP13-BH04_0.5 grained sands Becoming softer and wetter with depth XRF 2616ppm SAQP13-BH04_1.0 XRF 288ppm 1 ÎÌÌ CLAY; natural, light brown with grey mottles, high plasticity, firm, moist Borehole SAQP13-BH04 terminated at 1m 2 3 4 5 6 7 8

BOREHOLE NUMBER S	AQP9-BH0
	PAGE 1 OF

1

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CLIENT _ Department of Regional NSW

NOTES

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

PROJECT NAME Captains Flat Lead Management Plan
PROJECT LOCATION Captains Flat, NSW

PROJECT NUMBER	_ PROJECT LOCATION _ Captains Flat, NSW		
DATE STARTED 10/6/21 COMPLETED 10/6/21	R.L. SURFACE	DATUM	
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING	
EQUIPMENT _ Push Tube	HOLE LOCATION		
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM	

Classification Symbol Graphic Log Samples Material Description Additional Observations Tests Method Water Remarks RL (m) Depth (m) SAQP9-BH01_0.0 XRF 764ppm SAQP9-BH01_0.25 XRF 103ppm SAQP9-BH01_0.5 XRF 349ppm FILL; silty SAND, brown, dense, low plasticity silts, medium grained, rootlets, moist FILL; gravelly CLAY, red-brown, high plasticity, fine gravels and sands, moist, firm CLAY; natural, light grey with red and orange mottles, hard, becoming bedrock SAQP9-BH01_1.0 XRF 19ppm 1 Borehole SAQP9-BH01 terminated at 1m 2 3 4 5 6 7 8

RAMBOLL

BOREHOLE NUMBER SAQP9-BH02

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CLIENT Department of Regional NSW

PROJECT NUMBER 318001193

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE	BEARING
EQUIPMENT _ Push Tube	_ HOLE LOCATION	
HOLE SIZE _ 0.1m	LOGGED BY	CHECKED BY SM
NOTES		

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
T 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21	Water	RL (m)	Depth (m) - - - - - - - - - - - - - - - - - - -	Graphic Log	Classification	FILL; silly SAND, brown, dense, low plasticity sills, medium grained, rootlets, moist FILL; gravely CLAY, red-brown, high plasticity, fine gravels and sands, moist, firm CLAY; natural, light grey with red and orange mottles, hard, becoming bedrock Borehole SAOP9-BH02 terminated at 1m	Samples Tests Remarks SAQP9-BH02_0.0 XRF 230ppm SAQP9-BH02_0.25 XRF <lod SAQP9-BH02_0.75 XRF <lod SAQP9-BH02_1.0 XRF <lod< td=""><td>Additional Observations</td></lod<></lod </lod 	Additional Observations
BOREHOLE / TEST P								

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BOREHOLE NUMBER SAQP9-BH03

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CLIENT Department of Regional NSW

PROJECT NUMBER ______318001193

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY _SM

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP9-BH03_0.0 XRF 2359ppm SAQP9-BH03_0.25 XRF 39ppm SAQP9-BH03_0.5 RF 12ppm FILL; silty SAND, brown, dense, low plasticity silts, medium grained, rootlets, moist FILL; gravelly CLAY, red-brown, high plasticity, fine gravels and sands, moist, firm CLAY; natural, light grey with red and orange mottles, hard, becoming bedrock SAQP9-BH03_0.75 XRF <LOD SAQP9-BH03_1.0 XRF <LOD Borehole SAQP9-BH03 terminated at 1m 2 3 4 5 6 7 8

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RAMBOLL	

BOREHOLE NUMBER SAQP9-BH04

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CLIENT Department of Regional NSW

BOREHOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21

PROJECT NUMBER 318001193

PROJECT NAME Captains Flat Lead Management Plan
PROJECT LOCATION Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE _ <u>90°</u>	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM

NOTES Classification Symbol Graphic Log Samples Material Description Tests Additional Observations Method Water Remarks RL Depth (m) (m) SAQP9-BH04_0.0 XRF450ppm SAQP9-BH04_0.25 XRF 1256ppm FILL; silty SAND, brown, dense, low plasticity silts, medium grained, rootlets, moist FILL; gravelly CLAY, red-brown, high plasticity, fine gravels and sands, moist, firm SAQP9-BH04_0.5 XRF 365ppm CLAY; natural, light grey with red and orange mottles, hard, becoming bedrock SAQP9-BH04_0.75 XRF 238ppm SAQP9-BH04_1.0 XRF 229ppm 1 Borehole SAQP9-BH04 terminated at 1m 2 3 4 5 6 7 8

RAMBOLL

BOREHOLE NUMBER SAQP9-BH05

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CLIENT Department of Regional NSW

PROJECT NUMBER 318001193

PROJECT NAME Captains Flat Lead Management Plan

PROJECT LOCATION Captains Flat, NSW

DATE STARTED _10/6/21 COMPLETED _10/6/21	R.L. SURFACE	DATUM
DRILLING CONTRACTOR Stratacore Pty Ltd	SLOPE 90°	BEARING
EQUIPMENT _ Push Tube	HOLE LOCATION	
HOLE SIZE 0.1m	LOGGED BY	CHECKED BY SM

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	위	HOLE / TEST PIT 318001193 CAPTAINS FLAT JUNE 2021.GPJ GINT STD AUSTRALIA.GDT 19/8/21		W		(m)			FILL: silty SAND, brown, dense, low plasticity silts, medium grained, rootlets, moist FILL: gravelly CLAY, red-brown, high plasticity, fine gravels and sands, moist, firm CLAY; natural, light grey with red and orange mottles, hard, becoming bedrock Borehole SAQP9-BH05 terminated at 1m	SAQP9-BH05_0.0 XRF 529ppm SAQP9-BH05_0.5 XRF 96ppm SAQP9-BH05_0.75 XRF 4LOD SAQP9-BH05_1.0 XRF 4LOD	

APPENDIX 6 NATA ACCREDITED LABORATORY REPORTS



Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060

Attention:

Stephen Maxwell

Jun 23, 2021

Report Project name Project ID Received Date 805698-S ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Client Sample ID			QA01	QA02	QA07	QA08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Jn50356	S21-Jn50357	S21-Jn50358	S21-Jn50359
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	4600	2600	3900	6000
Arsenic	2	mg/kg	6.9	37	97	22
Barium	10	mg/kg	66	240	390	320
Cadmium	0.4	mg/kg	0.5	< 0.4	0.6	1.4
Chromium	5	mg/kg	9.8	< 5	11	8.9
Cobalt	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	51	99	400	110
Iron	20	mg/kg	10000	16000	44000	15000
Lead	5	mg/kg	120	730	2300	550
Manganese	5	mg/kg	180	230	77	250
Mercury	0.1	mg/kg	< 0.1	0.2	0.2	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	5.7	< 5
Nickel	5	mg/kg	9.1	< 5	< 5	< 5
Selenium	2	mg/kg	2.3	2.1	3.2	< 2
Titanium	10	mg/kg	460	55	78	120
Zinc	5	mg/kg	1200	1600	2500	510
% Moisture	1	%	3.9	6.6	6.3	36

Client Sample ID Sample Matrix			QA11 Soil	QA13 Soil	QA17 Soil	QA18 Soil
Eurofins Sample No.			S21-Jn50360	S21-Jn50361	S21-Jn50362	S21-Jn50363
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	7700	5200	1600	3000
Arsenic	2	mg/kg	8.0	23	14	30
Barium	10	mg/kg	120	390	260	720
Cadmium	0.4	mg/kg	< 0.4	0.9	0.7	1.5
Chromium	5	mg/kg	15	8.7	< 5	< 5
Cobalt	5	mg/kg	7.5	5.6	< 5	< 5
Copper	5	mg/kg	25	57	180	430
Iron	20	mg/kg	22000	17000	12000	26000
Lead	5	mg/kg	93	360	710	1900



NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.



Client Sample ID Sample Matrix			QA11 Soil	QA13 Soil	QA17 Soil	QA18 Soil
Eurofins Sample No.			S21-Jn50360	S21-Jn50361	S21-Jn50362	S21-Jn50363
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals		-				
Manganese	5	mg/kg	190	1300	110	210
Mercury	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	7.0
Nickel	5	mg/kg	11	8.3	< 5	< 5
Selenium	2	mg/kg	2.1	< 2	< 2	2.9
Titanium	10	mg/kg	170	94	67	110
Zinc	5	mg/kg	470	1000	3000	9400
% Moisture	1	%	1.8	19	3.7	4.3
% Clay	1	%	1.0	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	310	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.4	-	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	9.9	-	-	-

Client Sample ID			QA21	QA24	QA25	QA26
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Jn50364	S21-Jn50365	S21-Jn50366	S21-Jn50367
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	18000	9200	8600	6700
Arsenic	2	mg/kg	11	83	69	21
Barium	10	mg/kg	120	460	370	75
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	27	13	14	13
Cobalt	5	mg/kg	20	< 5	< 5	< 5
Copper	5	mg/kg	22	260	230	41
Iron	20	mg/kg	32000	42000	43000	22000
Lead	5	mg/kg	34	2400	2300	260
Manganese	5	mg/kg	230	87	89	56
Mercury	0.1	mg/kg	< 0.1	0.3	0.3	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	16	5.3	5.2	5.3
Selenium	2	mg/kg	5.5	3.9	4.3	2.3
Titanium	10	mg/kg	130	290	320	71
Zinc	5	mg/kg	59	250	230	74
% Moisture	1	%	32	14	14	26
% Clay	1	%	8.0	-	-	7.0
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	33	-	-	19
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.2	-	-	5.1
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	16	-	-	1.9



Client Sample ID			QA30	QA33	QA40	QA43
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Jn50368	S21-Jn50369	S21-Jn50370	S21-Jn50371
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	8500	4600	14000	6400
Arsenic	2	mg/kg	38	8.9	2.4	8.0
Barium	10	mg/kg	400	57	63	43
Cadmium	0.4	mg/kg	0.6	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.1	< 5	22	8.9
Cobalt	5	mg/kg	< 5	< 5	8.8	< 5
Copper	5	mg/kg	230	47	17	13
Iron	20	mg/kg	21000	11000	22000	13000
Lead	5	mg/kg	2100	240	24	90
Manganese	5	mg/kg	230	78	180	190
Mercury	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	6.8	< 5	16	< 5
Selenium	2	mg/kg	3.5	2.3	3.4	< 2
Titanium	10	mg/kg	250	470	280	270
Zinc	5	mg/kg	690	140	59	86
% Moisture	1	%	14	2.3	12	11
% Clay	1	%	-	-	9.0	< 1
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	< 10	12
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	5.9	5.5
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	5.4	2.4

Client Sample ID Sample Matrix			QA44 Soil	QA101 Soil	QA102 Soil	QA103 Soil
Eurofins Sample No.			S21-Jn50372	S21-Jn50373	S21-Jn50374	S21-Jn50375
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	5900	6100	12000	12000
Arsenic	2	mg/kg	6.5	94	62	67
Barium	10	mg/kg	46	32	38	54
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.7	0.7
Chromium	5	mg/kg	14	19	59	37
Cobalt	5	mg/kg	11	< 5	< 5	< 5
Copper	5	mg/kg	20	72	240	260
Iron	20	mg/kg	20000	24000	39000	30000
Lead	5	mg/kg	27	9800	9800	12000
Manganese	5	mg/kg	99	29	28	29
Mercury	0.1	mg/kg	< 0.1	0.2	0.2	0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	9.8	< 5	< 5	5.1
Selenium	2	mg/kg	3.6	6.8	9.5	9.9
Titanium	10	mg/kg	200	140	170	160
Zinc	5	mg/kg	54	86	360	390



Client Sample ID Sample Matrix			QA44 Soil	QA101 Soil	QA102 Soil	QA103 Soil
Eurofins Sample No.			S21-Jn50372	S21-Jn50373	S21-Jn50374	S21-Jn50375
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
% Moisture	1	%	20	12	15	15
% Clay	1	%	2.0	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	< 10	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.2	-	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	0.60	-	-	-

Client Sample ID			QA109	QA110	QA113	QA114
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Jn50377	S21-Jn50378	S21-Jn50379	S21-Jn50380
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	15000	9600	13000	31000
Arsenic	2	mg/kg	10	16	18	8.5
Barium	10	mg/kg	140	160	170	200
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	15	12	15	22
Cobalt	5	mg/kg	7.0	8.3	7.7	8.0
Copper	5	mg/kg	22	26	31	23
Iron	20	mg/kg	23000	20000	25000	29000
Lead	5	mg/kg	92	170	160	38
Manganese	5	mg/kg	330	590	500	92
Mercury	0.1	mg/kg	0.1	0.1	0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	11	11	16	19
Selenium	2	mg/kg	4.2	3.7	4.3	6.3
Titanium	10	mg/kg	190	110	140	280
Zinc	5	mg/kg	110	160	210	60
% Moisture	1	%	39	40	26	22
% Clay	1	%	8.0	7.0	7.0	16
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	67	30	20	11
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.9	5.8	5.9	6.5
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	12	11	7.2	13



Client Sample ID Sample Matrix Eurofins Sample No			GW4_0.2 Soil	GW7_0.2 Soil	GW8_0.2 Soil	SAQP11- BH01_0.0 Soil
Date Sampled			lup 03 2021	lup 03 2021	lup 03 2021	lup 03 2021
	100		Juli 03, 2021	Juli 03, 202 i	Juli 03, 2021	Juli 03, 2021
	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	5700	3900	14000	13000
Arsenic	2	mg/kg	130	37	61	40
Barium	10	mg/kg	590	120	250	220
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.8	0.4
Chromium	5	mg/kg	8.5	7.0	8.6	11
Cobalt	5	mg/kg	< 5	6.9	12	< 5
Copper	5	mg/kg	280	61	29	210
Iron	20	mg/kg	36000	27000	31000	26000
Lead	5	mg/kg	2700	920	1500	2500
Manganese	5	mg/kg	59	1100	600	120
Mercury	0.1	mg/kg	0.5	0.1	0.2	0.2
Molybdenum	5	mg/kg	5.1	< 5	< 5	< 5
Nickel	5	mg/kg	< 5	29	29	5.8
Selenium	2	mg/kg	3.3	4.2	7.9	5.0
Titanium	10	mg/kg	140	68	270	470
Zinc	5	mg/kg	700	340	1000	480
% Moisture	1	%	16	6.0	17	22

Client Sample ID Sample Matrix Eurofins Sample No.			SAQP11- BH03_0.0 Soil S21-Jn50385	SAQP11- BH10_0.0 Soil S21-Jn50386	SAQP9- BH03_0.0 Soil S21-Jn50387	SAQP9- BH04_0.25 Soil S21-Jn50388
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	11000	7800	9000	7900
Arsenic	2	mg/kg	26	41	170	90
Barium	10	mg/kg	270	340	120	440
Cadmium	0.4	mg/kg	1.6	3.9	< 0.4	0.8
Chromium	5	mg/kg	10	14	9.0	11
Cobalt	5	mg/kg	5.1	11	< 5	< 5
Copper	5	mg/kg	180	330	410	390
Iron	20	mg/kg	21000	15000	51000	41000
Lead	5	mg/kg	1300	1200	7300	4300
Manganese	5	mg/kg	190	650	94	140
Mercury	0.1	mg/kg	0.1	0.2	2.1	0.6
Molybdenum	5	mg/kg	< 5	< 5	5.8	< 5
Nickel	5	mg/kg	7.6	9.8	< 5	< 5
Selenium	2	mg/kg	4.1	4.2	8.3	3.8
Titanium	10	mg/kg	510	130	200	300
Zinc	5	mg/kg	460	1200	280	2500
% Moisture	1	%	24	25	12	12



Client Sample ID			SAQP10- BH02_0.25	SAQP13- BH02_0.0
Sample Matrix			Soil	Soil
Eurofins Sample No.			S21-Jn50389	S21-Jn50390
Date Sampled			Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit		
Heavy Metals				
Aluminium	20	mg/kg	4900	11000
Arsenic	2	mg/kg	56	23
Barium	10	mg/kg	1400	240
Cadmium	0.4	mg/kg	2.9	0.5
Chromium	5	mg/kg	6.8	21
Cobalt	5	mg/kg	< 5	12
Copper	5	mg/kg	780	56
Iron	20	mg/kg	42000	19000
Lead	5	mg/kg	3600	770
Manganese	5	mg/kg	230	550
Mercury	0.1	mg/kg	0.3	0.2
Molybdenum	5	mg/kg	7.9	5.2
Nickel	5	mg/kg	5.5	18
Selenium	2	mg/kg	< 2	2.3
Titanium	10	mg/kg	150	200
Zinc	5	mg/kg	19000	530
	1			
% Moisture	1	%	7.6	40



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals	Sydney	Jun 25, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8	Sydney	Jun 25, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Clay	Brisbane	Jun 30, 2021	14 Days
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Jun 25, 2021	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
% Moisture	Sydney	Jun 25, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Sydney	Jun 29, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jun 29, 2021	180 Days

- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage

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	Env	/ironment	Testing	Melbourne Monterey Road Dandenong South VIC 3175 "hone : +61 3 8564 5000	Sydn Unit F 16 Ma Lane	ey 3, Buildi irs Road Cove We	ng F ∍st NSW	2066	Brisbane 1/21 Sma Murarrie (^D hone : +	allwood QLD 41 -61739	Place 172 102 4600	₽6- Phc Phc	erth -48 Ban ∍lshpool one : +6	ksia Roć WA 61(11 8 925	ad 06 1 9600	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450	2
ABN: 50 005 085 521 wet): www.eurofins.com.a	au email: EnviroSale:	s@eurofins.com S	NATA # 1261 Site # 1254	Phon. NATA	e : +61 2 # 1261	9900 8∠ Site # 1{	400 3217	NATA # 1	1261 Sit	te # 2079	94 NA Site	ATA # 12 e # 237:	261 36		Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	IANZ # 1327	IANZ # 1290	
Company Name: Address:	Ramboll Au Level 3/100 North Sydn NSW 2060	ıstralia Pty Ltd) Pacific Highพะ ey	ay			Orde Repo Phon Fax:	rt #::: e::#::		31800 80569 02 995 02 995	1193 8 54 811 54 815	8 0					Received: Due: Priority: Contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	AM	
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	Ö	ample Detail		70 Glay	% Clay	Barium	Cobalt	Iron	Manganese	Molybdenum	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Titanium	Metals M8	Moisture Set	Cation Exchange Capacity			
Melbourne Labora	tory - NATA Site	e # 1254														×			
Sydney Laboratory	/ - NATA Site #	18217				×	×	×	×	×	×	×	×	×	×	×			
Brisbane Laborato	ry - NATA Site	# 20794		~	×														
Perth Laboratory -	NATA Site # 23	1736			$\left \right $														
Mayfield Laborato	ry - NATA Site #	± 25079			+		+	\downarrow						1	╡				
External Laborato	Y						_												
No Sample ID	Sample Date	Sampling Time	Matrix	LAB ID															
1 QA01	Jun 03, 2021		Soil	S21-Jn50356		×	×	×	×	×		×	×	×	×				
2 QA02	Jun 03, 2021		Soil	S21-Jn50357		×	×	×	×	×		×	×	×	×				
3 QA07	Jun 03, 2021		Soil	S21-Jn50358		×	×	×	×	×		×	×	×	×				
4 QA08	Jun 03, 2021		Soil	S21-Jn50359		×	×	×	×	×		×	×	×	×				
5 QA11	Jun 03, 2021		Soil	S21-Jn50360	×	×	×	×	×	×	×	×	×	×	×	×			
6 QA13	Jun 03, 2021		Soil	S21-Jn50361		×	×	×	×	×		×	×	×	×				
7 QA17	Jun 03, 2021		Soil	S21-Jn50362	~	× ~	×	×	×	×		×	×	×	×				
8 QA18	Jun 03, 2021		Soil	S21-Jn50363	~	~ ~	×	×	×	×		×	×	×	×				
9 QA21	Jun 03, 2021		Soil	S21-Jn50364	×	<u>~</u>	×	×	×	×	×	×	×	×	×	×			

Page 8 of 18

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ABN: 5	0 005 085 521 web: \	www.eurofins.	Environment com.au email: EnviroSale:	Testing s@eurofins.com	Melbourne Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sydne Unit F3 16 Mar Lane C Phone NATA	y Buildin s Road ove We: : +61 2 § ≠ 1261 S	ig F st NSW 2 3900 840 iite # 182	2066 P 4 B	risbane '21 Small lurarrie G hone : +6 ATA # 12	Iwood PI NLD 417 31 7 390 261 Site	lace 22 24600 #20794	Peri 46-4 Wel Pho Pho Site	th 18 Banks shpool V ne : +61 FA # 126 # 23736	sia Roa NA 610 8 9251 31	е 6 9600	Newcastle Nayfield East NSW 2304 Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland So Narcke Road Penrose, Auckland 1061 Penroa: +64.9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290
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			Sample Detail		% Clay	Aluminium	Barium	Cobalt	Iron	Manganese	Molybdenum	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Titanium	Metals M8	Moisture Set			
Melk	ourne Laborato	ory - NATA	Site # 1254																
Sydi	ney Laboratory	- NATA Si	te # 18217			×	×	×	×	×	×	×	×	×	×	×			
Bris	bane Laboratory	Y - NATA	Site # 20794		×														
Pert	h Laboratory - N	NATA Site	# 23736				-												
May	field Laboratory	y - NATA S	ite # 25079																
Exte	rnal Laboratory	/																	
10	QA24	Jun 03, 2(321	Soil	S21-Jn50365	×	×	×	×	×	×		×	×	×	×			
1	QA25	Jun 03, 2(321	Soil	S21-Jn50366	×	×	×	×	×	×		×	×	×	×			
12	QA26	Jun 03, 2(321	Soil	S21-Jn50367 X	×	×	×	×	×	×	×	×	×	×	×			
13	QA30	Jun 03, 2(321	Soil	S21-Jn50368	×	×	×	×	×	×		×	×	×	×			
14	QA33	Jun 03, 2(321	Soil	S21-Jn50369	×	×	×	×	×	×		×	×	×	×			
15	QA40	Jun 03, 2(321	Soil	S21-Jn50370 X	×	×	×	×	×	×	×	×	×	×	×			
16	QA43	Jun 03, 2(321	Soil	S21-Jn50371 X	×	×	×	×	×	×	×	×	×	×	×			
17	QA44	Jun 03, 2(321	Soil	S21-Jn50372 X	×	×	×	×	×	×	×	×	×	×	×			
18	QA101	Jun 03, 2(321	Soil	S21-Jn50373	×	×	×	×	×	×		×	×	×	×			

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S21-Jn50374 S21-Jn50375

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Jun 03, 2021 Jun 03, 2021

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ABN: 50 005 085 521 web: w	Environment Testing	Melbourne 5 Monterey Road 5 Monterey Road Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sydney Unit F3, I 16 Mars Lane Cov Phone : -	Building I Road /e West I +61 2 990 1261 Site	F NSW 206 00 8400 e # 18217	Bris 1/21 Mura 36 Phoi	bane Smallwo arrie QLD ne : +61 7 A # 1261	od Place 4172 3902 4 Site # 2	500 0794 1	Perth 46-48 Ba Welshpo Phone : - NATA # : Site # 23	inksia R ol WA 6 +61 8 92 1261 736	oad 106 51 9600	A 15 MA NA NA NA	wcastle 2 Industrial Drive Yrieid East NSW 2304 Box 60 Wickham 2293 ane : +61 2 4968 8448 TA # 1261 Site # 25079	Auckland So'Norke Road Penrose, Auckland 1061 Phone: +-64 9 526 45 51 IANZ # 1327	Christchurch Ra Detroit Drive Rolleston, Christchurch 76 Phone: 0800 856 450 IANZ # 1290	7675
Company Name: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060		ΟΥΞΪ	rder N eport <i>i</i> hone: ax:	.: • #	0 2 0 3 0 0 0 3 0 0 0 1 0 1	800119 5698 9954 8 9954 8	33 8118 8150					E L E O	teceived: ue: riority: contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	AM	
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD 318001193	AANAGEMENT PLAN	7										Eur	ofins Analytical S	ervices Manager : An	drew Black	
	Sample Detail		Aluminium	Barium	Cobalt	Iron	Molyddenum Manganese	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Titanium	Metals M8	Moisture Set	Cation Exchange Capacity				

Melbourne La Sydney Laboi Brisbane Lab	aboratory ratory - N oratory - NAT	Sal - NATA Site ATA Site # 1 NATA Site # 1 TA Site # 237	mple Detail # 1254 8217 20794 36			×	× .	× .				tract at 25°C as rec.)	×	×	×	×	
Mayfield Labo	oratory - I	NATA Site # 2	25079								_						
External Labo	oratory																
21 QA109	η	un 03, 2021		Soil	S21-Jn50377	×	Х	×	×	×	×	×	×	×	×	Х	
22 QA110	ηL	ın 03, 2021		Soil	S21-Jn50378	×	×	×	×	×		×	×	×	×	×	
23 QA113	ηr	un 03, 2021		Soil	S21-Jn50379	×	×	×	×	×	~ ×	×	×	×	×	×	
24 QA114	ηľ	un 03, 2021		Soil	S21-Jn50380	×	×	×	×	×	×	×	×	×	×	×	
25 GW4_0.2	2 Ju	un 03, 2021		Soil	S21-Jn50381		×	×	×	×	~ ×	~	×	×	×	×	
26 GW7_0.2	2 Ju	un 03, 2021		Soil	S21-Jn50382		×	×	×	×	~ ×	~	×	×	×	×	
27 GW8_0.2	2 Ju	un 03, 2021		Soil	S21-Jn50383		Х	×	×	×	×	~	×	×	×	Х	
28 SAQP11 BH01_0.	- 0	ın 03, 2021		Soil	S21-Jn50384		×	×	×	×	×	~	×	×	×	×	
29 SAQP11 BH03_0.	- ⁻	ın 03, 2021		Soil	S21-Jn50385		×	×	×	×	×	~	×	×	×	×	

		Australia					New Zealand	
	Environment Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydney Unit F3, Building F 5 16 Mars Road Lane Cove West NSW 206	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 56 Phone : +617 3902 4600	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600	New castle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 50 005 085 521 web: v	ww.eurofins.com.au email: EnviroSales@eurofins.com	NATA # 1261 Site # 1254	Phone:+61 2 9900 8400 NATA # 1261 Site # 18217	NATA # 1261 Site # 20794 7	NATA # 1261 Site # 23736	Phone:+61 2 4968 8448 NATA # 1261 Site # 25079	IANZ # 1327	IANZ # 1290
Company Name: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060		Order No.: Report #: Phone: Fax:	318001193 805698 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	AM
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD 318001193	MANAGEMENT PLAN	7			Eurofins Analytical Se	ervices Manager : An	drew Black
	Sample Detail		Cobalt Barium Aluminium	pH (1:5 Aqueous extract at 25°C as rec Molybdenum Manganese Iron	Moisture Set Metals M8 Titanium Selenium	Cation Exchange Capacity		

ange Capacity	×	×											
		×					×	×	×	×	×		
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		×					х	Х	Х	Х	Х	×	×
		×					×	×	×	×	×	×	×
eous extract at 25°C as rec.)		×											
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							S21-Jn50386	S21-Jn50387	S21-Jn50388	S21-Jn50389	S21-Jn50390	S21-Jn50391	S21-Jn50392
							Soil	Soil	Soil	Soil	Soil	Water	Water
mple Detail	# 1254	8217	20794	36	25079								
ů Na Na Na Na Na Na Na Na Na Na Na Na Na	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 237	- NATA Site #		Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03. 2021
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	SAQP11- BH10_0.0	SAQP9- BH03_0.0	SAQP9- BH04_0.25	SAQP10- BH02_0.25	SAQP13- BH02_0.0	R1	R2
	Melbo	Sydne	Brisb	Perth	Mayfi	Exter	30	31	32	33	34	35	36

		Australia												New Zealand	
ABN: 50 005 085 521 web: wv	Environment Testing w.eurofins.com.au email: EnviroSales@eurofins.com	Melbourne Monterey Road De Monterey Road De Monter +61 3 8564 5000 NATA # 1261 Site # 1254	Sydney Unit F3, Buil 16 Mars Roa Lane Cove V Phone : +61 NATA # 126	ding F d Vest NSW 2 9900 84 1 Site # 18	2066 P 1 1 2 2 2 2 2 1 7 2 1 1 7 2 1 7 2 1 7 2 1 1 1 1	risbane /21 Small/ lurarrie Q hone : +6 ATA # 12	wood Plac LD 4172 1 7 3902 4 61 Site #1	е 4600 20794	Perth 46-48 B Welshpo Phone : NATA # Site # 2	anksia R ool WA 6 +61 8 92 1261 3736	oad 106 251 9600	New May Pho NAT	vcastle 2 Industrial Drive frield East NSW 2304 Box 60 Wickham 2293 ne : +61 2 4968 8448 FA # 1261 Site # 25079	Auckland So'Norke 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: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060		Orde Rep Pho Fax:	er No.: ort #: ne:		318001 305698 32 9954 32 9954	193 + 8118 + 8150					Ϋ́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́́	eceived: ue: riority: ontact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	WA
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD 318001193	<i>J</i> ANAGEMENT PLAN										Euro	ofins Analytical So	ervices Manager : An	drew Black
	Sample Detail	% Clay	Aluminium	Cobalt	Iron	Manganese	Molybdenum	Selenium	Titanium	Metals M8	Moisture Set	Cation Exchange Capacity			

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Jun 03, 2021

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Melbourne Laboratory - NATA Site # 1254

Brisbane Laboratory - NATA Site # 20794

Sydney Laboratory - NATA Site # 18217

Mayfield Laboratory - NATA Site # 25079

External Laboratory

37 R3 Test Counts

Perth Laboratory - NATA Site # 23736

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Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
сос	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
СР	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.
- 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							
Aluminium			mg/kg	< 20	20	Pass	
Arsenic			mg/kg	< 2	2	Pass	
Barium			mg/kg	< 10	10	Pass	
Cadmium			mg/kg	< 0.4	0.4	Pass	
Chromium			mg/kg	< 5	5	Pass	
Cobalt			mg/kg	< 5	5	Pass	
Copper			mg/kg	< 5	5	Pass	
Lead			mg/kg	< 5	5	Pass	
Manganese			mg/kg	< 5	5	Pass	
Mercury			mg/kg	< 0.1	0.1	Pass	
Molybdenum			mg/kg	< 5	5	Pass	
Nickel			mg/kg	< 5	5	Pass	
Selenium			mg/kg	< 2	2	Pass	
Titanium			mg/kg	< 10	10	Pass	
Zinc			mg/kg	< 5	5	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at	25°C as rec.)		uS/cm	< 10	10	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium			%	87	80-120	Pass	
Arsenic			%	97	80-120	Pass	
Barium			%	95	80-120	Pass	
Cadmium			%	98	80-120	Pass	
Chromium			%	98	80-120	Pass	
Cobalt			%	98	80-120	Pass	
Copper			%	97	80-120	Pass	
Iron			%	85	80-120	Pass	
Lead			%	95	80-120	Pass	
Manganese			%	96	80-120	Pass	
Mercury			%	106	80-120	Pass	
Molybdenum			%	114	80-120	Pass	
Nickel			%	100	80-120	Pass	
Selenium			%	104	80-120	Pass	
Titanium			%	95	80-120	Pass	
Zinc			%	91	80-120	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at	25°C as rec.)		%	90	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	S21-Jn50356	CP	%	109	75-125	Pass	
Barium	N21-Jn48314	NCP	%	117	75-125	Pass	
Cadmium	S21-Jn50356	CP	%	97	75-125	Pass	
Chromium	S21-Jn50356	CP	%	92	75-125	Pass	
Cobalt	S21-Jn50356	CP	%	91	75-125	Pass	
Copper	N21-Jn48314	NCP	%	102	75-125	Pass	
Lead	N21-Jn48314	NCP	%	100	75-125	Pass	
Mercury	S21-Jn50356	CP	%	87	75-125	Pass	
Molybdenum	S21-Jn50356	CP	%	103	75-125	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	S21-Jn50356	CP	%	90			75-125	Pass	
Selenium	S21-Jn50356	CP	%	104			75-125	Pass	
Zinc	N21-Jn48314	NCP	%	82			75-125	Pass	
Spike - % Recovery							1		
Heavy Metals				Result 1					
Cadmium	S21-Jn50387	CP	%	104			75-125	Pass	
Chromium	S21-Jn50387	CP	%	93			75-125	Pass	
Cobalt	S21-Jn50387	CP	%	98			75-125	Pass	
Molybdenum	S21-Jn50387	CP	%	101			75-125	Pass	
Nickel	S21-Jn50387	CP	%	95			75-125	Pass	
Selenium	S21-Jn50387	CP	%	91			75-125	Pass	
Spike - % Recovery				1			I		
Heavy Metals				Result 1					
Arsenic	S21-Jn50389	CP	%	89			75-125	Pass	
Cadmium	S21-Jn50389	CP	%	102			75-125	Pass	
Chromium	S21-Jn50389	CP	%	103			75-125	Pass	
Cobalt	S21-Jn50389	CP	%	103			75-125	Pass	
Manganese	S21-Jn50389	CP	%	97			75-125	Pass	
Mercury	S21-Jn50389	CP	%	101			75-125	Pass	
Molybdenum	S21-Jn50389	CP	%	110			75-125	Pass	
Nickel	S21-Jn50389	CP	%	100			75-125	Pass	
Selenium	S21-Jn50389	CP	%	98			75-125	Pass	
Titanium	S21-Jn50389	CP	%	121			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate					1		I	[
		1		Result 1	Result 2	RPD			
% Moisture	S21-Jn50358	CP	%	6.3	5.3	18	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S21-Jn46577	NCP	uS/cm	170	190	7.0	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S21-Jn46577	NCP	pH Units	7.0	7.0	<1	30%	Pass	
Duplicate							1		
		1		Result 1	Result 2	RPD			
% Moisture	S21-Jn50368	CP	%	14	12	14	30%	Pass	
Duplicate					1		I		
Heavy Metals		1		Result 1	Result 2	RPD			
Aluminium	S21-Jn50375	CP	mg/kg	12000	12000	2.0	30%	Pass	
Arsenic	S21-Jn50375	CP	mg/kg	67	67	1.0	30%	Pass	
Barium	S21-Jn50375	CP	mg/kg	54	48	12	30%	Pass	
Cadmium	S21-Jn50375	CP	mg/kg	0.7	0.8	16	30%	Pass	
Chromium	S21-Jn50375	CP	mg/kg	37	40	8.0	30%	Pass	
Cobalt	S21-Jn50375	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S21-Jn50375	CP	mg/kg	260	250	2.0	30%	Pass	
Iron	S21-Jn50375	CP	mg/kg	30000	32000	6.0	30%	Pass	
Lead	S21-Jn50375	CP	mg/kg	12000	9900	17	30%	Pass	
Manganese	S21-Jn50375	CP	mg/kg	29	32	9.0	30%	Pass	
Mercury	S21-Jn50375	CP	mg/kg	0.1	0.2	15	30%	Pass	
Molybdenum	S21-Jn50375	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	S21-Jn50375	CP	mg/kg	5.1	5.3	4.0	30%	Pass	
Selenium	S21-Jn50375	CP	mg/kg "	9.9	10	1.0	30%	Pass	
	S21-Jn50375	CP	mg/kg "	160	180	13	30%	Pass	
ZINC	S21-Jn50375	CP	mg/kg	390	400	2.0	30%	Pass	



Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	S21-Jn50377	CP	meq/100g	12	13	9.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Jn50379	CP	%	26	27	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn50386	CP	mg/kg	7800	10000	27	30%	Pass	
Arsenic	S21-Jn50386	CP	mg/kg	41	25	48	30%	Fail	Q02
Barium	S21-Jn50386	CP	mg/kg	340	240	34	30%	Fail	Q02
Cadmium	S21-Jn50386	CP	mg/kg	3.9	2.5	44	30%	Fail	Q15
Chromium	S21-Jn50386	CP	mg/kg	14	11	25	30%	Pass	
Cobalt	S21-Jn50386	CP	mg/kg	11	8.5	22	30%	Pass	
Copper	S21-Jn50386	CP	mg/kg	330	210	41	30%	Fail	Q02
Iron	S21-Jn50386	CP	mg/kg	15000	23000	41	30%	Fail	Q02
Lead	S21-Jn50386	CP	mg/kg	1200	790	41	30%	Fail	Q02
Manganese	S21-Jn50386	CP	mg/kg	650	540	18	30%	Pass	
Mercury	S21-Jn50386	CP	mg/kg	0.2	0.1	51	30%	Fail	Q15
Molybdenum	S21-Jn50386	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	S21-Jn50386	CP	mg/kg	9.8	6.8	35	30%	Fail	Q15
Selenium	S21-Jn50386	CP	mg/kg	4.2	2.8	41	30%	Fail	Q15
Titanium	S21-Jn50386	CP	mg/kg	130	110	15	30%	Pass	
Zinc	S21-Jn50386	CP	mg/kg	1200	1300	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn50387	CP	mg/kg	9000	12000	31	30%	Fail	Q02
Arsenic	S21-Jn50387	CP	mg/kg	170	220	26	30%	Pass	
Barium	S21-Jn50387	CP	mg/kg	120	160	28	30%	Pass	
Cadmium	S21-Jn50387	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Jn50387	CP	mg/kg	9.0	11	21	30%	Pass	
Cobalt	S21-Jn50387	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S21-Jn50387	CP	mg/kg	410	660	46	30%	Fail	Q02
Iron	S21-Jn50387	CP	mg/kg	51000	60000	16	30%	Pass	
Lead	S21-Jn50387	CP	mg/kg	7300	12000	45	30%	Fail	Q02
Manganese	S21-Jn50387	CP	mg/kg	94	140	38	30%	Fail	Q02
Mercury	S21-Jn50387	CP	mg/kg	2.1	3.3	42	30%	Fail	Q02
Molybdenum	S21-Jn50387	CP	mg/kg	5.8	7.7	29	30%	Pass	
Nickel	S21-Jn50387	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	S21-Jn50387	CP	mg/kg	8.3	11	25	30%	Pass	
Titanium	S21-Jn50387	CP	mg/kg	200	300	40	30%	Fail	Q02
Zinc	S21-Jn50387	CP	mg/kg	280	450	47	30%	Fail	Q02
Duplicate				1					
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn50388	CP	mg/kg	7900	10000	23	30%	Pass	
Arsenic	S21-Jn50388	CP	mg/kg	90	130	34	30%	Fail	Q02
Barium	S21-Jn50388	CP	mg/kg	440	630	35	30%	Fail	Q02
Cadmium	S21-Jn50388	CP	mg/kg	0.8	0.6	25	30%	Pass	
Chromium	S21-Jn50388	CP	mg/kg	11	11	3.0	30%	Pass	
Cobalt	S21-Jn50388	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S21-Jn50388	CP	mg/kg	390	510	26	30%	Pass	
Iron	S21-Jn50388	CP	mg/kg	41000	53000	27	30%	Pass	
Manganese	S21-Jn50388	CP	mg/kg	140	150	9.0	30%	Pass	
Mercury	S21-Jn50388	CP	mg/kg	0.6	1.3	83	30%	Fail	Q15
Molybdenum	S21-Jn50388	CP	mg/kg	< 5	5.7	14	30%	Pass	
Nickel	S21-Jn50388	CP	mg/kg	< 5	< 5	<1	30%	Pass	



Duplicate				-		_			
Heavy Metals				Result 1	Result 2	RPD			
Selenium	S21-Jn50388	CP	mg/kg	3.8	6.3	49	30%	Fail	Q15
Titanium	S21-Jn50388	CP	mg/kg	300	280	7.0	30%	Pass	
Duplicate									
	_	_		Result 1	Result 2	RPD			
% Moisture	S21-Jn50389	CP	%	7.6	6.2	21	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	No
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
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
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:

John Nguyen Charl Du Preez Emily Rosenberg John Nguyen Jonathon Angell Analytical Services Manager Senior Analyst-Inorganic (NSW) Senior Analyst-Metal (VIC) Senior Analyst-Metal (NSW) Senior Analyst-Inorganic (QLD)

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.

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NATA

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

NATA Accredited Accreditation Number 1261 Site Number 18217

Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060

Attention:

Stephen Maxwell

Report Project name Project ID Received Date 805698-W ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

318	001	193
Jun	23,	2021

Client Sample ID			R1	R2	R3
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S21-Jn50391	S21-Jn50392	S21-Jn50393
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit			
Heavy Metals					
Aluminium	0.05	mg/L	< 0.05	< 0.05	< 0.05
Arsenic	0.001	mg/L	< 0.001	< 0.001	< 0.001
Barium	0.02	mg/L	< 0.02	< 0.02	< 0.02
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001
Cobalt	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	0.004	< 0.001
Iron	0.05	mg/L	< 0.05	0.33	< 0.05
Lead	0.001	mg/L	0.039	0.015	< 0.001
Manganese	0.005	mg/L	< 0.005	0.005	< 0.005
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	0.007	< 0.005	< 0.005
Nickel	0.001	mg/L	< 0.001	< 0.001	< 0.001
Selenium	0.001	mg/L	< 0.001	< 0.001	< 0.001
Titanium	0.005	mg/L	< 0.005	0.006	< 0.005
Zinc	0.005	mg/L	0.008	0.020	< 0.005



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals	Sydney	Jun 25, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8	Sydney	Jun 25, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

			A	vustralia													New Zealand		
	Env	vironment Tes	in o So So So So So So So So So So So So So	Telbourne Monterey Road andenong South VIC 3175 hone : +61 3 8564 5000	Sydn Unit F 16 Mé Lane	ey :3, Build ars Roac Cove W.	ing F est NSW	2066	Brisban 1/21 Sm Murarrie Phone : +	e allwood QLD 4 ⁻ +61735	Place 172 302 4600	- 46- Phc	a rth -48 Ban ∋lshpool one : +6	ksia Roi WA 61(11 8 925	ad 06 11 9600	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 767; Phone : 0800 856 450	75
ABN: 50 005 085 521 web	: www.eurofins.com.a	au email: EnviroSales@eu	N rofins.com S	IATA # 1261 ite # 1254	Phon NAT∕	e:+612 \#1261	9900 8- Site # 1-	400 8217	NATA #	1261 Si	te # 2075	94 NA Site	ATA # 12 e # 237:	261 36		Phone:+61 2 4968 8448 NATA # 1261 Site # 25079	IANZ # 1327	IANZ # 1290	
Company Name: Address:	Ramboll Au Level 3/100 North Sydn NSW 2060	lstralia Pty Ltd) Pacific Highway ey				Orde Repo Phon Fax:	e: # 10 #		31800 80569 02 99 { 02 99 {)1193 8 54 811 54 815	18 50					Received: Due: Priority: Contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	AM	
Project Name: Project ID:	ADDITION/ 318001193	AL - CAPTAINS FL/	AT LEAD M	ANAGEMENT PLA	7											Eurofins Analytical S	ervices Manager : An	drew Black	
	Ö	ample Detail			% Clav	Aluminium	Cobalt	Iron	Manganese	Molybdenum	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Titanium	Metals M8	Moisture Set	Cation Exchange Capacity			
Melbourne Laborat	ory - NATA Site	e # 1254				-										×			
Sydney Laboratory	- NATA Site #	18217					×	×	×	×	×	×	×	×	×	×			
Brisbane Laborato	ry - NATA Site	# 20794			×														
Perth Laboratory -	NATA Site # 23	3736			+	+	+		\downarrow						\uparrow				
Mayfield Laborato	<u>y - NATA Site #</u>	# 25079			+	+	+	+	_					\uparrow	+				
External Laborator	7				+	+	+	+						1	+				
No Sample ID	Sample Date	 Sampling Time 	Matrix	LAB ID															
1 QA01	Jun 03, 2021	Soil		S21-Jn50356		^ ×	×	×	×	×		×	×	×	×				
2 QA02	Jun 03, 2021	Soil		S21-Jn50357		^ ×	×	×	×	×		×	×	×	×				
3 QA07	Jun 03, 2021	Soil		S21-Jn50358		×	×	×	×	×		×	×	×	×				
4 QA08	Jun 03, 2021	Soil		S21-Jn50359		×	×	×	×	×		×	×	×	×				
5 QA11	Jun 03, 2021	Soil		S21-Jn50360	×	×	×	×	×	×	×	×	×	×	×	×			
6 QA13	Jun 03, 2021	Soil		S21-Jn50361		×	×	×	×	×		×	×	×	×				
7 QA17	Jun 03, 2021	Soil		S21-Jn50362		^ ×	×	×	×	×		×	×	×	×				
8 QA18	Jun 03, 2021	Soil		S21-Jn50363		^ ×	×	×	×	×		×	×	×	×				
9 QA21	Jun 03, 2021	Soil		S21-Jn50364	×		×	×	×	×	×	×	×	×	×	×			

	- June	20		Australia														New Zealand	
ABN: 6	0 005 085 521 web: \	E www.eurofins.col	nvironment Testing m.au email: EnviroSales@eurofins.con	Melbourne 6 Monterey Road 5 Monterey Road Dandemong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 m Site # 1254	Sydr Unit I Lane Phon NAT,	ney F3, Buil lars Ros : Cove V ie : +61 A # 126	ding F ad Vest NS\ 2 9900 £ 1 Site # ΄	N 2066 8400 18217	Brisbar 1/21 Sn Murarrié Phone : NATA #	ne nallwood e QLD 4 e QLD 7 3 : +61 7 3 f 1261 Si	Place 172 902 460 te # 207	00 4 4 2 7 2 0	erth 6-48 Ba /elshpo hone : - ATA # ite # 23	nksia R ol WA 6 +61 8 92 1261 736	oad 106 251 9600	NA NA	wcastle 2 Industrial Drive yfield East NSW 2304 Box 60 Wickham 2293 ane : +61 2 4968 8448 TA # 1261 Site # 25079	Auckland 35 O'Rorke Road Denose, Auckland 1061 Phone: +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone: 0800 856 450 IANZ # 1290
Ϋ́ς	mpany Name: dress:	Ramboll Level 3/1 North Sy NSW 206	Australia Pty Ltd 00 Pacific Highway dney 30			Ord Rep Phoi	er No. ort #: ne:		3180 8056 02 95 02 95	01193 98 954 81	18 50					KUFO	teceived: ue: riority: contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	WY
P P	oject Name: oject ID:	ADDITIO 3180011(01 - CAPTAINS FLAT LEA 93	AD MANAGEMENT PLAN	z											Euro	ofins Analytical Se	ervices Manager : An	drew Black
			Sample Detail		% Clav	Aluminium	Barium		Manganese	Molybdenum	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Titanium	Metals M8	Moisture Set	Cation Exchange Capacity			
Melk	ourne Laborato	SIV - NATA S	Site # 1254						_							×			
Syd	ney Laboratory	- NATA Site	# 18217			×	^ ×		×	×	×	×	×	×	×	×			
Bris	bane Laboratory	y - NATA Sit	te # 20794		×	$\left \right $													
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May	field Laboratory	v - NATA Sit	e # 25079			-	+	_	_	_									
Exte	rnal Laboratory																		
10	QA24	Jun 03, 202	Soil Soil	S21-Jn50365		×	^ ×	\sim	×	×		×	×	×	×				
1	QA25	Jun 03, 202	Soil Soil	S21-Jn50366		×	×	\sim	×	×		×	×	×	×				
12	QA26	Jun 03, 202	21 Soil	S21-Jn50367	×	×	^ ×	\sim	×	×	×	×	×	×	×	×			
13	QA30	Jun 03, 202	21 Soil	S21-Jn50368		×	^ ×	\sim	×	×		×	×	×	×				
14	QA33	Jun 03, 202	Soil Soil	S21-Jn50369		×	×	\sim	×	×		×	×	×	×				
15	QA40	Jun 03, 202	21 Soil	S21-Jn50370	×	×	×		×	×	×	×	×	×	Х	×			
16	QA43	Jun 03, 202	21 Soil	S21-Jn50371	×	×	×	$\hat{}$	×	×	×	×	×	×	×	×			
17	QA44	Jun 03, 202	Soil Soil	S21-Jn50372	×	×	×	\sim	×	×	×	×	×	×	×	×			
18	QA101	Jun 03, 202	21 Soil	S21-Jn50373		×	~ ×	${}$	×	×		×	×	×	×				

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S21-Jn50374 S21-Jn50375

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Jun 03, 2021 Jun 03, 2021

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ABN: 50 005 085 521 web: w	Environment Testing	Melbourne 6 Monterey Road 6 Monterey Road Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sydney Unit F3, Bu 16 Mars Rd Lane Cove Phone : +6 NATA # 12	uilding F oad West NS 81 2 9900 81 2 9900 81 Site #	W 2066 8400 18217	Brisbar 1/21 Sm Murarrie Phone : NATA #	e allwood F allwood F A1 7 39 1261 Site	⊐lace 72 02 4600 ∋ # 2079	Per 46-z Wel Pho RA Site	th 48 Banks Ishpool V bne : +61 TA # 126 * # 23736	sia Roac NA 6106 8 9251 31	0096	Newcastle 4/52 Industria Mayfield East PO Box 60 W Phone : +61 2 NATA # 1261	l Drive NSW 2304 lickham 2293 4968 8448 Site # 25079	Auckland Sc Nerke Road Penrose, Auckland 1061 Phone: +-64 9 526 45 51 IANZ # 1327	Christchurch A Detroit Drive Rolleston, Christchurch 76 Phone : 0800 856 450 IANZ # 1290	7675
Company Name: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060		Orc Pho Fay	der No. port #: one: K:		31800 80569 02 99	01193 98 154 811	ωQ					Received Due: Priority: Contact	1: Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	AM	
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD 318001193	AANAGEMENT PLAN	7									_	Eurofins Ar	ıalytical Se	ervices Manager : Ar	ldrew Black	
	Sample Detail	70 Ciay	Aluminium	Barium		Manganese	Molybdenum	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Titanium	Metals M8	Moisture Set	Cation Evolution Connection				

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	 	Australia					New Zealand	
ARN: 60,005,085,521, web. w	Environment Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261	Sydney Unit F3, Building F 16 Mars Road Lane Cove West NSW 20 Phone : +61 2 9900 8400 NATA Sile # 1531 Sile # 1820	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 66 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600 NATA #1261 NATA #1261	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 24968 8448 NATA # 1561 Stie # 26770	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: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060		Order No.: Report #: Phone: Fax:	318001193 805698 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	W
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD 318001193	MANAGEMENT PLAN	7			Eurofins Analytical Se	ervices Manager : An	drew Black
	Sample Detail		Cobalt Barium Aluminium	pH (1:5 Aqueous extract at 25°C as re Molybdenum Manganese Iron	Moisture Set Metals M8 Titanium Selenium	Cation Exchange Canacity		

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							Soil	Soil	Soil	Soil	Soil	Water	
mple Detail	# 1254	8217	20794	36	25079								
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	ourne Laborator	ey Laboratory -	ane Laboratory	I Laboratory - N	ield Laboratory	rnal Laboratory	SAQP11- BH10_0.0	SAQP9- BH03_0.0	SAQP9- BH04_0.25	SAQP10- BH02_0.25	SAQP13- BH02_0.0	R1	
	Melb	Sydn	Brist	Perth	Mayf	Exte	30	31	32	33	34	35	

		Australia												New Zealand		
ABN: 50 005 085 521 web: w	Environment Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sydney Unit F3, Buil 16 Mars Ros Lane Cove V Phone : +61 NATA # 126	ding F d Vest NSW 2 9900 84 1 Site # 18	2066 P 4-1 8	risbane /21 Smal lurarrie C hone : +6 ATA # 13	Iwood Pla NLD 4172 31 7 3902 261 Site ≠	ace 2 2 4600 ≄ 20794	Perth 46-48 Welshl Phone NATA Site #	Banksia pool WA ∴ +61 8 # 1261 23736	Road 6106 9251 960	0 A 4 M A 4 M	wcastle 22 Industrial Drive syfield East NSW 2304 D Box 60 Vickham 2293 one : +61 2 4968 8448 one : +1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 767 Phone : 0800 856 450 IANZ # 1290	75
Company Name: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060		Orde Rep Pho Fax:	er No.: ort #: ne:		318001 305698 32 995	193 8 4 8118 4 8150					E L E O	Received: Due: Priority: Contact Name:	Jun 23, 2021 10:19 Jun 30, 2021 5 Day Stephen Maxwell	AM	
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD 318001193	MANAGEMENT PLAN										Eur	ofins Analytical Se	ervices Manager : An	drew Black	
	Sample Detail	% Clay	Aluminium	Cobalt	Iron	Manganese	Molybdenum	pH (1:5 Aqueous extract at 25°C as rec.)	Selenium	Metals M8	Moisture Set	Cation Exchange Capacity				
Melbourne Laborato	ry - NATA Site # 1254											×				

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Brisbane Laboratory - NATA Site # 20794

Sydney Laboratory - NATA Site # 18217

Mayfield Laboratory - NATA Site # 25079

External Laboratory

37 R3 Test Counts

Perth Laboratory - NATA Site # 23736



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
сос	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
СР	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.
- 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				1			
Heavy Metals							
Aluminium			mg/L	< 0.05	0.05	Pass	
Arsenic			mg/L	< 0.001	0.001	Pass	
Barium			mg/L	< 0.02	0.02	Pass	
Cadmium			mg/L	< 0.0002	0.0002	Pass	
Chromium			mg/L	< 0.001	0.001	Pass	
Cobalt			mg/L	< 0.001	0.001	Pass	
Copper			mg/L	< 0.001	0.001	Pass	
Iron			mg/L	< 0.05	0.05	Pass	
Lead			mg/L	< 0.001	0.001	Pass	
Manganese			mg/L	< 0.005	0.005	Pass	
Mercury			mg/L	< 0.0001	0.0001	Pass	
Molybdenum			mg/L	< 0.005	0.005	Pass	
Nickel			mg/L	< 0.001	0.001	Pass	
Selenium			mg/L	< 0.001	0.001	Pass	
Titanium			mg/L	< 0.005	0.005	Pass	
Zinc			mg/L	< 0.005	0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium			%	89	80-120	Pass	
Arsenic			%	90	80-120	Pass	
Barium			%	83	80-120	Pass	
Cadmium			%	90	80-120	Pass	
Chromium			%	99	80-120	Pass	
Cobalt			%	101	80-120	Pass	
Copper			%	100	80-120	Pass	
Iron			%	97	80-120	Pass	
Lead			%	102	80-120	Pass	
Manganese			%	90	80-120	Pass	
Mercury			%	108	80-120	Pass	
Molybdenum			%	98	80-120	Pass	
Nickel			%	100	80-120	Pass	
Selenium			%	90	80-120	Pass	
Titanium			%	95	80-120	Pass	
Zinc			%	100	80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				1	1		
Heavy Metals	1			Result 1			
Aluminium	S21-Jn31317	NCP	%	95	75-125	Pass	
Spike - % Recovery						-	
Heavy Metals				Result 1			
Arsenic	S21-Jn50392	CP	%	95	75-125	Pass	
Barium	S21-Jn50392	CP	%	88	75-125	Pass	
Cadmium	S21-Jn50392	CP	%	96	75-125	Pass	
Chromium	S21-Jn50392	CP	%	106	75-125	Pass	
Cobalt	S21-Jn50392	CP	%	109	75-125	Pass	
Copper	S21-Jn50392	CP	%	109	75-125	Pass	
Iron	S21-Jn50392	CP	%	104	75-125	Pass	
Lead	S21-Jn50392	CP	%	110	75-125	Pass	
Manganese	S21-Jn50392	CP	%	97	75-125	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	S21-Jn50392	CP	%	119			75-125	Pass	
Molybdenum	S21-Jn50392	CP	%	107			75-125	Pass	
Nickel	S21-Jn50392	CP	%	108			75-125	Pass	
Selenium	S21-Jn50392	CP	%	104			75-125	Pass	
Titanium	S21-Jn50392	CP	%	97			75-125	Pass	
Zinc	S21-Jn50392	CP	%	105			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Jn50391	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Barium	S21-Jn50391	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Cadmium	S21-Jn50391	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S21-Jn50391	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt	S21-Jn50391	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S21-Jn50391	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron	S21-Jn50391	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead	S21-Jn50391	CP	mg/L	0.039	0.002	180	30%	Fail	Q02
Manganese	S21-Jn50391	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Mercury	S21-Jn50391	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	S21-Jn50391	CP	mg/L	0.007	< 0.005	160	30%	Fail	Q15
Nickel	S21-Jn50391	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Selenium	S21-Jn50391	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Titanium	S21-Jn50391	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc	S21-Jn50391	CP	mg/L	0.008	0.008	3.0	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	No
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
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
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:

John Nguyen John Nguyen Analytical Services Manager 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.

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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 272502

Client Details	
Client	Ramboll Australia Pty Ltd
Attention	Stephen Maxwell
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details	
Your Reference	318001193, Captains Flat Lead Management Plan
Number of Samples	2 Soil
Date samples received	24/06/2021
Date completed instructions received	24/06/2021

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	01/07/2021
Date of Issue	01/07/2021
NATA Accreditation Number 2901. This do	ocument shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17	7025 - Testing. Tests not covered by NATA are denoted with *

<u>Results Approved By</u> Giovanni Agosti, Group Technical Manager Manju Dewendrage, Chemist Authorised By

Nancy Zhang, Laboratory Manager

Envirolab Reference: 272502 Revision No: R00



Page | 1 of 8

Acid Extractractable metals in soil			
Our Reference		272502-1	272502-2
Your Reference	UNITS	QA45	QA104
Date Sampled		4/06/2021	16/06/2021
Type of sample		Soil	Soil
Date prepared	-	29/06/2021	29/06/2021
Date analysed	-	29/06/2021	29/06/2021
Arsenic	mg/kg	<4	57
Barium	mg/kg	35	18
Cadmium	mg/kg	<0.4	0.8
Chromium	mg/kg	15	39
Cobalt	mg/kg	9	2
Copper	mg/kg	19	290
Iron	mg/kg	24,000	37,000
Lead	mg/kg	25	8,900
Manganese	mg/kg	87	21
Mercury	mg/kg	<0.1	0.5
Molybdenum	mg/kg	<1	1
Nickel	mg/kg	12	5
Selenium	mg/kg	<3	<9
Titanium	mg/kg	30	16
Zinc	mg/kg	46	300
Aluminium	mg/kg	7,300	18,000

Moisture			
Our Reference		272502-1	272502-2
Your Reference	UNITS	QA45	QA104
Date Sampled		4/06/2021	16/06/2021
Type of sample		Soil	Soil
Date prepared	-	28/06/2021	28/06/2021
Date analysed	-	29/06/2021	29/06/2021
Moisture	%	22	11

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTR	OL: Acid Ext	ractracta	ble metals in soil			Du	plicate		Spike Red	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			29/06/2021	[NT]		[NT]	[NT]	29/06/2021	
Date analysed	-			29/06/2021	[NT]		[NT]	[NT]	29/06/2021	
Arsenic	mg/kg	4	Metals-020	<4	[NT]		[NT]	[NT]	103	
Barium	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	110	
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]		[NT]	[NT]	101	
Chromium	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	108	
Cobalt	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	98	
Copper	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	101	
Iron	mg/kg	10	Metals-020	<10	[NT]		[NT]	[NT]	88	
Lead	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	102	
Manganese	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	103	
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]		[NT]	[NT]	128	
Molybdenum	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	101	
Nickel	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	102	
Selenium	mg/kg	2	Metals-020	<2	[NT]		[NT]	[NT]	100	
Titanium	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	98	
Zinc	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	97	
Aluminium	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	114	[NT]

Result Definiti	ons
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	ol 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

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.

are similar to the analyte of interest, however are not expected to be found in real samples.

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

All Metals in soil - The PQL for Se has been raised due to interferences from analytes (other than those being tested) in samples 272502-1 and -2.

Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Attention:

Stephen Maxwell

Report
Project name
Project ID
Received Date

800910-S CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jun 04, 2021

Client Sample ID Sample Matrix			SED1 Soil	SED2 Soil	SED3 Soil	SED4 Soil
Eurofins Sample No.			S21-Jn12576	S21-Jn12577	S21-Jn12578	S21-Jn12579
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	69	44	36	140
Barium	10	mg/kg	490	300	150	180
Cadmium	0.4	mg/kg	22	5.5	4.6	1.1
Chromium	5	mg/kg	21	26	18	< 5
Cobalt	5	mg/kg	40	16	9.9	< 5
Copper	5	mg/kg	520	430	490	130
Iron	20	mg/kg	37000	36000	59000	130000
Lead	5	mg/kg	1500	2400	2500	1100
Manganese	5	mg/kg	1900	750	190	160
Mercury	0.1	mg/kg	0.3	0.2	0.2	0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	37	19	15	< 5
Selenium	2	mg/kg	4.4	< 2	< 2	< 2
Titanium	10	mg/kg	320	380	230	590
Zinc	5	mg/kg	11000	3600	3700	1500
% Moisture	1	%	80	74	60	69

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			SED5 Soil S21-Jn12580 Jun 03, 2021	SED6 Soil S21-Jn12581 Jun 03, 2021	SED7 Soil S21-Jn12582 Jun 03, 2021	SED8 Soil S21-Jn12583 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	140	13	17	44
Barium	10	mg/kg	630	38	41	140
Cadmium	0.4	mg/kg	1.1	4.8	0.9	1.4
Chromium	5	mg/kg	11	18	23	11
Cobalt	5	mg/kg	< 5	18	6.0	< 5
Copper	5	mg/kg	600	320	51	260
Iron	20	mg/kg	230000	18000	19000	21000
Lead	5	mg/kg	6700	220	260	550
Manganese	5	mg/kg	86	260	93	67
Mercury	0.1	mg/kg	0.4	< 0.1	< 0.1	0.4



Client Sample ID Sample Matrix			SED5 Soil	SED6 Soil	SED7 Soil	SED8 Soil
Data Sampled			Jup 02, 2021	Jup 02, 2021	Jup 02 2021	Jup 02 2021
Date Sampled			Juli 03, 2021	Juli 03, 2021	Juli 03, 2021	Juli 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	< 5	11	8.9	< 5
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Titanium	10	mg/kg	430	240	180	350
Zinc	5	mg/kg	1700	1300	600	500
% Moisture	1	%	33	20	13	16

Client Sample ID Sample Matrix			SED9 Soil	SED10 Soil	SED11 Soil	SED12 Soil
Eurofins Sample No.			S21-Jn12584	S21-Jn12585	S21-Jn12586	S21-Jn12587
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	70	84	130	75
Barium	10	mg/kg	56	1400	250	78
Cadmium	0.4	mg/kg	< 0.4	3.7	1.9	< 0.4
Chromium	5	mg/kg	6.7	6.6	20	6.9
Cobalt	5	mg/kg	11	< 5	6.2	< 5
Copper	5	mg/kg	80	1300	320	94
Iron	20	mg/kg	29000	63000	68000	57000
Lead	5	mg/kg	380	5900	1000	550
Manganese	5	mg/kg	110	220	220	66
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Molybdenum	5	mg/kg	< 5	19	< 5	< 5
Nickel	5	mg/kg	< 5	5.2	11	< 5
Selenium	2	mg/kg	< 2	2.9	2.3	< 2
Titanium	10	mg/kg	540	140	170	94
Zinc	5	mg/kg	190	21000	2000	650
% Moisture	1	%	19	21	56	29

Client Sample ID Sample Matrix			SED13 Soil	SED14 Soil	SED15 Soil	QA35 Soil
Eurofins Sample No.			S21-Jn12588	S21-Jn12589	S21-Jn12590	S21-Jn12591
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	27	13	2.8	110
Barium	10	mg/kg	190	140	53	470
Cadmium	0.4	mg/kg	< 0.4	0.7	< 0.4	0.5
Chromium	5	mg/kg	9.0	15	< 5	8.7
Cobalt	5	mg/kg	< 5	12	< 5	< 5
Copper	5	mg/kg	180	37	13	430
Iron	20	mg/kg	8300	13000	5300	270000
Lead	5	mg/kg	730	150	76	4400



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			SED13 Soil S21-Jn12588 Jun 03, 2021	SED14 Soil S21-Jn12589 Jun 03, 2021	SED15 Soil S21-Jn12590 Jun 03, 2021	QA35 Soil S21-Jn12591 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Manganese	5	mg/kg	72	550	190	65
Mercury	0.1	mg/kg	0.3	< 0.1	< 0.1	0.3
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	< 5	20	< 5	< 5
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Titanium	10	mg/kg	100	160	120	330
Zinc	5	mg/kg	230	500	81	1300
% Moisture	1	%	25	71	33	42



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Jun 07, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals	Sydney	Jun 07, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jun 05, 2021	14 Days
- Method: I TM-GEN-7080 Moisture			

			4	ustralia																New Z	ealand	
ABN: 50 005 085 521 web		ironment	Testing 6 6 6 6 6 7 7 8 8 0 8 0 8 0 8 0 8 0 10 10 10 10 10 10 10 10 10 10 10 10 1	lelbourne Monterey Road andenong South VIC 3175 hone : +61 3 8564 5000 ATA # 1261 ATA # 1261 ite # 1254 & 14271	Sydn Unit F 16 Ma Lane Phon NAT/	ey 3, Buildi rs Road Cove W # 1261 # 1261	ng F est NSW 9900 84	2066 F	Brisban 1/21 Sm Aurarrie Phone : VATA #	allwood QLD 4 +61 7 39 1261 Sit	Place 172 902 460 te # 207	°29 92 5 2 5 2 2	arth 	ksia Ro: I WA 610 31 8 925 261 36	ad 06 1 9600	New 4/52 May POI POI NAT	castle Industr field Ea 3ox 60 ' ne : +61 A # 126	al Drive it NSW 2 Vickham 2 4968 8 1 Site # :	.304 2293 3448 25079	Auckla 35 O'Ro Penros Phone IANZ #	nd srke Road A, Auckland 1061 +64 9 526 45 51 1327	Christchurch 43 DetroitDinve Rolleston. Christchurch 7675 Phone: 0.800 856 450 IANZ # 1290
Company Name: Address:	Ramboll Aus Level 3/100 I North Sydne: NSW 2060	stralia Pty Ltd Pacific Highw y	ay			Orde Repo Phon Fax:			31800 80091 02 99	1193 0 54 811 54 815	8 0					Ϋ́Δ̈́α̈́Ο΄.	sceive le: iority ontaci	d: Name	ä	Jun Jun 5 Da Step	4, 2021 5:45 P 11, 2021 y hen Maxwell	Σ
Project Name: Project ID:	CAPTAINS F 318001193	=LAT LEAD N	AANAGEMENT F	PLAN												Euro	fins ⊿	nalyti	cal Se	rvices	Manager : An	ndrew Black
					Darium	Cobalt	Cobalt (filtered	HOLD	Iron	Iron (filtered)	Manganese	Manganese (fi	Molybdenum	Molybdenum (Selenium	Selenium (filte	Titanium	Titanium (filter	Metals M8 filte	Hardness Set	Moisture Set	
	л О	mple Detail				-1)	1)					Itered)		filtered)		red)		ed)	red			
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Sydney Laboratory	/ - NATA Site # 1	8217		~	~	× 	×	×	×	×	×	×	×	×	×	×	×	×	~	×	×	
Brisbane Laborato	rry - NATA Site #	20794				+	_									+		+	+			
Perth Laboratory -	NATA Site # 237	736			-														_			
Mayfield Laborato	ry - NATA Site #	25079			+	_											+	_	+			
No Sample ID	Samula Data	Samuling	Matrix		+																	
		Time			+	_													_			
1 SW1	Jun 03, 2021		Water	S21-Jn12561		<u>^</u>	× >		× >	× >	× >	× >	× >	× >	× >	× >	× >	~ ` × >		× >		
2 SW3	Jun 03, 2021		Water	S21-In12563			: ×		: ×	: ×	: ×	: ×	×	: ×	: ×	: ×	: ×			: ×		
4 SW4	Jun 03, 2021		Water	S21-Jn12564			< ×		×	×	×	×	×	×	< ×	< ×	< ×	``````````````````````````````````````		< ×		
5 SW5	Jun 03, 2021		Water	S21-Jn12565			×		×	×	×	×	×	×	×	×	×	^ ×	~	×		
6 SW6	Jun 03, 2021		Water	S21-Jn12566		×	×		×	×	×	×	×	×	×	×	×	×	\sim	×		
7 SW7	Jun 03, 2021		Water	S21-Jn12567	~	×	×		×	×	×	×	Х	×	×	×	×	×	~	×		
8 SW8	Jun 03, 2021		Water	S21-Jn12568	~	×	×		×	×	×	×	×	×	×	×	×	^ ×	~	×		
9 SW9	Jun 03, 2021		Water	S21-Jn12569	~	~	×		×	×	×	×	×	×	×	×	×	×	\sim	×		

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydr Unit 16 M Lane	ey -3, Build ars Road Cove W	ing F 1 est NSW	2066	Brisban 1/21 Sm Murarrie Phone :	e allwood QLD 4 ⁷ +61 7 35	Place 172 302 4600	~ 8≥₽	elshpoo -148 Ban elshpoo	ksia Ro: I WA 610 31 8 925	ad 06 11 9600	New 4/52 Mayf POE	castle Industria ield Easi tox 60 M	I Drive NSW 23	304 2293	Aucklai 35 O'Rc Penrose Phone :	nd Irke Road , Auckland 1061 +64 9 526 45 5	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone: 0800 856 450
ABN: 50) 005 085 521 web: w	www.eurof	fins.com.au email: EnviroSales	s@eurofins.com	NATA # 1261 Site # 1254 & 14271	Phon NAT,	e:+612 \#1261	2 9900 8 [,] Site # 1	400 8217	NATA #	1261 Sit	ie # 207	94 Si N/	ATA # 1: te # 237	261 36		Phor NAT.	le : +61 A # 1261	2 4968 8. Site # 2	448 5079	IANZ #	1327	IANZ # 1290
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Pro	ject Name: ject ID:	CAP 3180	PTAINS FLAT LEAD M/ 001193	ANAGEMENT	r plan												Euro	ins A	nalytic	al Sei	rvices	Manager : .	Andrew Black
			Sample Detail			Barium	Covall	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
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Sydn	ey Laboratory -	- NATA	Site # 18217			×	^ ×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
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10	SW10	Jun 03,	, 2021	Water	S21-Jn12570	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	×	×		
-	SW11	Jun 03,	, 2021	Water	S21-Jn12571	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	×	×		
12	SW12	Jun 03,	, 2021	Water	S21-Jn12572	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	×	×		
13	SW13	Jun 03,	, 2021	Water	S21-Jn12573	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	×	×		
14	SW14	Jun 03.	, 2021	Water	S21-Jn12574	×	×	×		×	×	×	Х	×	×	×	×	×	×	×	×		
15	SW15	Jun 03,	, 2021	Water	S21-Jn12575	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	×	×		
16	SED1	Jun 03,	, 2021	Soil	S21-Jn12576	×	^			×		×		×		×		×	×			×	
17	SED2	Jun 03,	, 2021	Soil	S21-Jn12577	×	^	~		×		×		×		×		×	×			×	
18	SED3	Jun 03,	, 2021	Soil	S21-Jn12578	×	^			×		×		×		×		×	×			×	
19	SED4	Jun 03,	, 2021	Soil	S21-Jn12579	×	^			×		×		×		×		×	×			×	
20	SED5	Jun 03,	, 2021	Soil	S21-Jn12580	×				×		×		×		×		×	×			×	

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydne Unit F? 16 Mai Lane C	y 3, Buildin s Road ove We.	ig F st NSW 2	D <u>₹</u> → E	krisbane /21 Smal 1urarrie C hone : +(llwood P 2LD 417 31 7 390	lace 72 12 4600	Per 46- Phc	th 48 Bank Ishpool one : +6	(sia Roa WA 610 1 8 925	ad 06 1 9600	New 4/52 Mayf POE	castle Industri ield Eas 3ox 60 V	al Drive t NSW 2 Vickham	2304 2293	Auckla 35 O'R Penros Phone	Ind orke Road e, Auckland 1061 : +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5(0 005 085 521 web: w	www.euro	ofins.com.au email: EnviroSales	:s@eurofins.com	NATA # 1261 Site # 1254 & 14271	Phone NATA	: +61 2 # 1261 §	9900 84(Site # 18;	00 N 217	IATA # 1.	261 Site	; # 2079.	4 NA Site	TA # 12 e # 2373	61 86		Phor NAT,	ıе : +61 А # 126	2 4968 8 1 Site # 1	3448 25079	IANZ #	1327	IANZ # 1290
Adi	mpany Name: dress:	Ran Levi Nort NSV	mboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney N 2060	Λε			Order Repor Phon∉ Fax:	no.: # #:		31800′ 800910 32 995	1193) 4 8116 4 8150	e C					and r o	ceive ie: iority: ntact	d: Name		Jun 5 D. Stel	4, 2021 5:45 F 11, 2021 ay ohen Maxwell	W
Pro	oject Name: oject ID:	CAF 318	PTAINS FLAT LEAD M/ :001193	ANAGEMEN ⁻	T PLAN												Euro	fins A	nalyti	cal Se	irvices	s Manager : A	ndrew Black
			Sample Detail		Barium	Barium (filtered)	Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium	Titanium (filtered)	Metals M8 Intered	Hardness Set	Moisture Set	
Melb	ourne Laborato	ory - NA	ATA Site # 1254 & 142	71		-														-			
Sydn	- Laboratory	- NATA	\ Site # 18217		~		×	×	×	×	×	×	×	×	×	×	×	×	^ ×	^ ×	×	×	
Brisk	bane Laboratory	y - NAT	rA Site # 20794				+																
Perti	h Laboratory - N	NATA S	Site # 23736			+	_					╡	1		1		+	+	+	+	+		
Exter	rield Laboratory	V - NAI	A Site # 25079				+										+			+	+		
21	SED6	Jun 03	3, 2021	Soil	S21-Jn12581 ×		×			×		×		×		×		×		×	-	×	
22	SED7	Jun 03	3, 2021	Soil	S21-Jn12582 ×		×			×		×		×		×		×	^	×		×	
23	SED8	Jun 03	3, 2021	Soil	S21-Jn12583 ×		×			×		×		×		×		×		×		×	
24	SED9	Jun 03	3, 2021	Soil	S21-Jn12584 ×		×			×		×		×		×		×		×		×	
25	SED10	Jun 03	3, 2021	Soil	S21-Jn12585 ×		×			×		×		×		×		×		×		×	
26	SED11	Jun 03	3, 2021	Soil	S21-Jn12586 ×		×			×		×		×		×		×		×		×	
27	SED12	Jun 03	3, 2021	Soil	S21-Jn12587 ×		×			×		×		×		×		×		×		×	
28	SED13	Jun 03	3, 2021	Soil	S21-Jn12588 ×		×			×		×		×		×		×		×		×	
29	SED14	Jun 03	3, 2021	Soil	S21-Jn12589 ×		×			×		×		×		×		×	^	×		×	
30	SED15	Jun 03	3, 2021	Soil	S21-Jn12590 ×		×			×		×		×		×		×	^	×		×	
31	QA35	Jun 03	3, 2021	Soil	S21-Jn12591 X		×			×		×		×		×		×	$\hat{}$			×	

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•			Environment T	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 M∉ Lane	ey 3, Buildi rs Road Cove W(ng F ∍st NSW	2066 F	Brisban 1/21 Sma Murarrie	e allwood i QLD 41 +61 7 39	Place 172 102 4600	₽, \$ 6; ₽	rth -48 Bani sishpool one : +6	ksia Roa WA 610 11 8 925	d 6 1 9600	Newo 4/52 Mayfi POB	astle ndustria eld East ox 60 W	Drive NSW 23 ckham 2	04	Aucklan 35 O'Ror Penrose	d ke Road Auckland 1061 +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5	50 005 085 521 web: v	www.eurc	ofins.com.au email: EnviroSales(@eurofins.com	NAIA # 1261 Site # 1254 & 14271	Phon NAT/	e : +61 2 # 1261	9900 84 Site # 18	100 3217	NAIA#	1261 Sit	ie # 207(94 Sit	u A # 12 e # 237;	161 36		NAT/	e:+612 \#1261	4968 84 Site # 25	.48 5079	ANZ # 1	327	IANZ # 1290
Co Ad	ompany Name: Idress:	Rar Lev Nor NSV	mboll Australia Pty Ltd el 3/100 Pacific Highway th Sydney W 2060	~			Orde Repo Phon Fax:	rt #: e:#:		31800 80091 02 99 { 02 99 {	01193 0 54 811 54 815	8 0					C P U Co	ceive e: ority: ntact	I: Vame:		Jun 4 Jun 1 5 Day Stept	, 2021 5:45 Pl 1, 2021 / ien Maxwell	5
Prc	oject Name: oject ID:	CAI 318	PTAINS FLAT LEAD MA 001193	NAGEMENT	. PLAN												Eurof	ins Aı	alytica	al Ser	vices	Manager : An	drew Black
			Sample Detail		Barium	Porium	Copalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium (intered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melb	ourne Laborato	ory - NA	ATA Site # 1254 & 1427			\vdash	$\left \right $																
Sydr	ney Laboratory -	- NATA	A Site # 18217		^	~	~	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
Bris	bane Laboratory	TAN - Y	rA Site # 20794			+	+	+	+					\uparrow					_				
Pert	h Laboratory - N	NAIAS	Site # 23/36			+	+	+	_					1			+	-	_	_			
Exte	rnal Laboratory		A UIG # 20019					+	+								+		-				
32	QA35	Jun 06	3, 2021	Water	S21-Jn12592 >		×	×		×	×	×	×	×	×	×	×	×	×	×			
33	R01	Jun 0	3, 2021	Water	S21-Jn12593				×														
34	R02	Jun 00	3, 2021	Water	S21-Jn12594				×														
35	R03	Jun 0	3, 2021	Water	S21-Jn12595				×														
36	R04	Jun 0	3, 2021	Water	S21-Jn12596				×														
37	QA01	Jun 0	3, 2021	Soil	S21-Jn12597				×														
38	QA02	Jun 0	3, 2021	Soil	S21-Jn12598				×														
39	QA03	Jun 0	3, 2021	Soil	S21-Jn12599				×														
40	QA04	Jun 0	3, 2021	Soil	S21-Jn12600				×														
41	QA05	Jun 0	3, 2021	Soil	S21-Jn12601				×														
42	QA06	Jun 0	3, 2021	Soil	S21-Jn12602				×														

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 Ma Lane	y 3, Buildir s Road Sove We	ig F st NSW	2066 2066 2066	risbane /21 Sma lurarrie (hone : +	Ilwood P 2LD 41 61 7 390	lace 72 # 2070	Pho Pho Pho	th 48 Bank Ishpool ' nne : +6'	sia Roa NA 610 I 8 9251	9600 9	Newc 4/52 I Mayfi PO B	astle ndustria eld East ox 60 W	Drive NSW 23 ckham 2	04 293	Aucklar 35 O'Rol Penrose	d ke Road Auckland 1061 -64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5(0 005 085 521 web: w	www.eurc	ofins.com.au email: EnviroSales	s@eurofins.com	NALA # 1201 Site # 1254 & 14271	NATA	# 1261 \$	site # 18	217	- # {		# 2013	site	H # 12 # 2373	- 00		NATA	a∵+01⊿ /#1261	4300 04 Site # 25	5079	- # 7NR	126	0671 # 7NNA1
Col	mpany Name: Iress:	Rai Lev Nor NS	mboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney W 2060	Vr			Order Repol Phone Fax:			31800 30091 32 995 32 995	1193) 4 8118 4 8156	m 0					Co Du Co Du	ceived e: ority: ntact	: Vame:		Jun 4 Jun 1 5 Da	, 2021 5:45 Pl 1, 2021 / ien Maxwell	2
Pro	ject Name: ject ID:	CA 318	PTAINS FLAT LEAD M/ 001193	ANAGEMENI	r plan												Eurof	ins Ar	alytic	al Ser	vices	Manager : An	drew Black
			Sample Detail		Barium		Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)		Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melbo	ourne Laborato	ory - N	ATA Site # 1254 & 142	17																			
Sydn	ey Laboratory -	- NATA	A Site # 18217		~		×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	
Brisc	ane Laboratory	- NA	rA Site # 20794			+												_	_				
Marte	I Laboratory - N	NAIA:	5116 # 23/36 A Site # 25070				_									+		_		_			
Exter	nal Laboratory	-	A 0116 # 2001 9																				
43	QA07) un D	3, 2021	Soil	S21-Jn12603	-			×														
44	QA08	Jun 0;	3, 2021	Soil	S21-Jn12604				×														
45	QA09	Jun 0	3, 2021	Soil	S21-Jn12605				×														
46	QA10	Jun 0;	3, 2021	Soil	S21-Jn12606				×														
47	QA11)0 unc	3, 2021	Soil	S21-Jn12607				×														
48	QA12	Jun 0;	3, 2021	Soil	S21-Jn12608				×														
49	QA13	Jun 0;	3, 2021	Soil	S21-Jn12609				×														
50	QA14	Jun 0	3, 2021	Soil	S21-Jn12610				×														
51	QA15	Jun 0;	3, 2021	Soil	S21-Jn12611				×														
52	QA16	Jun 0	3, 2021	Soil	S21-Jn12612				×														
53	QA17)0 unc	3, 2021	Soil	S21-Jn12613				×														

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 Ma Lane	y 3, Buildir s Road Sove We	ig F st NSW	2066 2066 2066	risbane /21 Sma lurarrie (hone : +	Ilwood P 2LD 41 61 7 390	lace 72 02 4600	Phe Phe Ve	th 48 Bank Ishpool one : +6	(sia Roa WA 610 1 8 925	ad 06 1 9600	New Mayf PO E	castle Industria ield Eas Sox 60 V	I Drive NSW 23 fickham	304 2293	Auckla 35 O'Ra Penros Phone	nd srke Road 9, Auckland 1061 +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 50	0 005 085 521 web: w	www.eurc	ofins.com.au email: EnviroSale:	:s@eurofins.com	NALA # 1201 Site # 1254 & 14271	NATA	# 1261 \$	site # 18	217	- # {	7010	ñ/07 # :	4 Site	1 A # 12 9 # 2373	- y		NAT	A # 126	Site # 2	440 5079	# 7NH	1761	0671 # ZNM
Cor	mpany Name: Iress:	Rai Lev Nor NS	mboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney W 2060	Λε			Order Repol Phone Fax:			31800 30091 32 995 32 995	1193 0 4 8118 4 8156	<u>ه</u> ح					å g f ö	ceive ie: iority: intact	d: Name		Jun Jun 5 Da Step	4, 2021 5:45 F 11, 2021 y hen Maxwell	ž
Pro	iject Name: iject ID:	CA 318	PTAINS FLAT LEAD M 3001193	ANAGEMEN	r plan												Euro	fins A	nalytic	al Se	rvices	Manager : Al	ndrew Black
			Sample Detail		Barium		Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melho	ourne Laborato	N - NIC	ΔTΔ Site # 1254 & 142	71																			
Sydn	ev Laboratory -	- NATA	A Site # 18217		×		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
Brisb	ane Laboratory	y - NA	TA Site # 20794																				
Perth	n Laboratory - N	NATA S	Site # 23736			+	_										+	+	_		_		
Mayfi	ield Laboratory	y - NAT	A Site # 25079			+	+	_							1		+	+	_	_	_		
Exter	rnal Laboratory	~				+	+	_							1		+	+	_	_	_		
54	QA18	Jun 0;	3, 2021	Soil	S21-Jn12614	_			×														
55	QA19	Jun 0:	3, 2021	Soil	S21-Jn12615	+	_	_	×									+	_	_			
56	QA20	Jun 0:	3, 2021	Soil	S21-Jn12616	-	_		×														
57	QA21	Jun 0;	3, 2021	Soil	S21-Jn12617	_	_		×											_			
58	QA22	Jun 0;	3, 2021	Soil	S21-Jn12618				×														
59	QA23	Jun 0;	3, 2021	Soil	S21-Jn12619				×														
60	QA24	Jun 0;	3, 2021	Soil	S21-Jn12620				×														
61	QA25)0 unc	3, 2021	Soil	S21-Jn12621				×														
62	QA26	Jun 0	3, 2021	Soil	S21-Jn12622				×														
63	QA27	Jun 0	3, 2021	Soil	S21-Jn12623				×														
64	QA28)0 unc	3, 2021	Soil	S21-Jn12624				×														

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		2	Environment Te	sting	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 M ^c Lane	ey 3, Buildi irs Road Cove We	ng F ∋st NSW	2066 F	Srisband 1/21 Sma Aurarrie Phone : +	e allwood F QLD 41 +61 7 39	Place 72 02 4600	Р, & Р	rth 48 Bank Ishpool 2ne : +6	sia Roa WA 610 1 8 9251	6 6 1 9600	Newc 4/52 I Mayfic PO Bo	astle ndustria eld East ox 60 Wi	Drive NSW 23 ckham 2	293	Aucklan 35 O'Roi Penrose	d ke Road , Auckland 1061 +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5(0 005 085 521 web: w	www.euro	ıfins.com.au email: EnviroSales@e	∍urofins.com	NATA # 1261 Site # 1254 & 14271	Phon NAT∕	e : +612 .# 1261	9900 84 Site # 1£	100 r 3217 3	ATA #	1261 Sit	e # 207{	94 NA Site	.TA # 12 e # 2373	61 86		Phon NATA	e:+612 \#1261	: 4968 84 Site # 25	448 5079	ANZ # 1	327	IANZ # 1290
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			Sample Detail			Barium	Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium (Illered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melb	ourne Laborato	ory - NA	VTA Site # 1254 & 14271			\rightarrow																	
Sydn	ey Laboratory -	- NATA	\ Site # 18217		^	×	× _	×	×	×	×	×	×	×	×	×	×	^ ×	×	×	×	×	
Brisk	bane Laboratory	<u>VATA S</u>	A Site # 20794 ite # 23736				_	_	_								+	_	_	_			
Mavf	ield Laboratory	V - NAT	A Site # 25079			\vdash																	
Exter	rnal Laboratory					\vdash								$\left[\right]$		\vdash		\vdash	\vdash				
65	QA29	Jun 03	3, 2021 Soi	li	S21-Jn12625				×														
66	QA30	Jun 03	3, 2021 Sol	ii	S21-Jn12626				×														
67	QA31	Jun 03	3, 2021 Sol	li	S21-Jn12627				×														
68	QA32	Jun 03	3, 2021 Sol	il	S21-Jn12628				×														
69	QA33	Jun 03	3, 2021 Soi	li	S21-Jn12629				×														
70	QA34	Jun 03	3, 2021 Sol	ii	S21-Jn12630				×														
71	QA37	Jun 03	3, 2021 Sol	li	S21-Jn12631				×									_					
72	QA38	Jun 03	3, 2021 Soi	li	S21-Jn12632				×														
73	QA39	Jun 03	3, 2021 Soi	li	S21-Jn12633				×														
74	QA40	Jun 03	3, 2021 Soi	li	S21-Jn12634				×														
75	QA41	Jun 03	3, 2021 Soi	ii	S21-Jn12635				×														

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ABN: 50	0 005 085 521 web:	Environ: www.eurofins.com.au email:	ment Testing EnviroSales@eurofins.com	Melbourne 6 Monterey Road 6 Monterey Road Phone: +61 3 8564 5000 NATA # 1261 Site # 1254 & 14271	Sydno Unit F 16 Ma Lane Phone NATA	y 8, Buildir s Road 20ve We : +61 2 # 1261 \$	lg F st NSW 2 9900 840 Site # 182	0066 PA 2 B	risbane 21 Smal urarrie G hone : +(ATA # 1:	Iwood PI NLD 417 31 7 390 261 Site	ace 2 2 4600 # 20794	Pert 46-4 Wels Phoi NAT Site	h 8 Banksi shpool W A # 1261 # 23736	a Road A 6106 8 9251 9	000	Newcast 4/52 Indi Mayfield PO Box (Phone : NATA #	tle Lastrial Dr East NS 50 Wickh +61 2 49 1261 Site	ive W 2304 am 229 68 8448 8 8448	Au Ber 1AN	ckland D'Rorke Irose, Au Ine : +64 Die : +64 Z # 132	Road uckland 1061 + 9 526 45 51 7	Christchurch 43 Detroit Drive Rollesion, Christchurch 76 Phone: 0800 856 450 JANZ # 1290	675
Adi	mpany Name: dress:	Ramboll Australia Level 3/100 Pacifi North Sydney NSW 2060	Pty Ltd c Highway			Order Repol Phone Fax:			318001 300910 32 995 32 995	193) 4 8118 4 8150						Rece Due: Prior Cont	ived: ity: act Na	: E	מטרר	un 4, 2 un 11, Day tepher	2021 5:45 Pl 2021 Maxwell	×	
Pro	oject Name: oject ID:	CAPTAINS FLAT 318001193	LEAD MANAGEMEN	F PLAN											Ē	urofins	s Anal	ytical	Servio	ces Ma	anager : An	drew Black	
		Sample	Detail		Barium (filtered)	Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Selenium	Selenium (filtered)	Titanium	Titanium (filtered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set		
Melb	ourne Laborat	tory - NATA Site # 125	54 & 14271																				
Sydn	ley Laboratory	r - NATA Site # 18217			^ ×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
Brist	bane Laborato	ry - NATA Site # 2079.	4																				
Perth	- Laboratory	NATA Site # 23736																					
Mayf	ield Laborator	y - NATA Site # 25079																					
Exte	rnal Laborator	λ																					
76	QA42	Jun 03, 2021	Soil	S21-Jn12636				×															
77	QA43	Jun 03, 2021	Soil	S21-Jn12637				×															
78	QA44	Jun 03, 2021	Soil	S21-Jn12638				×															
79	QA45	Jun 03, 2021	Soil	S21-Jn12639				×															
80	QA46	Jun 03, 2021	Soil	S21-Jn12640				×															
Test	Counts			3	5	32	16	48	32	16	32	16	32 1	16 32	16	32	16	32	16	15	16		



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
СР	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.
- 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				1		I		
Heavy Metals								
Arsenic			mg/kg	< 2		2	Pass	
Barium			mg/kg	< 10		10	Pass	
Cadmium			mg/kg	< 0.4		0.4	Pass	
Chromium			mg/kg	< 5		5	Pass	
Cobalt			mg/kg	< 5		5	Pass	
Copper			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	
Molybdenum			mg/kg	< 5		5	Pass	
Nickel			mg/kg	< 5		5	Pass	
Selenium			mg/kg	< 2		2	Pass	
Titanium			mg/kg	< 10		10	Pass	
Zinc			mg/kg	< 5		5	Pass	
LCS - % Recovery								
Heavy Metals			-					
Arsenic			%	97		80-120	Pass	
Barium			%	103		80-120	Pass	
Cadmium			%	101		80-120	Pass	
Chromium		%	101		80-120	Pass		
Cobalt		%	100		80-120	Pass		
Copper		%	100		80-120	Pass		
Iron			%	103		80-120	Pass	
Lead			%	99		80-120	Pass	
Manganese			%	100		80-120	Pass	
Mercury			%	98		80-120	Pass	
Molybdenum			%	111		80-120	Pass	
Nickel			%	98		80-120	Pass	
Selenium			%	106		80-120	Pass	
Titanium			%	100		80-120	Pass	
Zinc			%	95		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				1		1		
Heavy Metals		-	-	Result 1				
Barium	S21-Jn12648	NCP	%	111		75-125	Pass	
Cadmium	S21-Jn12700	NCP	%	92		75-125	Pass	
Chromium	S21-Jn12700	NCP	%	117		75-125	Pass	
Cobalt	S21-Jn12700	NCP	%	101		75-125	Pass	
Lead	S21-Jn12700	NCP	%	92		75-125	Pass	
Mercury	S21-Jn12700	NCP	%	93		75-125	Pass	
Molybdenum	S21-Jn12446	NCP	%	88		75-125	Pass	
Nickel	S21-Jn12700	NCP	%	108		75-125	Pass	
Selenium	S21-Jn12700	NCP	%	88		75-125	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S21-Jn12584	CP	%	122		75-125	Pass	
Copper	S21-Jn12584	CP	%	117		75-125	Pass	
Manganese	S21-Jn12584	CP	%	103		75-125	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Titanium	S21-Jn12584	CP	%	81			75-125	Pass	
Zinc	S21-Jn12584	CP	%	107			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Jn12583	CP	mg/kg	44	37	17	30%	Pass	
Barium	S21-Jn12583	CP	mg/kg	140	140	5.0	30%	Pass	
Cadmium	S21-Jn12583	CP	mg/kg	1.4	1.2	16	30%	Pass	
Chromium	S21-Jn12583	CP	mg/kg	11	9.9	6.0	30%	Pass	
Cobalt	S21-Jn12583	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S21-Jn12583	CP	mg/kg	260	200	27	30%	Pass	
Iron	S21-Jn12583	CP	mg/kg	21000	19000	8.0	30%	Pass	
Lead	S21-Jn12583	CP	mg/kg	550	400	32	30%	Fail	Q15
Manganese	S21-Jn12583	CP	mg/kg	67	82	21	30%	Pass	
Mercury	S21-Jn12583	CP	mg/kg	0.4	0.4	17	30%	Pass	
Molybdenum	S21-Jn12583	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	S21-Jn12583	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	S21-Jn12583	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Titanium	S21-Jn12583	CP	mg/kg	350	380	9.0	30%	Pass	
Zinc	S21-Jn12583	CP	mg/kg	500	530	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Jn12583	CP	%	16	17	7.0	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

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:

Andrew Black John Nguyen Analytical Services Manager 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.

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Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Attention:

Stephen Maxwell

Report
Project name
Project ID
Received Date

800910-W CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jun 04, 2021

Client Sample ID			SW1	SW2	SW3	SW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Jn12561	S21-Jn12562	S21-Jn12563	S21-Jn12564
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Hardness mg equivalent CaCO3/L	1	mg/L	63	62	88	54
Heavy Metals						
Arsenic	0.001	mg/L	< 0.001	0.001	0.001	0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Barium	0.02	mg/L	0.02	< 0.02	0.03	< 0.02
Barium (filtered)	0.02	mg/L	0.02	0.02	0.03	0.02
Cadmium	0.0002	mg/L	0.0019	0.0019	0.011	0.0018
Cadmium (filtered)	0.0002	mg/L	0.0019	0.0020	0.012	0.0021
Chromium	0.001	mg/L	< 0.001	0.002	0.003	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	0.001	mg/L	0.003	0.003	0.008	0.003
Cobalt (filtered)	0.001	mg/L	0.003	0.003	0.008	0.003
Copper	0.001	mg/L	0.012	0.016	0.15	0.016
Copper (filtered)	0.001	mg/L	0.008	0.008	0.11	0.010
Iron	0.05	mg/L	2.1	3.9	3.0	3.8
Iron (filtered)	0.05	mg/L	0.63	0.87	0.82	1.7
Lead	0.001	mg/L	0.019	0.028	0.087	0.028
Lead (filtered)	0.001	mg/L	0.007	0.005	0.018	0.006
Manganese	0.005	mg/L	0.31	0.32	0.65	0.31
Manganese (filtered)	0.005	mg/L	0.30	0.35	0.71	0.33
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	0.005	0.005	0.008	0.003
Nickel (filtered)	0.001	mg/L	0.004	0.006	0.008	0.003
Selenium	0.001	mg/L	0.001	< 0.001	0.002	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	0.005	mg/L	< 0.005	< 0.005	0.010	0.006
Titanium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	0.005	mg/L	2.3	2.2	8.0	2.1
Zinc (filtered)	0.005	mg/L	1.6	1.8	6.8	1.8
Alkali Metals						
Calcium	0.5	mg/L	11	11	15	9.2
Magnesium	0.5	mg/L	8.8	8.6	12	7.6



Client Sample ID			SW5	SW6	SW7	SW8
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Jn12565	S21-Jn12566	S21-Jn12567	S21-Jn12568
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
		_				
Hardness mg equivalent CaCO3/L	1	mg/L	1400	33	32	300
Heavy Metals						
Arsenic	0.001	mg/L	0.010	0.002	0.002	0.003
Arsenic (filtered)	0.001	mg/L	0.008	< 0.001	< 0.001	0.001
Barium	0.02	mg/L	< 0.02	0.03	0.03	0.02
Barium (filtered)	0.02	mg/L	< 0.02	0.02	0.02	0.03
Cadmium	0.0002	mg/L	0.10	0.0029	0.0030	0.11
Cadmium (filtered)	0.0002	mg/L	0.11	0.0030	0.0032	0.12
Chromium	0.001	mg/L	0.002	0.003	0.003	0.003
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.002
Cobalt	0.001	mg/L	0.086	0.001	0.002	0.037
Cobalt (filtered)	0.001	mg/L	0.097	0.001	0.001	0.041
Copper	0.001	mg/L	0.33	0.063	0.060	1.7
Copper (filtered)	0.001	mg/L	0.36	0.045	0.046	1.9
Iron	0.05	mg/L	150	2.2	2.0	15
Iron (filtered)	0.05	mg/L	190	0.65	0.63	11
Lead	0.001	mg/L	1.2	0.29	0.30	1.2
Lead (filtered)	0.001	mg/L	1.3	0.11	0.13	1.2
Manganese	0.005	mg/L	10	0.042	0.042	2.5
Manganese (filtered)	0.005	mg/L	12	0.033	0.034	3.0
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	0.063	0.004	0.003	0.034
Nickel (filtered)	0.001	mg/L	0.072	0.003	0.003	0.036
Selenium	0.001	mg/L	0.011	0.002	0.001	0.007
Selenium (filtered)	0.001	mg/L	0.003	< 0.001	< 0.001	0.002
Titanium	0.005	mg/L	< 0.005	0.053	0.042	< 0.005
Titanium (filtered)	0.005	mg/L	< 0.005	0.012	0.011	< 0.005
Zinc	0.005	mg/L	120	1.4	1.4	67
Zinc (filtered)	0.005	mg/L	140	1.1	1.2	78
Alkali Metals						
Calcium	0.5	mg/L	280	4.2	4.2	55
Magnesium	0.5	mg/L	170	5.5	5.3	40

Client Sample ID Sample Matrix			SW9 Water	SW10 Water	SW11 Water	SW12 Water
Eurofins Sample No.			S21-Jn12569	S21-Jn12570	S21-Jn12571	S21-Jn12572
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Hardness mg equivalent CaCO3/L	1	mg/L	330	96	21	930
				•		
Heavy Metals						
Heavy Metals Arsenic	0.001	mg/L	0.002	0.001	< 0.001	0.003
Heavy Metals Arsenic Arsenic (filtered)	0.001	mg/L mg/L	0.002	0.001	< 0.001 0.001	0.003
Heavy Metals Arsenic Arsenic (filtered) Barium	0.001 0.001 0.02	mg/L mg/L mg/L	0.002 0.002 0.03	0.001 < 0.001 < 0.02	< 0.001 0.001 < 0.02	0.003 0.002 < 0.02



Client Sample ID			SW9	SW10	SW11	SW12
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Jn12569	S21-Jn12570	S21-Jn12571	S21-Jn12572
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Cadmium	0.0002	mg/L	0.16	0.0069	0.0003	0.024
Cadmium (filtered)	0.0002	mg/L	0.18	0.0072	0.0003	0.025
Chromium	0.001	mg/L	0.004	0.001	0.001	0.004
Chromium (filtered)	0.001	mg/L	0.004	< 0.001	< 0.001	0.004
Cobalt	0.001	mg/L	0.040	0.016	< 0.001	0.13
Cobalt (filtered)	0.001	mg/L	0.043	0.016	< 0.001	0.14
Copper	0.001	mg/L	2.6	0.19	0.006	0.33
Copper (filtered)	0.001	mg/L	2.7	0.18	0.005	0.35
Iron	0.05	mg/L	7.5	3.8	0.84	91
Iron (filtered)	0.05	mg/L	8.3	1.2	0.43	99
Lead	0.001	mg/L	1.3	0.11	0.008	0.024
Lead (filtered)	0.001	mg/L	1.4	0.069	0.004	0.025
Manganese	0.005	mg/L	3.0	1.3	0.081	14
Manganese (filtered)	0.005	mg/L	3.3	1.3	0.074	15
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	0.044	0.006	0.002	0.050
Nickel (filtered)	0.001	mg/L	0.047	0.007	0.002	0.053
Selenium	0.001	mg/L	0.009	0.004	0.001	0.016
Selenium (filtered)	0.001	mg/L	0.002	< 0.001	< 0.001	0.002
Titanium	0.005	mg/L	< 0.005	< 0.005	0.009	< 0.005
Titanium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	0.005	mg/L	95	8.2	0.39	67
Zinc (filtered)	0.005	mg/L	110	6.8	0.32	75
Alkali Metals						
Calcium	0.5	mg/L	72	13	2.9	100
Magnesium	0.5	mg/L	36	15	3.3	160

Client Sample ID Sample Matrix			SW13 Water	SW14 Water	SW15 Water	QA35 Water
Eurofins Sample No.			S21-Jn12573	S21-Jn12574	S21-Jn12575	S21-Jn12592
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Hardness mg equivalent CaCO3/L	1	mg/L	47	17	18	-
Heavy Metals						
Arsenic	0.001	mg/L	0.001	< 0.001	< 0.001	0.011
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.008
Barium	0.02	mg/L	0.03	< 0.02	< 0.02	< 0.02
Barium (filtered)	0.02	mg/L	0.03	< 0.02	< 0.02	< 0.02
Cadmium	0.0002	mg/L	0.0083	< 0.0002	< 0.0002	0.11
Cadmium (filtered)	0.0002	mg/L	0.0090	< 0.0002	< 0.0002	0.11
Chromium	0.001	mg/L	0.001	< 0.001	< 0.001	0.002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	0.001	mg/L	0.014	< 0.001	< 0.001	0.096
Cobalt (filtered)	0.001	mg/L	0.016	< 0.001	< 0.001	0.098



Client Sample ID			SW13	SW14	SW15	QA35
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Jn12573	S21-Jn12574	S21-Jn12575	S21-Jn12592
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Copper	0.001	mg/L	0.37	0.002	0.002	0.37
Copper (filtered)	0.001	mg/L	0.37	0.003	0.003	0.37
Iron	0.05	mg/L	0.65	0.69	0.69	170
Iron (filtered)	0.05	mg/L	0.22	0.52	0.40	190
Lead	0.001	mg/L	0.15	0.005	0.004	1.3
Lead (filtered)	0.001	mg/L	0.14	0.003	0.002	1.4
Manganese	0.005	mg/L	0.35	0.024	0.027	11
Manganese (filtered)	0.005	mg/L	0.38	0.010	0.012	12
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	0.003	0.002	0.003	0.071
Nickel (filtered)	0.001	mg/L	0.003	0.002	0.002	0.072
Selenium	0.001	mg/L	0.003	< 0.001	< 0.001	0.013
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.002
Titanium	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Titanium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	0.005	mg/L	4.3	0.041	0.042	130
Zinc (filtered)	0.005	mg/L	3.7	0.058	0.049	140
Alkali Metals						
Calcium	0.5	mg/L	6.3	2.4	2.6	-
Magnesium	0.5	mg/L	7.6	2.8	2.8	-



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Hardness Set			
Hardness mg equivalent CaCO3/L	Sydney	Jun 11, 2021	28 Days
- Method: E020.1 Hardness in water			
Alkali Metals	Sydney	Jun 11, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8	Sydney	Jun 11, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Jun 11, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals	Sydney	Jun 11, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Sydney	Jun 11, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

Date Reported: Jun 11, 2021
			٩	vustralia																New 2	ealand	
ABN: 50 005 085 521 web		ironment email: EnviroSale	Testing 6 6 6 6 6 6 6 6 6 6 7 7 8 8 8 8 8 8 8 8	lelbourne Monterey Road andenong South VIC 3175 hone : +61 3 8564 5000 ATA # 1261 ATA # 1254 & 14271 ite # 1254 & 14271	Sydn Unit F Lane Phon NATA	ey 33, Build ars Roac Cove W ∋ : +61 2	ing F 1 est NSW ? 9900 84 Site # 16	2066 100 3217	Brisban 1/21 Sm Murarrie Phone : NATA #	e allwood QLD 4 +61 7 3 1261 Si	Place 172 902 460 te # 207	0 4 9 4 2 2 2 2 3 0 5 0 2 5 0 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	erth 5-48 Bar (elshpoo 1one : + ATA # 1, te # 237	lksia Ro I WA 61 31 8 925 261 36	ad 06 51 9600	Nev May Pho NA	vcastle 2 Industr field Ea Box 60 ne : +6' FA # 126	al Drive st NSW 2 Vickham 2 4968 1 Site #	2304 2293 8448 25079	Auckla 35 O'R Penros Phone IANZ #	nd orke Road e. Auckland 1061 : +64 9 526 45 51 1327	Christehurch 43 Detroit Dinve Rolleston, Christchurch 7675 Phone , 0800 856 450 IANZ # 1290
Company Name: Address:	Ramboll Aus Level 3/100 I North Sydnei NSW 2060	tralia Pty Ltd Pacific Highw y	ay			Orde Repc Phon Fax:	r No.: brt #: e:		31800 8009 02 99 02 99)1193)1193 0 54 81	50 50					άσευ	eceiv ue: riority ontac	d: Name	ö	Jun 5 D, Stej	4, 2021 5:45 P 11, 2021 ay bhen Maxwell	Σ
Project Name: Project ID:	CAPTAINS F 318001193	⁻ LAT LEAD N	AANAGEMENT F	PLAN												Euro	fins /	nalyti	cal Se	irvices	Manager : Ar	ndrew Black
	ο σ	mple Detail			Barium	Rarium (filtered)	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium	Titanium (filtered)	Motals M8	Hardness Set	Moisture Set	
Melbourne Laborat	tory - NATA Site	# 1254 & 142	271																			
Sydney Laboratory	- NATA Site # 1	8217			×	\sim	×	×	×	×	×	×	×	×	×	×	×	×	^ ×	×	×	
Brisbane Laborato	ry - NATA Site #	20794			-	-		_												_		
Perth Laboratory -	NATA Site # 237	36			-	+	_	_											_	_		
Mayfield Laborator	ry - NATA Site #	25079				+																
No Sample ID	Sample Date	Sampling	Matrix	LAB ID																		
1 SW1	Jun 03, 2021	2	Water	S21-Jn12561	×		×		×	×	×	×	×	×	×	×	×	×	~ 	×		
2 SW2	Jun 03, 2021		Water	S21-Jn12562	×		×		×	×	×	×	×	×	×	×	×	×	^ ×	×		
3 SW3	Jun 03, 2021		Water	S21-Jn12563	×		×		×	×	×	×	×	×	×	×	×	×	^ ×	×		
4 SW4	Jun 03, 2021		Water	S21-Jn12564	×	^ ×	×		×	×	×	×	Х	×	×	×	×	×	×	×		
5 SW5	Jun 03, 2021		Water	S21-Jn12565	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	^ ×	×		
6 SW6	Jun 03, 2021		Water	S21-Jn12566	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	^ ×	×		
7 SW7	Jun 03, 2021		Water	S21-Jn12567	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	^ ×	×		
8 SW8	Jun 03, 2021		Water	S21-Jn12568	×	^ ×	×		×	×	×	×	×	×	×	×	×	×	^ ×	×		
9 SW9	Jun 03, 2021		Water	S21-Jn12569	×	~	×		×	×	×	×	×	×	×	×	×	×	×	×		

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydr Unit 5 16 M Lane	ey ⁻ 3, Build ars Roac Cove W	ling F 1 est NSM	/ 2066	Brisban 1/21 Sm Murarrie Phone :	le nallwood cLD 4 +61 7 3(Place 172 902 460	0 7 4 7 2 1 2	erth 3-48 Bat 'elshpoc 1one : +	ıksia Rc I WA 61 51 8 925	ad 06 51 9600	Nev 4/52 May POI	rcastle ? Industr field Ea Box 60 \	al Drive tt NSW 2 Vickham	2304 2293	Auckla 35 O'R Penros Phone	and orke Roac e, Auckla : +64 9 53	1 nd 1061 26 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5(0 005 085 521 web: w	www.euro	fins.com.au email: EnviroSales	s@eurofins.com	NATA # 1261 Site # 1254 & 14271	Phor NAT,	ie : +61 ; A # 1261	2 9900 8 Site # 1	400 8217	NATA #	: 1261 Si	ite # 207	794 Si N	ATA # 1 ite # 237	261 '36		Pho NA1	ne : +61 ^A # 126	2 4968 { 1 Site # :	8448 25079	# ZNZ	1327		IANZ # 1290
Col Add	mpany Name: dress:	Ran Levé Nort NSV	booll Australia Pty Ltd al 3/100 Pacific Highwa h Sydney V 2060	Λŧ			Orde Repc Phor Fax:	er No.: ort #: te:		3180(8009 ⁻ 02 99 02 99	01193 10 54 81 ⁻ 54 81 ⁻	18 50					кого	eceive ue: 'iority ontact	ed: Name		Jun 5 Da Stej	4, 202 11, 202 ay ohen M	l 5:45 PM 21 axwell	
Pro Pro	oject Name: oject ID:	CAF 318(PTAINS FLAT LEAD M/ 001193	ANAGEMENT	T PLAN												Euro	fins A	nalyti	cal Se	rvices	s Mana	ger : Andı	ew Black
			Sample Detail			Barium	Barium (filtered)	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium	Titanium (filtered)	Metals M8	Hardness Set	Moisture Set		
Melb	ourne Laborato	ory - NA	TA Site # 1254 & 142.	71																	_			
Sydn	ey Laboratory -	- NATA	Site # 18217			×	^ ×	×	×	×	×	×	×	×	×	×	×	×	^ ×	~ ×	×	×		
Brist	bane Laboratory	<u>Y - NAT</u>	A Site # 20794 ite # 23736			+	-											+						
Mavf	ield Laboratory	- NATA	A Site # 25079				-	-									t			-	\vdash			
Exter	rnal Laboratory																							
10	SW10	Jun 03	, 2021	Water	S21-Jn12570	×	×	×		×	×	×	×	×	×	×	×	×	×	^ ×	×			
11	SW11	Jun 03	, 2021	Water	S21-Jn12571	×	×	×		×	×	×	×	×	×	×	×	×	^ ×	×	×			
12	SW12	Jun 03	, 2021	Water	S21-Jn12572	×	^ ×	×		×	×	×	×	×	\times	×	×	×	^ ×	^ ×	×			
13	SW13	Jun 03	, 2021	Water	S21-Jn12573	×	^ ×	×		×	×	×	×	×	×	×	×	×	^ ×	^ ×	×			
14	SW14	Jun 03	, 2021	Water	S21-Jn12574	×	^ ×	×		×	×	×	×	×	×	×	×	×	^ ×	^ ×	×			
15	SW15	Jun 03	, 2021	Water	S21-Jn12575	×	^ ×	×		×	×	×	×	×	×	×	×	×	^ ×	^ ×	×			
16	SED1	Jun 03	, 2021	Soil	S21-Jn12576	×		~		×		×		×		×		×		×		×		
17	SED2	Jun 03	, 2021	Soil	S21-Jn12577	×		~		×		×		×		×		×	^	×		×		
18	SED3	Jun 03	, 2021	Soil	S21-Jn12578	×	^	~		×		×		×		×		×		×		×		
19	SED4	Jun 03	, 2021	Soil	S21-Jn12579	×	^	~		×		×		×		×		×		×		×		
20	SED5	Jun 03	, 2021	Soil	S21-Jn12580	×				×		×		×		×		×				×		

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 Ma Lane (y 3, Buildin -s Road >ove We:	ig F st NSW ;	B M 2066 PI	risbane 21 Small urarrie Q hone : +6	wood Pl LD 417 31 7 390	ace 2 2 4600	Pert 46-4 Wels Phol	h 8 Banks shpool V ne : +61	ia Road VA 6106 8 9251	9600	Newca 4/52 In Mayfiel PO Bo	istle dustrial d East 1 x 60 Wid	Drive ISW 230 kham 23	293 P	Vuckland 5 O'Ror enrose, hone : -	e Road Auckland 1061 64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5	0 005 085 521 web: v	www.euro	ofins.com.au email: EnviroSales	s:@eurofins.com	NATA # 1261 Site # 1254 & 14271	Phoné NATA	: +61 2 # 1261 \$	9900 84 Site # 18:	217 N	АТА # 12	261 Site	# 20794	Site	A # 126 # 23736	,		Phone NATA ;	: +61 2 # 1261 \$	4968 84 site # 25	48 I. 079	ANZ # 1:	27	IANZ # 1290
Co Ad	mpany Name: dress:	Ran Levi Nort NSV	nboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney // 2060	ау			Order Repor Phon€	.:. unit 1 #:: 2 #:		318001 300910 32 995⁄	193 193 4 8118 4 8150						Rec Due Prio	eived : rity:	eme		Jun 4 Jun 1 5 Day Stenh	2021 5:45 PN 1, 2021 en Maxwell	~
Prc	oject Name: oject ID:	CAF 318(PTAINS FLAT LEAD M	ANAGEMENI	T PLAN		-			2	5						Eurofii	ns An	alytica	al Serv	vices	danager : An	drew Black
			Sample Detail		Banum	Barium	Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Titanium	Titanium (filtered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
diaM	ourne Lahorato		110 Site # 1254 & 142	24																			
Sydr	ney Laboratory -	- NATA	\ Site # 18217				×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
Bris	bane Laboratory	y - NAT	^T A Site # 20794			$\left + \right $																	
Pert	h Laboratory - N	NATA S	site # 23736													_	_						
May	field Laboratory	V - NAT	A Site # 25079													_	_						
Exte	rnal Laboratory		-													_	_						
21	SED6	Jun 03	3, 2021	Soil	S21-Jn12581	×	×			\times		×		×		×	×		×			×	
22	SED7	Jun 03	3, 2021	Soil	S21-Jn12582	<u> </u>	×			×		×		×		×	×	_	×			×	
23	SED8	Jun 03	3, 2021	Soil	S21-Jn12583	×	×			×		×	_	×		×	×		×			×	
24	SED9	Jun 03	3, 2021	Soil	S21-Jn12584 >	×	×			×		×		×		×	×		×			×	
25	SED10	Jun 03	3, 2021	Soil	S21-Jn12585 >	×	×			×		×		×		×	×		×			×	
26	SED11	Jun 03	3, 2021	Soil	S21-Jn12586 >	×	×			×		×		×		×	×		×			×	
27	SED12	Jun 03	3, 2021	Soil	S21-Jn12587	~	×			×		×		×		×	×		×			×	
28	SED13	Jun 03	3, 2021	Soil	S21-Jn12588	✓	×			×		×		×		×	×		×			×	
29	SED14	Jun 03	3, 2021	Soil	S21-Jn12589	 ✓	×			×		×		×		×	×		×			×	
30	SED15	Jun 03	3, 2021	Soil	S21-Jn12590 >	×	×			×		×		×		×	×		×			×	
31	QA35	Jun 03	3, 2021	Soil	S21-Jn12591		×			×		×		×		×	×		×			×	

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•			Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 Mit Lane	9y 3, Buildi rs Road Cove W€	ng F st NSW	2066 F - 1 E	Srisbane 1/21 Sma Aurarrie (hone : +	Ilwood F 2LD 41 61 7 39(72 02 4600	Per Pho Pho	th 48 Bank Ishpool \ ne : +61	sia Roa WA 610(1 8 9251	ط 6 9600	Newc 4/52 Mayfik PO Bc	astle ndustria eld East x 60 Wi	Drive VSW 230 Skham 22	4 00 d 1	uckland 5 O'Rork enrose, hone : +	e Road Auckland 1061 54 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone 20800 856 450
ABN: 5	0 005 085 521 web: v	www.eurc	ofins.com.au email: EnviroSale:	s@eurofins.com	NA I # 1261 Site # 1254 & 14271	NAT/	# 1261 2 # 1261	9900 84 Site # 1£	3217 r	# 4 I 4	201 5116	6/07.# 0	4 Site	IA # 12(∍ # 2373,	0. 0		NATA	e:+612 \#1261	4968 84 ² Site # 25(/1 6/(C	EL # ZNN	21	IANZ # 1290
Adi Adi	mpany Name: dress:	Rar Lev Nor NSV	mboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney N 2060	Ле			Ordei Repo Phoni Fax:	n No.: rt#: 8:		31800 80091 02 995 02 995	1193 0 4 811 4 815	00					Du Du C Du	ceivec e: ority: ntact I	: Jame:		Jun 4, Jun 1 [,] 5 Day Steph	2021 5:45 Pl I, 2021 en Maxwell	5
Prc	oject Name: oject ID:	CAI 318	PTAINS FLAT LEAD M. 001193	IANAGEMENT	PLAN												Eurofi	ins An	alytica	ll Serv	rices N	/anager : An	drew Black
			Sample Detail		Barium	Porium	Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium (filtered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melb	ourne Laborato	ory - NA	ATA Site # 1254 & 142	71			\vdash								\vdash		\vdash						
Sydr	- Laboratory	- NATA	\ Site # 18217		×	 	×	×	×	×	×	×	×	×	×	×	^ ×	×	×	×	×	×	
Brist	bane Laboratory	y - NAI	LA Site # 20794																				
Pert	h Laboratory - N	NATA S	Site # 23736			+	+	+	\downarrow				+	+	+	+	+	+					
May	field Laboratory	V - NAT	A Site # 25079			+	+						+	+		+	+	+				Т	
a2 32	rnal Laboratory ∩∆35		2004	Water	S01-In10500 X		×	×		×	×	×	×	×	×	×			×	×			
33	R01	Jun 05	3, 2021	Water	S21-Jn12593				×				:	:	:	:			:	:			
34	R02	Jun 05	3, 2021	Water	S21-Jn12594	\vdash	\vdash		×				$\left \right $	\square	\vdash	\vdash	\vdash	\vdash					
35	R03	Jun 03	3, 2021	Water	S21-Jn12595				×														
36	R04	Jun 06	3, 2021	Water	S21-Jn12596				×														
37	QA01	Jun 06	3, 2021	Soil	S21-Jn12597				×														
38	QA02	Jun 06	3, 2021	Soil	S21-Jn12598				×								_						
39	QA03	Jun 06	3, 2021	Soil	S21-Jn12599				×								_						
40	QA04	Jun 06	3, 2021	Soil	S21-Jn12600				×														
41	QA05	Jun 03	3, 2021	Soil	S21-Jn12601				×														
42	QA06	Jun 03	3, 2021	Soil	S21-Jn12602				×														

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 Ma Lane	y 3, Buildir s Road Sove We	ig F st NSW	2066 2066 2066	risbane /21 Sma lurarrie (hone : +	Ilwood P 2LD 41 61 7 390	lace 72 # 2070	Pho Pho Pho	th 48 Bank Ishpool ' nne : +6'	sia Roa NA 610 I 8 9251	9600 9	Newc 4/52 I Mayfi PO B	astle ndustria eld East ox 60 W	Drive NSW 23 ckham 2	04 293	Aucklar 35 O'Rol Penrose	d ke Road Auckland 1061 -64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5(0 005 085 521 web: w	www.eurc	ofins.com.au email: EnviroSales	s@eurofins.com	NALA # 1201 Site # 1254 & 14271	NATA	# 1261 \$	site # 18	217	- # {		# 2013	site	H # 12 # 2373	- 00		NATA	a∵+01⊿ /#1261	4300 04 Site # 25	5079	- # 7NR	126	0671 # 7NNA1
Col	mpany Name: Iress:	Rai Lev Nor NS	mboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney W 2060	Vr			Order Repol Phone Fax:			31800 30091 32 995 32 995	1193) 4 8118 4 8156						Co Du Co	ceived e: ority: ntact	: Vame:		Jun 4 Jun 1 5 Da	, 2021 5:45 Pl 1, 2021 / ien Maxwell	2
Pro	iject Name: iject ID:	CA 318	PTAINS FLAT LEAD M/ 001193	ANAGEMENI	r plan												Eurof	ins Ar	alytic	al Ser	vices	Manager : An	drew Black
			Sample Detail		Barium		Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)		Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melbo	ourne Laborato	ory - N	ATA Site # 1254 & 142	17																			
Sydn	ey Laboratory -	- NATA	A Site # 18217		~		×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	
Brisc	ane Laboratory	- NA	rA Site # 20794			+												_	_				
Marte	I Laboratory - N	NAIA:	5116 # 23/36 A Site # 25070				_									+		_		_			
Exter	nal Laboratory	-	A 0116 # 2001 9																				
43	QA07) un D	3, 2021	Soil	S21-Jn12603	-			×														
44	QA08	Jun 0;	3, 2021	Soil	S21-Jn12604				×														
45	QA09	Jun 0	3, 2021	Soil	S21-Jn12605				×														
46	QA10	Jun 0;	3, 2021	Soil	S21-Jn12606				×														
47	QA11)0 unc	3, 2021	Soil	S21-Jn12607				×														
48	QA12	Jun 0;	3, 2021	Soil	S21-Jn12608				×														
49	QA13	Jun 0;	3, 2021	Soil	S21-Jn12609				×														
50	QA14	Jun 0	3, 2021	Soil	S21-Jn12610				×														
51	QA15	Jun 0;	3, 2021	Soil	S21-Jn12611				×														
52	QA16	Jun 0	3, 2021	Soil	S21-Jn12612				×														
53	QA17)0 unc	3, 2021	Soil	S21-Jn12613				×														

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		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000	Sydn Unit F 16 Ma Lane	ey 3, Buildii rs Road 2ove We	ng F ist NSW	2066 F 1	3risban /21 Sm Aurarrie hone : +	allwood F QLD 41 61 7 39(⊃lace 72 02 4600	₽66 Phc Phc	rth 48 Bank Ishpool 3ne : +6	ƙsia Roa WA 610 1 8 9251	6 6 1 9600	Newc 4/52 I Mayfic PO Bo	castle ndustria eld East ox 60 Wi	l Drive NSW 23 ckham 2	304 2293	Aucklar 35 O'Ro Penrose Phone :	nd rike Road t, Auckland 1061 +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: 5(0 005 085 521 web: w	www.eurol	fins.com.au email: EnviroSale	ss@eurofins.com	NATA # 1261 Site # 1254 & 14271	Phon NATA	e : +61 2 # 1261 :	9900 84 Site # 18	.00 h 1217	ATA#	1261 Site	e # 2076	94 NA Site	TA#12 =#2373	161 36		Phon NATA	e:+612 \#1261	: 4968 8∠ Site # 2!	448 5079	ANZ #	1327	IANZ # 1290
Col	mpany Name: dress:	Ran Levé Nort NSV	hboll Australia Pty Ltd al 3/100 Pacific Highwa h Sydney V 2060	ay			Order Repo Phon Fax:			31800 80091 02 99£ 02 99£	1193 0 54 811 54 815	80					C P D C P L C	ceived e: ority: ntact l	1: Vame:		Jun ∠ Jun ´ 5 Da Stepl	4, 2021 5:45 F 11, 2021 y hen Maxwell	W
Pro Pro	oject Name: oject ID:	CAF 318(PTAINS FLAT LEAD M 001193	IANAGEMEN ⁻	F PLAN												Eurofi	ins Ar	alytic	al Ser	vices	Manager : Aı	ndrew Black
			Sample Detail		Barium		Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium (IIIIered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melb	ourne Laborato	ory - NA	VTA Site # 1254 & 142	171		-	+											-		_			
Sydn	ey Laboratory -	- NATA	Site # 18217		^		×	×	×	×	×	×	×	×	×	×	×	^ 	×	×	×	×	
Brisk	pane Laboratory	<u>y - NAT</u> NATA Si	A Site # 20794 ite # 23736			_	_	_	_								+	_	_	_	_		
Mayf	ield Laboratory	V - NATA	A Site # 25079																				
Exter	rnal Laboratory						-							F	\vdash	\vdash		\vdash		-			
54	QA18	Jun 03	, 2021	Soil	S21-Jn12614				×														
55	QA19	Jun 03	, 2021	Soil	S21-Jn12615				×														
56	QA20	Jun 03	, 2021	Soil	S21-Jn12616				×		_												
57	QA21	Jun 03	, 2021	Soil	S21-Jn12617				×		_												
58	QA22	Jun 03	, 2021	Soil	S21-Jn12618				×														
59	QA23	Jun 03	, 2021	Soil	S21-Jn12619				×														
60	QA24	Jun 03	, 2021	Soil	S21-Jn12620				×														
61	QA25	Jun 03	, 2021	Soil	S21-Jn12621				×														
62	QA26	Jun 03	, 2021	Soil	S21-Jn12622				×														
63	QA27	Jun 03	, 2021	Soil	S21-Jn12623				×														
64	QA28	Jun 03	, 2021	Soil	S21-Jn12624				×														

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•		2	Environment	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261	Sydr Unit F 16 Má Lane Phone	ey 3, Buildi Irs Road Cove Wé	ng F sst NSW	2066 P 1 1 1	Srisban(1/21 Smé Aurarrie Phone : +	e allwood F QLD 41 +61 7 39	Place 172 102 4600	46- Phc Phc Na	rth 48 Banl- ilshpool 5ne : +6 TA # 12	(sia Roa WA 610 1 8 925	ad 06 1 9600	Newo 4/52 Mayf POB	castle Industria ield East ox 60 M	I Drive NSW 23 ickham 2	804 2293 448	Aucklai 35 O'Rc Penrose Phone :	nd srke Road 9, Auckland 1061 +64 9 526 45 51 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IAN7 # 1290
ABN: 5(0 005 085 521 web: v	www.eurc	ofins.com.au email: EnviroSales	s@eurofins.com	Site # 1254 & 14271	NAT/	# 1261	site # 15	3217				sit.	e # 2375			NAT	A # 1261	Site # 2	5079		770	
Adi Adi	mpany Name: dress:	Rar Lev Nor NSV	mboll Australia Pty Ltd el 3/100 Pacific Highwa th Sydney // 2060	ау			Ordel Repo Phon Fax:	r. No.: rt #: e:		31800 80091 02 99 〔 02 99 〔	1193 0 54 811 54 815	8 Q					C P U C P U	ceive e: ority: ntact	d: Name:		Jun Jun 5 Da Step	4, 2021 5:45 F 11, 2021 'y hen Maxwell	¥
Pro	oject Name: oject ID:	CAI 318	PTAINS FLAT LEAD M/ 001193	ANAGEMEN ⁻	T PLAN												Eurof	ins Al	nalytic	al Sei	rvices	Manager : Al	ndrew Black
			Sample Detail		Barium	Barium	Cobalt	Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium	Selenium (filtered)	Titanium	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set	
Melb	ourne Laborato	ory - NA	ATA Site # 1254 & 142	71																			
Sydn	ey Laboratory -	- NATA	A Site # 18217		~	×	× _	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
Brist	oane Laboratory	NA1	TA Site # 20794			+	+	+	\downarrow		\square			╡							_		
Pert	n Laboratory - N	NATA S	site # 23736			+	+		\downarrow					+					+		_		
May1 Evtor	rield Laboratory	y - NAT	A Site # 25079				_	_											_				
65	QA29	Jun 0	3, 2021	Soil	S21-Jn12625	+			×											-			
66	QA30	Jun 0	3, 2021	Soil	S21-Jn12626				×														
67	QA31	Jun 0	3, 2021	Soil	S21-Jn12627	_			×														
68	QA32	Jun 0	3, 2021	Soil	S21-Jn12628	_			×														
69	QA33	Jun 0	3, 2021	Soil	S21-Jn12629	_			×														
70	QA34	Jun 0	3, 2021	Soil	S21-Jn12630				×														
71	QA37	Jun 0	3, 2021	Soil	S21-Jn12631	_			×														
72	QA38	Jun 0	3, 2021	Soil	S21-Jn12632	_			×														
73	QA39	Jun 0	3, 2021	Soil	S21-Jn12633				×														
74	QA40	Jun 0	3, 2021	Soil	S21-Jn12634				×														
75	QA41	Jun 0	3, 2021	Soil	S21-Jn12635				×														

Page 12 of 19

•	for			Australia															ž	ew Zea	land		
ABN: 50	CULULI	Environm .www.eurofins.com.au email: Env	ent Testing	Melbourne 6 Monterey Road Dadennig South VIC 3175 Phone: +61 3 8564 5000 NATA # 1261 Site # 1254 & 14271	Sydn Unit F 16 Ma Lane Phon- NATA	3, Buildi rs Road Cove We # 1261:	ng F sst NSW 2 9900 840 Site # 182	0 N 20066 P 2 B	risbane 21 Sma urarrie (hone : + ATA # 1	llwood P 2LD 417 61 7 390 261 Site	lace 72 12 4600 # 20794	Per 46-4 Wel Pho Pho Site	th 18 Banks shpool V ne : +61 FA # 126 # 23736	sia Road VA 6106 8 9251	9600	Newca 4/52 In Mayfiel PO Boy Phone NATA ≠	stle dustrial D d East N: 60 Wick +61 2 4 1261 Si	rive SW 2304 ham 229 968 844	33 PPe 35	o'Rork O'Rork Inrose, / Ione : +(NZ # 13	e Road wckland 1061 4 9 526 45 51 27	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 JANZ # 1290	75
Adi	mpany Name: dress:	Ramboll Australia Pt Level 3/100 Pacific H North Sydney NSW 2060	y Ltd lighway			Order Repol		00000	31800 ⁻ 30091(32 995 32 995	1193) 4 8118 4 8150	~ ~ ~					Rec Due Prio Con	eived: rity: tact Na	ame:	, , , , , , , , , , , , , , , , , , , ,	Jun 4, Jun 11 5 Day Stephe	2021 5:45 Pl , 2021 sn Maxwell	Σ	
Prc Pro	iject Name: iject ID:	CAPTAINS FLAT LE 318001193	AD MANAGEMEN	T PLAN												iurofir	is Ana	lytical	Servi	ices N	lanager : An	drew Black	
		Sample De	stail		Barium		Cobalt (filtered)	HOLD	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Molybdenum	Molybdenum (filtered)	Selenium (Illerea)	Titanium	Titanium (filtered)	Metals M8	Metals M8 filtered	Hardness Set	Moisture Set		
Melb	ourne Laborat	ory - NATA Site # 1254	8, 14271			┝					T			F			L	L					
Sydn	ley Laboratory	NATA Site # 18217			×	×	×	×	×	×	×	×	×	×	\^ ×	×	×	×	×	×	×		
Brist	ane Laborato	ry - NATA Site # 20794																					
Perth	- Laboratory	NATA Site # 23736																					
Mayf	ield Laborator	y - NATA Site # 25079																					
Exter	rnal Laborator																						
76	QA42	Jun 03, 2021	Soil	S21-Jn12636				×															
77	QA43	Jun 03, 2021	Soil	S21-Jn12637				×															
78	QA44	Jun 03, 2021	Soil	S21-Jn12638				×															
79	QA45	Jun 03, 2021	Soil	S21-Jn12639	\vdash	$\left \right $		×						$\left \right $									
80	QA46	Jun 03, 2021	Soil	S21-Jn12640				×															
Test	Counts				32	6 32	16	48	32	16	32	16	32	16	32 1	32	16	32	16	15	16		



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
сос	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
СР	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.
- 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	
Barium	mg/L	< 0.02	0.02	Pass	
Barium (filtered)	mg/L	< 0.02	0.02	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	
Cobalt	mg/L	< 0.001	0.001	Pass	
Cobalt (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	
Iron	mg/L	< 0.05	0.05	Pass	
Iron (filtered)	mg/L	< 0.05	0.05	Pass	
Lead	mg/L	< 0.001	0.001	Pass	
Lead (filtered)	mg/L	< 0.001	0.001	Pass	
Manganese	mg/L	< 0.005	0.005	Pass	
Manganese (filtered)	mg/L	< 0.005	0.005	Pass	
Mercury	mg/L	< 0.0001	0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001	0.0001	Pass	
Molybdenum	mg/L	< 0.005	0.005	Pass	
Molybdenum (filtered)	mg/L	< 0.005	0.005	Pass	
Nickel	mg/L	< 0.001	0.001	Pass	
Nickel (filtered)	mg/L	< 0.001	0.001	Pass	
Selenium	mg/L	< 0.001	0.001	Pass	
Titanium	mg/L	< 0.005	0.005	Pass	
Titanium (filtered)	mg/L	< 0.005	0.005	Pass	
Zinc	mg/L	< 0.005	0.005	Pass	
Method Blank			 		
Alkali Metals					
Calcium	mg/L	< 0.5	0.5	Pass	
Magnesium	mg/L	< 0.5	0.5	Pass	
LCS - % Recovery			 		
Heavy Metals					
Arsenic	%	91	80-120	Pass	
Arsenic (filtered)	%	101	80-120	Pass	
Barium	%	90	80-120	Pass	
Barium (filtered)	%	102	80-120	Pass	
Cadmium	%	91	80-120	Pass	
Cadmium (filtered)	%	103	80-120	Pass	
Chromium	%	92	80-120	Pass	
Chromium (filtered)	%	101	80-120	Pass	
Cobalt	%	88	80-120	Pass	
Cobalt (filtered)	%	102	80-120	Pass	
Copper	%	90	80-120	Pass	
Copper (filtered)	%	100	80-120	Pass	
Iron	%	92	80-120	Pass	
Iron (filtered)	%	102	80-120	Pass	
Lead	%	90	80-120	Pass	
Lead (filtered)	%	104	80-120	Pass	



Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Manganese			%	90		80-120	Pass	
Manganese (filtered)			%	103		80-120	Pass	
Mercury			%	97		80-120	Pass	
Mercury (filtered)			%	100		80-120	Pass	
Molybdenum			%	100		80-120	Pass	
Molybdenum (filtered)			%	120		80-120	Pass	
Nickel			%	92		80-120	Pass	
Nickel (filtered)			%	101		80-120	Pass	
Selenium			%	89		80-120	Pass	
Selenium (filtered)			%	108		80-120	Pass	
Titanium			%	95		80-120	Pass	
Titanium (filtered)			%	106		80-120	Pass	
Zinc			%	90		80-120	Pass	
Zinc (filtered)			%	103		80-120	Pass	
LCS - % Recovery								
Alkali Metals								
Calcium			%	96		80-120	Pass	
Magnesium			%	101		80-120	Pass	
Toot	Lab Sample ID	QA	Unito	Begult 1		Acceptance	Pass	Qualifying
Test	Lab Sample ID	Source	Units	Result I		Limits	Limits	Code
Spike - % Recovery					I I			
Heavy Metals				Result 1				
Iron	S21-Jn12705	NCP	%	89		75-125	Pass	
Manganese	S21-Jn12705	NCP	%	86		75-125	Pass	
Zinc	S21-Jn12705	NCP	%	94		75-125	Pass	
Spike - % Recovery					Г Г			
Alkali Metals				Result 1				
Calcium	S21-Jn12705	NCP	%	90		75-125	Pass	
Spike - % Recovery					l – I			
Heavy Metals				Result 1				
Arsenic (filtered)	S21-Jn12573	CP	%	94		75-125	Pass	
Barium (filtered)	S21-Jn12573	CP	%	86		75-125	Pass	
Cadmium (filtered)	S21-Jn12573	CP	%	87		75-125	Pass	
Chromium (filtered)	S21-Jn12573	CP	%	95		75-125	Pass	
Cobalt (filtered)	S21-Jn12573	CP	%	94		75-125	Pass	
Iron (filtered)	S21-Jn12573	CP	%	99		75-125	Pass	
Lead (filtered)	S21-Jn12573	CP	%	89		75-125	Pass	
Mercury (filtered)	S21-Jn12573	CP	%	101		75-125	Pass	
Nickel (filtered)	S21-Jn12573	CP	%	100		75-125	Pass	
Selenium (filtered)	S21-Jn12573	CP	%	101		75-125	Pass	
Titanium (filtered)	S21-Jn12573	CP	%	99		75-125	Pass	
Spike - % Recovery				1	1			
Heavy Metals				Result 1				
Arsenic	S21-Jn12592	CP	%	98		75-125	Pass	
Barium	S21-Jn12592	CP	%	94		75-125	Pass	
Cadmium	S21-Jn12592	CP	%	116		75-125	Pass	
Chromium	S21-Jn12592	CP	%	92		75-125	Pass	
Cobalt	S21-Jn12592	CP	%	90	ļ	75-125	Pass	
Copper	S21-Jn12592	CP	%	93	ļ	75-125	Pass	
Lead	S21-Jn12592	CP	%	102	ļ	75-125	Pass	
Mercury	S21-Jn12592	CP	%	101	ļ	75-125	Pass	
Molybdenum	S21-Jn12592	CP	%	93		75-125	Pass	
Nickel	S21-Jn12592	CP	%	92		75-125	Pass	
Selenium	S21-Jn12592	CP	%	98		75-125	Pass	
Titanium	S21-Jn12592	CP	%	94		75-125	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				1	1		1	r	
Alkali Metals	1			Result 1					
Magnesium	S21-Jn12592	CP	%	102			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate				I			1		
Heavy Metals				Result 1	Result 2	RPD		_	
Arsenic	S21-Jn12561	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Arsenic (filtered)	S21-Jn12561	CP	mg/L	< 0.001	0.001	18	30%	Pass	
Barium	S21-Jn12561	CP	mg/L	0.02	0.02	3.0	30%	Pass	
Barium (filtered)	S21-Jn12561	CP	mg/L	0.02	0.02	11	30%	Pass	
	S21-Jn12561	CP	mg/L	0.0019	0.0019	2.0	30%	Pass	
Cadmium (filtered)	S21-Jn12561	CP	mg/L	0.0019	0.0019	3.0	30%	Pass	
Chromium	S21-Jn12561	СР	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chromium (filtered)	S21-Jn12561	СР	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt	S21-Jn12561	СР	mg/L	0.003	0.003	2.0	30%	Pass	
Cobalt (filtered)	S21-Jn12561	СР	mg/L	0.003	0.003	10	30%	Pass	
Copper	S21-Jn12561	CP	mg/L	0.012	0.012	1.0	30%	Pass	
Copper (filtered)	S21-Jn12561	CP	mg/L	0.008	0.008	2.0	30%	Pass	
Iron	S21-Jn12561	СР	mg/L	2.1	2.1	2.0	30%	Pass	
Iron (filtered)	S21-Jn12561	СР	mg/L	0.63	0.64	3.0	30%	Pass	
Lead	S21-Jn12561	СР	mg/L	0.019	0.019	1.0	30%	Pass	
Lead (filtered)	S21-Jn12561	CP	mg/L	0.007	0.006	4.0	30%	Pass	
Manganese	S21-Jn12561	CP	mg/L	0.31	0.31	<1	30%	Pass	
Manganese (filtered)	S21-Jn12561	CP	mg/L	0.30	0.31	2.0	30%	Pass	
Mercury	S21-Jn12561	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Mercury (filtered)	S21-Jn12561	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	S21-Jn12561	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Molybdenum (filtered)	S21-Jn12561	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel	S21-Jn12561	CP	mg/L	0.005	0.005	6.0	30%	Pass	
Nickel (filtered)	S21-Jn12561	CP	mg/L	0.004	0.005	10	30%	Pass	
Selenium	S21-Jn12561	CP	mg/L	0.001	< 0.001	43	30%	Fail	Q15
Selenium (filtered)	S21-Jn12561	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Titanium	S21-Jn12561	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Titanium (filtered)	S21-Jn12561	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
	S21-Jn12561	CP	mg/L	2.3	2.3	<1	30%	Pass	
Zinc (filtered)	S21-Jn12561	СР	mg/L	1.6	1.6	2.0	30%	Pass	
Duplicate				D #4	D # 0				
Alkali Metals	004 1: 40504	0.0		Result 1	Result 2	RPD	0.00%	Deres	
Calcium	S21-Jn12561	CP	mg/L	11	11	<1	30%	Pass	
Magnesium	S21-Jn12561	СР	mg/L	8.8	8.9	1.0	30%	Pass	
Duplicate				Desided	Develto	DDD	1		
Heavy Metals	004 1:40575	0.0		Result 1	Result 2	RPD	0.00%	Deres	
Arsenic	S21-Jn12575		mg/L	< 0.001	< 0.001	<1	30%	Pass	
Barlum	S21-Jn12575		mg/L	< 0.02	< 0.02	<1	30%	Pass	
Cadmium	S21-Jn12575		mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Cabalt	021-JN125/5		mg/L	< 0.001	< 0.001	<1	30%	Pass	
Conner	S21-Jn12575		mg/L	< 0.001	< 0.001	<1	30%	Pass	
	S21-JN125/5		mg/L	0.002	0.002	8.0	30%	Pass	
	521-JN125/5		rng/L	0.69	0.57	18	30%	Pass	
	S21-Jn125/5		mg/L	0.004	0.005	2.0	30%	Pass	
Manganese	S21-JN12575		mg/L	0.027	0.027	1.0	30%	Pass	
Nebula de recurs	S21-Jn125/5		mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Niekel	521-JN125/5		mg/L	< 0.005	< 0.005	<1	30%	Pass	
INICKEI	S21-Jn125/5	L Ch	mg/L	0.003	0.002	-22	30%	Pass	



Duplicate										
Heavy Metals				Result 1	Result 2	RPD				
Selenium	S21-Jn12575	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass		
Titanium	S21-Jn12575	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass		
Zinc	S21-Jn12575	CP	mg/L	0.042	0.039	8.0	30%	Pass		
Duplicate										
Alkali Metals	_			Result 1	Result 2	RPD				
Calcium	S21-Jn12575	CP	mg/L	2.6	2.7	6.0	30%	Pass		
Magnesium	S21-Jn12575	CP	mg/L	2.8	2.9	2.0	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

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:

Andrew Black John Nguyen Analytical Services Manager 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.

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Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the ended to the signation of the signation of lesting, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Attention:

Stephen Maxwell

Report Project name Project ID Received Date 802794-S ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jun 15, 2021

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SED1 Soil S21-Jn27518 Jun 03, 2021	SED2 Soil S21-Jn27519 Jun 03, 2021	SED3 Soil S21-Jn27520 Jun 03, 2021	SED4 Soil S21-Jn27521 Jun 03, 2021
Heavy Metals						
Aluminium	20	mg/kg	17000	12000	14000	9600
% Moisture	1	%	78	65	59	65

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SED5 Soil S21-Jn27522 Jun 03, 2021	SED6 Soil S21-Jn27523 Jun 03, 2021	SED7 Soil S21-Jn27524 Jun 03, 2021	SED8 Soil S21-Jn27525 Jun 03, 2021
Heavy Metals						
Aluminium	20	mg/kg	6000	5500	5700	15000
% Moisture	1	%	36	19	14	31

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	SED9 Soil S21-Jn27526 Jun 03, 2021	SED10 Soil S21-Jn27527 Jun 03, 2021	SED11 Soil S21-Jn27528 Jun 03, 2021	SED12 Soil S21-Jn27529 Jun 03, 2021
Heavy Metals						
Aluminium	20	mg/kg	5100	3600	14000	4000
% Moisture	1	%	15	18	55	8.5



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			SED13 Soil S21-Jn27530 Jun 03, 2021	SED14 Soil S21-Jn27531 Jun 03, 2021	SED15 Soil S21-Jn27532 Jun 03, 2021	QA35 Soil S21-Jn27533 Jun 03, 2021
Test/Reference	LOR	Unit		,	,	,
Heavy Metals						
Aluminium	20	mg/kg	9900	10000	4500	2900
% Moisture	1	%	16	62	23	25

Client Sample ID			QA01	QA02	QA03	QA04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Jn27539	S21-Jn27540	S21-Jn27541	S21-Jn27542
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	5000	4100	5000	6000
% Moisture	1	%	9.3	6.9	4.4	30

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	QA05 Soil S21-Jn27543 Jun 03, 2021	QA06 Soil S21-Jn27544 Jun 03, 2021	QA07 Soil S21-Jn27545 Jun 03, 2021	QA08 Soil S21-Jn27546 Jun 03, 2021
Heavy Metals						
Aluminium	20	mg/kg	7500	6600	2800	7400
% Moisture	1	%	12	11	5.8	33

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			QA09 Soil S21-Jn27547 Jun 03, 2021	QA10 Soil S21-Jn27548 Jun 03, 2021	QA11 Soil S21-Jn27549 Jun 03, 2021	QA12 Soil S21-Jn27550 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	7100	3300	7700	9500
% Moisture	1	%	28	35	1.8	4.4



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			QA13 Soil S21-Jn27551 Jun 03, 2021	QA14 Soil S21-Jn27552 Jun 03, 2021	QA15 Soil S21-Jn27553 Jun 03, 2021	QA16 Soil S21-Jn27554 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	10000	2500	2400	7800
% Moisture	1	%	11	12	1.9	5.4

Client Sample ID			QA17	QA18	QA19	QA20
Sample Matrix			5011	5011	5011	5011
Eurofins Sample No.			S21-Jn27555	S21-Jn27556	S21-Jn27557	S21-Jn27558
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	3800	1700	3300	10000
% Moisture	1	%	4.0	4.0	7.6	16

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	QA21 Soil S21-Jn27559 Jun 03, 2021	QA22 Soil S21-Jn27560 Jun 03, 2021	QA23 Soil S21-Jn27561 Jun 03, 2021	QA24 Soil S21-Jn27562 Jun 03, 2021
Heavy Metals	2011	01110				
Aluminium	20	mg/kg	23000	19000	14000	9500
% Moisture	1	%	16	16	4.8	6.0

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			QA25 Soil S21-Jn27563 Jun 03, 2021	QA26 Soil S21-Jn27564 Jun 03, 2021	QA27 Soil S21-Jn27565 Jun 03, 2021	QA28 Soil S21-Jn27566 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	11000	7600	8400	8300
% Moisture	1	%	13	23	24	25



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			QA29 Soil S21-Jn27567 Jun 03, 2021	QA30 Soil S21-Jn27568 Jun 03, 2021	QA31 Soil S21-Jn27569 Jun 03, 2021	QA32 Soil S21-Jn27570 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	3100	12000	12000	11000
% Moisture	1	%	1.2	< 1	12	9.4

Client Sample ID			QA33	QA34	QA37	QA38
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Jn27571	S21-Jn27572	S21-Jn27575	S21-Jn27576
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	6500	6300	18000	18000
% Moisture	1	%	8.7	9.2	5.6	6.6

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			QA39 Soil S21-Jn27577 Jun 03, 2021	QA40 Soil S21-Jn27578 Jun 03, 2021	QA41 Soil S21-Jn27579 Jun 03, 2021	QA42 Soil S21-Jn27580 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	24000	14000	14000	14000
% Moisture	1	%	9.1	2.8	14	16

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			QA43 Soil S21-Jn27581 Jun 03, 2021	QA44 Soil S21-Jn27582 Jun 03, 2021	QA45 Soil S21-Jn27583 Jun 03, 2021	QA46 Soil S21-Jn27584 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	20	mg/kg	7500	8000	7000	12000
% Moisture	1	%	12	15	24	18



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals	Sydney	Jun 15, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jun 15, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

			•	ustralia							New Zealand		
	5	vironment	Testing	elbourne Monterey Road andenong South VIC 3175 hone : +61 3 8564 5000 ATA # 1260	Sydney Unit F3, I 16 Mars Lane Co Phone : -	Building Road ve West +61 2 99	F NSW 2066 00 8400	Brisbane 1/21 Smallwood Place Murarie QLD 4172 Phone : +617 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 24968 8448 Phone : +61 24968 8448	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 767 Phone : 0800 856 450 IANZ # 1290	375
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npany Name: Iress:	Ramboll / Level 3/1(North Syd NSW 206	Australia Pty Ltd 30 Pacific Highw Iney 0	ay		ΟΥĒΪ	rder N eport i hone: ax:	:	318001193 802794 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 A Jun 18, 2021 3 Day Stephen Maxwell	2	
ject Name: ject ID:	ADDITIOI 31800115	NAL - CAPTAIN: 33	S FLAT LEAD M	ANAGEMENT PLAN					-	Eurofins Analytical Se	ervices Manager : And	rew Black	
		Sample Detail		Aluminium	Aluminium (filtered)	Moisture Set							
ourne Laborato	ory - NATA S	ite # 1254 & 14	271										
ey Laboratory	- NATA Site	# 18217		~	×	×							
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nal Laboratory													
Sample ID	Sample Da	te Sampling Time	Matrix	LAB ID									
SW1	Jun 03, 202 [.]	_	Water	S21-Jn27503 ×	×								
SW2	Jun 03, 202		Water	S21-Jn27504 ×	×								
SW3 SW4	Jun 03, 202	, ,	Water	S21-Jn27505 X	× ×								
SW5	Jun 03, 202'		Water	S21-Jn27507 ×	< ×								
SW6	Jun 03, 202	-	Water	S21-Jn27508 ×	×								
SW7	Jun 03, 202 [.]		Water	S21-Jn27509 ×	×								
SW8	Jun 03, 202 ⁻	-	Water	S21-Jn27510 ×	×								
SW9	Jun 03, 202		Water	S21-Jn27511 ×	×								
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6 Monterey Road U Dandenong South VIC 3175 11 Phone : +61 3 8564 5000 Li NATA # 1261 P1 Site # 1254 & 14271 N Melbourne **Environment Testing**

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Australia

Brisbane 1/21 Smalwood Place Murarie QLD 4172 5 Phone: +61 7 3902 4600 5 NATA # 1261 Site # 20794 Sydney Unit F3, Building F 11 5 16 Mars Road M Lane Cove West NSW 2066 P Lane Cove West NSW 2066 N Phone : +61 2 9900 8400 N NATA # 1261 Slie # 18217

318001193 802794

Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 JANZ # 1290 Jun 15, 2021 3:39 AM Jun 18, 2021 Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327 Stephen Maxwell 3 Day Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 Door 60 Wickham 2293 Phone : +61 2 4968 9448 NATA # 1261 Site # 25079 Contact Name: Received: Priority: Due: Perth 46-48 Banksia Road Weshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736

New Zealand

Eurofins Analytical Services Manager : Andrew Black

Ad Ad	ompany Name: ddress:	Ramboll Australia Pt Level 3/100 Pacific H North Sydney NSW 2060	y Ltd lighway			Ph Faj	der No. port #: one: K:	2
Pr Pr	oject Name: oject ID:	ADDITIONAL - CAP 318001193	TAINS FLAT LEAD N	JANAGEMENT PL	AN			
		Sample Do	stail		Aluminium	Aluminium (filtered)	Moisture Set	
Melb	bourne Laborato	orv - NATA Site # 1254	& 14271					
Sydi	ney Laboratory	- NATA Site # 18217			×	×	×	
Bris	bane Laboratory	/ - NATA Site # 20794						
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10	SW10	Jun 03, 2021	Water	S21-Jn27512	Х	×		
11	SW11	Jun 03, 2021	Water	S21-Jn27513	Х	×		
12	SW12	Jun 03, 2021	Water	S21-Jn27514	×	×		
13	SW13	Jun 03, 2021	Water	S21-Jn27515	Х	×		
14	SW14	Jun 03, 2021	Water	S21-Jn27516	×	×		
15	SW15	Jun 03, 2021	Water	S21-Jn27517	×	×		
16	SED1	Jun 03, 2021	Soil	S21-Jn27518	×		×	
17	SED2	Jun 03, 2021	Soil	S21-Jn27519	×		×	
18	SED3	Jun 03, 2021	Soil	S21-Jn27520	×		×	
19	SED4	Jun 03, 2021	Soil	S21-Jn27521	×		×	
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Metbourne S 6 Monterey Road U Dandenong Suth VIC 3175 1 Phone - 1013 8564 5000 P NATA # 1261 P Site # 1254 & 14271 N Environment Testing

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Company Name: Address:

Australia

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16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone :
NATA # 1261 Site # 18217		Site # 23736	NATA #

Order No.: Report #: Phone: Fax:

	New Zealand		
Newcastle 4/52 Industrial Drive Mayrield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland So'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 20 Editoli Drinkve Rollesion, Christveurch 7675 Phone : 0800 856 450 JANZ # 1290 JANZ # 1290	
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 A Jun 18, 2021 3 Day Stephen Maxwell	W	

ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060 Project Name: Project ID:

Eurofins Analytical Services Manager : Andrew Black

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Moisture Set		×					Х	Х	Х	Х	Х	Х	Х	×	×	×	Х
Aluminium (filtered)		×															
Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
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mple Detail	# 1254 & 142	8217	20794	36	25079												
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Melbourne S 6 Monterey Road U Dandenong Suth VIC 3175 11 Phone : +61 3 8564 5000 Li NATA # 1261 PI Site # 1254 & 14271 N Environment Testing

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Australia

Sydney	Brisbane	Perth	Newcastle
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industria
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield Eas
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 V
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61
NATA # 1261 Site # 18217		Site # 23736	NATA # 126

4/52 Industrial Drive Mayfield East NSW 2304	35 O'Rorke Road Penrose, Auckland 1061	43 Detroit Drive Rolleston, Christchurch 7675	
PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Phone : +64 9 526 45 51 IANZ # 1327	Phone : 0800 856 450 IANZ # 1290	
Received:	Jun 15, 2021 3:39 /	W	
Due:	Jun 18, 2021		
Priority:	3 Day		
Contact Name:	Stephen Maxwell		

Christchurch 43 Detroit Drive

New Zealand Auckland 35 O'Rorke Road

Company Name: Address:	Ramboll Australia Pty Ltd Level 3/100 Pacific Highway	Order No.: Report #:
	North Sydney NSW 2060	Phone: Fax:
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193	

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×										×	×	×	×	×
Aluminium (filtered)		×					×									
Aluminium		×					×	×	×	×	×	×	×	×	×	×
							S21-Jn27534	S21-Jn27535	S21-Jn27536	S21-Jn27537	S21-Jn27538	S21-Jn27539	S21-Jn27540	S21-Jn27541	S21-Jn27542	S21-Jn27543
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Soil

Jun 03, 2021

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Metbourne S 6 Monterey Road U Dandenong South VIC 3175 1 Phone - e13 8564 5000 F NATA # 1261 F N Site # 1254 & 14271 N Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Address:

Australia

Sydney	Brisbane	Perth	Newcastle
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industrial Drive
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield East NSW 2304
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 Wickham 2293
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61 2 4968 8448
NATA # 1261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079

New Zealand Auckland 35 O'Rorke Road Penrose, Auckland 1061

Newcastle MayZi Industrial Drive MayZie Industrial Drive 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland So Rorke Road Penrose. Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchur Phone : 0800 856 456 IANZ # 1290	h 7675
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	MA	

Order No.: Report #: Phone: Fax: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060 Project Name: Project ID:

318001193 802794

ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×					×	×	×	×	×	×	×	×	×	×	×
Aluminium (filtered)		Х															
Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
							S21-Jn27545	S21-Jn27546	S21-Jn27547	S21-Jn27548	S21-Jn27549	S21-Jn27550	S21-Jn27551	S21-Jn27552	S21-Jn27553	S21-Jn27554	S21-Jn27555
	71						Soil										
mple Detail	# 1254 & 142	8217	20794	36	25079												
ö	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 237	- NATA Site #		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	ield Laboratory	nal Laboratory	QA07	QA08	QA09	QA10	QA11	QA12	QA13	QA14	QA15	QA16	QA17
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	43	44	45	46	47	48	49	50	51	52	53

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Melbourne S 6 Monterey Road U Dandenong Suth VIC 3175 11 Phone : +61 3 8564 5000 Li NATA # 1261 PI Site # 1254 & 14271 N Australia Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Address:

Sydney	Brisbane	Perth	Newcastle
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industrial Drive
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield East NSW 2304
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 Wickham 2293
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61 2 4968 8448
NATA # 1261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079

Order No.: Report #: Phone: Fax:

	New Zealand		
Newcastle MayZi Industrial Drive MayZield East NSW 2304 AryGield East NSW 2304 Prone: +61 2 4968 8448 Prone: +61 2 4968 8448 VATA # 1261 Site # 25079	Auckland So Nerke Road Penrose. Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 23 Detroit Druixteurch Rolleston, Christehurch 7675 Phone : 0800 856 450 JANZ # 1290	
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	Ŵ	

Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060 Project Name: Project ID:

ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×					×	×	×	×	×	×	×	×	×	×	×
Aluminium (filtered)		×															
Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
							S21-Jn27556	S21-Jn27557	S21-Jn27558	S21-Jn27559	S21-Jn27560	S21-Jn27561	S21-Jn27562	S21-Jn27563	S21-Jn27564	S21-Jn27565	S21-Jn27566
	71						Soil										
mple Detail	# 1254 & 142	8217	20794	36	25079												
ů	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 237	- NATA Site #		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	QA18	QA19	QA20	QA21	QA22	QA23	QA24	QA25	QA26	QA27	QA28
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	54	55	56	57	58	59	60	61	62	63	64

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Metbourne S 6 Monterey Road U Dandenong South VIC 3175 1 Phone - e13 8564 5000 F NATA # 1261 F N Site # 1254 & 14271 N Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Address:

Australia

Sydney	Brisbane	Perth	Newcastle
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industrial Drive
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield East NSW 2304
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 Wickham 2293
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61 2 4968 8448
NATA # 1261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079

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Newcastle MayZi Industrial Drive MayZie Industrial East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland So'Rorke Road Pennose. Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurc Phone : 0800 856 450 IANZ # 1290	7675
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Order No.: Report #: Phone: Fax: ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060 Project Name: Project ID:

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×					×	Х	Х	Х	Х	×	×	Х	×	×
Aluminium (filtered)		×														
Aluminium		×					×	Х	Х	Х	Х	×	Х	Х	×	×
							S21-Jn27567	S21-Jn27568	S21-Jn27569	S21-Jn27570	S21-Jn27571	S21-Jn27572	S21-Jn27575	S21-Jn27576	S21-Jn27577	S21-Jn27578
e Detail	254 & 14271	7	-94		62		Soil									
Sampl	ry - NATA Site # 1:	- NATA Site # 1821	/ - NATA Site # 207	IATA Site # 23736	- NATA Site # 250		Jun 03, 2021	Jun 03. 2021								
	ourne Laborato	ey Laboratory .	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	QA29	QA30	QA31	QA32	QA33	QA34	QA37	QA38	QA39	QA40
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	65	66	67	68	69	70	71	72	73	74

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S21-Jn27579

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Australia	Melbourne 6 Monterey Road Dandenong South VIC
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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736 Brisbane 1/21 Smallwood Place Murarie QLD 4172 5 Phone: +61 7 3902 4600 5 NATA # 1261 Site # 20794
 Melbourne
 Sydney

 6 Monterey Road
 Unit F3, Building F

 Dandenong South VIC 3175
 16 Mars Road

 Phone : +61 3 8564 5000
 Lane Cove West NSW 2066

 NATA # 1261
 Phone : +61 2 9900 8400

 Site # 1254 8 14271
 NATA # 1261 Site # 18217

318001193 802794

Order No.: Report #: Phone:

Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290 Jun 15, 2021 3:39 AM Jun 18, 2021 New Zealand Aucktand 35 O'Rorke Road Perroses, Aucktand 1061 Phone: +64 9 526 45 51 IANZ # 1327 Stephen Maxwell 3 Day Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 Door 60 Wickham 2293 Phone : +61 2 4968 9448 NATA # 1261 Site # 25079 Due: Priority: Contact Name: Received:

Eurofins Analytical Services Manager : Andrew Black

Ad	mpany Name: dress:	Ramboll Aust Level 3/100 F North Sydney NSW 2060	ralia Pty Ltd Pacific Highw /	ay			Or Ph Fay	der No port # one: K:	0.11
Prc	oject Name: oject ID:	ADDITIONAL 318001193	CAPTAINS	S FLAT LEAD M	ANAGEMENT PL	AN			
		S.	mple Detail			Aluminium	Aluminium (filtered)	Moisture Set	
Melb	ourne Laborato	ory - NATA Site	# 1254 & 142	271					
Sydr	ney Laboratory	- NATA Site # 18	8217			×	×	×	
Brist	bane Laboratory	y - NATA Site #	20794						
Pertl	h Laboratory - N	VATA Site # 237	36						
May	field Laboratory	/ - NATA Site # 2	25079						
Exte	rnal Laboratory								
76	QA42	Jun 03, 2021		Soil	S21-Jn27580	×		×	
77	QA43	Jun 03, 2021		Soil	S21-Jn27581	×		×	
78	QA44	Jun 03, 2021		Soil	S21-Jn27582	×		×	
79	QA45	Jun 03, 2021		Soil	S21-Jn27583	×		×	
80	QA46	Jun 03, 2021		Soil	S21-Jn27584	×		×	
Test	Counts					80	16	60	



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
СР	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.
- 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									
Aluminium			mg/kg	< 20			20	Pass	
LCS - % Recovery									
Heavy Metals									
Aluminium			%	116			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				T	1		1	1	
Heavy Metals	1			Result 1					
Aluminium	S21-Jn27567	CP	%	102			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate				1	1		T		
Heavy Metals	1			Result 1	Result 2	RPD			
Aluminium	S21-Jn27519	CP	mg/kg	12000	15000	16	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Jn27521	CP	%	65	67	3.0	30%	Pass	
Duplicate					D # 0		1		
	004 1 07504	0.0	0/	Result 1	Result 2	RPD	0.00%		
% Moisture	S21-Jn27531	СР	%	62	61	2.0	30%	Pass	
Duplicate				Deput 1	Deput 2		1		
% Moisturo	\$21 lp27546	СР	0/_	22	21	60 60	30%	Pass	
	021-01127 040		70	55	51	0.0	3070	1 435	
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn27556	CP	ma/ka	1700	1800	60	30%	Pass	
Duplicate	01101121000	0.				0.0			
				Result 1	Result 2	RPD			
% Moisture	S21-Jn27556	CP	%	4.0	4.3	8.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn27561	CP	mg/kg	14000	13000	4.0	30%	Pass	
Duplicate				-					
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn27562	CP	mg/kg	9500	9600	<1	30%	Pass	
Duplicate							T	-	
	1			Result 1	Result 2	RPD			
% Moisture	S21-Jn27566	CP	%	25	22	12	30%	Pass	
Duplicate				I	1		1		
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn27576	CP	mg/kg	18000	15000	17	30%	Pass	
Duplicate						855	1		
	004 1 07775	07	64	Result 1	Result 2	RPD	0.000		
% Moisture	S21-Jn27576	CP	%	6.6	6.6	1.0	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

Authorised by:

Andrew Black John Nguyen Analytical Services Manager 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.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney **NSW 2060**





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the ended to the signation of the signation of lesting, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Attention:

Stephen Maxwell

Report Project name Project ID Received Date 802794-W ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jun 15, 2021

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			SW1 Water S21-Jn27503 Jun 03, 2021	SW2 Water S21-Jn27504 Jun 03, 2021	SW3 Water S21-Jn27505 Jun 03, 2021	SW4 Water S21-Jn27506 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	0.33	0.70	1.6	0.62
Aluminium (filtered)	0.05	mg/L	0.09	0.06	< 0.05	0.10

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			SW5 Water S21-Jn27507 Jun 03, 2021	SW6 Water S21-Jn27508 Jun 03, 2021	SW7 Water S21-Jn27509 Jun 03, 2021	SW8 Water S21-Jn27510 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	13	2.5	2.0	16
Aluminium (filtered)	0.05	mg/L	13	0.74	0.51	13

Client Sample ID			SW9	SW10	SW11	SW12
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Jn27511	S21-Jn27512	S21-Jn27513	S21-Jn27514
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	16	2.6	0.50	24
Aluminium (filtered)	0.05	mg/L	15	1.2	0.16	23

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			SW13 Water S21-Jn27515 Jun 03, 2021	SW14 Water S21-Jn27516 Jun 03, 2021	SW15 Water S21-Jn27517 Jun 03, 2021	QA35 Water S21-Jn27534 Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	2.4	0.27	0.21	14
Aluminium (filtered)	0.05	mg/L	1.1	0.14	0.10	12



Client Sample ID			R01	R02	R03	R04
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Jn27535	S21-Jn27536	S21-Jn27537	S21-Jn27538
Date Sampled			Jun 03, 2021	Jun 03, 2021	Jun 03, 2021	Jun 03, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	< 0.05	0.20	< 0.05	< 0.05



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals	Sydney	Jun 18, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Sydney	Jun 15, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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ABN: 4	10005 085 521 web: '	CD www.eurofins	Envirc s.com.au em	onment nail: EnviroSale	Seurofins.com	lelbourne Monterey Road Monterey Road andenong South VIC 3175 hone : +61 3 8564 5000 (ATA # 1261 ite # 1261 & 14271	Sydney Unit F3 16 Mars Lane Co Phone	Building Road ove Wes +61 2 9 +1261 S	g F st NSW 2066 9900 8400 ite # 18217	Brisbane 1/21 Smallwood Place Murarie OLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Weishpool WA 6106 Nohoe : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone: +61 2 4968 9448 NATA # 1261 Site # 25079	Auckland 35 O'Ronke Road Pennose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290
ŏĕ	ompany Name: Idress:	Ramb(Level 3	oll Austra 3/100 Pa	alia Pty Ltd cific Highwa	ау		0 1	Order Report	No.: t#:	318001193 802794		Received: Due:	Jun 15, 2021 3:39 A Jun 18, 2021	×
		North NSW	Sydney 2060					hone ax:		02 9954 8118 02 9954 8150		Priority: Contact Name:	3 Day Stephen Maxwell	
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											_	Eurofins Analytical Se	ervices Manager : And	Irew Black
			Samp	ple Detail		Auminium	Aluminium (filtered)	Moisture Set						
Mel	ourne Laborato	ory - NAT	A Site #	1254 & 142	:71									
Syd	ney Laboratory	- NATA S	ite # 182	17		^	×	×						
Bris	bane Laborator	y - NATA	Site # 20	0794										
Per	h Laboratory - I	NATA Site	e # 23736	010										
Exte	rnal Laboratory	A IAN - V	01 # AIIO	610										
No	Sample ID	Sample	Date	Sampling Time	Matrix	LAB ID			1					
-	SW1	Jun 03, 2	2021		Water	S21-Jn27503	×							
2	SW2	Jun 03, 2	2021		Water	S21-Jn27504 >	× :							
3	SW3 SW4	Jun 03, 2	2021		Water	S21-Jn27505 >	××	_						
5	SW5	Jun 03, 2	2021		Water	S21-Jn27507	< ×							
9	SW6	Jun 03, 2	2021		Water	S21-Jn27508	×							
2	SW7	Jun 03, 2	2021		Water	S21-Jn27509 >	×							
8	SW8	Jun 03, 2	2021		Water	S21-Jn27510	×							
б	SW9	Jun 03, 2	2021		Water	S21-Jn27511	×							

Page 4 of 14

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NATA # 1261 Site # 18217		Site # 23736	NATA # 126

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Newcastle MayFindUstrial Drive MayField East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland So Nevke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurc Phone : 0800 856 450 IANZ # 1290	7675 ר
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	WF	

Order No.: Report #: Phone: Fax: ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060 Project Name: Project ID:

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Eurofins Analytical Services Manager : Andrew Black

	Sam	nple Detail			um	um (filtered)	e Set
rne Laborat	ory - NATA Site #	≠ 1254 & 142	71				
Laboratory	- NATA Site # 18	1217			×	×	×
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aboratory - I	NATA Site # 2373	36					
d Laboratory	y - NATA Site # 2	5079					
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V10	Jun 03, 2021		Water	S21-Jn27512	Х	×	
V11	Jun 03, 2021		Water	S21-Jn27513	×	×	
V12	Jun 03, 2021		Water	S21-Jn27514	Х	×	
V13	Jun 03, 2021		Water	S21-Jn27515	×	×	
V14	Jun 03, 2021		Water	S21-Jn27516	×	Х	
V15	Jun 03, 2021		Water	S21-Jn27517	Х	×	
ED1	Jun 03, 2021		Soil	S21-Jn27518	×		×
ED2	Jun 03, 2021		Soil	S21-Jn27519	Х		×
ED3	Jun 03, 2021		Soil	S21-Jn27520	×		×
ED4	Jun 03, 2021		Soil	S21-Jn27521	×		×
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Metbourne S 6 Monterey Road U Dandenong Suth VIC 3175 1 Phone : +61 3 8564 5000 L NATA # 1261 N Site # 1254 & 14271 N Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Sydney	Brisbane	Perth	Newcas
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Ind
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfielo
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone :
NATA # 1261 Site # 18217		Site # 23736	NATA #

	New Zealand		
Newcastle MayZi Industrial Drive MayZield East NSW 2304 APYEINE East NSW 2304 Prone: : +61 2 4968 8448 Phone: : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland So Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch Ra Detroit Drive Rolleston, Christehurch 76 Phone : 0800 856 450 JANZ # 1290	75
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	WE	

Order No.: Report #: Phone: Fax:

Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060

Company Name: Address:

ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Project Name: Project ID:

Eurofins Analytical Services Manager : Andrew Black

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	:71						Soil										
mple Detail	# 1254 & 142	18217	ŧ 20794	736	25079												
ů	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 23	- NATA Site #		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	SED6	SED7	SED8	SED9	SED10	SED11	SED12	SED13	SED14	SED15	QA35
	Melbo	Sydne	Brisb.	Perth	Mayfi	Exter	21	22	23	24	25	26	27	28	29	30	31
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eu																	

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Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060

Company Name: Address:

Project Name: Project ID:

	Australia				
	Melbourne	Sydney	Brisbane	Perth	~
	6 Monterey Road	Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4
	Dandenong South VIC 3175	16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	~
	Phone : +61 3 8564 5000	Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	ш.
	NATA # 1261	Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	ш.
E	Site # 1254 & 14271	NATA # 1261 Site # 18217		Site # 23736	2

	New Zealand		
Newcastle MayFindLeast NSW 2304 MayField East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland Bo Chroke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch Phone : 0800 856 450 IANZ # 1290	7675
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	Mt	

318001193 802794 02 9954 8118 02 9954 8150 Order No.: Report #: Phone: Fax: ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×										×	×	×	×	×	×
Aluminium (filtered)		×					×										
Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
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	71						Water	Water	Water	Water	Water	Soil	Soil	Soil	Soil	Soil	Soil
mple Detail	# 1254 & 142	8217	20794	36	25079												
σ	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 237	- NATA Site # :		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	QA35	R01	R02	R03	R04	QA01	QA02	QA03	QA04	QA05	QA06
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	32	33	34	35	36	37	38	39	40	41	42

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Australia S Melbourne S 6 Monterey Road U Dandenong Suth VIC 3175 14 Phone : +61 3 8564 5000 Li NATA # 1261 N Site # 1254 & 14271 N Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Company Name: Address:

Sydney	Brisbane	Perth	Newcastle	4
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industrial Drive	ო
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield East NSW 2304	ш
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 Wickham 2293	ш
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61 2 4968 8448	-
NATA # 1261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079	

Order No.: Report #:

	New Zealand		
Newcastle Mayfield East NSW 2304 Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland Bo Ororke Road Pernose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch Christchurch Rolleston, Christehurch 767; Phone : 0800 856 450 IANZ # 1290	
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	W	

	North Sydney NSW 2060	Phone: Fax:
Project Name: Project ID:	ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193	

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×					×	×	×	×	×	×	×	×	×	×	×
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Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
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	71						Soil										
mple Detail	# 1254 & 142	8217	20794	36	25079												
σ ώ	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 237	- NATA Site # :		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	QA07	QA08	QA09	QA10	QA11	QA12	QA13	QA14	QA15	QA16	QA17
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	43	44	45	46	47	48	49	50	51	52	53

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Metbourne S 6 Monterey Road U Dandenong Suth VIC 3175 1 Phone : +61 3 8564 5000 L NATA # 1261 N Site # 1254 & 14271 N Australia Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060

Company Name: Address:

Project Name: Project ID:

Sydney	Brisbane	Perth	Newcastle
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industrial Drive
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield East NSW 2:
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 Wickham
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61 2 4968 8
NATA # 1261 Site # 18217		Site # 23736	NATA # 1261 Site # 2

	New Zealand		
Newcastle MayZi Industrial Drive MayZi Industrial East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland Sc Nerke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7 Phone : 0800 856 450 IANZ # 1290	675
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	W	

318001193 802794 02 9954 8118 02 9954 8150 Order No.: Report #: Phone: Fax: ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×					×	×	×	×	×	×	×	×	×	×	×
Aluminium (filtered)		×															
Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
							S21-Jn27556	S21-Jn27557	S21-Jn27558	S21-Jn27559	S21-Jn27560	S21-Jn27561	S21-Jn27562	S21-Jn27563	S21-Jn27564	S21-Jn27565	S21-Jn27566
	71						Soil										
mple Detail	# 1254 & 142	8217	20794	36	25079												
S S	ry - NATA Site	NATA Site #1	- NATA Site #	ATA Site # 237	- NATA Site # :		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	QA18	QA19	QA20	QA21	QA22	QA23	QA24	QA25	QA26	QA27	QA28
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	54	55	56	57	58	59	60	61	62	63	64

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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Address:

Australia

Sydney	Brisbane	Perth	Newcastle
Unit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road	4/52 Industrial Drive
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106	Mayfield East NSW 2304
Lane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600	PO Box 60 Wickham 2293
Phone : +61 2 9900 8400	NATA # 1261 Site # 20794	NATA # 1261	Phone : +61 2 4968 8448
NATA # 1261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079

	New Zealand		
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Eurofins Analytical Services Manager : Andrew Black

Moisture Set		×					×	×	×	×	×	×	×	×	×	×	×
Aluminium (filtered)		×															
Aluminium		×					×	×	×	×	×	×	×	×	×	×	×
							S21-Jn27567	S21-Jn27568	S21-Jn27569	S21-Jn27570	S21-Jn27571	S21-Jn27572	S21-Jn27575	S21-Jn27576	S21-Jn27577	S21-Jn27578	S21-Jn27579
	71						Soil										
mple Detail	# 1254 & 142	8217	20794	36	25079												
ũ	ry - NATA Site	NATA Site # 1	- NATA Site #	ATA Site # 237	- NATA Site # :		Jun 03, 2021										
	ourne Laborato	ey Laboratory -	ane Laboratory	Laboratory - N	eld Laboratory	nal Laboratory	QA29	QA30	QA31	QA32	QA33	QA34	QA37	QA38	QA39	QA40	QA41
	Melbo	Sydn	Brisb	Perth	Mayfi	Exter	65	66	67	68	69	70	71	72	73	74	75

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	fine	Australia	
		Melbourne	S S
	Environment Tecting	6 Monterey Road	
		Dandenong South VIC 3175	<u> </u>
		Phone : +61 3 8564 5000	
		NATA # 1261	<u>n</u>
ABN: 50 005 085 521	web: www.eurofins.com.au email: EnviroSales@eurofins.com	Site # 1254 & 14271	2
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Company Nar	ne: Ramboll Australia Ptv I to		

Sydney	Brisbane	Perth
Jnit F3, Building F	1/21 Smallwood Place	46-48 Banksia Road
16 Mars Road	Murarrie QLD 4172	Welshpool WA 6106
ane Cove West NSW 2066	Phone : +61 7 3902 4600	Phone : +61 8 9251 9600
	NATA # 1261 Site # 20794	NATA # 1261
VATA # 1261 Site # 18217		Site # 23736

Order No.: Report #: Phone: Fax:

Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060

Company Name: Address:

ADDITIONAL - CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193

Project Name: Project ID:

Newcastle 4/32 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	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 JANZ # 1290
Received: Due: Priority: Contact Name:	Jun 15, 2021 3:39 / Jun 18, 2021 3 Day Stephen Maxwell	W

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Moisture Set		×					×	×	×	×	×	60
Aluminium (filtered)		×										16
Aluminium		×					Х	Х	Х	Х	×	80
							S21-Jn27580	S21-Jn27581	S21-Jn27582	S21-Jn27583	S21-Jn27584	
	1271						Soil	Soil	Soil	Soil	Soil	
Sample Detail	TA Site # 1254 & 1 [,]	Site # 18217	A Site # 20794	te # 23736	<pre>\ Site # 25079</pre>		2021	2021	2021	2021	2021	
	ry - NA	NATA	- NAT/	ATA Si	- NATA		Jun 03,					
	ourne Laborato	ey Laboratory -	oane Laboratory	1 Laboratory - N	ield Laboratory	rnal Laboratory	QA42	QA43	QA44	QA45	QA46	Counts
	Melb	Sydn	Brist	Perth	Mayf	Extel	76	77	78	79	80	Test



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
СР	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.
- 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				Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Aluminium			mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)			mg/L	< 0.05			0.05	Pass	
LCS - % Recovery									
Heavy Metals									
Aluminium			%	86			80-120	Pass	
Aluminium (filtered)			%	87			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	S21-Jn23394	NCP	%	82			75-125	Pass	
Spike - % Recovery				1			1		
Heavy Metals				Result 1					
Aluminium	S21-Jn27534	CP	%	118			75-125	Pass	
Spike - % Recovery				1			1		
Heavy Metals	1			Result 1					
Aluminium	S21-Jn27536	CP	%	90			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate				i			1		
Heavy Metals	i			Result 1	Result 2	RPD			
Aluminium	S21-Jn27503	CP	mg/L	0.33	0.36	7.0	30%	Pass	
Aluminium (filtered)	S21-Jn27503	CP	mg/L	0.09	0.09	2.0	30%	Pass	
Duplicate				1	,		1		
Heavy Metals	r			Result 1	Result 2	RPD			
Aluminium (filtered)	S21-Jn27513	CP	mg/L	0.16	0.18	12	30%	Pass	
Duplicate				1	1		1		
Heavy Metals	ŕ			Result 1	Result 2	RPD			
Aluminium S21-Jn27517 CP			mg/L	0.21	0.18	14	30%	Pass	
Duplicate									
Heavy Metals	r	,		Result 1	Result 2	RPD			
Aluminium	S21-Jn27535	CP	mg/L	< 0.05	< 0.05	<1	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

Authorised by:

Andrew Black John Nguyen Analytical Services Manager 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.

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CERTIFICATE OF ANALYSIS 271012

Client Details	
Client	Ramboll Australia Pty Ltd
Attention	Stephen Maxwell
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details	
Your Reference	318001193, Captains Flat Lead Management Plan
Number of Samples	1 Soil, 1 Water
Date samples received	07/06/2021
Date completed instructions received	07/06/2021

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	15/06/2021				
Date of Issue	15/06/2021				
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Accredited for compliance with ISO/IEC 17	7025 - Testing. Tests not covered by NATA are denoted with *				

Results Approved By Giovanni Agosti, Group Technical Manager Hannah Nguyen, Senior Chemist Thomas Beenie, Lab Technician Authorised By

Nancy Zhang, Laboratory Manager

Envirolab Reference: 271012 Revision No: R00



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Acid Extractractable metals in soil		
Our Reference		271012-1
Your Reference	UNITS	QA36
Date Sampled		03/06/2021
Type of sample		Soil
Date prepared	-	15/06/2021
Date analysed	-	15/06/2021
Arsenic	mg/kg	31
Barium	mg/kg	30
Cadmium	mg/kg	<0.4
Chromium	mg/kg	3
Cobalt	mg/kg	<1
Copper	mg/kg	200
Iron	mg/kg	4,400
Lead	mg/kg	1,300
Manganese	mg/kg	30
Mercury	mg/kg	0.4
Molybdenum	mg/kg	<1
Nickel	mg/kg	1
Selenium	mg/kg	<12
Titanium	mg/kg	24
Zinc	mg/kg	480
Aluminium	mg/kg	230

Moisture		
Our Reference		271012-1
Your Reference	UNITS	QA36
Date Sampled		03/06/2021
Type of sample		Soil
Date prepared	-	08/06/2021
Date analysed	-	09/06/2021
Moisture	%	33

All metals in water-dissolved		
Our Reference		271012-2
Your Reference	UNITS	QA36
Date Sampled		03/06/2021
Type of sample		Water
Date prepared	-	08/06/2021
Date analysed	-	08/06/2021
Arsenic-Dissolved	μg/L	6
Barium-Dissolved	µg/L	6
Cadmium-Dissolved	µg/L	100
Cobalt-Dissolved	µg/L	67
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	240
Iron-Dissolved	μg/L	170,000
Mercury-Dissolved	µg/L	<0.05
Manganese-Dissolved	µg/L	11,000
Molybdenum-Dissolved	µg/L	<1
Nickel-Dissolved	µg/L	47
Lead-Dissolved	µg/L	1,400
Selenium-Dissolved	µg/L	<1
Titanium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	140,000
Aluminium-Dissolved	µg/L	16,000

All metals in water - total		
Our Reference		271012-2
Your Reference	UNITS	QA36
Date Sampled		03/06/2021
Type of sample		Water
Date prepared	-	10/06/2021
Date analysed	-	10/06/2021
Arsenic-Total	µg/L	11
Barium-Total	µg/L	9
Cadmium-Total	µg/L	120
Cobalt-Total	µg/L	90
Chromium-Total	µg/L	<1
Copper-Total	µg/L	330
Iron-Total	µg/L	160,000
Mercury-Total	µg/L	<0.05
Manganese-Total	µg/L	11,000
Molybdenum-Total	µg/L	<1
Nickel-Total	µg/L	66
Lead-Total	µg/L	1,300
Selenium-Total	µg/L	2
Titanium-Total	µg/L	1.1
Zinc-Total	µg/L	130,000
Aluminium-Total	µg/L	14,000

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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						Du	plicate		Spike Red	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/06/2021	[NT]		[NT]	[NT]	15/06/2021	
Date analysed	-			15/06/2021	[NT]		[NT]	[NT]	15/06/2021	
Arsenic	mg/kg	4	Metals-020	<4	[NT]		[NT]	[NT]	94	
Barium	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	104	
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]		[NT]	[NT]	89	
Chromium	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	105	
Cobalt	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	92	
Copper	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	93	
Iron	mg/kg	10	Metals-020	<10	[NT]		[NT]	[NT]	114	
Lead	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	99	
Manganese	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	98	
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]		[NT]	[NT]	114	
Molybdenum	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	95	
Nickel	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	93	
Selenium	mg/kg	2	Metals-020	<2	[NT]		[NT]	[NT]	90	
Titanium	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	97	
Zinc	mg/kg	1	Metals-020	<1	[NT]		[NT]	[NT]	97	
Aluminium	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CON	TROL: All m	etals in w	ater-dissolved			Du	plicate		Spike Red	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			09/06/2021	[NT]		[NT]	[NT]	09/06/2021	
Date analysed	-			09/06/2021	[NT]		[NT]	[NT]	09/06/2021	
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	99	
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	103	
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]		[NT]	[NT]	100	
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	97	
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	98	
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	99	
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]		[NT]	[NT]	101	
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]		[NT]	[NT]	95	
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]		[NT]	[NT]	98	
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	100	
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	100	
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	99	
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	97	
Titanium-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	102	
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	114	
Aluminium-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CO	NTROL: All	metals in	water - total			Du	plicate		Spike Red	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			09/06/2021	[NT]		[NT]	[NT]	09/06/2021	
Date analysed	-			09/06/2021	[NT]		[NT]	[NT]	09/06/2021	
Arsenic-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	109	
Barium-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	117	
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	[NT]		[NT]	[NT]	111	
Cobalt-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	105	
Chromium-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	105	
Copper-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	104	
Iron-Total	µg/L	10	Metals-022	<10	[NT]		[NT]	[NT]	112	
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]		[NT]	[NT]	96	
Manganese-Total	µg/L	5	Metals-022	<5	[NT]		[NT]	[NT]	109	
Molybdenum-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	111	
Nickel-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	107	
Lead-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	110	
Selenium-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	107	
Titanium-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	114	
Zinc-Total	µg/L	1	Metals-022	<1	[NT]		[NT]	[NT]	117	
Aluminium-Total	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	118	[NT]

Result Definiti	ons
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	ol 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

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.

are similar to the analyte of interest, however are not expected to be found in real samples.

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

The PQL for Se has been raised due to interferences from analytes (other than those being tested) in sample 271012-1.



Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060



NATA Accredited Accreditation Number 1261 Site Number 25079

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention:

Stephen Maxwell

Report Project name Project ID Received Date 804715-W CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jun 22, 2021

Client Sample ID Sample Matrix			GW1 Water	GW2 Water	GW3 Water	GW4 Water
Eurotins Sample No.			N21-JN42606	N21-JN42607	N21-JN42608	N21-JN42609
Date Sampled			Jun 18, 2021	Jun 18, 2021	Jun 18, 2021	Jun 18, 2021
Test/Reference	LOR	Unit				
Hardness mg equivalent CaCO3/L	1	mg/L	460	280	840	260
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	0.13	0.35	15	< 0.05
Arsenic (filtered)	0.001	mg/L	0.002	0.001	0.007	0.001
Barium (filtered)	0.02	mg/L	0.07	0.04	0.05	0.05
Cadmium (filtered)	0.0002	mg/L	0.049	0.090	0.17	0.0009
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.007	0.002
Cobalt (filtered)	0.001	mg/L	0.32	0.16	0.19	0.011
Copper (filtered)	0.001	mg/L	0.083	0.097	2.7	0.007
Iron (filtered)	0.05	mg/L	< 0.05	0.06	7.2	< 0.05
Lead (filtered)	0.001	mg/L	0.41	0.017	0.049	< 0.001
Manganese (filtered)	0.005	mg/L	11	8.4	7.5	0.87
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel (filtered)	0.001	mg/L	0.14	0.11	0.18	0.014
Selenium (filtered)	0.001	mg/L	0.005	0.004	0.009	0.003
Titanium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc (filtered)	0.005	mg/L	23	37	47	0.48
Alkali Metals						
Calcium	0.5	mg/L	56	64	140	62
Magnesium	0.5	mg/L	77	30	120	26

Client Sample ID Sample Matrix Eurofins Sample No.			GW5 Water N21-Jn42610	GW6 Water N21-Jn42611	GW9_S Water N21-Jn42612	GW9_D Water N21-Jn42613
Date Sampled			Jun 18, 2021	Jun 18, 2021	Jun 18, 2021	Jun 18, 2021
Test/Reference	LOR	Unit				
Hardness mg equivalent CaCO3/L	1	mg/L	140	180	1700	1600
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.001	0.001	0.001	0.002
Barium (filtered)	0.02	mg/L	0.04	0.03	0.04	0.02
Cadmium (filtered)	0.0002	mg/L	0.0003	< 0.0002	< 0.0002	0.0003



Client Sample ID Sample Matrix			GW5 Water	GW6 Water	GW9_S Water	GW9_D Water
Eurofins Sample No.			N21-Jn42610	N21-Jn42611	N21-Jn42612	N21-Jn42613
Date Sampled			Jun 18, 2021	Jun 18, 2021	Jun 18, 2021	Jun 18, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Chromium (filtered)	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Cobalt (filtered)	0.001	mg/L	0.007	< 0.001	0.014	0.013
Copper (filtered)	0.001	mg/L	0.003	0.004	0.002	0.002
Iron (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.44
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Manganese (filtered)	0.005	mg/L	1.7	0.095	20	9.7
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	0.007	< 0.005
Nickel (filtered)	0.001	mg/L	0.003	0.004	0.015	0.005
Selenium (filtered)	0.001	mg/L	< 0.001	0.001	0.005	0.005
Titanium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc (filtered)	0.005	mg/L	0.081	0.067	0.22	0.53
Alkali Metals						
Calcium	0.5	mg/L	28	49	450	460
Magnesium	0.5	mg/L	17	13	130	110

Client Sample ID			GW10	D01_180621	T01_180621	R10
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N21-Jn42614	N21-Jn42615	N21-Jn42616	N21-Jn42617
Date Sampled			Jun 18, 2021	Jun 18, 2021	Jun 18, 2021	Jun 16, 2021
Test/Reference	LOR	Unit				
Hardness mg equivalent CaCO3/L	1	mg/L	440	-	-	-
Heavy Metals						
Aluminium	0.05	mg/L	-	-	-	< 0.05
Aluminium (filtered)	0.05	mg/L	< 0.05	0.38	0.36	-
Arsenic	0.001	mg/L	-	-	-	< 0.001
Arsenic (filtered)	0.001	mg/L	0.001	< 0.001	0.001	-
Barium	0.02	mg/L	-	-	-	< 0.02
Barium (filtered)	0.02	mg/L	0.05	0.04	0.03	-
Cadmium	0.0002	mg/L	-	-	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	0.0097	0.092	0.089	-
Chromium	0.001	mg/L	-	-	-	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Cobalt	0.001	mg/L	-	-	-	< 0.001
Cobalt (filtered)	0.001	mg/L	0.078	0.17	0.17	-
Copper	0.001	mg/L	-	-	-	< 0.001
Copper (filtered)	0.001	mg/L	0.004	0.10	0.10	-
Iron	0.05	mg/L	-	-	-	< 0.05
Iron (filtered)	0.05	mg/L	< 0.05	0.05	< 0.05	-
Lead	0.001	mg/L	-	-	-	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	0.015	0.016	-
Manganese	0.005	mg/L	-	-	-	< 0.005
Manganese (filtered)	0.005	mg/L	1.6	8.7	8.6	-
Mercury	0.0001	mg/L	-	-	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	-
Molybdenum	0.005	mg/L	-	-	-	< 0.005
Molybdenum (filtered)	0.005	mg/L	0.007	< 0.005	< 0.005	-



Client Sample ID Sample Matrix Eurofins Sample No.			GW10 Water N21-Jn42614	D01_180621 Water N21-Jn42615	T01_180621 Water N21-Jn42616	R10 Water N21-Jn42617
Date Sampled			Jun 18, 2021	Jun 18, 2021	Jun 18, 2021	Jun 16, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Nickel	0.001	mg/L	-	-	-	< 0.001
Nickel (filtered)	0.001	mg/L	0.12	0.12	0.12	-
Selenium	0.001	mg/L	-	-	-	< 0.001
Selenium (filtered)	0.001	mg/L	0.004	0.001	< 0.001	-
Titanium	0.005	mg/L	-	-	-	< 0.005
Titanium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Zinc	0.005	mg/L	-	-	-	< 0.005
Zinc (filtered)	0.005	mg/L	0.98	37	36	-
Alkali Metals						
Calcium	0.5	mg/L	54	-	-	-
Magnesium	0.5	mg/L	75	-	-	-

Client Sample ID Sample Matrix			R11 Water	R12 Water
Eurofins Sample No.			N21-Jn42618	N21-Jn42619
Date Sampled			Jun 17, 2021	Jun 18, 2021
Test/Reference	LOR	Unit		
Heavy Metals				
Aluminium	0.05	mg/L	< 0.05	< 0.05
Arsenic	0.001	mg/L	< 0.001	< 0.001
Barium	0.02	mg/L	< 0.02	< 0.02
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001
Cobalt	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	0.001	< 0.001
Iron	0.05	mg/L	< 0.05	< 0.05
Lead	0.001	mg/L	< 0.001	< 0.001
Manganese	0.005	mg/L	< 0.005	< 0.005
Mercury	0.0001	mg/L	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005
Nickel	0.001	mg/L	< 0.001	< 0.001
Selenium	0.001	mg/L	< 0.001	< 0.001
Titanium	0.005	mg/L	< 0.005	< 0.005
Zinc	0.005	mg/L	< 0.005	< 0.005



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Hardness Set			
Hardness mg equivalent CaCO3/L	Sydney	Jun 29, 2021	28 Days
- Method: E020.1 Hardness in water			
Alkali Metals	Sydney	Jun 29, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals	Sydney	Jun 29, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Sydney	Jun 23, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Mobil Metals : Metals M15	Sydney	Jun 23, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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•		2	Environment	Testing	lelbourne Monterey Road andenong South VIC 3175 hone : +61 3 8564 5000	Sydr Unit I 16 M. Lane	ey -3, Build ars Road Cove W	ing F iest NSW	/ 2066	Brisban 1/21 Sm Murarrie Phone :	ie nallwood 9 QLD 4 +61 7 3	Place 172 902 460	0	erth 6-48 Bá Velshpo hone :	anksia R ol WA 6 +61 8 92	toad 3106 251 960	0 Z45⊄1	ewcastl (52 Indu layfield F O Box 6	e strial Dr East NS 0 Wickh	ve W 2304 am 2290	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: :	50 005 085 521 web.	: www.eurofins.c	com.au email: EnviroSalı	N es@eurofins.com S	ATA # 1261 ite # 1254	Phon NAT/	e:+612 \#1261	2 9900 8. Site # 1	400 8217	NATA #	1261 SI	te # 201	794 N S	JATA# site # 23	1261 8736		ΔZ	hone : + ATA # 1	61 2 49 261 Site	58 8448 • # 2507!	IANZ # 1327	IANZ # 1290
Ϋ́Υ	ompany Name: Idress:	Rambo Level 3, North S NSW 2(II Australia Pty Ltd /100 Pacific Highw \ydney 360	ay			Orde Repc Phon Fax:	r No.: ort #: ie:		3180(8047 ⁻ 02 99 02 99	01193 15 154 81 154 81	50 50						Recei Due: Priori	ved: ty: ict Na	: me:	Jun 22, 2021 10:00 Jun 29, 2021 5 Day Stephen Maxwell	MA
ደ ደ	oject Name: oject ID:	CAPTA 318001	INS FLAT LEAD N 193	AANAGEMENT F	PLAN												Eu	rofins	Anal	vtical	Services Manager : A	ndrew Black
			Sample Detail			Aluminium (filtered)		Cadmium (filtered)	Chromium (filtered)	Cobalt (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Molybdenum (filtered)	Nickel (filtered)	Selenium (filtered)	Titanium (filtered)	Zinc (filtered)	Hardness Set	
Mell	bourne Laborat		Site # 1254																			
Svd	nev Laboratory	- NATA Sit	e # 18217			×		× ~	×	×	×	×	×	×	×	×	×	×	×	×	×	
Bris	bane Laborato	ry - NATA S	Site # 20794																			
Pert	th Laboratory -	NATA Site	# 23736					\vdash														
May	field Laborator	.y - NATA S	ite # 25079																			
Exte	ernal Laborator	ý																				
No	Sample ID	Sample I	Date Sampling Time	Matrix	LAB ID																	
~	GW1	Jun 18, 20	321	Water	N21-Jn42606	×	∕ ×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
2	GW2	Jun 18, 20	121	Water	N21-Jn42607	×	×	×	×	×	×	×	×	×	×	×	×	×	Х	×	×	
3	GW3	Jun 18, 20	121	Water	N21-Jn42608	×	×	×	×	×	×	×	×	×	×	×	×	×	Х	×	×	
4	GW4	Jun 18, 20	121	Water	N21-Jn42609	×	×	×	×	×	×	×	×	×	×	×	×	×	Х	×	×	
5	GW5	Jun 18, 20	121	Water	N21-Jn42610	×	×	×	×	×	×	×	×	×	×	×	×	×	Х	×	×	
9	GW6	Jun 18, 20	121	Water	N21-Jn42611	×	~ ×	×	×	×	×	×	×	×	×	×	×	×	Х	×	×	
7	GW9_S	Jun 18, 20	121	Water	N21-Jn42612	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
8	GW9 D	Jun 18, 20	721	Water	N21-Jn42613	×	^ ×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	
б	GW10	Jun 18, 20	321	Water	N21-Jn42614	×		×	×	×	×	×	×	×	×	×	×	×	×	×	×	

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	curoll	Envil	ronment Testing	Melbourne Melbourne Monterey Road Dandenorg South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261	Sydn Unit F Lane Phone	3, Buildi rs Road Cove We	ng F sst NSW 9900 84	2066	Arisbane /21 Sma Aurarrie Phone : -	allwood F QLD 41 61 7 39 1261 Site	lace 72 02 4600 ⊭ # 2079	466 Phe NA NA	th 48 Bank 48 Bank 18 hpool 50e : +6 TA # 12	(sia Roa WA 610 1 8 925 61	1 9600	Newc 4/52 Mayfi PO B	astle ndustria eld East ox 60 V e : +61	I Drive NSW 23 ickham 2 i 4968 84	2293 F F 304	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 JANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 76 Phone : 0800 856 450 IANZ # 1290	375
ABN: 90	1 UUD 080 271 WED:	www.euronns.com.au	emaii: EnviroSales@euronns.com	SITE # 1254	NAIA	1.02.1 #	5116 # 110	712					9 # 2373	Q		NALA	1201	Site # 2	6709			
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Pro	ject Name: ject ID:	CAPTAINS F 318001193	LAT LEAD MANAGEMEN1	r plan												Eurof	ins Aı	nalytic	al Ser	vices Manager : An	drew Black	
		San	nple Detail		Aluminium (filtered)	Barium (filtered)	Cadmium (filtered)	Chromium (filtered)	Cobalt (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Molybdenum (filtered)	Nickel (filtered)	Selenium (filtered)	Zinc (filtered)	Hardness Set			
Melbo	ourne Laborato	IN - NATA Site #	# 1254		-	-										+	-	-		1		
Sydn	ey Laboratory	- NATA Site # 18	3217		×	×	×	×	×	Х	×	×	×	×	×	×	×	×	×			
Brisb	ane Laboratory	/ - NATA Site # :	20794																			
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Mayfi	eld Laboratory	NATA Site # 2	5079																			
Exter	nal Laboratory																					
10	D01_180621	Jun 18, 2021	Water	N21-Jn42615	×	×	×	×	×	Х	×	×	×	×	×	×	×	×				
11	T01_180621	Jun 18, 2021	Water	N21-Jn42616	×	×	×	×	×	×	×	×	×	×	×	×	×	×				
12	R10	Jun 16, 2021	Water	N21-Jn42617	×	×	×	×	×	×	×	×	×	×	×	×	×	×				
13	R11	Jun 17, 2021	Water	N21-Jn42618	×	×	×	×	×	×	×	×	×	×	×	×	×	×				
14	R12	Jun 18, 2021	Water	N21-Jn42619	×	×	×	×	×	×	×	×	×	×	×	×	×	×				

Date Reported:Jun 29, 2021

Date Reported:Jun 29, 2021

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Test Counts 14 R12

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Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
сос	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
СР	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.
- 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		1	•		
Heavy Metals					
Aluminium	mg/L	< 0.05	0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05	0.05	Pass	
Arsenic	mg/L	< 0.001	0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001	0.001	Pass	
Barium	mg/L	< 0.02	0.02	Pass	
Barium (filtered)	mg/L	< 0.02	0.02	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	
Cobalt	mg/L	< 0.001	0.001	Pass	
Cobalt (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	
Iron	mg/L	< 0.05	0.05	Pass	
Iron (filtered)	mg/L	< 0.05	0.05	Pass	
Lead	mg/L	< 0.001	0.001	Pass	
Lead (filtered)	mg/L	< 0.001	0.001	Pass	
Manganese	mg/L	< 0.005	0.005	Pass	
Manganese (filtered)	mg/L	< 0.005	0.005	Pass	
Mercury	mg/L	< 0.0001	0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001	0.0001	Pass	
Molybdenum	mg/L	< 0.005	0.005	Pass	
Molybdenum (filtered)	mg/L	< 0.005	0.005	Pass	
Nickel	mg/L	< 0.001	0.001	Pass	
Nickel (filtered)	mg/L	< 0.001	0.001	Pass	
Selenium	mg/L	< 0.001	0.001	Pass	
Selenium (filtered)	mg/L	< 0.001	0.001	Pass	
Titanium	mg/L	< 0.005	0.005	Pass	
Titanium (filtered)	mg/L	< 0.005	0.005	Pass	
Zinc	mg/L	< 0.005	0.005	Pass	
Method Blank			 		
Alkali Metals					
Calcium	mg/L	< 0.5	0.5	Pass	
Magnesium	mg/L	< 0.5	0.5	Pass	
LCS - % Recovery			 		
Heavy Metals					
Aluminium	%	95	80-120	Pass	
Aluminium (filtered)	%	96	80-120	Pass	
Arsenic	%	101	80-120	Pass	
Arsenic (filtered)	%	97	80-120	Pass	
Barium	%	101	80-120	Pass	
Barium (filtered)	%	95	80-120	Pass	
Cadmium	%	106	80-120	Pass	
Cadmium (filtered)	%	98	80-120	Pass	
Chromium	%	98	80-120	Pass	
Chromium (filtered)	%	95	80-120	Pass	
Cobalt	%	98	80-120	Pass	
Cobalt (filtered)	%	98	80-120	Pass	
Copper	%	94	80-120	Pass	



Test			Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Copper (filtered)			%	97	80-120	Pass	
Iron			%	93	80-120	Pass	
Iron (filtered)			%	95	80-120	Pass	
Lead			%	97	80-120	Pass	
Lead (filtered)			%	96	80-120	Pass	
Manganese			%	96	80-120	Pass	
Manganese (filtered)			%	100	80-120	Pass	
Mercury			%	81	80-120	Pass	
Mercury (filtered)			%	96	80-120	Pass	
Molybdenum			%	112	80-120	Pass	
Molybdenum (filtered)			%	111	80-120	Pass	
Nickel			%	96	80-120	Pass	
Nickel (filtered)			%	94	80-120	Pass	
Selenium			%	104	80-120	Pass	
Selenium (filtered)			%	102	80-120	Pass	
Titanium			%	97	80-120	Pass	
Titanium (filtered)			%	96	80-120	Pass	
Zinc			%	96	80-120	Pass	
Zinc (filtered)			%	94	80-120	Pass	
LCS - % Recovery							
Alkali Metals			-				
Calcium			%	94	80-120	Pass	
Magnesium			%	102	80-120	Pass	
Test	Lab Sample ID	QA	Units	Result 1	Acceptance	Pass	Qualifying
Creike 0/ Decement	•	Source			Limits	Limits	Code
Spike - % Recovery				Deput 1	1		
Aluminium (filtered)	S21 In12020	NCD	0/		75 105	Deee	
Araania (filtered)	S21-J1143929		70	00	75-125	Pass	
Rarium (filtered)	S21-J1143929	NCP	70 0/_	94	75-125	Pass	
Cadmium (filtered)	S21-J1143929	NCP	70 0/_	91	75-125	Pass	
Chromium (filtered)	S21-J1143929	NCP	70 0/_	90	75-125	Pass	
Cobalt (filtered)	S21-J1143929		70 0/2	87	75 125	Pass	
Copper (filtered)	S21-J1143929		70 0/2	86	75 125	Pass	
Iron (filtorod)	S21-J1143929		70 0/2	00	75 125	Pass	
Lead (filtered)	S21-Jn43929	NCP	/0	80	75-125	Dass	
Manganese (filtered)	S21-Jn43329	NCP	/0	88	75-125	Dass	
Marcuny (filtered)	S21-Jn41110	NCP	//	87	75-125	Dass	
Molybdenum (filtered)	S21-J143929	NCP	%	118	75-125	Pass	
Nickel (filtered)	S21-In43929	NCP	%	85	75-125	Pass	
Selenium (filtered)	S21-In43929	NCP	%	100	75-125	Pass	
Titanium (filtered)	S21-In43929	NCP	%	88	75-125	Pass	
Zinc (filtered)	S21-In43929	NCP	%	95	75-125	Pass	
Spike - % Recovery	021-01140020	1101	70	55	10-120	1 433	
Alkali Metals				Result 1			
Calcium	S21-Jn43945	NCP	%	90	75-125	Pass	
Magnesium	S21-In43945	NCP	%	96	75-125	Pass	
Spike - % Recovery	02101140040	1101	70	00	10 120	1 400	
Heavy Metals				Result 1			
Aluminium	S21In43945	NCP	%	93	75-125	Pass	
Arsenic	S21In43945	NCP	%	105	75-125	Pass	
Barium	S21-In43045	NCP	%	95	75-125	Pase	
Cadmium	S21-In43045	NCP	%	105	75-125	Pase	
Chromium	S21-In43045	NCP	%	98	75-125	Pase	
Cobalt	S21-In/20/5	NCP	%	05	75_125	Page	
Cobait	321-31143943		/0	90	10-120	F d 5 5	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	S21-Jn43945	NCP	%	91			75-125	Pass	
Iron	S21-Jn43945	NCP	%	91			75-125	Pass	
Lead	S21-Jn43945	NCP	%	92			75-125	Pass	
Manganese	S21-Jn43945	NCP	%	97			75-125	Pass	
Mercury	S21-Jn43945	NCP	%	81			75-125	Pass	
Molybdenum	S21-Jn43945	NCP	%	112			75-125	Pass	
Nickel	S21-Jn43945	NCP	%	94			75-125	Pass	
Selenium	S21-Jn43945	NCP	%	104			75-125	Pass	
Titanium	S21-Jn43945	NCP	%	101			75-125	Pass	
Zinc	S21-Jn43945	NCP	%	94			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance	Pass Limits	Qualifying Code
Duplicate		oouroo		1			Linito	2	
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	N21-Jn42606	CP	mg/L	0.13	0.13	3.0	30%	Pass	
Arsenic (filtered)	N21-Jn42606	CP	mg/L	0.002	< 0.001	57	30%	Fail	Q15
Barium (filtered)	N21-Jn42606	CP	mg/L	0.07	0.07	4.0	30%	Pass	
Cadmium (filtered)	N21-Jn42606	CP	mg/L	0.049	0.049	<1	30%	Pass	
Chromium (filtered)	N21-Jn42606	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	N21-Jn42606	CP	mg/L	0.32	0.32	1.0	30%	Pass	
Copper (filtered)	N21-Jn42606	CP	mg/L	0.083	0.084	1.0	30%	Pass	
Iron (filtered)	N21-Jn42606	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead (filtered)	N21-Jn42606	CP	mg/L	0.41	0.42	2.0	30%	Pass	
Manganese (filtered)	N21-Jn42606	CP	mg/L	11	11	1.0	30%	Pass	
Mercury (filtered)	N21-Jn42606	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum (filtered)	N21-Jn42606	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel (filtered)	N21-Jn42606	CP	mg/L	0.14	0.14	1.0	30%	Pass	
Selenium (filtered)	N21-Jn42606	CP	mg/L	0.005	0.005	11	30%	Pass	
Titanium (filtered)	N21-Jn42606	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	S21-Jn42585	NCP	mg/L	0.008	0.012	45	30%	Fail	Q15
Duplicate				1	1		1		
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	N21-Jn42614	CP	mg/L	1.3	1.4	11	30%	Pass	
Arsenic	N21-Jn42614	CP	mg/L	0.003	0.003	2.0	30%	Pass	
Barium	N21-Jn42614	CP	mg/L	0.06	0.06	1.0	30%	Pass	
Cadmium	N21-Jn42614	CP	mg/L	0.010	0.010	<1	30%	Pass	
Chromium	N21-Jn42614	CP	mg/L	0.002	0.002	4.0	30%	Pass	
Cobalt	N21-Jn42614	CP	mg/L	0.086	0.087	1.0	30%	Pass	
Copper	N21-Jn42614	CP	mg/L	0.007	0.007	6.0	30%	Pass	
Iron	N21-Jn42614	CP	mg/L	1.7	2.0	17	30%	Pass	
Lead	N21-Jn42614	CP	mg/L	0.013	0.014	12	30%	Pass	
Manganese	N21-Jn42614	CP	mg/L	1.8	1.8	1.0	30%	Pass	
Mercury	N21-Jn42614	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	N21-Jn42614	CP	mg/L	0.007	0.007	5.0	30%	Pass	
Nickel	N21-Jn42614	CP	mg/L	0.13	0.13	1.0	30%	Pass	
Selenium	N21-Jn42614	CP	mg/L	0.003	0.003	17	30%	Pass	
Titanium	N21-Jn42614	CP	mg/L	0.017	0.017	1.0	30%	Pass	
Zinc	N21-Jn42614	CP	mg/L	1.2	1.2	2.0	30%	Pass	
Duplicate				1					
Alkali Metals				Result 1	Result 2	RPD			
Calcium	N21-Jn42614	CP	mg/L	54	56	4.0	30%	Pass	
Magnesium	N21-Jn42614	CP	mg/L	75	75	<1	30%	Pass	



Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S21-Jn41834	NCP	mg/L	0.53	0.57	6.0	30%	Pass	
Arsenic	S21-Jn41834	NCP	mg/L	0.003	0.003	7.0	30%	Pass	
Barium	S21-Jn41834	NCP	mg/L	0.03	0.03	2.0	30%	Pass	
Cadmium	S21-Jn41834	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S21-Jn41834	NCP	mg/L	0.002	0.002	3.0	30%	Pass	
Cobalt	S21-Jn41834	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S21-Jn41834	NCP	mg/L	0.015	0.014	8.0	30%	Pass	
Iron	S21-Jn41834	NCP	mg/L	0.79	0.82	3.0	30%	Pass	
Lead	S21-Jn41834	NCP	mg/L	0.006	0.006	1.0	30%	Pass	
Manganese	S21-Jn41834	NCP	mg/L	0.018	0.018	3.0	30%	Pass	
Mercury	S21-Jn41834	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	S21-Jn41834	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel	S21-Jn41834	NCP	mg/L	0.002	0.001	26	30%	Pass	
Selenium	S21-Jn41834	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Titanium	S21-Jn41834	NCP	mg/L	0.013	0.015	19	30%	Pass	
Zinc	S21-Jn41834	NCP	mg/L	0.039	0.036	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	No
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:

Andrew Black John Nguyen Analytical Services Manager 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.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Attention:

Stephen Maxwell

Report
Project name
Project ID
Received Date

803030-W CAPTAIN FLAT LEAD MANAGEMENT PLAN 318001193 Jun 11, 2021

Client Sample ID Sample Matrix			R1 Water	R2 Water	R3 Water
Eurofins Sample No.			S21-Jn29258	S21-Jn29259	S21-Jn29260
Date Sampled			Jun 07, 2021	Jun 08, 2021	Jun 10, 2021
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	0.001	mg/L	< 0.001	< 0.001	< 0.001
Barium	0.02	mg/L	< 0.02	< 0.02	< 0.02
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.001	0.001	< 0.001
Cobalt	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	0.001	< 0.001	0.001
Iron	0.05	mg/L	< 0.05	< 0.05	< 0.05
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001
Manganese	0.005	mg/L	< 0.005	< 0.005	< 0.005
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	< 0.001	< 0.001	< 0.001
Selenium	0.001	mg/L	< 0.001	< 0.001	< 0.001
Titanium	0.005	mg/L	< 0.005	< 0.005	< 0.005
Zinc	0.005	mg/L	< 0.005	< 0.005	< 0.005



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Jun 15, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals	Sydney	Jun 16, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

	- Jon o					Australia											New Zealand		
	1005 085 521 web: V		Enviror	: EnviroSales	Testing	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 124 8 14271 Stie # 1542 1	Sydn Unit F Unit F Lane Phon NATA	=3, Build =3, Build ars Roac Cove W e : +61 2 e : +61 2	ing F ing F est NSW 2 9900 8. Site # 1	V 2066 400 8217	Brisban 1/21 Sm Murarrie Phone : NATA #	e allwood QLD 41 +61 7 35 1261 Sit	Place 172 002 4600 e # 2079	9 8 8 8	rth -48 Banksia Road elshpool WA 6106 one : +61 8 9251 9600 \TA # 1261	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 76 Phone : 0800 856 450 IANZ # 1290	675
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ŗ ŗ	oject Name: piect ID:	CAPT/ 31800	AIN FLAT I 1193	LEAD MAI	NAGEMENT F	NAJe						- - -	2						
			0												Β	curofins Analytical Se	ervices Manager : And	rew Black	
			Sample	e Detail			Barium		HOLD	Iron	Manganese	Molybdenum	Selenium	Titanium	Metals M8				
Mell	bourne Laborato	ory - NAT/	A Site # 12	54 & 142	71			$\left \right $											
Syd	ney Laboratory	- NATA Si	ite # 18217	7			×	×	×	×	×	×	×	×	×				
Bris	bane Laborator	Y - NATA	Site # 207	94															
Ler	field behaviory - I	NALA JILE	1 # 23/30	4				+											
Exte	rireid Laboratory	, AIAN - V	DICE # 2001	0				+											
Ň	Sample ID	Sample	Date Sa	ampling Time	Matrix	LAB ID													
-	R1	Jun 07, 2	021		Water	S21-Jn29258	×	Ê		×	×	×	×	×	×				
2	R2	Jun 08, 2	021		Water	S21-Jn29259	×			×	×	×	×	×	×				
З	R3	Jun 10, 2	021		Water	S21-Jn29260	×	^		×	×	×	×	×	×				
4	GW1_0.0	Jun 07, 2	021		Soil	S21-Jn29261			×										
5	GW2_0.0	Jun 07, 2	021		Soil	S21-Jn29262			×										
9	D1	Jun 07, 2	021		Soil	S21-Jn29263			×										
2	GW4_0.2	Jun 08, 2	021		Soil	S21-Jn29264			×										
8	GW6_0.0	Jun 08, 2	021		Soil	S21-Jn29265	_		×		_								
6	D2	Jun 08, 2	021		Soil	S21-Jn29266		\neg	×										

Eurofins Environment Testing Unit F3, Building F, 16 Mars Road, Lane Cove West, NSW, Australia, 2066 ABN : 50 005 085 521 Telephone: +61 2 9900 8400

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		20		Australia											New Zealand		
ABN:	50 005 085 521 web: V	Enviror www.eurofins.com.au emai	iment Testing E. EnviroSales@eurofins.com	Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254 & 14271	Sydne Unit F3 16 Mar Lane C Phone NATA	y Buildir s Road cove We : +61 2 : +61 2	lg F st NSW 9900 840 Site # 18	2066 PM -1 B	risbane 21 Sma urarrie (hone : + ATA # 1	Wood PI LD 417 31 7 390 261 Site	ace 2 2 4600 # 20794	Pert 46-4 Wels Phor NAT Site	th 8 Banksia Road shpool WA 6106 ne : +61 8 9251 9600 À # 1261 # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 Dox 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	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	5
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66	roject Name: roject ID:	CAPTAIN FLAT I 318001193	-EAD MANAGEMENT I	PLAN										Eurofins Analytical Se	ervices Manager : An	drew Black	
		Sample	e Detail	Barium	CANCELLED	Cobalt	HOLD	Iron	Manganese	Molybdenum	Selenium	Titanium	Metals M8				
Me	Ibourne Laborato	ory - NATA Site # 12	54 & 14271														
Syc	dney Laboratory	- NATA Site # 18217			×	×	×	×	×	×	×	×	×				
Bri	sbane Laborator	y - NATA Site # 207	94														
Per	rth Laboratory - N	VATA Site # 23736															
Ma	yfield Laboratory	- NATA Site # 2507	6,														
Ext	ternal Laboratory																
10	GW7_0.2	Jun 08, 2021	Soil	S21-Jn29267			×										
-	GW8_2.0	Jun 08, 2021	Soil	S21-Jn29268			×										
12	D3	Jun 08, 2021	Soil	S21-Jn29269			×										
13	SAQP11- BH01 0.0	Jun 10, 2021	Soil	S21-Jn29270			×										
4	D4	Jun 10, 2021	Soil	S21-Jn29271			×										

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S21-Jn29273 S21-Jn29274

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Jun 10, 2021 Jun 10, 2021

16 D5 17 SAQP11-BH07 0.25 18 SAQP11-

S21-Jn29275

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S21-Jn29271 S21-Jn29272

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15 SAQP11-BH3 0.0
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ABN:	50 005 085 521 web: v	www.eurofins.com.au email: En	viroSales@eurofins.com	NATA # 1261 Site # 1254 & 14271	Phone NATA	:: +61 2 # 1261	9900 840 Site # 182	00 N 217	ATA # 1.	261 Site	# 20794	NAT Site	-A # 1261 # 23736	Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	IANZ # 1327	IANZ # 1290
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		Sample D	stail	Barium			HOLD	Iron	Manganese	Molybdenum	Selenium	Titanium	Metals M8			
Mel	bourne Laborato	orv - NATA Site # 1254	& 14271													
Svc	Iney Laboratory	- NATA Site # 18217		×			×	×	×	×	×	×	×			
Bri	sbane Laboratory	/ - NATA Site # 20794			-											
Per	th Laboratory - N	IATA Site # 23736														
Ma	vfield Laboratory	- NATA Site # 25079														
Ext	ernal Laboratory															
18	SAQP11- BH10_0.0	Jun 10, 2021	Soil	S21-Jn29275												
19	SAQP9- BH03_0.0	Jun 10, 2021	Soil	S21-Jn29276			×									
20	D6	Jun 10, 2021	Soil	S21-Jn29277			×									
21	SAQP9- BH04_0.25	Jun 10, 2021	Soil	S21-Jn29278			×									
22	SAQP10- BH02 0.25	Jun 10, 2021	Soil	S21-Jn29279			×									
23	D7	Jun 10, 2021	Soil	S21-Jn29280			×									
24	SAQP10- BH03_0.5	Jun 10, 2021	Soil	S21-Jn29281			×									

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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Level 3/100 Pacific Highway Ramboll Australia Pty Ltd

Company Name: Address:

North Sydney

NSW 2060

	Australia	
	Melbourne	Sydney
miree and Tooting	6 Monterey Road	Unit F3, Bu
VIRONIMENT JESUNG	Dandenong South VIC 3175	16 Mars Ro
	Phone : +61 3 8564 5000	Lane Cove
	NATA # 1261	Phone : +6
au email: EnviroSales@eurofins.com	Site # 1254 & 14271	NATA # 12

Perth 46-48 Banksia Road Weshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736 Brisbane 1/21 Smalwood Place Murarie QLD 4172 5 Phone: +61 7 3902 4600 5 NATA # 1261 Site # 20794 Lane Cove West NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217 uilding F oad

Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 JANZ # 1290 Jun 11, 2021 4:57 PM Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327 Jun 21, 2021 **New Zealand** 5 Day Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 Dox 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079 Received: **Priority:** Due:

Stephen Maxwell

Contact Name:

318001193 803030

Order No.:

Report #: Phone:

Fax:

Eurofins Analytical Services Manager : Andrew Black

Page 6 of 10

		PLAN 821- 821- 821- 821- 821-	1-Jn29285 1-Jn29282	Barium × · · · · · · · · · · · · · · · · · ·	CANCELLED ×	Cobalt ×		Manganese ×		Malufadanum	Selenium ×
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Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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 millilitre

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
СР	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.
- 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				1		-1		
Heavy Metals								
Arsenic			mg/L	< 0.001		0.001	Pass	
Barium			mg/L	< 0.02		0.02	Pass	
Cadmium			mg/L	< 0.0002		0.0002	Pass	
Chromium			mg/L	< 0.001		0.001	Pass	
Cobalt			mg/L	< 0.001		0.001	Pass	
Copper			mg/L	< 0.001		0.001	Pass	
Iron			mg/L	< 0.05		0.05	Pass	
Lead			mg/L	< 0.001		0.001	Pass	
Manganese			mg/L	< 0.005		0.005	Pass	
Mercury			mg/L	< 0.0001		0.0001	Pass	
Molybdenum			mg/L	< 0.005		0.005	Pass	
Nickel			mg/L	< 0.001		0.001	Pass	
Selenium			mg/L	< 0.001		0.001	Pass	
Titanium			mg/L	< 0.005		0.005	Pass	
Zinc			mg/L	< 0.005		0.005	Pass	
LCS - % Recovery				<u> </u>	· · ·			
Heavy Metals								
Arsenic			%	94		80-120	Pass	
Barium			%	89		80-120	Pass	
Cadmium			%	93		80-120	Pass	
Chromium			%	99		80-120	Pass	
Cobalt			%	94		80-120	Pass	
Copper			%	96		80-120	Pass	
Iron			%	97		80-120	Pass	
Lead			%	100		80-120	Pass	
Manganese			%	02		80-120	Dass	
Moreuny			70 0/2	102		80.120	Pass	
Molybdonum			0/2	112		80.120	Pass	
Nickol			0/2	07		80.120	Pass	
Solonium			70 0/.	97		80.120	Pass	
Titonium			0/	00		80.120	Pass	
Zine			70	94		80.120	Pass	
ZINC		0.4	70	93		00-120	Pass	Qualifying
Test	Lab Sample ID	Source	Units	Result 1		Limits	Limits	Code
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S21-Jn31317	NCP	%	100		75-125	Pass	
Barium	S21-Jn31317	NCP	%	84		75-125	Pass	
Cadmium	S21-Jn31317	NCP	%	100		75-125	Pass	
Chromium	S21-Jn31317	NCP	%	104		75-125	Pass	
Cobalt	S21-Jn31317	NCP	%	102		75-125	Pass	
Copper	S21-Jn31317	NCP	%	102		75-125	Pass	
Iron	S21-Jn31317	NCP	%	104		75-125	Pass	[]
Lead	S21-Jn31317	NCP	%	106		75-125	Pass	
Manganese	S21-Jn31317	NCP	%	96		75-125	Pass	
Mercury	S21-Jn31317	NCP	%	107		75-125	Pass	[]
Molybdenum	S21-Jn31317	NCP	%	115		75-125	Pass	[]
Nickel	S21-Jn31317	NCP	%	103		75-125	Pass	[]
Selenium	S21-Jn31317	NCP	%	93		75-125	Pass	
Titanium	S21In31317	NCP	%	102		75-125	Pass	
Zinc	S21-Jn31317	NCP	%	97		75-125	Pass	
	0210101017	1101	70		1	10.120	1 4 3 3	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Jn37297	NCP	mg/L	0.002	0.002	10	30%	Pass	
Barium	S21-Jn37297	NCP	mg/L	0.13	0.13	2.0	30%	Pass	
Cadmium	S21-Jn37297	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S21-Jn37297	NCP	mg/L	0.009	0.009	3.0	30%	Pass	
Cobalt	S21-Jn37297	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S21-Jn37297	NCP	mg/L	0.010	0.010	<1	30%	Pass	
Iron	S21-Jn37297	NCP	mg/L	0.37	0.38	2.0	30%	Pass	
Lead	S21-Jn37297	NCP	mg/L	0.002	0.002	25	30%	Pass	
Manganese	S21-Jn37297	NCP	mg/L	0.086	0.085	1.0	30%	Pass	
Mercury	S21-Jn37297	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	S21-Jn37297	NCP	mg/L	0.012	0.012	4.0	30%	Pass	
Nickel	S21-Jn37297	NCP	mg/L	0.002	0.002	15	30%	Pass	
Selenium	S21-Jn37297	NCP	mg/L	0.005	0.006	19	30%	Pass	
Titanium	S21-Jn37297	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc	S21-Jn37297	NCP	mg/L	1.3	1.3	2.0	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

Authorised by:

Andrew Black John Nguyen Analytical Services Manager 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.

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Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention:

Stephen Maxwell

Report Project name Project ID Received Date 811512-S ADDITONAL CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jul 19, 2021

Client Sample ID Sample Matrix Eurofins Sample No.			MS_VAC1 Dust S21-JI34967	MS_VAC2 Dust S21-JI34968	MS_VAC3 Dust S21-JI34969
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit			
Sulphur	5	mg/kg	1000	1100	990
Heavy Metals					
Lead	5	mg/kg	360	270	300
Titanium	10	mg/kg	170	180	150



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Sulphur	Melbourne	Jul 20, 2021	7 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
Heavy Metals	Sydney	Jul 23, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

	Jouro (2				Australia							New Zealand	
ABN: 5	0 005 085 521 web:	C C C C C C C C C C C C C C C C C C C	Environm xom.au email: Env	viroSales@	esting eurofins.com	Melbourne 5 Monterey Road Jandenong South VIC 317; Phone : +61 3 8564 5000 VATA # 1261 Site # 1264	Sydney Unit F3 5 16 Mar: Lane C Phone NATA #	/ Building s Road ove Wes : +61 2 9 # 1261 S	g F st NSW 2066 9900 8400 ite # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Prone : +61 2 4968 8448 NATA # 1261 Site # 25079	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
Ad	mpany Name: Idress:	Rambo Level 3, North S	ll Australia Pt /100 Pacific F ydney	ty Ltd Highway			011	Order Report Phone	No.: t #:	811512 02 9954 8118		Received: Due: Priority:	Jul 19, 2021 9:32 AN Jul 26, 2021 5 Day	5
		NSW 2	090					ax:		02 9954 8150		Contact Name:	Stephen Maxwell	
Å Å	oject Name: oject ID:	ADDIT(318001	DNAL CAPT/ 193	AINS FL,	AT LEAD MA	NAGEMENT PLAN								
												Eurofins Analytical Se	rvices Manager : And	drew Black
							Sulphur Lead	Titanium						
			Sample D	etail										
Melk	ourne Laborat	tory - NATA	Site # 1254				×							
Syd	ney Laboratory	- NATA Sit	e # 18217				×	×						
Bris	bane Laborator	ry - NATA S	Site # 20794				+							
Pert	h Laboratory -	NATA Site	# 23736											
May	field Laborator	<u>y - NATA S</u>	ite # 25079											
	Sample ID	y Samula I	Jate Samp	pling	Matrix									
	-	•	Tin	ne č										
- 0	MS_VAC1	Jun 17, 2(221		bust	S21-JI34967	× × × ×	× :						
N	MS_VACZ	Jun 17, 20	1.2(ISU	521-JI34968	×	~						
e	MS_VAC3	Jun 17, 2(021		Just	S21-JI34969	×	×						
Test	Counts						3 3	e						

Page 3 of 6



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated. 3.
- 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.
- This report replaces any interim results previously issued. 9.

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
СР	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.
- 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									
Lead			mg/kg	< 5			5	Pass	
Titanium			mg/kg	< 10			10	Pass	
LCS - % Recovery									
Heavy Metals									
Lead			%	100			80-120	Pass	
Titanium			%	97			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S21-JI28844	NCP	%	106			75-125	Pass	
Titanium	N21-JI33907	NCP	%	91			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S21-JI29409	NCP	mg/kg	17	18	5.0	30%	Pass	
Titanium	S21-JI29409	NCP	mg/kg	< 10	< 10	<1	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
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

Authorised by:

Andrew Black Emily Rosenberg John Nguyen Analytical Services Manager Senior Analyst-Metal (VIC) 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.

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Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney **NSW 2060**





NATA Accredited Accreditation Number 1261 Site Number 25079

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Attention:

Stephen Maxwell

Report	804978-A
Project name	CAPTAINS FLAT LEAD MANAGEMENT PLAN
Project ID	318001193
Received Date	Jun 23, 2021

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	MS_SWAB1 Wipes N21-Jn44554 Jun 17, 2021	MS_SWAB2 Wipes N21-Jn44555 Jun 17, 2021	MS_SWAB3 Wipes N21-Jn44556 Jun 17, 2021	MS_SWAB4 Wipes N21-Jn44557 Jun 17, 2021
Heavy Metals						
Lead	1	Total ug	640	97	210	22

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			CH_SWAB1 Wipes N21-Jn44558 Jun 17, 2021	CH_SWAB2 Wipes N21-Jn44559 Jun 17, 2021	CH_SWAB3 Wipes N21-Jn44560 Jun 17, 2021	CH_SWAB4 Wipes N21-Jn44561 Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	8.7	2.4	46	210

Client Sample ID Sample Matrix			RFS_SWAB1 Wipes	RFS_SWAB2 Wipes	RFS_SWAB3 Wipes	RFS_SWAB4 Wipes
Eurofins Sample No.			N21-Jn44562	N21-Jn44563	N21-Jn44564	N21-Jn44565
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	43	27	18	8.7

Client Sample ID Sample Matrix			STP_SWAB1 Wipes	STP_SWAB2 Wipes	STP_SWAB3 Wipes	STP_SWAB4 Wipes
Eurofins Sample No.			N21-Jn44566	N21-Jn44567	N21-Jn44568	N21-Jn44569
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	10	18	6.8	< 1



Client Sample ID Sample Matrix			SWAB_QA01 Wipes	SWAB_QA02 Wipes	SWAB_RB Wipes	SWAB_BLANK Wipes
Eurofins Sample No.			N21-Jn44570	N21-Jn44571	N21-Jn44572	N21-Jn44573
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	5.8	15	< 1	< 1



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals	Sydney	Jun 30, 2021	180 Days

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

	.Jon of				Australia						New Zealand	
ABN: 5	0 005 085 521 web:	ET ET	1Vironment 1.au email: EnviroSal	I Testing	leIbourne Monterey Road Monterey Road South VIC 3175 Thone : +61 3564 5000 IATA # 1261 ite # 1254	Sydne: Unit F3 16 Mar Lane C Phone NATA	y t, Building F s Road cove West NSW 2066 : :+61 2 9900 8400 : :1261 Site # 18217	Brisbane 1/21 Smallwood Place Muranie GLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road 46-48 Banksia Road Velshpool WA 6106 Phone: +61 8 2251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive A/52 Industrial Drive Arghield Eart NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Perrose, Auckland 1061 Phone: +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Denseson, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290
Ad	mpany Name: dress:	Ramboll / Level 3/10 North Syd	Australia Pty Ltd 30 Pacific Highw Iney	/a/			Order No.: Report #: Phone:	318001193 804978 02 9954 8118		Received: Due: Priority:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day	M
Prc)ject Name:)ject ID:	CAPTAIN 31800119	N S FLAT LEAD N 13	MANAGEMENT	PLAN	_	TaX:	02 8854 8150		Contact Name: Eurofins Analytical Se	otepnen Maxwell	drow Black
					HOLD	Lead (% w/w)						
			Sample Detail									
			400 H CT									
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May	field Laborator	<u>y - NATA Site</u>	e # 25079									
No	Sample ID	Sample Da	te Sampling Time	Matrix	LAB ID							
-	MS_SWAB1	Jun 17, 202 [.]		Paint	N21-Jn44554	×						
2	MS_SWAB2	Jun 17, 202		Paint	N21-Jn44555	×						
4 3	MS_SWAB3 MS_SWAB4	Jun 17, 202		Paint	N21-Jn44556 N21-Jn44557	××						
5	CH SWAB1	Jun 17, 202	-	Paint	N21-Jn44558	×						
9	CH_SWAB2	Jun 17, 202 [.]		Paint	N21-Jn44559	×						
7	CH_SWAB3	Jun 17, 202 [.]	-	Paint	N21-Jn44560	×						
8	CH_SWAB4	Jun 17, 202	-	Paint	N21-Jn44561	×						
6	RFS_SWAB1	Jun 17, 202	_	Paint	N21-Jn44562	×						

	i Joyne	U S			Australia						New Zealand	
ABN: 50	005 085 521 web: v	www.eurof	Environment fins.com.au email: EnviroSa	t Testing	Melbourne 5 Monterey Road Dandenong South VIC 3175 Phone: +61 3 8564 5000 NATA # 1261 Site # 1254	Sydne: Unit F3 16 Mar Lane C Phone NATA	/ Building F s Road ove West NSW 2066 :+61 2 9900 8400 # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 D Box 60 Nexkham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 OfRorke 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
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Mayfi	eld Laboratory	y - NAT/	A Site # 25079									
10	RFS SWAB2	Jun 17	, 2021	Paint	N21-Jn44563	×						
11	RFS_SWAB3	Jun 17	, 2021	Paint	N21-Jn44564	×						
12	RFS_SWAB4	Jun 17	, 2021	Paint	N21-Jn44565	×						
1 3	STP_SWAB1	Jun 17	, 2021	Paint	N21-Jn44566	×						
14 7	STP_SWAB2	Jun 17	, 2021	Paint Doint	N21-Jn44567	× >						
0 9	STP SWAB4	Jun 17	, 2021	Paint	N21-Jn44569	< ×	1					
17	SWAB QA01	Jun 17	, 2021	Paint	N21-Jn44570	×	1					
18	SWAB QA02	Jun 17	, 2021	Paint	N21-Jn44571	×						
6	SWAB_RB	Jun 17	, 2021	Paint	N21-Jn44572	×						
20	SWAB_BLAN	Jun 17	, 2021	Paint	N21-Jn44573	×						

Page 5 of 10

Jun o	5		*	Australia						New Zealand	
005 085 521 web:	CIII	Environment fins.com.au email: EnviroSal	Testing Iss@eurofins.com	Aelbourne Monterey Road andesnong South VIC 3175 andesnong South VIC 3175 Phone: 1413 8564 5000 ATA # 1261 site # 1254	Sydney Unit F3 16 Mar Lane C Phone NATA #	y , Building F s Road ove West NSW 2066 :+61 2 9900 8400 # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Muranie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600 NATA # 261 Site # 23736	Newcastle 4/52 Industrial Drive A/52 Industrial Drive PO Box 60 Wickham 2293 Phone: +61 2 4968 9448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Rolleston, 0800 856 450 IANZ # 1290
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ject Name:	CAF	PTAINS FLAT LEAD N	MANAGEMENT	PLAN							
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				HOLD	Lead (% w/w)						
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ey Laboratory	y - NATA	\ Site # 18217		×	×						
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nal Laborator	2										
SWAB_BLAN K	Jun 17	7, 2021	Paint	N21-Jn44573							
MS_VAC1	Jun 17	7, 2021	Paint	N21-Jn44574 X							
MS_VAC2	Jun 17	7, 2021	Paint	N21-Jn44575 X							
MS_VAC3	Jun 17	7, 2021	Paint	N21-Jn44576 X							
CH_VAC1	Jun 17	7, 2021	Paint	N21-Jn44577 X							
CH VAC2	Jun 17	7, 2021	Paint	N21-Jn44578 X							
RFS VAC1	Jun 17	7, 2021	Paint	N21-Jn44580 X							
RFS_VAC2	Jun 17	7, 2021	Paint	N21-Jn44581 X							
RFS_VAC3	Jun 17	7, 2021	Paint	N21-Jn44582 X							
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Internal Quality Control Review and Glossary

General

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- 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.
- This report replaces any interim results previously issued. 9.

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

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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 millilitre

Terms	
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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.
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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
СР	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

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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

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- 4. Organochlorine Pesticide analysis where reporting Spike data. Toxaphene is not added to the Spike.
- 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.
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Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Heavy Metals						
Lead	Total ug	< 1		1	Pass	
LCS - % Recovery						
Heavy Metals						
Lead	%	99		80-120	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
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

Authorised by:

Andrew Black John Nguyen Analytical Services Manager 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.

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Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





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Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

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Stephen Maxwell

Report Project name Project ID Received Date 815203-S CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Aug 06, 2021

Client Sample ID Sample Matrix			PAINT_01 Paint	PAINT_02 Paint	PAINT_03 Paint
Eurofins Sample No.			N21-Au10998	N21-Au10999	N21-Au11000
Date Sampled			Aug 04, 2021	Aug 04, 2021	Aug 04, 2021
Test/Reference	LOR	Unit			
Lead (% w/w)	0.01	%	< 0.01	0.14	< 0.01



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Lead (% w/w)	Sydney	Aug 10, 2021	6 Months

- Method: LTM-MET-3040 Metals in Waters Soils & Sediments by ICP-MS

	Jon o				٩	Australia					New Zealand	
•	CULUII		Environme	ent T	esting	Melbourne Monterey Road andenong South VIC 3175 Phone : +61 3 8564 5000	Sydney Unit F3. Building F 5 16 Mars Road Lane Cove West NSW 206	Brisbane 1/21 Smaltwood Place Murarrie QLD 4172 6 Phone : +617 3902 4600	Perth 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450
ABN: :	50 005 085 521 web	b: www.eurofins	s.com.au email: Env	viroSales	0 @eurofins.com	IATA # 1261 Site # 1254	Phone : +61 2 9900 8400 NATA # 1261 Site # 18217	NATA # 1261 Site # 20794	NATA # 1261 Site # 23736	Phone:+61 2 4968 8448 NATA # 1261 Site # 25079	IANZ # 1327	IANZ # 1290
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Syd	ney Laboratory	- NATA SI	te # 18217 Sito # 20704				×					
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Comments

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Attempt to Chill was evident	N/A
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

Authorised by:

Emma Beesley John Nguyen Analytical Services Manager Senior Analyst-Metal (NSW)

Glenn Jackson General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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APPENDIX 7 TECHNICAL NOTE ON THE DEVELOPMENT OF SITE-SPECIFIC TRIGGER LEVELS FOR LEAD IN SOIL

CAPTAINS FLAT LEAD MANAGEMENT PLAN – DERIVATION OF SITE SPECIFIC GUIDELINE VALUES FOR LEAD IN SOIL DERIVATION OF SITE-SPECIFIC GUIDELINE VALUES FOR LEAD IN SOIL

Project name	Captains Flat Lead Management Plan
Project no.	318001193
Recipient	Department of Regional NSW
Document type	Technical Note
Version	0
Date	25/11/2021
Prepared by	Anand Chandra
Checked by	Steve Maxwell
Approved by	Rowena Salmon
Description	The report provides details of lead site specific guideline values derived from site bioaccessibility data

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APPENDICES

Appendix 1 UniSA Bioaccessibility Report Appendix 2 SSGV - HIL A Appendix 3 SSGV -HIL C Appendix 4 SSGV HIL - D

1. Introduction

Ramboll Australia Pty Ltd (Ramboll) was retained by the Department of Regional NSW (Regional NSW) to prepare the Captains Flat Lead Management Plan to address exposure risks from lead within the environment and the community that relates to the legacy Lake George Mine. This report provides information regarding the development of site-specific guideline values (SSGVs) for lead. The SSGVs are part of the conceptual site model being developed to assist in finalising the Captains Flat Lead Management Plan.

The Captains Flat Lead Management Plan Precinct (the Precinct) was defined in the Ramboll Review of Information and SAQP and encompasses built areas of the Captains Flat community, the legacy Lake George Mine site and the Molonglo River from upstream of the water supply dam to a waterhole approximately 1.5 km downstream of the mine. The Precinct includes roads accessing Captains Flat (to a distance of at least 400 m), the rail corridor (to a distance of 1 km) and bushland areas at the perimeters of the community.

The extended period of mining within the area has included a range of potentially contaminating activities. As a result, elevated lead concentrations have been identified in shallow soils within the Precinct associated with dust deposition, runoff and emplacement of ore, mine waste and slag. Elevated soil lead concentrations are also expected to influence indoor dust lead concentrations. Distribution around the former preschool and at the south end of Foxlow Street appears related to application of mine waste as fill, surficial deposition (potential runoff from the eastern embankment of the mine and/or windborne dust deposition). Distribution at Foxlow Parklet appears related to application of fill. Lead within accessible soils in the Precinct has originated from different transport pathways and has undergone varying degrees of environmental degradation. It is therefore likely that the bioavailability¹ of lead varies across the Precinct.

Lead health investigation levels (HILs) available from NEPM (2013) can be updated using site-specific measure of bioavailability to reflect local exposure conditions. This report details the approach taken to update the following HILs with site-specific bioavailability measurements:

- 1. HIL A Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.
- 2. HIL C Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths.
- 3. HIL D Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

The above HILs were updated based on the exposure scenarios expected at the site.

2. Objectives

The objective of this report was to use site-specific bioavailability data from accessible soils to derive SSGVs for lead considering different exposure scenarios.

Tier 1 screening assessment of soil lead results indicate that relevant NEPM HILs are exceeded at some locations within the Precinct. While relevant HILs are exceeded, the actual risk of adverse effects remains unclear. NEPM HILs for lead use conservative bioavailability assumptions for lead in soil and dust. For soil lead at the site, this refers to the fraction of orally ingested lead that dissolves into the gastrointestinal tract and the fraction of this dissolved lead that is actually absorbed into systemic circulation. For ore and slag derived lead, it is unlikely that lead would be 100% bioavailable, although

¹ Bioavailability is a generic term defined as the fraction of a contaminant that is absorbed into the body following dermal contact, ingestion or inhalation. It is expressed as the ratio (or percentage) of the absorbed dose (systemic dose) to the administered dose (NEPM 2013).

factors such as extended weathering, particle size, mixing with soil organic matter may change bioavailability at the point of exposure. To better understand potential risks and the extent to which exposure can change blood lead concentrations in human receptors (especially sensitive subpopulations such as children who are more susceptible to adverse effects of lead), site-specific bioavailability measurement of soil lead was conducted to allow the development of SSGVs.

The scope of works included:

- Sampling of shallow soils from various locations within the Precinct, based on areas of potential exposure.
- Measurement of soil lead bioavailability (bioaccessibility defined later in this report) at the University of South Australia
- Derivation of SSGVs using the Integrated Exposure Uptake Biokinetic (IEUBK) model and Adult Lead Methodology (ALM) available from United States Environment Protection Agency (US EPA), as used previously for derivation of lead HILs.
- Preparation of this technical note to document the derivation.

Generally, only bioavailability information was updated in the IEUBK and ALM models, while the remaining input parameters were kept same as NEPM (2013). Guidance from the following documents was adopted:

- NEPC (2013a) Assessment of Site Contamination: Schedule B4 Site-specific Health Risk Assessment Methodology. National Environment Protection Council, Adelaide
- NEPC (2013b) Guidance note Lead: Supplementary information to Schedule B7 section 5.4. NEPM Toolbox. <u>http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox</u>
- NEPC (2013c) Guideline on derivation of health-based investigation levels. National Environment Protection Council, Adelaide (Appendix A1 and Appendix D)
- EnRisks (2011) IEUBK modelling for establishing HIL A and conducting site-specific adjustments to the model <u>https://www.enrisks.com.au/wp-content/uploads/2013/04/IEUBK-Modelling-for-</u> Establishing-HIL-A-and-Site-Specific-Adjustments.pdf

3. Data Review and Evaluation

Shallow soil samples were collected from a number of non-residential locations within the Precinct, targeting locations where recreational exposures were likely to occur. Residential sampling within the Precinct were conducted previously by the EPA and soil samples from residential areas were not available for bioavailability testing. For confidentiality reasons, sample results from residential areas were not part of the scope of this report. A total of 16 samples were collected for bioavailability testing including one duplicate.

All samples were tested for lead and bioavailability of lead and particle size distribution. Mining related samples such as ores and slag can contain very high concentrations of lead present in a heterogenous matrix containing different mineral phases. Therefore, standard soil analysis method for lead extraction and determination of total lead concentration in such samples is not appropriate. Sample lead concentrations were analysed by ALS Geochemistry using a four-acid digestion approach. Soil lead concentration summary is provided in Table 3-1.

3.1 Bioavailability Measurements

The toxic effect of a contaminant depends upon the uptake or absorbed dose of contaminant, that is, the amount that gets into the bloodstream after being ingested, inhaled or via skin contact. The fraction

of a compound that is absorbed into the body (systemic dose) following exposure via all pathways is generically termed the 'bioavailable fraction'.

More specifically:

- absolute bioavailability is the fraction of a compound which is ingested, inhaled or applied to the skin that actually is absorbed and reaches systemic circulation and
- relative bioavailability (RBA) is referred to the comparative bioavailability of different forms of a chemical or for different exposure media containing the chemical. It is the ratio of the absorbed fraction from the exposure medium in the risk assessment (e.g. soil) to the absorbed fraction from the dosing medium used in the critical toxicity study.

The assessment of contaminant bioaccessibility may also be considered for estimating contaminant uptake. Bioaccessibility is related to the solubility of the contaminant in the gastrointestinal tract. More specifically, in the context of soil contamination, it is defined as the fraction of a contaminant in soil that is soluble in the relevant physiological milieu (usually the gastrointestinal tract) which is potentially available for absorption. If the lead is sourced from the breakdown of car batteries for example then the lead is likely to be readily bioaccessible; however, if the lead is sourced from an ore body then the bioaccessibility can be quite different and a site-specific value may be used in the site-specific risk assessment. This can be assessed by validating with *in vitro* test systems.

Relative bioavailability of contaminants in soil is complicated, variable and difficult to predict. This is because it depends strongly on the nature of the soil matrix (for example, soil type, age of soil, organic carbon, potential particle size, etc.) and on environmental conditions, particularly redox potential. NEPM HILs for lead are derived using 50% absolute bioavailability value, derived from 100% relative bioavailability assumptions; however, a site-specific assessment can be conducted to further verify or refine this assumption. *In vitro* assays are appropriate as a surrogate method for estimating relative bioavailability for contaminants such as lead and arsenic (NEPC 2013a). There are a number of *in vitro* methods that may be considered as a surrogate measure of arsenic and lead relative bioavailability and these may include Relative Bioavailability Leaching Procedure (RBALP) (US EPA 2007), the Solubility Bioavailability Research Consortium (SBRC) (Kelley et al. 2002) or the in vitro gastrointestinal method (IVG).

The bioaccessibility of lead in the soils from the site was determined in <250 µm particle size fraction using gastric and intestinal phase of the SBRC assay. The gastric phase of this method (termed RBALP for lead) has been correlated to in vivo lead relative bioavailability when determined using juvenile swine (Juhasz et al., 2007; USEPA 2007). Sixteen samples were tested at the Future Industries Institute, based at the Mawson Lakes Campus of the University of South Australia (UniSA). The tests were conducted for several replicates and included quality control testing. The reports are provided in **Appendix 1** (which also describes the method used).

Bioaccessibility values for the samples were calculated for gastric (SBRC-G) and intestinal (SBRC-I) phases. Gastric phase extraction occurs in an acidic environment at pH 1.5, while the intestinal phase extraction uses a pH of about 6.5-7.0. The extraction in different phases is designed to replicate the human gut and estimate the soluble fraction of lead in stomach and intestine. Due to the lower pH in gastric phase, the gastric phase bioaccessibility is expected to be higher than intestinal phase bioaccessibility. Usually the difference is not expected to be large between the two extraction phases (Smith et al. 2011; Juhasz, A. personal communication, 20 May 2020) however was large in Captains Flat samples. The gastrointestinal absorption of inorganic lead (the form relevant for the site) occurs primarily from the duodenum (first part of small intestine) and may involve saturable mechanisms of

absorption (ATSDR 2019). The stomach plays a role in uptake via transformation(s) of lead-bearing media or form-specific lead to potentially more soluble or otherwise mobile forms (Mushak 1991). The epithelial lining of the small intestine in humans and experimental animals is the principal anatomical and physiological location where lead uptake occurs (Mushak 1991). Therefore, the intestinal phase values are likely to be a realistic indicator of the fraction of lead that will reach systemic circulation.

In vivo bioassays such as the juvenile swine, provide the most reliable indication of RBA of lead in soil and are, therefore, the preferred method of analysis (US EPA 2007). However, to reduce cost and time, *in vitro* methods, such as the one employed by UniSA, are commonly used for estimating lead RBA. For the *in vitro* methods to be acceptable, results for various soil types and chemical forms of lead need to be validated. It has been shown previously that relative SBRC-I values obtained using *in vitro* methods provide the best estimate of overall *in vivo* relative lead bioavailability, especially for soils that have more soluble forms of lead (Smith et al. 2011; Juhasz et al. 2009). SBRC-G values provide a good prediction of *in vivo* relative lead bioavailability for soils where lead mineralogy limits lead dissolution but tend to overpredict relative lead bioavailability for soils with more soluble forms of lead (Juhasz et al. 2009). Lead mineralogy in Precinct soils appears variable and so SBRC-G has been conservatively adopted. This aligns with US EPA 2021 guidance that recommends gastric phase extractions for *in vitro* bioaccessibility assessments for lead in soil.

The SBRC-G, SBRC-I and relative SBRC-I values for different samples are shown in Table 3-1. For this assessment maximum SBRC-G values was adopted as a conservative measure of lead bioaccessibility for site soils.

Soil	Total Pb	In vitro	Pb Bioacc Pb Bioacc		Location
	(mg kg ⁻¹)	Phase	(mg kg⁻¹)	(%)	
	3250	SBRC-G	224	6.9	
R_S117a		SBRC-I	9.5	0.3	Flood berms
		Rel-SBRC-I*		2.8	
	2720	SBRC-G	2010	73.9	
R_S118a		SBRC-I	224	8.2	Tennis Court
		Rel-SBRC-I*		79.6	
	2580	SBRC-G	42	1.6	
R_S119a		SBRC-I	2.5	0.1	Flood berms
		Rel-SBRC-I*		0.9	
	9090	SBRC-G	5660	62.3	
R_S120a		SBRC-I	2080	22.9	Foxlow Parklet
		Rel-SBRC-I*		60.8	
	49250	SBRC-G	30250	61.4	
R_S121a		SBRC-I	13150	26.7	Foxlow Parklet
		Rel-SBRC-I*		70.9	
	5055	SBRC-G	3695	73.1	
R_S122a		SBRC-I	1210	23.9	Foxlow Parklet
		Rel-SBRC-I*		63.6	

Table 3-1: Bioaccessibility results of soil samples from the Precinct.

Soil	Total Pb	In vitro	Pb Bioacc	Pb Bioacc	Location	
	(mg kg ⁻¹)	Phase	(mg kg⁻¹)	(%)		
	3865	SBRC-G	740	19.1		
R_S123a		SBRC-I	90	2.3	Eastern embankment	
		Rel-SBRC-I*		22.5		
	30650	SBRC-G	7015	22.9		
R_S124a		SBRC-I	1485	4.8	Eastern embankment	
		Rel-SBRC-I*		12.9		
	7510	SBRC-G	4900	65.2		
R_S125a		SBRC-I	614	8.2	Eastern embankment	
		Rel-SBRC-I*		21.7		
	91800	SBRC-G	52400	57.1		
R_S126a		SBRC-I	25900	28.2	Rail Corridor	
_		Rel-SBRC-I*		75		
	3125	SBRC-G	1080	34.6		
R_S145a		SBRC-I	168	5.4	Eastern embankment	
		Rel-SBRC-I		52		
	1965	SBRC-G	223	11.3		
R_S146a		SBRC-I	33	1.7	Eastern embankment	
		Rel-SBRC-I		16.2		
	30850	SBRC-G	776	2.5		
R_S147a		SBRC-I	92	0.3	Rail Corridor	
K_5147a		Rel-SBRC-I		2.9		
	49050	SBRC-G	39300	80.1		
R_S148a		SBRC-I	19600	40	Rail Corridor	
		Rel-SBRC-I		~100		
	4400	SBRC-G	565	12.8		
R_S149a		SBRC-I	56	1.3	Eastern embankment	
		Rel-SBRC-I		12.3		
	1485	SBRC-G	824	55.5		
QA201		SBRC-I	126	8.5	Replicate of R_S123a	
		Rel-SBRC-I		82		
	6400	SBRC-G	4760	74.4 ^w		
QC1 ^w		SBRC-I	938	14.7	Laboratory reference	
		Rel-SBRC-I		~100		

Two QC samples were analysed. Lead bioaccessibility for the QC1 (laboratory reference sample) soil was within a suitable gastric phase extraction range for this reference material. QC201 was the replicate for sample R_S123a and has a calculated relative percent difference (RPD) of 97.6%. The RPDs for total

lead in the bioaccessible fraction and SBRC-G are the same indicating that variable gastric phase bioaccessibility that has been reported is a function of variability in total lead concentrations (or other soil properties that result in variable total lead concentrations – eg: multiple contaminant sources) rather than variability in analysis.

For the derivation of SSGVs, the bioaccessibility results from the rail corridor were not considered. The history of the rail corridor indicates spillage of ore concentrate during rail loading and the contaminant profile (higher total lead and TCLP) are unique compared to other public areas of the Precinct. For these reasons rail corridor SBRC-G values were excluded. Additionally, rail corridor contamination is being managed separately to the rest of the Precinct and is being regulated under a VMP, subject to site audit and that interim measures including fencing and signage to restrict access to the corridor have already been implemented.

The SBRC-G values considered for deriving the SSGVs are shown in Table 3-2. Statistics for the dataset are also shown in that table.

Soil	Total Pb	In vitro	Pb Bioacc.	Pb Bioacc.	Location		
	(mg kg ⁻¹)	Phase	(mg kg ⁻¹)	(%)			
R_S117a	3250	SBRC-G	224	6.9	Flood berms		
R_S118a	2720	SBRC-G	2010	73.9	Tennis Court		
R_S119a	2580	SBRC-G	42	1.6	Flood berms		
R_S120a	9090	SBRC-G	5660	62.3	Foxlow Parklett		
R_S121a	49250	SBRC-G	30250	61.4	Foxlow Parklett		
R_S122a	5055	SBRC-G	3695	73.1	Foxlow Parklett		
R_S123a	3865	SBRC-G	740	19.1	Eastern embankment		
R_S124a	30650	SBRC-G	7015	22.9	Eastern embankment		
R_S125a	7510	SBRC-G	4900	65.2	Eastern embankment		
R_S145a	3125	SBRC-G	1080	34.6	Eastern embankment		
R_S146a	1965	SBRC-G	223	11.3	Eastern embankment		
R_S149a	4400	SBRC-G	565	12.8	Eastern embankment		
Pb Bioaccessibility % Statistics							
n				12			
min				1.6			
max	max				73.9		
Mean				37.1			
Median				28.8			
SD				28			
95% UCL				51.6			
95 %ile	95 %ile				73.5		
80 %ile				64.6			

Table 3-2: Bioaccessibility values (SBRC-G) considered for deriving lead SSGVs for the Precinct.

Based on the maximum, 75% bioaccessibility has been adopted for deriving the SSGVs.

4. Adopted Target Blood Lead Level (BLL)

Potential health effects of lead vary greatly depending upon a person's age, exposure levels, duration of exposure and presence of any pre-existing conditions. Children and foetuses (via pregnant women) are most at risk. In pregnant women, lead in the bloodstream can cross the placenta into the foetal blood. Children and babies (including foetuses) are more sensitive to health effects from lead than adults (NHMRC 2016). There is an association between blood lead levels of 5 to 10 μ g/dL and adverse cognitive effects (reduced Intelligence Quotient (IQ) and academic achievement) and behavioural problems (effects on attention, impulsivity and hyperactivity) in children. It is now recommended that for blood lead levels greater than 5 μ g/dL the sources of exposure should be investigated and reduced particularly for children and pregnant women (NHMRC 2016).

The main receptors at the site include Precinct residents and visitors including children and workers. The most sensitive receptors representing these groups are females of reproductive capacity and infants/children. Current NEPM (2013) HILs for lead adopts a BLL of 10 μ g/dL for these groups of sensitive receptors. Recent NSW EPA advice on the adoption of this BLL is as follows:

The EPA support the use of 10ug/dL blood lead levels in bioavailability modelling for the Captains Flat lead management plan and for developing site specific health investigation levels. We note that:

- This trigger level was used to derive the current HIL's for lead and until the NEPM is revised, it is still considered the acceptable value. This approach would be consistent with the National Environment Protection measure (Assessment of Site Contamination). For reference, the relevant clause in the NEPM (schedule B7, section 5.4) states: [...]. For the purpose of deriving the HILs, lead has been assumed to act as a threshold contaminant and a blood lead concentration of 10 µg dL⁻¹ has been applied as the maximum tolerable level for adults, children and the developing fetus (NHMRC 2009). It should be noted that it is generally recognised that there may be no threshold for the neurotoxic action of lead (DEFRA 2002).
- 2. We have received advice from NSW Health (and indirectly from the NHMRC lead committee) that the value of 10ug/dL should still be used for the time being. They did however note that where background levels of blood leads in an area are likely to exceed 5ug/dL, additional protection measures should be established.

Based on the advice from NSW EPA and to be consistent with current NEPM (2013) lead HILs, a BLL of 10 μ g/dL was adopted for all exposure scenarios/receptors in this report.

5. Approach to Modelling

The effects of lead exposure have often been evaluated based on the blood lead content, which is generally considered to be the most accurate means of characterising exposure. Other measures of exposure such as bone lead, hair lead and urine lead, can be used but are considered less reliable. Physiologically based pharmacokinetic models, such as the US EPA IEUBK model, have been used for assessment of lead exposure risks in children. The model simulates multimedia exposures, uptake and kinetics of lead in children ages 0-7 years for predicting pseudo-steady state relationships between lead exposure and blood lead. US EPA also developed a slope factor model called ALM for assessing lead exposures in adults. Lead biokinetics are represented with a simple linear relationship between blood lead and lead uptake called the biokinetic slope factor. Using this model, a foetus being carried by a pregnant woman is the most sensitive receptor. Both these models are lifetime models and rely upon an equilibrium of lead distribution that is established over an extended period. Normally, they cannot be
used to characterise short-term kinetics of blood lead (ATSDR 2019), however exposure adjusted approaches can be used (US EPA 2016 and 2003b). The ALM and IEUBK model require a minimum of 90 days exposure to produce quasi-steady state blood lead concentrations (US EPA 2003a).

The derivation of NEPM Health screening levels (HILs) used the IEUBK model for calculating HIL-A, HIL-B and HIL-C where children are main receptors and the ALM for calculating HIL-D where an adult female of reproductive capacity (foetus) is the most sensitive receptor. Accordingly, all of these values are derived assuming long-term, consistent exposure is occurring. However, the level and frequency of exposure can vary at the site, especially under recreational exposure scenario where exposures may not occur frequently for 365 days of the year. Never-the-less approach consistent with NEPM (2013) has been adopted for the derivation of relevant SSGVs for lead.

6. Existing HILs

The NEPM (2013) guidelines provide default HILs for lead under different land use scenarios. The most relevant default HIL values applicable to different site receptors are:

- Precinct residents HIL A (residential 300 mg/kg): residential areas within the Precinct are typical
 of low density housing with accessible soils. Other applicable locations such as childcare/preschools
 are also present.
- Precinct residents and visitors HIL C (recreational; 600 mg/kg): Precinct residents and visitors may use public open space such as parks, playgrounds and playing fields.
- Workers HIL D (1500 mg/kg): workers may be present in commercial/industrial properties within the Precinct.

The HILs are applicable for assessing human health risk via all relevant pathways of exposure. HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario. The HILs are generally derived by integrating exposure estimates with toxicity reference values, that is, tolerable daily intakes (TDI), acceptable daily intakes (ADI), and reference doses (RfD), to estimate the soil concentration of a substance that will prevent exceedance of the toxicity reference value under the defined land use scenario. The toxicity reference values are generally based on the known most sensitive significant toxicological effect.

HILs establish the concentration of a contaminant above which further appropriate health investigation and evaluation will be required. Levels slightly in excess of the HILs do not necessarily imply unacceptable conditions or that a significant health risk is likely to be present. Exceeding a HIL means further investigation is required and does not indicate that 'clean-up' is required. The use of investigation and screening levels as default remediation criteria may result in unnecessary remediation and increased development costs, unnecessary disturbance to the site and local environment, and potential waste of valuable landfill space. As such, default HILs are not intended to be clean-up levels. The decision on whether clean-up is required, and to what extent, should be based on site-specific assessment triggered by an exceedance of the HIL. Health risk assessment is the primary driver for making site decisions including the need for appropriate risk management options. Other considerations such as practicality, timescale, effectiveness, cost, sustainability and associated ecological risk assessment can also be relevant.

7. Exposure Assessment

The exposure assumptions for Precinct residents, visitors and workers were adopted from NEPM (2013) guidelines. Soil and dust ingestion, and inhalation are likely to be the main routes of exposure. The primary method of assessing exposure to lead contamination was via blood lead modelling, using IEUBK for Precinct residents and visitors (HIL-A and HIL-C) and ALM for workers (HIL-D). The models allow for soil and dust intake via ingestion. The IEUBK model also includes background intake for air, water and dietary lead.

7.1 Intake via Ingestion

Lead concentrations across the site were variable suggesting that lead intake would vary depending on the location of exposure at the site. For workers, the ingested amount would be reduced if sufficient personal protective equipment is used, and dust minimisation protocols are followed.

The health impacts of ingested lead depend on the bioavailability of lead in the ingested material. It is the proportion of an ingested chemical substance that is absorbed from the gut into the body and reaches systematic circulation without change (EA 2009). The bioavailability of lead in the material was analysed and is described in Section 3.

The water use guidelines developed separately (refer to Ramboll 2021 Conceptual Site Model Report) shows that children can have additional lead intake from recreational exposures as follows:

- Incidental ingestion 0.36 µg/day
- Recreational drinking 0.23 µg/day

The total estimated intake from recreational water exposure is about 0.6 μ g/day. This level of intake is unlikely to cause any material change in the developed SSGV for lead. However, this intake was added to the IEUBK model as alternate intake for all age groups.

7.2 Intake via inhalation

Lead in dust particles would be associated with particles of different sizes and this influences where in the respiratory tract it is deposited. Lead associated with smaller, respirable dust particles are predominantly deposited in the pulmonary region of the respiratory tract, where it can either get absorbed directly into general circulation or be transported via phagocytic cells to the gastrointestinal tract. Lead associated with larger particles would be deposited in the upper and large airways, such as nasal and pharyngeal and tracheobronchial regions of the respiratory tract and may be transported via mucociliary transport to the oesophagus and swallowed. This would also make its way to the gastrointestinal tract.

The dust lung retention factor describes the percentage of respirable dust that is small enough to be retained in lungs and is associated with health effects. For both indoor and outdoor dust exposures, the respirable fraction is estimated at 37.5% of the inspirable fraction. This fraction is recommended by enHealth (2012) where it was considered that 75% of the inhaled (inspirable) dust will be retained in the respiratory tract (25% is exhaled) of which 50% is small enough to reach the pulmonary alveoli, resulting in a respirable fraction of 37.5%. Therefore, a large proportion of the inhaled particles are expected to either be exhaled out or be transported to the gastrointestinal tract where absorption similar to ingested soil fractions would occur.

7.3 Exposure Parameters

The US EPA IEUBK and ALM models were used to undertake blood lead modelling and development of the SSGVs. The input parameters were directly adopted from NEPM (2013) guidelines (as described in EnRisks 2011, NEPM Schedule B7 Appendix A1 and D and elsewhere in NEPM guidelines), except for bioaccessibility information.

8. Toxicity Assessment

Lead (Pb) is a naturally occurring element and can exist in three oxidation states, Pb(0) – metallic lead, Pb(II) – most common and Pb(IV). The most common mineral form of lead is galena (PbS), followed by anglesite (PbSO₄) and cerussite (PbCO₃). Lead is used in a wide range of materials, including storage batteries, metal alloys, radiation shields, ammunition and chemical resistant linings. Lead has also been widely used as a paint pigment and additive in petrol, although its use in these products has been greatly reduced (ATSDR, 2007).

Natural mobilization of lead occurs via the weathering of mineral deposits and as a result of volcanic activity (ATSDR, 2007). However, these releases are minor compared to emissions from anthropogenic sources, including the mining and smelting of lead-bearing ores, the manufacture of lead-containing products, the combustion of coal and the incineration of lead-based wastes (ATSDR, 2007). The use of lead in products such as petrol, paints, pesticides, ammunition and fishing sinkers has historically resulted in emissions of lead being released to the environment. However, as lead has been phased out as a constituent of these products over the years, their significance as an environmental source of lead has greatly diminished.

Lead is persistent in the environment, the primary sinks being soil and sediment (ATSDR, 2007). Atmospheric lead is mainly present in particulate form, with an average residence time of 10 days (ATSDR, 2007). The transport and bioavailability of lead deposited to soil is dependent upon the pH and mineral composition of the soil, as well as the amount and type of organic matter present (WHO, 1995). Lead strongly adsorbs to organic matter and is not readily leached to groundwater or sub-soils (ATSDR, 2007). Lead deposited to water will partition between the sediment and aqueous phase depending upon the salinity, pH and hardness of the water and the amount of humic material present (WHO, 1995).

To quantify exposure in humans, data are expressed in terms of absorbed lead, and not in terms of external exposure levels (e.g., concentration in water) or dose (e.g., mg/kg/day). Blood lead mainly reflects exposure history of the previous few months and does not necessarily reflect the larger burden and much slower elimination kinetics of lead in bone. Lead in bone is considered a biomarker of cumulative or long-term exposure because lead accumulates in bone over the lifetime and most of the lead body burden resides in bone. Most of the body burden of Pb (the total amount of Pb in the body) is distributed to the bone, with approximately 94% and 76% of the body burden found in bone in adults and children, respectively (ATSDR 2019). The remainder is distributed to blood and soft tissues. Once absorbed, lead is rapidly taken up in the blood and distributed to soft tissues including the kidney, liver and bone marrow and then slowly redistributed to the bone (WHO, 2011). Lead has a half-life of approximately 40 days in blood and soft tissue, and 20 to 30 years in bone (NHMRC, 2011). Lead is primarily excreted in faeces and urine, with minor excretion via sweat, saliva, hair, nails and breast milk (ATSDR, 2007).

Lead exposure can cause increases in blood lead concentrations with blood lead concentrations between 5 to 39 µg/dL potentially associated with short-term impacts relating to spontaneous abortion, postnatal developmental delay and reduced birth weight (SafeWork Australia 2013). Short-term effects of blood

lead >40 μg/dL could also include neurocognitive deficits, sperm abnormalities, anaemia, colic, encephalopathy and other nonspecific symptoms such as headache, fatigue, sleep disturbance, anorexia, constipation, arthralgia and myalgia. Signs and symptoms of gastrointestinal and neurological toxicity can also occur at blood lead levels >30 μg/dL, with severity increasing with blood lead following short-term exposure (ATSDR 2019). While inorganic lead compounds are classified by the International Agency for Research on Cancer (IARC) as Group 2A agents that are probably carcinogenic to humans, the non-carcinogenic effects (threshold) are more sensitive and have a more pronounced effects in exposed children and adults. For risk assessment purposes, clean-up determinations and levels based on the more sensitive, non-cancer endpoint are expected to be protective against other effect requiring higher exposures, including cancer endpoints.

8.1.1 Threshold (non-carcinogenic) Health Effects

The majority of information regarding the toxicity of lead has been gathered from studies of workers in occupational settings and from studies of adults and children in the general population. Exposure to lead can have effects on multiple organs and bodily functions due to its multi-mode action in biological systems (ATSDR, 2007). The developing nervous system, haematological and cardiovascular systems and the kidneys are considered the most sensitive targets for lead toxicity (ATSDR, 2007). However, health effects observed as a result of lead exposure can differ substantially between individuals depending on age, the amount of lead, the length of exposure and the presence of other health conditions (NHMRC, 2015).

Occupational studies of lead workers suggest long-term exposure to lead may be associated with increased mortality due to cerebrovascular disease (ATSDR, 2007). Population studies have reported significant associations between lead levels measured in both bone and blood and increases in blood pressure (ATSDR, 2007). Lead is also known to inhibit heme biosynthesis, shorten erythrocyte lifespan and induce inappropriate production of the erythropoietin hormone, leading to inadequate maturation of red cell progenitors and contributing to anaemia (ATSDR, 2007). Indeed, low levels of haemoglobin have been observed in both adults and children following long-term exposure to lead (NHMRC, 2015). Lead also affects kidney function by reducing glomerular filtration rates (ATSDR, 2007). Kidney inflammation, renal impairment and chronic nephropathy causing death, have been observed following short-term exposures to lead, with the more severe effects associated with increasing blood lead levels (NHMRC, 2015).

Encephalopathy (severe abnormal brain function) has been associated with prolonged exposure to high amounts of lead in adults and children (NHMRC, 2015). Symptoms can include irritability, agitation, poor attention span, headache, confusion, uncoordinated movements, drowsiness, constipation, convulsions, vomiting, seizures, coma and death (NHMRC, 2015). Lead poisoning in children has been linked to residual cognitive deficits that can be still detected in adulthood (ATSDR, 2007). Other neurobehavioral effects observed after long-term, high concentration exposure in adults and children include problems with thinking, anxiety, mood change, dizziness, fatigue, sleep disturbance, lethargy, impotence, decreased libido, dizziness, weakness, paresthesia and paralysis (NHMRC, 2015). Associations between blood and/or bone lead and poorer performance in neurobehavioral tests have been reported in studies of older populations, with lead also shown to affect nerve conduction velocity and postural balance in workers (ATSDR, 2007).

Lead has been associated with accelerated skeletal maturation in children, which may predispose them to the development of osteoporosis in later life (ATSDR, 2007). Increased occurrence of dental caries in children and periodontal bone loss have also been linked to lead exposure, as has a reduction in circulating levels of vitamin D, which is required for maintenance of calcium homeostasis (ATSDR, 2007).

Changes in the circulating levels of thyroid hormones and reproductive hormones have been observed in workers exposed to lead, as well as altered immune parameters with reported effects including changes in T-cell populations, response to T-cell mitogens and reduced chemotaxis of polymorphonuclear leukocytes (ATSDR, 2007). Lead exposure has been linked to increases in serum IgE in children, a primary mediator for type-1 hypersensitivity involved in allergic diseases such as asthma, leading to suggestions that lead could be a risk factor for childhood asthma (ATSDR, 2007).

8.1.2 Carcinogenic (genotoxic) Health Effects

The IARC has determined that there is sufficient evidence from animal studies and limited evidence from human studies to classify inorganic lead and lead compounds as probably carcinogenic to humans.

Ingestion of high concentrations of lead compounds has been linked to the development of renal tumors in experimental animals (ATSDR, 2007). Human-based research, however, has been less conclusive. Studies of lead workers have shown limited evidence of an increased risk of lung and stomach cancer as a result of occupational exposure to lead, with others showing weak evidence for an association with kidney cancer and gliomas (ATSDR, 2007).

Occupational studies suggest lead is a clastogenic agent, capable of inducing chromosomal aberrations, micronuclei and sister chromatid exchanges in peripheral blood cells (ATSDR, 2007). Mammalian studies testing mutagenicity have correlated DNA damage observed in the lung, liver and kidney with lead exposure, although *in vitro* studies have yielded mostly negative results for lead (ATSDR, 2007).

9. Lead SSGVs

Absolute bioavailability (ABA; absorption fraction) values were calculated from the adopted bioaccessibility data and used in IEUBK and ALM models. The values were calculated as follows and are shown in **Table 9-1** together with NEPM defaults:

$$AF_{S,D} = AF_{Soluble} \times RBA_{Soil/Soluble} \dots eq 11.1$$

where,

AF _{s,D}	Absorption fraction (same for soil and dust)
AFsoluble	Absorption factor in children (0.5) and adults (0.2)
RBA	Relative bioavailability

Table 9-1: Bioavailability input data for modelling.

Approach	ABA (AF _{S,D})		RBA
NEPM Default	50.0%	50%	100%
Site Specific - HIL A & C	37.5%	50%	75%
Site Specific - HIL D	15.0%	20%	75%

The IEUBK model was used to derive SSGVs for to update HIL-A and HIL-C guideline values. The algorithms and background information about the IEUBK model are provided elsewhere (NEPC 2013d; US EPA 1994). IEUBK models blood lead levels in children aged 0-84 months (0-7 years) and calculates blood lead concentrations in 7 age groups separately (0-1 yrs, 1-2 yrs, 2-3 yrs, 3-4yrs, 4-5 yrs, 5-6 yrs and 6-7 yrs). The age range 1–2 years is considered to be the most sensitive as a result of lowest body

weight combined with high hand-to-mouth activity and crawling. Parameters associated with air, water, diet, soil and dust were adopted from NEPM defaults.

The ALM was used was used to derive SSGV to update HIL-D guideline value. The algorithms and background information about this methodology are provided elsewhere (NEPC 2013d; US EPA 2003a). The baseline blood lead concentration input parameter of the model represents the geometric mean blood lead concentration in woman of child-bearing age and the geometric standard deviation (GSD) input parameter is a measure of the inter-individual variability in these concentrations. The default input parameters in the model comes from a survey of US women 17-45 years of age under the National Health and Nutrition Examination Survey (NHANES). The most recent update of the model default parameters was conducted in 2014, with previous updates conducted in 2002, 2007 and 2010 (US EPA 2017a). Consistent with the NEPM derivation of lead HIL-D values, these latest default parameters were used in the model calculations.

The calculated SSGVs for different exposure scenarios are shown in Table 9-2 and model print outs are provided in Appendices 2 to 4.

				SSGV- estimated (75% Bioacc)	Adopted SSGV Based on 75%
Landuse	NEPM Ref Units		Default Value	10 μg/dL BLL Target	Bioacc
Residential	HIL A	mg/kg	300	399	400
Public open space	HIL C	mg/kg	600	683	700
Commercial / industrial	HIL D	mg/kg	1500	3675	4000

Table 9-2: Lead SSGVs developed using site-specific bioaccessibility data.

10. Blood Lead Level Check

The SSGVs were used to predict blood lead levels in receptor groups to ensure sensitive sub populations would be protected from the proposed SSGVs. These are shown in Table 10-1 and Table 10-2.

IEUBK Output Description	Children Age Groups (Years)	Units	Output Value (HILA – 400 mg/kg)	Output Value (HILC – 700 mg/kg)	Comments	
	0.5 - 1	µg/dL	3.5	3.6		
	1 - 2	µg/dL	5.5	5.5		
	2 - 3	µg/dL	5.5	5.6	Mean blood lead level in children of	
Geometric mean blood	3 - 4	µg/dL	4.9	5.0	age group of 1-3 years has the highest predicted blood lead level but is below the adopted BLL of 10 µg/dL.	
	4 - 5	µg/dL	4.6	4.7		
lead level	5 - 6	µg/dL	4.4	4.5		
	6 - 7	µg/dL	4.2	4.2		
	0 - 7	µg/dL	4.6	4.7	Mean blood lead level in children of age 0-7 years.	
Percent above the target	0 - 7	%	5	5.4	NHMRC guidelines require that at least	
Percent below the target	0 - 7	%	95	94.6	95% of the Australian population should be below the target blood lead level.	

Table 10-1: Summary of IEUBK modelling results for SSGVs, HIL-A and HIL-C

Table 10-2: Summary of ALM modelling results

ALM Output Description	Units	Output Value (HILD – 4000 mg/kg)	Comments
Geometric mean blood lead of adult worker (female of reproductive capacity)	µg/dL	4.5	This value applies to females of reproductive capacity. However, if it is assumed that model default input parameters also apply to 'males and females not of reproductive capacity' then this value would be a good estimate of their blood lead concentration. Value is below target of 10 µg/dL.
95th percentile blood lead among foetuses of adult workers	µg/dL	10.8	This is the expected blood lead concentration against a target of 10 μ g/dL. The estimated blood lead level is slightly exceeded due to rounding-off of the SSGV.
Probability that foetal blood lead exceeds target blood lead (assuming lognormal distribution)	%	6.4	This is the expected probability that foetuses of exposed sensitive onsite workers exceed the target value of 10 µg/dL. NHMRC guidelines require that at least 95% of the Australian population should be below the target blood lead level. Therefore, acceptable probability for exceeding the target is 5%. The estimated probability is slightly exceeded due to rounding-off of the SSGV.

11. Uncertainty and Sensitivity

The SSGVs were mainly developed by updating the bioaccessibility estimate from NEPM assumptions. Therefore, only parameters relating to bioavailability measurements are discussed here. NEPM (2013) and references therein should be consulted for uncertainties and sensitivities relating to other modelling parameters.

A SSGV has been derived for land uses contemplated under HIL-A though Ramboll has only considered its application to the pre-school and school. The NSW EPA is providing guidance on private land and may consider this SSGV applicable to private residences.

The bioaccessibility of lead in soil in public areas was observed to range around 10% at the Eastern Embankment to maximums of around 74% in Foxlow Parklet. EnRisks (2011) states that where *only a minimal number of RBA samples are collected, and these show a large range of RBA values...such assessments defaults to the use of the maximum RBA values*. The Precinct bioaccessibility investigation included a comprehensive sampling of different areas of the Precinct with a total of 16 samples and therefore variability in soil lead bioaccessibility is considered to be well characterised. This means that Precinct users are likely to be exposed to soil with a range of bioavailability and is highly unlikely that someone (including children) are exposed to soils with highest bioaccessibility all of the exposure time.

Furthermore, note that bioaccessibility measurements are performed on $<250 \mu m$ soils samples to simulate soil particle sizes associated with hand-mouth action of children in the most sensitive age group (1–2-year-olds). Parts of the public areas where samples were collected from are grassed and therefore soil access is restricted. Hence the level of exposure assumed in a continuous long-term exposure model such as IEUBK is not likely to exist, at least from public areas.

Based on the above, a more realistic bioaccessibility estimate, commensurate with the expected level of exposure, would have been represented by 95% upper confidence limit (UCL) of mean or 80th percentile. A sensitivity analysis is presented in Table 11-1 to demonstrate the range of SSGVs that may result from such a consideration.

Bioaccessibility Statistics	Bioaccessibility value (%)	SSGV – HIL A (mg/kg)	SSGV – HIL C (mg/kg)	SSGV – HIL D (mg/kg)
Maximum	75	400	700	4000
95 th percentile	73.5	406	696	3750
80 th percentile	65	460	800	4200
95% UCL	50	600	1000	5500

Table 11-1: Sensitivity analysis of SSGVs from different bioaccessibility statistics.

*values for maximum biocc has been rounded-off

12. Conclusions

Site-specific lead guideline values (SSGVs) were developed using lead bioaccessibility data collected from various areas of the Precinct with target blood lead level of 10 μ g/dL. The following SSGVs were developed for different landuse scenarios using conservative estimates of overall soil bioavailability at the site:

- SSGV HIL A: 400 mg/kg
- SSGV HIL C: 700 mg/kg
- SSGV HIL D: 4000 mg/kg

The above SSGVs can be applied for screening assessment of soil concentrations within public spaces in the Precinct and to determine areas which require remediation and/or management. Marginal exceedance of these SSGVs may not constitute an immediate risk of adverse effects, however further investigation including exposure assessment may be warranted.

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14. Limitations

Ramboll prepared this letter report in accordance with the agreed scope of work for Regional NSW and in accordance with our understanding and interpretation of current regulatory standards in NSW, Australia.

The report has derived health-based site-specific guideline values (SSGVs) for lead based on currently available data and information about the site. Where such data is inadequate, the report has used protective assumptions in the derivation. The report has also assumed that there will not be any change in exposure scenario in the future. The outcomes of this report are based on the assumptions and calculations/modelling used for assessment of exposures. The SSGVs provided in this report should be used according to the guideline provided and apply only to exposure scenarios discussed in this report. The conclusions are applicable to the extent these assumptions remain relevant for the site.

The conclusions presented in this report represent Ramboll's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment. Ramboll did not independently verify all of the written or oral information provided to Ramboll during the course of this assessment. While Ramboll has no reason to doubt the accuracy of the information provided to Ramboll was itself complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

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Ramboll - Captains Flat Lead Management Plan - Derivation of Site Specific Guideline Values for Lead in Soil

APPENDIX 1 UNISA BIOACCESSIBILITY REPORT

University of South Australia



Assessment of Pb Bioaccessibility in Impacted Soil – Captains Flat

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INTRODUCTION

This report was prepared for Ramboll Pty Ltd to assess lead 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 in the < 2 mm and < 250 μm soil particle size fractions;
- Assess lead 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 in soil. The report was to include:
 - $_{\odot}$ Assessment of lead concentration in the < 2 mm and < 250 μm soil particle size fractions;
 - $\circ~$ Assessment of lead bioaccessibility in the < 250 μm soil particle size fractions using an in vitro method;
 - o Methodology procedures; and
 - QA/QC protocols

PROJECT BACKGROUND

Soil testing was initiated at the invitation of Ramboll Pty Ltd for an assessment of lead 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 concentration for each sample is shown in Table 1 while lead bioaccessibility results are shown in Tables 2 (SBRC-G lead bioaccessibility), 3 (SBRC-I lead bioaccessibility) and 4 (summary of data).

- Total lead concentration in the < 2 mm particle size fraction ranged from 1350 mg kg⁻¹ (QA201) to 104000 mg kg⁻¹ (R_S126a) (Table 1) with concentrations in the < 250 µm particle size fraction ranging from 1485 mg kg⁻¹ (QA201) to 91800 mg Pb kg⁻¹ (R_S126a) (Table 1).
- Lead bioaccessibility determined using gastric phase extraction (SBRC-G) ranged from 1.6% (R_S119a) to 80.1% (R_S148a) (Tables 2 and 4).
- When assays parameters were modified to reflect intestinal phase conditions (SBRC-I), lead bioaccessibility was reduced (0.1-40.0%), presumably as a result of re-adsorption of lead onto soil particles and / or precipitation at the neutral intestinal phase pH (Tables 3 and 4).
- Lead relative bioaccessibility (ReI-SBRC-I) was calculated by adjusting the solubility of lead from contaminated soil by the solubility of lead acetate at the corresponding intestinal phase pH value. Lead relative bioaccessibility ranged from 0.9% (R_S119a) to ~100% (R_S148a) (Table 4).
- Gastric phase lead bioaccessibility for QC1 was within an acceptable range for this reference material.

	ID #	< 2 mm so size fra	< 2 mm soil particle size fraction		< 250 µm soil particle size fraction	
Soli	ID #	Pb (mg kg ⁻¹)	Pb (mg kg ⁻¹) Mean Pb (mg kg ⁻¹)		Pb (mg kg ⁻¹)	Mean Pb (mg kg ⁻¹)
R_S117a	R_S117a-1 R_S117a-2	2610 2490	2550	R_S117a-3 R_S117a-4	3270 3230	3250
R_S118a	R_S118a-1 R_S118a-2	3620 3550	3585	R_S118a-3 R_S118a-4	2710 2730	2720
R_S119a	R_S119a-1 R_S119a-2	2240 2210	2225	R_S119a-3 R_S119a-4	2600 2560	2580
R_S120a	R_S120a-1 R_S120a-2	8630 8980	8805	R_S120a-3 R_S120a-4	9090 50800†	9090
R_S121a	R_S121a-1 R_S121a-2	52100 51200	51650	R_S121a-3 R_S121a-4	58100 40400	49250
R_S122a	R_S122a-1 R_S122a-2	5610 5140	5375	R_S122a-3 R_S122a-4	4420 5690	5055
R_S123a	R_S123a-1 R_S123a-2	4220 4390	4305	R_S123a-3 R_S123a-4	3870 3860	3865
R_S124a	R_S124a-1 R_S124a-2	22100 22300	22200	R_S124a-3 R_S124a-4	30600 30700	30650
R_S125a	R_S125a-1 R_S125a-2	7420 7420	7420	R_S125a-3 R_S125a-4	7540 7480	7510
R_S126a	R_S126a-1 R_S126a-2	102500 105500	104000	R_S126a-3 R_S126a-4	92600 91000	91800
R_S145a	R_S145a-1 R_S145a-2	3210 3170	3190	R_S145a-3 R_S145a-4	3130 3120	3125

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

R_S146a	R_S146a-1 R_S146a-2	1870 1920	1895	R_S146a-3 R_S146a-4	1960 1970	1965
R_S147a	R_S147a-1 R_S147a-2	30400 30400	30400	R_S147a-3 R_S147a-4	30800 30900	30850
R_S148a	R_S148a-1 R_S148a-2	44800 44000	44400	R_S148a-3 R_S148a-4	49200 48900	49050
R_S149a	R_S149a-1 R_S149a-2	4370 4140	4255	R_S149a-3 R_S149a-4	4440 4360	4400
QA201	QA201-1 QA201-2	1370 1330	1350	QA201-3 QA201-4	1500 1470	1485

[†]Data from sample R_S120a-4 was considered an outlier given Pb concentrations in R_S120a-1, R_S120a-2 and R_S120a-3 (plus XRF data) were ~5-fold lower. The value of 50800 mg kg⁻¹ was not used to calculate the average Pb concentration in R_S120a.

Soil	Sample #	ICP-AES Pb (mg l ⁻¹)	Soil:Solution Ratio	Dilution	Gastric Phase Pb Bioaccessibility	Mean Gastric Phase Pb Bioaccessibility
		((mg kg ⁻¹)	(mg kg ⁻¹)
R_S117a	S117a-G1 S117a-G2	0.221 0.227	100 100	10 10	221 227	224
R_S118a	S118a-G1 S118a-G2	1.99 2.03	100 100	10 10	1990 2030	2010
R_S119a	S119a-G1 S119a-G2	0.042 0.042	100 100	10 10	42 42	42
R_S120a	S120a-G1 S120a-G2	5.11 6.21	100 100	10 10	5110 6210	5660
R_S121a	S121a-G1 S121a-G2	30.9 29.6	100 100	10 10	30900 29600	30250
R_S122a	S122a-G1 S122a-G2	3.70 3.69	100 100	10 10	3700 3690	3695
R_S123a	S123a-G1 S123a-G2	0.838 0.642	100 100	10 10	838 642	740
R_S124a	S124a-G1 S124a-G2	6.61 7.42	100 100	10 10	6610 7420	7015
R_S125a	S125a-G1 S125a-G2	5.07 4.73	100 100	10 10	5070 4730	4900
R_S126a	S126a-G1 S126a-G2	58.0 46.8	100 100	10 10	58000 46800	52400
R_S145a	S145a-G1 S145a-G2	1.09 1.07	100 100	10 10	1090 1070	1080

 Table 2. Lead bioaccessibility in contaminated soils determined using gastric phase extraction (SBRC-G).

R_S146a	S146a-G1 S146a-G2	0.248 0.198	100 100	10 10	248 198	223
R_S147a	S147a-G1 S147a-G2	0.752 0.799	100 100	10 10	752 799	776
R_S148a	S148a-G1 S148a-G2	39.6 39.0	100 100	10 10	39600 39000	39300
R_S149a	S149a-G1 S149a-G2	0.555 0.575	100 100	10 10	555 575	565
QA201	QA201-G1 QA201-G2	0.817 0.830	100 100	10 10	817 830	824
QC1 [†]	QC1-G	4.76	100	10	4760	
QC2 [‡]	QC2-G	<0.001	-	10	<0.01	

[†]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).

Soil	Sample #	ICP-AES Pb (mg l⁻¹)	Soil:Solution Ratio	Dilution	Intestinal Phase Pb Bioaccessibility (mg kg ⁻¹)	Mean Intestinal Phase Pb Bioaccessibility (mg kg ⁻¹)
R_S117a	S117a-I1 S117a-I2	0.010 0.009	100 100	10 10	10 9.0	9.5
R_S118a	S118a-I1 S118a-I2	0.247 0.200	100 100	10 10	247 200	224
R_S119a	S119a-I1 S119a-I2	0.003 0.002	100 100	10 10	3.0 2.0	2.5
R_S120a	S120a-I1 S120a-I2	1.98 2.18	100 100	10 10	1980 2180	2080
R_S121a	S121a-I1 S121a-I2	13.1 13.2	100 100	10 10	13100 13200	13150
R_S122a	S122a-I1 S122a-I2	1.28 1.14	100 100	10 10	1280 1140	1210
R_S123a	S123a-I1 S123a-I2	0.091 0.089	100 100	10 10	91 89	90
R_S124a	S124a-I1 S124a-I2	1.27 1.70	100 100	10 10	1270 1700	1485
R_S125a	S125a-I1 S125a-I2	0.702 0.526	100 100	10 10	702 526	614
R_S126a	S126a-I1 S126a-I2	26.4 25.4	100 100	10 10	26400 25400	25900
R_S145a	S145a-I1	0.181	100	10	181	

 Table 3. Lead bioaccessibility in contaminated soils determined using gastro-intestinal phase extraction (SBRC-I).

	S145a-l2	0.155	100	10	155	168
R_S146a	S146a-I1	0.033	100	10	33	
	S146a-I2	0.032	100	10	32	33
R_S147a	S147a-I1	0.085	100	10	85	
	S147a-I2	0.098	100	10	98	92
R_S148a	S148a-I1	20.7	100	10	20700	
	S148a-l2	18.5	100	10	18500	19600
R_S149a	S149a-I1	0.023	100	10	23	
	S149a-I2	0.088	100	10	88	56
QA201	QA201-I1	0.114	100	10	114	
	QA201-I2	0.137	100	10	137	126
QC1 [†]	QC1-I	0.967	100	10	967	
0.001		0.040		10	0.40	
QC2+	QU2-I	0.019	-	10	0.19	

[†]QC1 comprised of a lead-contaminated (6400 mg Pb kg⁻¹) reference soil. [‡]QC2 comprised of SBRC intestinal phase solution without soil addition (assay blank).

Soil	Total Pb	In vitro	Pb Bioacc.	Pb Bioacc. [‡]
	(mg kg⁻¹)	Phase	(mg kg ⁻¹)	(%)
R_S117a	3250	SBRC-G	224	6.9
		SBRC-I	9.5	0.3
		Rel-SBRC-I*		2.8
R_S118a	2720	SBRC-G	2010	73.9
		SBRC-I	224	8.2
		Rel-SBRC-I*		79.6
R_S119a	2580	SBRC-G	42	1.6
		SBRC-I	2.5	0.1
		Rel-SBRC-I*		0.9
R_S120a	9090	SBRC-G	5660	62.3
		SBRC-I	2080	22.9
		Rel-SBRC-I*		60.8
R_S121a	49250	SBRC-G	30250	61.4
		SBRC-I	13150	26.7
		Rel-SBRC-I*		70.9
R_S122a	5055	SBRC-G	3695	73.1
		SBRC-I	1210	23.9
		Rel-SBRC-I*		63.6
R_S123a	3865	SBRC-G	740	19.1
		SBRC-I	90	2.3
		Rel-SBRC-I*		22.5
R_S124a	30650	SBRC-G	7015	22.9
		SBRC-I	1485	4.8
		Rel-SBRC-I*		12.9
R_S125a	7510	SBRC-G	4900	65.2
		SBRC-I	614	8.2
		Rel-SBRC-I*		21.7
R_S126a	91800	SBRC-G	52400	57.1
		SBRC-I	25900	28.2
		Rel-SBRC-I*		75.0
R_S145a	3125	SBRC-G	1080	34.6
		SBRC-I	168	5.4
		Rel-SBRC-I		52.0
R_S146a	1965	SBRC-G	223	11.3

Table 4. Total lead concentration and bioaccessible lead in contaminated soils (< 250 μm soil particle size fraction).

		SBRC-I Rel-SBRC-I	33	1.7 16.2
R_S147a	30850	SBRC-G	776	2.5
		SBRC-I	92	0.3
		Rel-SBRC-I		2.9
R_S148a	49050	SBRC-G	39300	80.1
		SBRC-I	19600	40.0
		Rel-SBRC-I		~100
R_S149a	4400	SBRC-G	565	12.8
		SBRC-I	56	1.3
		Rel-SBRC-I		12.3
QA201	1485	SBRC-G	824	55.5
		SBRC-I	126	8.5
		Rel-SBRC-I		82.0
QC1 ^Ω	6400	SBRC-G	4760	74.4 ^Ω
		SBRC-I	938	14.7
		Rel-SBRC-I		~100

[‡]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.

*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.

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

REFERENCES

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- 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.

Soil samples

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

Assessment of total lead concentration in the < 2 mm and < 250 µm soil fractions

Total lead concentration in the < 2 mm and < 250 μ m soil fractions were determined by ALS Geochemistry. A copy of the ALS Geochemistry analytical report is included in Appendix 3.

Assessment of lead 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 HCI) 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 μ m filters and analysed by ICP-MS.

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 μ m filters and analysed by ICP-MS. Gastric and intestinal phase extractions were performed in triplicate for each soil sample. 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 Environmental; a copy of the ALS Environmental analytical report is included in Appendix 3.

QA/QC procedures

ALS Environmental conducted the analysis for total and bioaccessible lead concentrations for all samples. ALS Environmental 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 Lead-contaminated (6400 mg Pb kg⁻¹) reference soil.
- b. QC2 SBRC solution without soil addition (assay blank).

APPENDIX 2 – CHAIN OF CUSTODY FORMS

Ramboll - Captains Flat Lead Management Plan - Derivation of Site Specific Guideline Values for Lead in Soil

APPENDIX 2 SSGV - HIL A

Find Soil Pb Concentration	×
Select Age Group for Graph 0 to 84 months V	Find Cancel Help?
Parameter Change	Please note
Change Cutoff 10 µg/dl Change GSD (Geometric Standard Deviation) 1.6	Depending on the values entered, calculating the
Probability of Exceeding the Cutoff (PC) 5 %	PRG may take a few moments.
Soil and/or Dust Concentration 399 PPM	
TRW Homepage: <u>http://www.epa.gov/superfund/health/contaminar</u>	its/lead/index.htm

These IEUBK Model results are valid as long as they were produced with an official, unmodified version of the IEUBK Model with a software certificate.

While IEUBK Model output is generally written with three digits to the right of the decimal point, the true precision of the output is strongly influenced by least precise input values.

Model Version: 2.0 Build1 User Name: Anand Chandra Date: 15 November 2021 Site Name: Captains Flat Operable Unit: Ramboll Australia Run Mode: Site Risk Assessment

Air Data

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor. Other Air Parameters:

Month	Time Outdoors	Ventilation Rate	Lung Absorption	Outdoor Air Pb Conc
	(hours)	(m³/day)	(%)	(µg Pb/m³)
6-12	1.000	3.216	32.000	0.100
12-24	2.000	4.970	32.000	0.100
24-36	3.000	6.086	32.000	0.100
36-48	4.000	6.954	32.000	0.100
48-60	4.000	7.682	32.000	0.100
60-72	4.000	8.318	32.000	0.100
72-84	4.000	8.887	32.000	0.100

****** Diet ******

Month	Diet Intake(µg/day)

6-12	5.100
12-24	5.800
24-36	6.700
36-48	3.200
48-60	3.600
60-72	4.100
72-84	4.700

****** Drinking Water ******

• • • •	
12-24	0.308
24-36	0.356
36-48	0.417
48-60	0.417
60-72	0.417
72-84	0.480

Drinking Water Concentration: 0.700 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used Average multiple source concentration: 280.050 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700 Outdoor airborne lead to indoor household dust lead concentration: 0.500 Use alternate indoor dust Pb sources? No

Month	Soil (µg Pb/g)	House Dust (µg Pb/g)
6-12	400.000	280.050
12-24	400.000	280.050
24-36	400.000	280.050
36-48	400.000	280.050
48-60	400.000	280.050
60-72	400.000	280.050
72-84	400.000	280.050

****** Alternate Intake ******

Month Alternate (µg Pb/day)

6-12	0.600
12-24	0.600
24-36	0.600
36-48	0.600
48-60	0.600
60-72	0.600
72-84	0.600

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

CALCULATED BLOOD LEAD AND LEAD UPTAKES:

***************************************	*

Month	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
6-12	0.034	2.365	0.278	0.159
12-24	0.057	2.557	0.265	0.095
24-36	0.075	2.997	0.268	0.111
36-48	0.093	1.467	0.275	0.134
48-60	0.102	1.667	0.278	0.135
60-72	0.111	1.912	0.280	0.136
72-84	0.118	2.201	0.281	0.157
Month	Soil+Dust	Total	Blood	
	(µg/day)	(µg/day)	(µg/dL)	
6-12	3.785	6.621	3.5	
12-24	11.244	14.218	5.5	
24-36	11.408	14.860	5.5	
36-48	11.690	13.659	4.9	
48-60	11.811	13.993	4.6	
60-72	11.895	14.334	4.4	
72-84	11.944	14,703	4.2	

Ramboll - Captains Flat Lead Management Plan - Derivation of Site Specific Guideline Values for Lead in Soil

APPENDIX 3 SSGV -HIL C

Find Soil Pb Concentration	×
Select Age Group for Graph 0 to 84 months V	Find Cancel Help?
Parameter Change	Please note
Change Cutoff 10 µg/dl	Depending on the values entered,
Probability of Exceeding the Cutoff (PC) 5 %	calculating the PRG may take a few moments.
Soil and/or Dust Concentration 683 PPM	
TRW Homepage: <u>http://www.epa.gov/superfund/health/contaminan</u>	ts/lead/index.htm

These IEUBK Model results are valid as long as they were produced with an official, unmodified version of the IEUBK Model with a software certificate.

While IEUBK Model output is generally written with three digits to the right of the decimal point, the true precision of the output is strongly influenced by least precise input values.

Model Version: 2.0 Build1 **User Name: Anand Chandra** Date: 15 November 2021 Site Name: Captains Flat **Operable Unit: Ramboll Australia** Run Mode: Site Risk Assessment **#** Alternate Source Data From Recreational water expsoure # GI Values + Bioavailability Data **Rec Water 50%** # GI Values + Bioavailability Data Ν # GI Values + Bioavailability Data Yes # GI Values + Bioavailability Data Υ # GI Values + Bioavailability Data Yes # Soil/Dust Data Check

****** Air ******

Indoor Air Pb Concentration: 0.000 percent of outdoor. Other Air Parameters:

Time Outdoors	Ventilation Rate	Lung Absorption	Outdoor Air Pb Conc
(hours)	(m³/day)	(%)	(µg Pb/m³)
1.000	3.216	32.000	0.100
2.000	4.970	32.000	0.100
2.000	6.086	32.000	0.100
2.000	6.954	32.000	0.100
2.000	7.682	32.000	0.100
2.000	8.318	32.000	0.100
2.000	8.887	32.000	0.100
	Time Outdoors (hours) 1.000 2.000 2.000 2.000 2.000 2.000 2.000	Time Outdoors (hours)Ventilation Rate (m³/day)1.0003.2162.0004.9702.0006.0862.0006.9542.0007.6822.0008.3182.0008.887	Time Outdoors (hours)Ventilation Rate (m³/day)Lung Absorption (%)1.0003.21632.0002.0004.97032.0002.0006.08632.0002.0006.95432.0002.0007.68232.0002.0008.31832.0002.0008.88732.000

****** Diet ******

Month	Diet Intake(µg/day)
6-12	5.100
12-24	5.800
24-36	6.700
36-48	3.200
48-60	3.600
60-72	4.100
72-84	4.700

****** Drinking Water ******

Water	Consumption:
Month	Water (L/day)

6-12	0.490
12-24	0.308
24-36	0.356
36-48	0.417
48-60	0.417
60-72	0.417
72-84	0.480

Drinking Water Concentration: 0.700 µg Pb/L

****** Soil & Dust ******

Month	Soil (µg Pb/g)	House Dust (µg Pb/g)
6-12	700.000	0.000
12-24	700.000	0.000
24-36	700.000	0.000
36-48	700.000	0.000
48-60	700.000	0.000
60-72	700.000	0.000
72-84	700.000	0.000

****** Alternate Intake ******

Month Alternate (µg Pb/day)

 6-12
 0.600

 12-24
 0.600

 24-36
 0.600

 36-48
 0.600

 48-60
 0.600

 60-72
 0.600

 72-84
 0.600

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

CALCULATED BLOOD LEAD AND LEAD UPTAKES:

Month	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
6-12	0.004	2.362	0.278	0.159
12-24	0.013	2.551	0.264	0.095
24-36	0.016	2.990	0.268	0.111
36-48	0.019	1.464	0.274	0.134
48-60	0.020	1.664	0.277	0.135
60-72	0.022	1.909	0.279	0.136
72-84	0.024	2.198	0.281	0.157
Month	Soil+Dust	Total	Blood	
	(µg/day)	(µg/day)	(µg/dL)	
6-12	3.891	6.694	3.6	
12-24	11.544	14.466	5.5	
24-36	11.716	15.101	5.6	
36-48	12.009	13.899	5.0	
48-60	12.135	14.232	4.7	
-------	--------	--------	-----	
60-72	12.224	14.571	4.5	
72-84	12.276	14.936	4.2	

Ramboll - Captains Flat Lead Management Plan - Derivation of Site Specific Guideline Values for Lead in Soil

APPENDIX 4 SSGV HIL - D

Calculations of Preliminary Remediation Goals (PRGs) for Soil in Nonresidential Areas U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee Version date 06/14/2017

EDIT RED CELLS

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009- 2014	GSDi and PbBo from Analysis of NHANES 2007-2010	GSDi and PbBo from Analysis of NHANES 1999-2004	GSDi and PbBo from Analysis of NHANES III (Phases 1&2)
PbB _{fetal} , 0.95	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	10	10	10	10
R _{fetal/maternal}	Fetal/maternal PbB ratio		0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL	0.4	0.4	0.4	0.4
		per ug/day				
GSDi	Geometric standard deviation PbB		1.8	1.7	1.8	2.1
PbB ₀	Baseline PbB	µg/dL	0.6	0.7	1.0	1.5
IR _s	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.025	0.025	0.025	0.025
AF _{s, D}	Absorption fraction (same for soil and dust)		0.15	0.15	0.15	0.15
EF _{s, D}	Exposure frequency (same for soil and dust)	days/yr	240	240	240	240
AT _{S, D}	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PRG in Soil for no more than 5	% probability that fetal PbB exceeds target PbB	ppm	3,675	3,996	3,270	1,803

Calculations of Blood Lead Concentrations (PbBs) and Risk in Nonresidential Areas

U.S. EPA Technical Review Workgroup for Lead

Version date 06/14/2017

Edit Red Cells

Variable	Description of Variable	Units	GSDI and PbBo from Analysis of NHANES 2009- 2014	GSDI and PbBo from Analysis of NHANES 2007- 2010	GSDI and PbBo from Analysis of NHANES 2004- 2007	GSDI and PbBo from Analysis of NHANES III (Phases 1&2)
PbS	Soil lead concentration	µg/g or ppm	4000	3675	3675	3675
R _{fetal/maternal}	Fetal/maternal PbB ratio		0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per ug/dav	0.4	0.4	0.4	0.4
GSD _i	Geometric standard deviation PbB		1.8	1.7	1.8	2.1
PbB ₀	Baseline PbB	µg/dL	0.6	0.7	1.0	1.5
IR _S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.025	0.025	0.025	0.025
IR _{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day				
Ws	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil					
K _{SD}	Mass fraction of soil in dust					
AF _{S, D}	Absorption fraction (same for soil and dust)		0.15	0.15	0.15	0.15
EF _{S, D}	Exposure frequency (same for soil and dust)	days/yr	240	240	240	240
AT _{S, D}	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB _{adult}	PbB of adult worker, geometric mean	µg/dL	4.5	4.3	4.6	5.1
PbB _{fetal} , 0.95	95th percentile PbB among fetuses of adult workers	µg/dL	10.8	9.3	10.9	15.6
PbBt	Target PbB level of concern (e.g., 2-8 ug/dL)	µg/dL	10.0	10.0	10.0	10.0
P(PbB _{fetal} > PbB _t)	Probability that fetal PbB exceeds target PbB, assuming lognormal distribution	%	6.4%	3.8%	6.8%	14.8%

APPENDIX 8 CAPTAINS FLAT PRECINCT INTERIM WATER USE GUIDELINES

CAPTAINS FLAT LEAD MANAGEMENT PLAN – INTERIM WATER USE GUIDELINES

Project name **Captains Flat Lead Management Plan** Project no. 318001193 Recipient **Department of Regional NSW** Document type Technical Note Version 0 25/11/2021 Date **Anand Chandra** Prepared by Checked by Stephen Maxwell Approved by **Rowena Salmon**

Summary

These Interim Water Use Guidelines should be read in conjunction with the Conceptual Site Model Captains Flat Lead Management Plan (Ramboll 2021) and have been prepared as guidance to manage risks associated with exposure to contaminants from historic mining during use of public waters at Captains Flat. It is anticipated that these interim guidelines will be reviewed after mine site rehabilitation and abatement measures proposed for public lands within Captains Flat.

A water treatment plant and reticulated watermains provide potable water within Captains Flat. Ramboll understands treated public water quality is managed under the NSW Health Drinking Water Monitoring Program. The quality of treated public water supply is not considered further in these guidelines.

Surface waters in the Precinct consist predominantly of the local water supply dam and the Molonglo River. They also consist of tributaries to Molonglo River such as Copper Creek and drainage lines primarily associated with acidic water discharges. A water use survey conducted in the Precinct indicated that surface waters are used mainly for primary contact recreation such as swimming and secondary contact recreation such as fishing, pet washing and livestock watering. Potable use of water (drinking and cooking) is primarily obtained from a reticulated water supply where available and rainwater tanks. Regular potable use of surface waters including untreated water from the local water supply dam should generally be avoided. However, exposure risks associated with contaminants from historic mining practices that may occur through occasional potable use of untreated water from the local water supply dam are low.

A summary of the maximum frequencies and durations for use of Precinct surface waters (Local water supply dam, Molonglo River and Copper Creek) to limit risk from exposure to contaminants associated with historic mining practices to acceptable levels are provided in **Table 6-1** of this report. The recommended frequencies and durations are not different from the current usage pattern as indicated by the water use survey. Hence there may not be a need to alter the current usage pattern of surface waters in the Precinct. However, contact with acidic discharge waters which are associated with discoloured water and/or sediments (yellow-orange) should be avoided where possible.

Responses to the water use survey indicate that groundwater within the Precinct is currently not being extracted for any use; however, any future extraction bore should be licensed and water quality tested to assess suitability for the intended use.

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4. 4.1	Exposure Adjusted Recreational Guideline Value Precinct Groundwater	4 Error! Bookmark not defined.
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APPENDICES

Appendix 1

Validation of Exposure Adjusted Recreational Guideline value

1. Introduction

A water use survey was recently conducted to better understand how surface water is being used within the Precinct. The survey results generally indicates that exposure to surface waters within the Precinct occurs via primary and secondary contact recreational activities such as swimming, fishing, agricultural use and washing of pets. There is some indication that untreated water from the water supply dam is being used for drinking and/or potable purposes during camping in the area. Regular potable use of untreated surface waters within the Precinct is not recommended and residents should rely on reticulated water and/or rainwater where available.

Surface waters within the Precinct consists of:

- 1) Local water supply dam
- 2) Molonglo River
- 3) Copper Creek
- 4) Various drainage lines such as main adit spring, acidic discharge drainage and smaller tributaries.

The water use survey also indicates that groundwater within the Precinct is not being used for any purposes.

The water use guidelines developed in this report therefore considers potential exposures to the above surface water bodies. Additional consideration is included for potential future exposures to groundwater.

Recommendations are provided to limit exposure risks to contaminants associated with historic mining as identified in the Conceptual Site Model Captains Flat Lead Management Plan (Ramboll 2021) and do not apply to any other risk (eg: biological contamination).

2. Objectives

The objective of this report is to develop interim guidelines that appropriately limit contaminant exposure risks related to historic mining during use of public water within the Precinct.

3. Exposure Pathways

Exposure pathways (identified from water use survey) relevant for surface water use guidelines presented in this report are:

- Primary contact recreational:
 - Swimming adults and children are likely to swim in surface waters at locations which are suitable for swimming.
 - Recreational drinking adults and children may also occasionally use water from the local water supply dam to drink and/or cook whilst camping.
- Secondary contact recreational:
 - Fishing adults and children are likely to fish in surface waters at locations which are suitable for fishing.
 - Washing pets adults and children may use surface water to wash pets at suitable locations. While this may not be a recreational activity, exposure is considered to be similar to secondary contact recreational.
 - Washing pets adults and children may use surface water to wash pets at suitable locations. While this may not be a recreational activity, exposure is considered to be similar to secondary contact recreational.

 Livestock watering – adults may use surface water from suitable locations to provide stock watering needs. While this may not be a recreational activity, exposure is considered to be similar to secondary contact recreational.

Frequent long-term use of surface waters from the Precinct for potable purposes such as drinking and cooking is not considered to be a complete exposure pathway (source-pathway-receptor) as residents in the precinct either have reticulated water or use rainwater tank. As noted above the only drinking/potable use scenario considered is while camping near the water supply dam.

The water usage survey indicates that none of the respondents are extracting groundwater within the Precinct for potable or non-potable use. In addition, based on a search of the DR NSW Geoscience MinView GIS portal conducted by Ramboll on 25/11/2021 there are no registered groundwater bores within the Precinct. This data appears current to November 2018 and further confirmation of groundwater extraction within the Precinct is recommended.

4. Exposure Adjusted Recreational Guideline Values

Exposure adjusted recreational guideline values (EARGV) were calculated for some contaminants for which default guideline values were exceeded, using the approach of NHMRC (2019). **Table 4-1** shows the derivation of EARGV and Appendix 1 provides a validation of the derivation approach against water use survey results.

Analyte	Toxicity	TDI (mg/kg- bw/day)	Ingestion volume (L/event)	Event Frequency (events/year)	Body Weight (kg)	Proportion of intake from water	Exposure Adjusted Recreational GV	Comments
Cadmium	Threshold	0.0007	0.2	150	70	0.1	0.06	Based on NHMRC, NMMRC (2011)
Cobalt	Threshold	0.0003	0.2	150	70	0.1	0.03	Based on USEPA Regional Screening Levels. Assumed 10% of TDI
Iron	Threshold	0.7	0.2	150	70	0.2	119	Based on USEPA Regional Screening Levels. Assumed 20% of TDI
Lead - child	Threshold	0.0035	0.1	150	13	0.2	0.22	Based on NHMRC, NMMRC (2011). 1L/d based on children and therefore 10% (100 mL) recreational intake
Lead - adult	Threshold	0.0035	0.2	150	70	0.2	0.60	Adopted child (infant) TDI from NHMRC, NMMRC (2011)
Manganese	Threshold	10 mg/day	0.2	150	70	0.1	12	Based on NHMRC, NMMRC (2011)
Zinc	Threshold	0.3	0.2	150	70	0.1	26	Based on USEPA Regional Screening Levels Assumed 10% of TDI

Table 4-1: Exposure adjusted recreational guideline values.

TDI – tolerable daily intake

EARGVs were generally calculated using an exposure frequency of 150 events per year with an average ingestion rate of 200 mL/day (or per event, assuming one event per day). For lead the EARGV was based on exposure to children as the most sensitive receptor, which included 150 events per year with an average ingestion rate of 100 mL/day. Therefore, adults were assumed to have incidental ingestion of 30 L of water per year while children were assumed to have 15 L of water per year.

Average water ingestion rates were assumed to be 10% of the drinking water ingestion rates provided in the Australian Drinking Water Guidelines (NHMRC, NRMMC 2011). The NHMRC, NRMMC (2011) states that the 'World Health Organization (WHO) has estimated that adults consume an average of 2 L of water per day, and this figure is believed to be an appropriate average figure for Australia'. For contaminants that have effects based on exposure to children e.g., lead, NHMRC, NRMMC (2011) uses 1 L as the average water intake rate. As the Precinct surface waters are not used for long-term potable purposes, the use of intake rates based on recreational exposure scenario is considered to be most appropriate. Note that while a conservative intake rate of 10% drinking water intake rate was used for calculating the EARGV, the Australian Exposure Factors Guidance (enHealth 2012) provides more realistic recommendations for incidental water ingestion rates by adults and children in a recreational water exposure scenario. As the Australian Drinking Water Guidelines are based on average water intake volumes, average intake rates from enHealth (2012) was adopted in this assessment.

5. Exposure Assessment

5.1 Exposure Assessment based on Contaminant Concentrations

Water quality data were collected from various different surface waters present in the Precinct. The following summarises the results of total metal concentrations screened against EARGV:

- Molonglo River no exceedance at any sampling location
- Local water supply dam no exceedance at any location
- Copper Creek exceedances were found
- Drainage lines and other tributaries to Molonglo River exceedances were found

The exceedances found within Copper Creek and drainage lines are further summarised and discussed in Table 5-1 below. The maximum magnitude of exceedance of the recreational guideline for any of the metals listed is considered to be low (7-times exceeded for lead). Furthermore, the higher metal concentrations in drainage lines appear to be associated with acidic discharge and such locations are not suitable for recreational water activities. Where drainage lines discharge into Molonglo River, no downstream exceedance is noted most likely due to change in pH (and chemistry) within the river together with dilution. Where drainage lines enter Copper Creek, some exceedance of lead EARGV are noted. As the drainage lines are not suitable locations for recreational activities, with restricted access especially for young children, any potential exposure would be considered to be rare or infrequent. Copper Creek however is accessible by landowners only (not general public) and has potential for secondary contact recreational activities.

Metals	Concen	trations (mg/L)					
	Cd	Co	Fe	Mn	Pb	Zn	Notes	Potential for Exposure
Rec Criteria	0.06	0.03	119	12	0.2	26		
SW5	0.1	0.086	150		1.2	120	Location is the main adit spring which feeds directly into Molonglo River via a 50 m long channel. No exceedances noted in downstream samples from Molonglo River. There is no public access as it is located behind the STP. Any access and therefore contact is expected to be minimal (incidental) and not likely to be suitable for swimming or any other recreational water activity	Rare / infrequent - secondary contact
SW6					0.29		Part of Copper Creek downstream from the rail corridor. The area has little or no public access and not likely to be suitable for swimming or any other recreational water activity	Rare / infrequent - secondary contact
SW7					0.3		Part of Copper Creek upstream from the rail corridor. This area is part of private land used for rural residential / hobby farm with pigs, goats and chickens. There is no public access, but potential exists for secondary contact of site users with surface water relating to irrigation, pet washing and stock watering. The location is not likely to be suitable for frequent swimming activities.	Frequent - secondary contact
SW8	0.11	0.04			1.2	67	Part of drainage line downstream from the rail corridor leading into Copper Creek. The area has little or no public access and not likely to be suitable for swimming or any other recreational water activity	Rare / infrequent - secondary contact
SW9	0.16	0.04			1.3	95	Part of drainage line upstream from the rail corridor leading into Copper Creek. The area has little or no public access and not likely to be suitable for swimming or any other recreational water activity	Rare / infrequent - secondary contact
SW12		0.13		14		67	Part of a drainage line leading into Molonglo River. The area is accessible to the public but is not suitable for any recreational water activity including swimming, fishing, pet washing or livestock watering. Any contact with waters in this drainage line is expected to be incidental.	Rare / infrequent - secondary contact

Table 5-1: Metal concentrations and locations where recreational guideline values were exceeded together with potential for exposure.

5.2 Precinct Groundwater

Filtered groundwater concentrations of metals were collected from various locations in the Precinct. Assessment of the filtered concentrations against drinking water guidelines values and EARGV suggests that Precinct groundwater is unsuitable for direct use for potable and non-potable purposes. Filtered samples may under-represent metals in groundwater which may also be associated with mobile colloidal particles greater than the filter size (0.45 μ m) and therefore can also be consumed via drinking and/or incidental ingestion during activities such as irrigation, stock watering and bathing/washing. Furthermore, groundwater quality was seen to vary across the Precinct and therefore groundwater concentrations of metals at any future extraction bore cannot be predicted. Any future extraction bores must be appropriately licensed and water quality tested to verify suitability for the intended use.

5.3 Exposure Assessment Based on Intake Volume

An exposure assessment has been completed comparing incidental intake volumes for exposure pathways developed integrating water usage survey results against Tolerable Daily Intakes (TDIs) adopted in development of the EARGV. The total mean incidental water intake volumes (30L/year for adults and 15 L/year for children) are considered to be safe intake volumes that will not exceed the proportion of TDI (tolerable daily intake) allowed for water intake for each contaminant. Recommended exposure frequencies and durations were designed to yield lower mean intake volumes compared to that used in the derivation of EARGV, as well as providing a safety net for any higher exposure frequencies. The exposure assessment and recommended water use frequencies and durations are provided in **Table 5-2** and Table 5-3 for all considered exposure pathways except recreational drinking from the local water supply dam which is considered separately under Section 5.3.1.

Table 5-2: Recommended	recreational surface	water exposure	frequencies and	durations for adults
	i cei cational sallace	mater exposure	in equencies una	adiations for addits

Exposure media	Pathway	Туре	Receptor	Recommended Exp Frequency (events / year)	Recommended Event Duration (minutes per event)	Mean Water intake volume (L) per event (hour)	Mean Yearly volume intake (L)	Notes
Surface Water - Molonglo River, Local Water Supply Dam and Copper Creek	Swimming	Primary contact	Adults	120	60	0.025	3	The recommended exp events per year and is water use survey. Exp event and this is highe Water intake rates per intake volumes during
	Fishing	Secondary contact	Adults	120	60	0.0025	0.3	The recommended exp events per year and is water use survey. Expo event and this is highe Secondary contact inta contact intake volume. estimate of water inges kayaking and fishing) o
	Washing pets	Secondary contact	Adults	240	60	0.0025	0.6	The recommended exp events per year and is water use survey. Exp event and this is highe Secondary contact inta contact intake volume. estimate of water inges kayaking and fishing) o
	Livestock watering	itering Secondary contact Adults 240 60 0.0025						The recommended exp events per year and is the water use survey. I per event and this is hi respondents. Secondar primary contact intake mean estimate of wate (canoeing, kayaking ar mL.
	4.5 (6.75 for Copper Creek)	Based on the mean int frequencies of exposur contaminants from rec frequencies are conser frequencies of any indi such individuals did no						

posure frequency has conservatively been put at 120 s higher than most exposure frequencies stated in the posure duration has been assumed to be 1 hour per er than the duration stated in the survey. r hour is based on enHealth (2012) recommended s swimming for adults.

posure frequency has conservatively been put at 120 s higher than most exposure frequencies stated in the posure duration has been assumed to be 1 hour per er than durations described by survey respondents. take volume has been adopted as 10% of primary e. Note that Dorevitch et al. (2011) provides mean estion during limited-contact recreation (canoeing, on surface waters as approximately 3-4 mL.

posure frequency has conservatively been put at 240 s higher than most exposure frequencies stated in the posure duration has been assumed to be 1 hour per er than durations described by survey respondents. ake volume has been adopted as 10% of primary e. Note that Dorevitch et al. (2011) provides mean estion during limited-contact recreation (canoeing, on surface waters as approximately 3-4 mL.

posure frequency has conservatively been put at 240 s higher than majority exposure frequencies stated in Exposure duration has been assumed to be 1 hour higher than durations described by survey rry contact intake volume has been adopted as 10% of e volume. Note that Dorevitch et al. (2011) provides er ingestion during limited-contact recreation nd fishing) on surface waters as approximately 3-4

take volumes, adults can safely engage in higher re without exceeding the allowable daily intake of creational exposure. The recommended exposure rvative and provides a level of safety net if exposure lividuals get higher than recommended, especially if ot take part in the survey. Ramboll - Captains Flat Lead Management Plan - Interim Water Use Guidelines

Exposure media	Pathway	Туре	Receptor	Recommended Exp Frequency (events / year)	Recommended Event Duration (minutes per event)	Mean Water intake volume (L) per event (hour)	Mean Yearly volume intake (L)	Notes
Surface Water - Molonglo River, Local Water Supply Dam and Copper Creek	Swimming	Primary contact	Children	120	60	0.05	6	The recommended exp events per year and is the water use survey. per event and this is hi rates per hour is based during swimming for cl and intake rate is expe that young children in throughout the year ar Based on this the recommins.
	Fishing	Secondary contact	Children	120	60	0.005	0.6	The recommended exp events per year and is the water use survey. per event and this is h contact intake volume rate Note that Dorevito ingestion during limiter on surface waters as a children in the most se this activity and durati this the recommended
	Washing pets	Secondary contact	Children	240	60	0.005	1.2	The recommended exp events per year and is the water use survey. per event and this is hi contact intake volume rate. Note that Dorevit ingestion during limited on surface waters as a children in the most see this activity and durati this the recommended
	Livestock watering	Secondary contact	Children	0	0	0.005	0	Children, especially you unlikely to frequently e recommendations are
		7.8 (11.7 for Copper Creek)	Based on the mean int frequencies of exposur contaminants from rec scenarios considered w The recommended exp level of safety net if ex recommended, especia					

posure frequency has conservatively been put at 120 is higher than majority exposure frequencies stated in Exposure duration has been assumed to be 1 hour higher than duration stated in the survey. Water intake d on enHealth (2012) recommended intake volumes shildren. Note that rates are based on an hourly basis ected to be half if exposed only for 30mins. Also note the most sensitive age group are not likely to swim and durations are expected to be shorter than adults. Immended exposure duration for children is 30-60

posure frequency has conservatively been put at 120 is higher than majority exposure frequencies stated in Exposure duration has been assumed to be 1 hour higher than duration stated in the survey. Secondary has been adopted as 10% of primary contact intake ch et al. (2011) provides mean estimate of water ed-contact recreation (canoeing, kayaking and fishing) approximately 3-4 mL. Children, especially young ensitive age group are unlikely to frequently engage in ions are expected to be shorter than adults. Based on I exposure duration for children is 30-60 mins.

posure frequency has conservatively been put at 120 higher than majority exposure frequencies stated in Exposure duration has been assumed to be 1 hour igher than duration stated in the survey. Secondary has been adopted as 10% of primary contact intake tch et al. (2011) provides mean estimate of water d-contact recreation (canoeing, kayaking and fishing) pproximately 3-4 mL. Children, especially young ensitive age group are unlikely to frequently engage in ions are expected to be shorter than adults. Based on exposure duration for children is 30-60 mins.

ung children in the most sensitive age group are engage in this activity and therefore no provided

take volumes, children can safely engage in higher re without exceeding the allowable daily intake of reational exposure. Note that a 30 min exposure in all vill yield a mean water intake volume of ~4 L/year. bosure frequencies are conservative and provides a coposure frequencies of any individuals get higher than ally if such individuals did not take part in the survey. Exceedances were noted in Copper Creek, with lead concentrations (about 0.3 mg/L) exceeding the EARGV by about 1.5-times. Therefore, anyone undertaking recreational activities in Copper Creek would be expected to have lead intake at 1.5-times higher rate than comparative activities in either Molonglo River or Local water supply dam. This is equivalent to 1.5-times higher mean intake water volume. The following would apply to Copper Creek:

- Adults total average surface water intake volume for Copper Creek would be 4.5 L/year x 1.5 = 6.75 L/year.
- Children total average surface water intake volume for Copper Creek would be 7.8 L/year x 1.5 = 11.7 L/year.

As both the estimated intake volumes for adults and children are below the target volumes, then adults and children undertaking recreational activities in Copper Creek are also considered to be safe. Note that the above volume estimates for Copper Creek includes swimming exposure, although it may not be practical to swim in the creek.

The recommended exposure frequencies and durations are higher than the frequencies/durations stated in the water use survey for the majority of the participants. Therefore, there may not be a need to alter the current usage pattern of surface waters in the precinct. However, contact with acidic discharge waters which are associated with discolored water and/or sediments (yellow-orange) should be avoided.

5.3.1 Consumption of Water from the Water Supply Dam

The water use survey results indicated that some residents may be drinking untreated water from the water supply dam while camping. This may primarily relate to use for cooking, beverages e.g. tea and direct consumption. The water use is expected to be supplemented by other sources of water and drinks and therefore the following assumptions are considered to be reasonable for recreational drinking of dam waters:

- Adults 1 L per day while camping adopted as 50% of average drinking water intake volume (2 L/day) defined by NHMRC, NRMMC (2011). 50% of the remaining intake is considered to be supplemented by other sources of water eg. bottled water, water from reticulated supply and other bottled drinks.
- Children 0.5 L per day while camping adopted as 50% of average drinking water intake volume (1 L/day) defined by NHMRC, NRMMC (2011).

A camping frequency of 10-times per year is considered to be a reasonable estimate of camping being conducted by members of the public at the dam. Based on the rates of recreational drinking water the following can be concluded:

- Adults will consume about 10 L of untreated dam water. The total water intake volume allowing for incidental water ingestion from other possible recreational activities would be 14.5 L/year (10 L + 4.5 L). This total average volume of water ingestion is lower than that allowed for in derivation of EARGV, which is 30 L.
- Children will consume about 5 L of untreated dam water. The total water intake volume allowing for incidental water ingestion from other possible recreational activities would be 12.8 L/year (10 L + 7.8 L). This total average volume of water ingestion is lower than that allowed for in derivation of EARGV, which is 15 L.

6. Interim Water Use Guidelines

The recommended usage frequencies and duration of surface water in the precinct is summarised in Table 6-1.

Note:

- The water use guidelines consider exposure to users of the water such as adult and child residents. It does not consider exposure to pets, livestock or vegetation
- The water use guidelines do not consider cumulative exposures from water on private land
- Sediment related intake has not been considered for the water use guidelines. Sediment intake is
 considered to be negligible during primary and secondary contact activities and water use guidelines
 will also limit sediment exposure
- No recommendations for consumptions rates of fish and/or crustacean (prawns/yabbies) caught from the precinct surface waters can be made at this stage. Tissue concentrations from edible portions of these local food items is required before any such recommendations can be made.

	Water Use	Recom Frequenc	mended cy of Use	Re	commended Du	ration of Use	
Surface Water Body	Activity	Per month	Per Year	Per event (hours)	Per Month (hours)	Per Year (hours)	Recommendations
	Drinking (everyday)	0	0	0	0	0	Members of the public (adults and children) should use reticulated water.
	Recreational Drinking (Dam water only)	-	10	-	-	-	Members of the public should limit use of untreated dam water to 5-10 L per year for potable purposes. The lower volume is applicable to children.
Local water supply dam,	Swimming	10	120	0.5 - 1	5 - 10	60 - 120	Members of the public should limit swimming in Precinct surface waters to 10-times per month for 30 to 60 minutes. The lower duration is applicable to children.
Molonglo River and Copper Creek	Fishing	20	240	0.5 - 1	5 - 10	120 - 240	Members of the public should limit fishing in Precinct surface waters to 10-times per month for 30 to 60 minutes. The lower duration is applicable to children.
	Livestock watering	20	240	1	10	240	Members of the public should limit use of Precinct surface waters for livestock watering to 10-times per month for 60 minutes.
	Pet Washing	20	240	0.5 - 1	5 - 10	120 - 240	Members of the public should limit use Precinct surface waters for pet washing to 10-times per month for 30 to 60 minutes. The lower duration is applicable to children.
Various drainage lines - main adit spring, acidic discharge drainage and smaller tributaries.	None	0	0	0	0	0	Frequent contact with acidic discharge waters which are associated with discolored water and/or sediments (yellow- orange) should be avoided where possible

Table 6-1: Summary of the interim	water use guid	delines. Note that free	quencies and durations are	total for all o	of the surface water b	odies considered.

Ramboll - Captains Flat Lead Management Plan – Interim Water Use Guidelines

Surface Water Body	Water Use	Recommended Frequency of Use		Recommended Duration of Use			
	Activity	Per month	Per Year	Per event (hours)	Per Month (hours)	Per Year (hours)	Recommendations
Groundwater	Potable and non-potable	Exposure ass any future us	essment will	need to be condu	cted to determin	e suitability of	Any future groundwater extraction bore should be appropriately licensed with water quality tested to determine suitability for the intended use.

7. Uncertainties

The exposure assessment conducted in this report uses mean water intake rates provided by Australian Exposure Factors Guidance. The recommended mean intake rates are derived by local and overseas data. While such rates are considered to be applicable to the general population, variations in intake rates can exist. The recommended water use frequencies and durations allows for a safety net that may account for any large variations in intake rates during recreational activities. Note that water intake rates during swimming provided by enHealth (2012) includes all outdoor activities and therefore using additional rates to account for intake during secondary contact recreational activities is very conservative.

NHMRC, NRMMC (2011) allows for a 20% TDI for water sources of lead intake, as shown in **Table 7-1**. An estimate of lead daily intake (mg/day) is shown in for all sources of water intake, including incidental ingestion from primary and secondary recreational, recreational drinking and everyday drinking water. The concentrations adopted are for local water supply dam (0.017 mg/L) as a mid-point of historical concentration range of 0.03 – 0.003 mg/L (note recent Ramboll concentrations measured in dam waters were maximum of 0.005 mg/L total lead). Drinking water concentration (0.0007 mg/L) was obtained from NEPM (2013) as used in the derivation of relevant lead HILs. The calculated daily intake of lead from all sources of water does not exceed 20% of TDI and only contributes around 1% of TDI for adults and 3% for children.

It is noted that NHMRC, NRMMC (2011) currently uses a tolerable daily intake value of 0.0035 mg/kg/day that was originally adopted by World Health Organisation. This TDI was withdrawn by WHO in 2010 (WHO 2010) but is adopted in this assessment in the absence of any other value or approach provided by NHMRC, NRMMC (2011). The effects of lead exposure have often been evaluated based on the blood lead content, which is generally considered to be the most accurate means of assessing exposure. The relationship between acceptable TDI and blood lead levels is generally not available, especially within Australia. OEHHA (2009) determined that a daily lead intake from water ingestion of 2.86 μ g/day corresponds to a 1 μ g/dL increase in blood lead level. In other words, 2.86 μ g/day can be used as a benchmark for daily oral intake from water that corresponds to a level of concern for neurobehavioral effects in children, designated as a decrease of 1 IQ point. The calculated daily intake of lead from all water sources are below the value of 2.86 μ g/day. Therefore, water intake (hence lead intake) from recommended water usage guidelines is not likely to cause significant change in blood lead levels for residents of the Precinct.

Metal	TDI NHMRC, NRMMC	Child (13kg)	Adult (70kg)	Intake from all water sources (20% of TDI) (mg/day)			
	(2011) (mg/kg/day)	Intake (mg/day)	Intake (mg/day)	Child	Adult		
Lead	0.0035	0.0455	0.245	0.0091	0.049		

Table 7-1: Tolerable daily intake (TDI) for lead allowed from all water sources.

Table 7-2: Tolerable daily intake (TDI) for lead allowed from all water sources.

Receptor	Intake Source	Average Yearly Volume (L/year)	Lead Conc (mg/L)	Total Lead Intake from Water sources per year (mg/year)	Lead Intake per day (mg/day)	% of TDI
Adult	Incidental ingestion	4.5	0.017	0.0765	0.00021	0.09
	Recreational drinking	10	0.017	0.17	0.00047	0.2
	Everyday drinking (2L/d)	730	0.0007	0.511	0.0014	0.6
	Т	otal			0.0021	0.8
Children	Incidental ingestion	7.8	0.017	0.1326	0.00036	0.8
	Recreational drinking	5	0.017	0.085	0.00023	0.5
	Everyday drinking (1L/d)	365	0.0007	0.2555	0.0007	1.5
	T	otal			0.0013	2.8

8. Conclusion

The report provides an assessment of exposure to Precinct surface waters by adults and children. Recommendations on the safe usage (frequency and duration) of surface waters is also provided, although based on water use survey results, a change in current usage pattern may not be required. While groundwater within the precinct is currently not being extracted, future extraction bores need to be licensed and water quality tested. Furthermore, edible tissue concentrations of fish and crustaceans need to be measured to assess if any controls on consumption rate is required.

9. References

Dorevitch, S., Panthi, S., Huang, Y., Li, H., Michalek, A. M., Pratap, P., Wroblewski, M., Liu, L., Scheff, P. A. and Li, A. (2011). Water ingestion during water recreation. Water Research. 45 (5): 2020-2028

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NHMRC (2019) Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water, Canberra: National Health and Medical Research Council.

OEHHA (2009) Public Health Goals for Chemicals in Drinking Water: Lead. April 2009. California Environmental Protection Agency. Office of Environmental Health Hazard Assessment.

WHO 2010, Joint FAO/WHO Expert Committee on Food Additives (JECFA), Seventy-third meeting, Geneva, Summary and Conclusions, Issue 24.

10. Limitations

Ramboll prepared this letter report in accordance with the agreed scope of work for Regional NSW and in accordance with our understanding and interpretation of current regulatory standards in NSW, Australia.

The report has derived health-based recommendations for precinct surface water use based on currently available data and information about the site. Where such data is inadequate, the report has used protective assumptions in the derivation. The report has also assumed that there will not be any change in exposure scenario in the future. The outcomes of this report are based on the assumptions and calculations/modelling used for assessment of exposures. The interim water use guidelines provided in this report should be used according to the guideline provided and applies only to exposure scenarios discussed in this report. The conclusions are applicable to the extent these assumptions remain relevant for the site. Risks to site ecological receptors, pets or vegetation were not explicitly considered in this assessment.

The conclusions presented in this report represent Ramboll's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment. Ramboll did not independently verify all of the written or oral information provided to Ramboll during the course of this assessment. While Ramboll has no reason to doubt the accuracy of the information provided to Ramboll was itself complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

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Ramboll - Captains Flat Lead Management Plan - Interim Water Use Guidelines

APPENDIX 1 VALIDATION OF EXPOSURE ADJUSTED RECREATIONAL GUIDELINE VALUE



Validation of Exposure Adjusted Recreational Guideline Values

Table 1 shows the exposure assessment based on water use survey results. Average water intake volumes were calculated based on survey results and compared against average water intake volume used in exposure adjusted guideline values (Table 2 and Table 3). The water intake volume used for exposure adjusted recreational guideline values is higher and therefore is conservative and protective of all possible routes of exposure and different receptors. As such, exposure adjusted recreational guideline values can be used for screening assessment of surface water quality of the precinct. Table 1: Exposure assessment based on water use survey.

Exposure media	Pathway	Туре	Receptor	Exp Frequency (events / year)	Event Duration (minutes per event)	Mean Water intake volume (L) per event (hour)	Mean Yearly volume intake (L)	Notes
Local water supply dam	Swimming	Primary contact	Adults and children	120	10	0.05	6	Survey suggests swimming for less than 10 times per mont year. Maximum duration stated in the survey was 60 minute event. A value of 10 minutes per event can be adopted, how in 'exposure adjusted' recreation guideline values (GVs), he Water intake rates per hour is based on enHealth (2012) re Corresponding intake rates of adults are 0.025 L/hr. Note th secondary contact activities as shown below) occur for one duration to be much shorter. Also note that young children throughout the year and durations are expected to be short
	Fishing	Secondary contact	Adults and children	120	ND	0.005	0.6	Survey suggests less than 10-times per month. Conservativ considered. Maximum duration of activity from survey was intake volume has been adopted as 10% of primary contact provides mean and upper confidence estimates of water ing kayaking and fishing) on surface waters as approximately 3 young children in the most sensitive age group are unlikely to be conservative.
	Washing pets	Secondary contact	Adults and children	240	ND	0.005	1.2	Maximum frequency from the survey was 21-30 times per r frequency of less than 10-times per month. A representativ especially young children in the most sensitive age group ar included to be conservative.
	Livestock watering	Secondary contact	Adults	240	ND	0.005	1.2	Maximum frequency from the survey was 21-30 times per r frequency of less than 10-times per month. A representativ especially young children in the most sensitive age group a
Molonglo River	Swimming	Primary contact	Adults and children	120	10	0.05	6	Survey suggests swimming for less than 10 times per mont year. Survey suggests maximum swimming duration of mor minutes per event can be adopted, however note that even adjusted' recreation guideline values (GVs), hence does not young children in the most sensitive age group are unlikely
	Fishing	Secondary contact	Adults	240	ND	0.005	1.2	Survey data suggests maximum fishing duration of more th from the survey was 21-30 times per month. Note that maj 10-times per month. A representative value of 20-times per especially young children in the most sensitive age group an included to be conservative.
	Washing pets	Secondary contact	Adults	240	ND	0.005	1.2	Maximum frequency from the survey was 11-20 times per r frequency of less than 10-times per month. A representativ especially young children in the most sensitive age group an included to be conservative.
Groundwater	No pathway							None of the survey participants reported having groundwate

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th. Conservatively, this equals less than 120 times per es per month. This equates to about 6 minutes per wever note that event duration has not been included ence does not affect final calculated value. commended intake volumes for children. hat the adopted volumes assume swimming (and other hour. This is conservative as survey results suggests in the most sensitive age group are not likely to swim ter than adults. vely, a yearly frequency of <120-times can be more than 60 minutes per month. Secondary contact t intake rate. Note that Dorevitch et al. (2011) gestion during limited-contact recreation (canoeing, 8-4 mL and 10-15 mL respectively. Children, especially to frequently engage in this activity but are included month. Note that majority of the respondents reported e value of 20-times per month was adopted. Children, re unlikely to frequently engage in this activity but are month. Note that majority of the respondents reported ve value of 20-times per month was adopted. Children, re unlikely to frequently engage in this activity. th. Conservatively, this equals less than 120 times per re than 30 minutes per month in total. A value of 10 t duration has not been included in 'exposure t affect final calculated value. Children, especially to frequently engage in this activity. an 60 minutes per month. Maximum fishing frequency jority of the respondents reported fishing for less than month was adopted for Molonglo River. Children, re unlikely to frequently engage in this activity but are month. Note that majority of the respondents reported e value of 10-times per month was adopted. Children, re unlikely to frequently engage in this activity but are

er bore



Table 2: Comparison of yearly incidental water intake volume for adults and children except for lead.

Exposure Route Approach used for Exposure Adjusted Recreational GVs Local Water Supply Dam Molongly Exposure Route Receptor Intake Volume (L) Exposure Frequency per year Total yearly water intake volume (L) Mean yearly water intake volume (L) M	Molonglo River					
Exposure Route	Receptor	Intake Volume (L)	Exposure Frequency per year	Total yearly water intake volume (L)	Mean yearly water intake volume (L)	Mean yearly water intake volume (L)
Swimming					6	6
Fishing	Adults and children (except	0.2	150	20	0.6	1.2
Pet Washing	Adults and children (except for lead)	0.2	150	30	1.2	1.2
Livestock watering					1.2	-
Total		0.2	150	30	9	8.4

Table 3: Comparison of yearly incidental water intake volume for children for lead.

		Approach use	d for Exposure Adjı	sted Recreational GVs	Local Water Supply Dam	Molonglo River		
Exposure Route	Receptor	Intake Volume (L)	Exposure Frequency per year	Total yearly water intake volume (L)	Mean yearly water intake volume (L)	Mean yearly water intake volume (L)		
Swimming					6	6	Australian drinking water guidelines are b	
Fishing	Children (lead only)	0.1	150	15	0.6	1.2	recreational GV for lead is based on the v	
Pet Washing		(lead only)	0.1	150	15	1.2	1.2	volume assumed in the exposure adjuste
Livestock watering					-	-	will swim for long durations and partake f	
Total		0.1	150	15	7.8	8.4	recreational activities. The activity duration hour with a frequency of 150 days per ye recommends using a representative media outdoor activity) of 52 days/year (upper duration of 0.5 hours/day for general pop estimate of 75 hours per year). For childr year (2.25 hours per month) is recommen 18.7 % of Australian population participal Therefore, realistic upper estimates of ye L/hour x 75hours) for ≥5 year olds and 1 assumption used in the derivation of expo children, is more conservative than these on children has also been adopted for adu well. Note that no intake volumes are inco especially young children in the most sen this activity.	

Note:

- The above assessment considers the worst-case scenario where the same adults or children undertake all possible activities based on results from the survey.
- The assessment also suggests that individuals either are exposed to the local water supply dam or the Molonglo River, as exposure frequencies cited in Table 1 are considered to be maximum possible frequencies to • any surface water body. In reality, individuals may get exposed to both sources of surface water. However, the total frequency of exposure to any surface water is considered to remain same. For example: While the calculations in Table 1 suggests that an individual only swims in the Molonglo River for 120 days of the year, that individual can also swim in the water supply dam for a fraction of that time. That hypothetical individual may for example swim for 60 days of the year in Molonglo River and 60 days in water supply dam. As the total frequency of exposure still remains same (60 + 60 = 120 days/yr), total intake volumes would also remain same.

ND - no data/information;

References:

Dorevitch, S., Panthi, S., Huang, Y., Li, H., Michalek, A. M., Pratap, P., Wroblewski, M., Liu, L., Scheff, P. A. and Li, A. (2011). Water ingestion during water recreation. Water Research. 45 (5): 2020-2028 enHealth (2012) Australian Exposure Factor Guidance. Guidelines for assessing human health risks from environmental hazards. Department of Health and Ageing, GPO Box 9848, Canberra ACT 2601. Online ISBN: 978-1-74241-769-1

Note

based on average water intake volumes and therefore appropriate for comparison. Exposure adjusted alue derived for children assuming average water rinking water consumption). The total yearly intake d quideline for lead is below mean intake volume ely that young children in the most sensitive age group frequently in some of the secondary contact on for the recreational GV has been assumed to be one ar (equates to 150 hours per year). enHealth (2012) ian swimming frequency (including all sport and estimate of 150 days/year) for ≥ 5 years of age, with a ulation (equates to mean of 26 hours/year and upper en aged <5 years a maximum value of 27 hours per ended. Furthermore, enHealth (2012) states that only te in swimming for more than 53-times per year. arly incidental water intake volumes are 3.75L (0.05 .4L (0.05 L/hour X 27hours) for <5 year olds. The osure adjusted recreational GV for lead, applicable to estimates. Note that the lead recreational value based ults and is considered to be protective of all adults as luded for livestock watering exposure as children, sitive age group are unlikely to frequently engage in

APPENDIX 9 CAPTAINS FLAT MEN'S SHED LEAD INVESTIGATION REPORT AND EXPOSURE ASSESSMENT



Department of Regional NSW PO Box 344 Hunter Region Mail Centre 2310 NSW Attention: Paul McBain

Delivered: by email

Dear Paul,

Captains Flat Men's Shed – Foxlow Street Captains Flat NSW Lead Investigation Report

This report presents the findings of an investigation of lead at the property currently occupied by the Captains Flat Men's Shed, undertaken as part of the investigation of contaminants related to the historic loading and transport of ore concentrates in the rail corridor at Captains Flat.

Investigation at the property comprised collection of samples as shown in **Table 1** and the attached figure (**Attachment 1**). Soil samples were collected by the NSW EPA in February 2021 and were selected to target areas of elevated lead determined using a field portable x-ray fluorescence metals analyser (fpXRF). Dust samples were collected 17 June 2021 using swabs and a high flow cyclonic vacuum by Ramboll. Paint samples were collected from building surfaces with hand tools on 4 August 2021 by Ramboll. Further detail is presented in the Captains Flat Surface Soil Testing Report (NSW EPA 2021) and the Conceptual Site Model Captains Flat Lead Management Plan (Ramboll 2021).

Table 1: Samples Collected

Туре	Number of samples collected
Soil	2
Dust (from inside property) - swabs	4
Dust (from inside property) - vacuum	3
Paint	3

Sample locations are presented on a site features plan presented as **Attachment 1**.

Date 25/11/2021

Ramboll Level 2, Suite 18 Eastpoint 50 Glebe Road PO Box 435 The Junction NSW 2291 Australia

T +61 2 4962 5444 https://ramboll.com

Results

Sample results were compared against guidelines relevant for a commercial/industrial property which is relevant to the current site use. A tabulated assessment of sample results against relevant guidelines is presented in summary as **Table 2**. Concentrations shown in **bold** are above the relevant guideline. Laboratory reports are provided in **Attachment 2**.

Туре	Guideline		Result	
Soil	1500 (mg/kg) ¹	ms-a 18	ms-b 560	
Dust Interior – Floors (swab)	1000 (µg/m²) ^{2,3}	MS_SWAB1 7111	MS_SWAB2 1078	MS_SWAB3 2333
Dust Interior – Floors (vacuum)	1500 (mg/kg)⁴	MS_VAC1 360	MS_VAC2 270	MS_VAC3 300
Dust Interior – window sill	5000 (µg/m²) ³	MS_SWAB4 244		
Paint	0.1%5	PAINT_01 <0.01	PAINT_02 0.14	PAINT_03 <0.01

 Table 2: Summary lead concentrations relevant to health investigation levels

¹NEPM (2013) Schedule B1: Guideline on investigation levels for soil and groundwater. National Environment Protection (Assessment of Site Contamination) Measure 1999. Federal Register of Legislative Instruments F2013C00288 (HIL D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites).

 $^{\rm 2}$ The dust swab results presented are lead loadings (µg lead/m²) and were calculated as follows:

Lead loading $(\mu g/m^2)$ = Total lead (μg) / sample area (m^2) .

³ AS 4361.2-1998 Guide to lead paint management – Residential and commercial buildings.

⁴ There are no guidelines specific to vacuum samples, however In the absence of elevated outdoor soil lead concentrations, it is appropriate for the indoor dust concentrations collected by vacuum to be compared with HIL D..

⁵ Australian Government Department of the Environment, Lead Alert: the six step guide to painting your home, 5th Ed. 2016.

Lead concentrations in outdoor soil fall below adopted guidelines and indicate risks associated with lead in soil are low.

The lead loadings $(\mu g/m^2)$ in all floor swab samples exceed the adopted criteria and indicate higher risks from lead in floor dust may exist. The level of lead in dust samples however can be reported as a concentration (mg/kg), just like for outdoor soil. The soil Health Investigation Level adopted (HIL D) is a concentration-based guideline that represents a safe lead concentration for commercial/industrial users where lead exposure can occur from both outdoor soil and indoor dust. In the absence of elevated outdoor soil lead concentrations, the indoor dust concentrations from vacuum samples assessed against HIL D is a relevant indicator of cumulative risk associated with exposure to lead in soil and dust. All lead concentrations inside and outside the Men's Shed building were reported below HIL D and so adopting this approach indicates risks are low and acceptable. Additionally, the criteria adopted in the assessment described above are appropriate for a generic industrial land use scenario and a more accurate assessment of risks can be achieved by considering how the Captains Flat Men's Shed is used. An exposure assessment that considers site specific details of frequency and duration of potential exposures at the Captains Flat Men's Shed is presented as **Attachment 3**.

Based on the usage of the site the exposure assessment predicted that potential exposure for Men's Shed members to outdoor and indoor lead dust would be approximately three times lower than potential exposure during typical working hours on a commercial/ industrial site. Maximum lead concentrations observed at the Men's Shed were nine - ten times lower than site specific guideline values. Based on these lines of evidence the potential exposure risks from lead indoor dust and/or outdoor soil are considered to be low and acceptable.

Lead in one external paint sample (PAINT02) exceeded the criteria indicative of lead-based paints being present on buildings. Lead-based paints should be managed in accordance AS 4361.1-2017 Guide to hazardous paint management Part 1 Lead and other hazardous metallic pigments in industrial applications.

For further information please contact the undersigned.

Yours sincerely

Tan

Stephen Maxwell Managing Consultant

D+61 (2) 4962 5444 M+61 478 658 194 smaxwell@ramboll.com

Attachments

Kel

Rowena Salmon Principal Contaminated Land Specialist

rsalmon@ramboll.com

Attachment 1 - Site Features Plan Attachment 2 – Laboratory Reports Attachment 3 – Lead Exposure Assessment Captains Flat SES Compound

Reference

AS 4361.1-2017 Guide to hazardous paint management Part 1 Lead and other hazardous metallic pigments in industrial applications NSW EPA (2021) Captains Flat Surface Soil Testing Report Ramboll (2021) Conceptual Site Model Captains Flat Lead Management Plan

Limitations

Ramboll Australia Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to DR NSW and in accordance with our understanding and interpretation of current regulatory standards. A representative program of sampling and laboratory analyses was undertaken as part of this investigation. While every care has been taken, concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. We cannot therefore preclude the presence of materials that may be hazardous. Site conditions may change over time. This report is based on conditions encountered at the Site at the time of the report and Ramboll disclaims responsibility for any changes that may have occurred after this time. The conclusions presented in this report represent Ramboll's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment. Ramboll did not independently verify all of the written or oral information provided to Ramboll during the course of this investigation. While Ramboll has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate. This report to give legal advice. This advice can only be given by qualified legal advisors.

Ramboll - Captains Flat Men's Shed

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Attachment 1 – Site Features Plan
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Legend

Site boundary

Sample locations

- Dust swab and vacuum \bigcirc sample (floor)
- Dust swab sample (window sill)
- Paint sample
- Soil sample (EPA) •

Exceedance (criteria	
Dust swab (µg/m²)	AS 4361.2 (1998) - Hard Floors	AS 4361.2 (1998) - Window Sill
Pb	1,000	5,000
Dust vacuum (mg/kg)	HIL D (NEPM)	
Pb	1,500	
Soil (mg/kg)	HIL D (NEPM)	
Pb	1,500	
Paint (%)	Aus Dept of Env (2016)	
Pb	0.1	



Ramboll - Captains Flat Men's Shed

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Attachment 2 – Laboratory Reports
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Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

3



Environment Testing

ABN: 50 005 085 521

www.eurofins.com.au

EnviroSales@eurofins.com

New Zealand

Australia

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

Sydney Unit F3, Building F 16 Mars Road NATA # 1261 Site # 18217

Brisbane
 Muraris Road
 Muraris QLD 4172

 Lane Cove West NSW 2066
 Phone : +61 7 3902 4600

 Phone : +61 2 9900 8400
 NATA # 1261 Site # 10017
 1/21 Smallwood Place NATA # 1261 Site # 20794 Perth 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736 Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079 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

Sample Receipt Advice

Company name:	Ramboll Australia Pty Ltd
Contact name:	Stephen Maxwell
Project name:	CAPTAINS FLAT LEAD MANAGEMENT PLAN
Project ID:	318001193
Turnaround time:	5 Day
Date/Time received	Aug 6, 2021 8:30 AM
Eurofins reference	815203

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.
- 1 COC has been completed correctly.
- N/A Attempt to chill was evident.
- 1 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.
- X Split sample sent to requested external lab.
- X Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Stephen Maxwell - smaxwell@ramboll.com.

Note: A copy of these results will also be delivered to the general Ramboll Australia Pty Ltd email address.

Global Leader - Results you can trust

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com		Australia	stralia					New Zealand				
		www.eurofins.com	Environment Testing		Melbourne 6 Monterey Road Dandenong South VIC 317 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Syd Uni 75 16 Lar Pho NA	dney it F3, Building F Mars Road ne Cove West NSW 2066 one : +61 2 9900 8400 TA # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 76 Phone : 0800 856 450 IANZ # 1290
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Project Name: CAPTAINS FLAT LEAD MANAGEMENT PLAN Project ID: 318001193										Eurofins Analytical S	ervices Manager : An	drew Black
Sample Detail						Lead (% w/w)						
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Sydr	ey Laboratory -	NATA Site #	18217			Х						
Bris	oane Laboratory	/ - NATA Site	# 20794									
Pert	h Laboratory - N	ATA Site # 2	3736									
May	ield Laboratory	- NATA Site	# 25079									
Exte	rnal Laboratory											
No	Sample ID	Sample Dat	e Sampling Time	Matrix	LAB ID							
1	PAINT_01	Aug 04, 2021	1	Paint	N21-Au10998	Х						
	PAINT 02	Aug 04, 2021		Paint	N21-Au10999	Х						
2	-											
2 3	PAINT_03	Aug 04, 2021		Paint	N21-Au11000	X						



Environment Testing

Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention:

Stephen Maxwell

Report Project name Project ID Received Date 815203-S CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Aug 06, 2021

Client Sample ID			PAINT_01	PAINT_02	PAINT_03
Sample Matrix			Paint	Paint	Paint
Eurofins Sample No.			N21-Au10998	N21-Au10999	N21-Au11000
Date Sampled			Aug 04, 2021	Aug 04, 2021	Aug 04, 2021
Test/Reference	LOR	Unit			
Lead (% w/w)	0.01	%	< 0.01	0.14	< 0.01


Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Lead (% w/w)	Sydney	Aug 10, 2021	6 Months

- Method: LTM-MET-3040 Metals in Waters Soils & Sediments by ICP-MS

🔍 eurotu	nc			Australia						New Zealand	
ABN: 50 005 085 521 web: 1	www.eurofins.com.a	ironment	Testing es@eurofins.com	Melbourne 6 Monterey Road Dandenong South VIC 31 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	Sy Ur 75 16 La Pt N/	ydney hit F3, Building F 3 Mars Road ane Cove West NSW 2066 hone : +61 2 9900 8400 ATA # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone: +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7 Phone: 0800 856 450 IANZ # 1290
Company Name: Address:	Ramboll Aus Level 3/100 North Sydne NSW 2060	stralia Pty Ltd Pacific Highwa y	Ŋ			Order No.: Report #: Phone: Fax:	318001193 815203 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Aug 6, 2021 8:30 A Aug 13, 2021 5 Day Stephen Maxwell	Μ
Project Name: Project ID:	CAPTAINS I 318001193	FLAT LEAD M/	ANAGEMENT	PLAN					Eurofins Analytical Se	ervices Manager : An	drew Black
	Sa	mple Detail			Lead (% w/w)						
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Melbourne Laborato Sydney Laboratory - Brisbane Laboratory	ry - NATA Site NATA Site # 1 / - NATA Site #	# 1254 8217 20794			X						
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Melbourne Laborato Sydney Laboratory - Brisbane Laboratory - N Perth Laboratory - N Mayfield Laboratory External Laboratory No Sample ID	ry - NATA Site NATA Site # 1 / - NATA Site # ATA Site # 237 - NATA Site # Sample Date	# 1254 8217 20794 736 25079 Sampling	Matrix	LAB ID	x						
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Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- 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.
- This report replaces any interim results previously issued. 9.

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
сос	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
СР	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.
- 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 5. 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.



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
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

Authorised by:

Emma Beesley John Nguyen Analytical Services Manager 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.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

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ABN: 50 005 085 521

www.eurofins.com.au

EnviroSales@eurofins.com

New Zealand

Australia

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 Phone : +61 2 9900 8400
 NATA # 1261 Site # 10017
 NATA # 1261 Site # 18217

1/21 Smallwood Place NATA # 1261 Site # 20794

Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736

Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079

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

Sample Receipt Advice

Company name:	Ramboll Australia Pty Ltd
Contact name:	Stephen Maxwell
Project name:	CAPTAINS FLAT LEAD MANAGEMENT PLAN
Project ID:	318001193
Turnaround time:	5 Day
Date/Time received	Jun 23, 2021 12:30 PM
Eurofins reference	804978

Sample Information

- 1 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. 1
- 1 COC has been completed correctly.
- N/A Attempt to chill was evident.
- 1 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.
- X Split sample sent to requested external lab.
- X Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Stephen Maxwell - smaxwell@ramboll.com.

Note: A copy of these results will also be delivered to the general Ramboll Australia Pty Ltd email address.

Global Leader - Results you can trust

🕂 eurofir	15			Australia							New Zealand	
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6 CH_SWAB2	Jun 17, 2021		Paint	N21-Jn44559		Х	_					
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Project Name: CAPTAINS FLAT LEAD MANAGEMENT PLAN: Project ID: Sit001193 Lorofins Analytical Services Manager : Andrew Black Image: Comparison of the state of th	Company Name: Address:	Ramboll Australia Pty Level 3/100 Pacific H North Sydney NSW 2060	y Ltd lighway			O Re Pi Fa	rder No.: eport #: hone: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	PM
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	20 SWAB_BLAN	Jun 17, 2021	Paint	N21-Jn44573		Х]					

🔅 eurofi	ns		Australia							New Zealand	
ABN: 50 005 085 521 web:	www.eurofins.com.a	rironment Testing	Melbourne 6 Monterey Road Dandenong South VIC 3 Phone : +61 3 8564 500 NATA # 1261 Site # 1254	5 175 1 0 L P N	Sydney Unit F3, Building F 175 16 Mars Road 0 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 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 767 Phone : 0800 856 450 IANZ # 1290
Company Name: Address:	Ramboll Au Level 3/100 North Sydne NSW 2060	stralia Pty Ltd Pacific Highway ∋y			O Re Pl Fa	rder No.: eport #: hone: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	PM
Project Name: Project ID:	CAPTAINS 318001193	FLAT LEAD MANAGEMEN	NT PLAN						Eurofins Analytical Se	ervices Manager : Ar	ldrew Black
	Si	ample Detail		HOLD	Lead (% w/w)						
Melbourne Laborate	ory - NATA Site	e # 1254									
Sydney Laboratory	- NATA Site #	18217		х	х						
Brisbane Laborator	y - NATA Site #	# 20794									
Perth Laboratory -	NATA Site # 23	736									
Mayfield Laboratory	- NATA Site #	25079				-					
External Laboratory	1	1 1			<u> </u>						
20 SWAB_BLAN K	Jun 17, 2021	Paint	N21-Jn44573			-					
21 MS_VAC1	Jun 17, 2021	Paint	N21-Jn44574	X		-					
22 MS_VAC2	Jun 17, 2021	Paint	N21-Jn44575	X		-					
23 MS_VAC3	Jun 17, 2021	Paint	N21-Jn44576	X	<u> </u>	-					
24 CH_VAC1	Jun 17, 2021	Paint	N21-Jn44577	X		-					
25 CH_VAC2	Jun 17, 2021	Paint	N21-Jn44578	X		-					
26 CH_VAC3	Jun 17, 2021	Paint	N21-Jn44579	X		-					
27 RFS_VAC1	Jun 17, 2021	Paint	N21-Jn44580	X	-	-					
28 RFS_VAC2	Jun 17, 2021	Paint	N21-Jn44581	X		-					
29 RFS_VAC3	Jun 17, 2021	Paint	N21-Jn44582	Х]					

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ABN: 50 00	ABN: 50 005 085 521 web: www.eur		Environment Testing		Melbourne 6 Monterey Road Dandenong South VIC 3 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254	S U 175 1 D L P N	ydney Init F3, 6 Mars ane Co hone : IATA #	Building F Road ve West NSW 2066 +61 2 9900 8400 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone: - 461 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 767 Phone: 0800 856 450 IANZ # 1290
Company Name: Ramb Address: Level North NSW Project Name: CAPT		Ramboll Level 3/ North Sy NSW 20 CAPTAI	Australia Pty Ltd 100 Pacific Highway rdney 60 NS FLAT LEAD MA	IT PLAN	Order No.: Report #: Phone: Fax:		order No.: eport #: hone: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	PM	
Projec	ct ID:	3180011	93	-							Eurofins Analytical Second	ervices Manager : Ar	drew Black
			Sample Detail			10LD	.ead (% w/w)						
Melbou	Irne Laborato	ory - NATA	Site # 1254										
Sydney	/ Laboratory	- NATA Site	e # 18217			Х	Х						
Brisbar	ne Laborator	y - NATA Si	te # 20794										
Perth L	aboratory - N	NATA Site #	23736					1					
Mayfiel	d Laboratory	/ - NATA Sit	e # 25079					4					
Externa	al Laboratory	/						4					
30 ST	TP_VAC1	Jun 17, 20	21 F	Paint	N21-Jn44583	Х		4					
31 ST	TP_VAC2	Jun 17, 20	21 F	Paint	N21-Jn44584	Х		4					
32 ST	TP_VAC3	Jun 17, 20	21 F	Paint	N21-Jn44585	Х		-					



Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 25079

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Stephen Maxwell

Report	ł
Project name	(
Project ID	;
Received Date	

804978-A CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jun 23, 2021

Client Sample ID			MS_SWAB1	MS_SWAB2	MS_SWAB3	MS_SWAB4
Sample Matrix			Wipes	Wipes	Wipes	Wipes
Eurofins Sample No.			N21-Jn44554	N21-Jn44555	N21-Jn44556	N21-Jn44557
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	640	97	210	22

Client Sample ID			CH_SWAB1	CH_SWAB2	CH_SWAB3	CH_SWAB4
Sample Matrix			Wipes	Wipes	Wipes	Wipes
Eurofins Sample No.			N21-Jn44558	N21-Jn44559	N21-Jn44560	N21-Jn44561
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	8.7	2.4	46	210

Client Sample ID Sample Matrix			RFS_SWAB1 Wipes	RFS_SWAB2 Wipes	RFS_SWAB3 Wipes	RFS_SWAB4 Wipes
Eurofins Sample No.			N21-Jn44562	N21-Jn44563	N21-Jn44564	N21-Jn44565
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	43	27	18	8.7

Client Sample ID			STP_SWAB1	STP_SWAB2	STP_SWAB3	STP_SWAB4
Sample Matrix			Wipes	Wipes	Wipes	Wipes
Eurofins Sample No.			N21-Jn44566	N21-Jn44567	N21-Jn44568	N21-Jn44569
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	10	18	6.8	< 1



Client Sample ID			SWAB_QA01	SWAB_QA02	SWAB_RB	SWAB_BLANK
Sample Matrix			Wipes	Wipes	Wipes	Wipes
Eurofins Sample No.			N21-Jn44570	N21-Jn44571	N21-Jn44572	N21-Jn44573
Date Sampled			Jun 17, 2021	Jun 17, 2021	Jun 17, 2021	Jun 17, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	5.8	15	< 1	< 1



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Heavy Metals	Sydney	Jun 30, 2021	180 Days

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

	eurofi	ns			Australia							New Zealand	
•••	curon	Envi	Environment Testing		Melbourne 6 Monterey Road Dandenong South VIC 317 Phone : +61 3 8564 5000 NATA # 1261		Sydney Unit F3, Building F '5 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 9900 8400		Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448	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
ABN: 5	0 005 085 521 web:	www.eurofins.com.au	email: EnviroSale	s@eurofins.com	Site # 1254	N	ATA # 1	261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079		
Cor Ad	mpany Name: dress:	Ramboll Aus Level 3/100 I North Sydne NSW 2060	tralia Pty Ltd Pacific Highwa y	ау			O R(Pl Fa	rder No.: eport #: none: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	PM
Pro Pro	Project Name:CAPTAINS FLAT LEAD MANAGEMENT PLANProject ID:318001193										Eurofins Analytical So	ervices Manager : An	drew Black
		Sa	mple Detail			HOLD	Lead (% w/w)						
Melb	ourne Laborate	ory - NATA Site	# 1254					-					
Sydn	ney Laboratory	- NATA Site # 1	8217			X	X	-					
Brist	bane Laborator	y - NATA Site #	20794					-					
Pertr	n Laboratory - I	$\frac{NATA Site # 237}{2}$	30					-					
Exto	rnal Laboratory	/ - NATA Sile # /	23079					-					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	MS_SWAB1	Jun 17, 2021		Paint	N21-Jn44554		Х	-					
2	MS_SWAB2	Jun 17, 2021		Paint	N21-Jn44555		X	4					
3	MS_SWAB3	Jun 17, 2021		Paint	N21-Jn44556		X						
4	MS_SWAB4	Jun 17, 2021		Paint	N21-Jn44557		X	-					
5	CH_SWAB1	Jun 17, 2021		Paint	N21-Jn44558		X	-					
6	CH_SWAB2	Jun 17, 2021		Paint	N21-Jn44559		X	-					
7	CH_SWAB3	Jun 17, 2021		Paint	N21-Jn44560		Х	-					
8	CH_SWAB4	Jun 17, 2021		Paint	N21-Jn44561		X	-					
9	RFS_SWAB1	Jun 17, 2021		Paint	N21-Jn44562		Х	J					

Curronment Testing Network Buildowne	🎎 eurofin			Australia							New Zealand	
Company Name: Ramboll Australia Pty Lid Order No.: 318001193 Address: Level 3100 Pacific Highway North Sydney Dref No.: 318001193 Project Name: CAPTAINS FLAT LEAD MANAGEMENT PLAN Phone: 02 9954 8119 Project Name: CAPTAINS FLAT LEAD MANAGEMENT PLAN Bear State Sample Detail 0 Image: Sample Detail Belbourne Laboratory - NATA Site # 1254 Sample Detail Belbourne Laboratory - NATA Site # 1254 Sample Detail Belbourne Laboratory - NATA Site # 1254 Sample Detail Belbourne Laboratory - NATA Site # 1254 Sample Detail Belbourne Laboratory - NATA Site # 1254 Sample Detail Belbourne Laboratory - NATA Site # 20794 Paint N21-In44563 Perint Laboratory - NATA Site # 20794 Paint N21-In44565 Str P. SWABB Jun 17, 2021 Paint N21-In44565		Environme	ent Testing	Melbourne 6 Monterey Road Dandenong South VIC 31 Phone : +61 3 8564 5000 NATA # 1261		Sydney Unit F3, Building F 75 16 Mars Road Lane Cove West NSW 20 Phone : +61 2 9900 8400		Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448	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: Ramboll Australia Pty Lid Order No.: 318001193 Received:: Jun 33, 2021 12:30 PM Address: Level 3/100 Pacific Highway North Synday Phone: 02 8948 8118 Due:: Jun 30, 2021 Project Name: CAPTAINS FLAT LEAD MANAGEMENT PLAN Phone: 02 8948 8150 Prointy:: Stapping Project ID: 318001193 Barnet Stapping Stapping Eurofins Analytical Services Manager : Andrew Bit Sample Detail Sample Detail Stapping Stapping Stapping Stapping Melbourne Laboratory: -NATA Site # 18217 X X Stapping Stapping Britsbane Laboratory: -NATA Site # 18217 X X Stapping Stapping Or RES SWA82 Jun 17, 2021 Paint N21-Jun44565 X 10 RFS SWA82 Jun 17, 2021 Paint N21-Jun44565 X 16 STP SWA83 Jun 17, 2021 Paint N21-Jun44565 X 16 STP SWA84 Jun 17, 2021 Paint N21-Jun44565 X 16 STP SWA84 Jun 17, 2021 Paint N21-Jun44565 X 16 STP SWA84 Jun 17, 2021 Paint N21-Jun44565 X	ABIN: 50 005 065 521 Web. W	Sile # 1254		ATA #	201 3110 # 16217		Sile # 23730	NATA # 1201 Sile # 25079				
Project Name: CAPTAINS FLAT LEAD MANAGEMENT PLAN Project ID: 318001193 Eurofins Analytical Services Manager : Andrew Bl Sample Detail Melbourne Laboratory - NATA Site # 1254 Sydney Laboratory - NATA Site # 20734 Parth Laboratory - NATA Site # 20739 External Laboratory - NATA Site # 20179 External Laboratory - NATA Site # 2017 Paint N21-Jn44563 x 13 STP_SWAB2 Jun 17, 2021 Paint N21-Jn44566 x 13 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44566 x 14 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44566 x 15 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44566 x 16 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44568 x 17 SVBAB Jun 17, 2021 Paint N21-Jn44568 x 18 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44568 x 19 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44568 x 19 STP_SWAB4 Jun 17, 2021 Paint N21-Jn44568 x 19 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44568 x 19 STP_SWAB4 JUN 17, 2021 Paint N21-Jn44568 x 19 STP_SW	Company Name: Address:	Company Name: Ramboll Australia Pty Ltd Address: Level 3/100 Pacific Highway North Sydney NSW 2060					rder No.: eport #: none: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	РМ
Melbourne Laboratory - NATA Site # 1254 x Sydney Laboratory - NATA Site # 1254 x Sydney Laboratory - NATA Site # 1217 x Brisbane Laboratory - NATA Site # 20794 - Perth Laboratory - NATA Site # 23736 - Mayfield Laboratory - NATA Site # 23736 - Mayfield Laboratory - NATA Site # 23736 - Il RFS_SWABA Jun 17, 2021 Paint N21-Jn44565 I2 RFS_SWABA Jun 17, 2021 Paint N21-Jn44565 I3 STP_SWAB1 Jun 17, 2021 Paint N21-Jn44565 I4 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44565 I5 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44565 I3 STP_SWAB1 Jun 17, 2021 Paint N21-Jn44565 I3 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44565 I4 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44565 I7 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44568 I6 STP_SWAB3 Jun 17, 2021 Paint N21-Jn44568 I6 STP_SWAB4 Jun 17, 2021 Paint N21-Jn44568	Project Name:CAPTAINS FLAT LEAD MANAGEMENT PLANProject ID:318001193									Eurofins Analytical Se	ervices Manager : An	drew Black
Melbourne Laboratory - NATA Site # 1254 X Sydney Laboratory - NATA Site # 18217 X X Brisbane Laboratory - NATA Site # 20794 X X Perth Laboratory - NATA Site # 23736 X Mayfield Laboratory - NATA Site # 25079 X External Laboratory - NATA Site # 25079 X InRFS_SWAB2Jun 17, 2021PaintN21-Jn44563 X 11RFS_SWAB3Jun 17, 2021PaintN21-Jn44564 X 13STP_SWAB1Jun 17, 2021PaintN21-Jn44566 X 14STP_SWAB2Jun 17, 2021PaintN21-Jn44566 X 15STP_SWAB3Jun 17, 2021PaintN21-Jn44568 X 16STP_SWAB4Jun 17, 2021PaintN21-Jn44569 X 16STP_SWAB4Jun 17, 2021PaintN21-Jn44569 X 16STP_SWAB4Jun 17, 2021PaintN21-Jn44569 X		Sample De	etail		HOLD	Lead (% w/w)						
Sydney Laboratory - NATA Site # 18217 X X Brisbane Laboratory - NATA Site # 20794 - Perth Laboratory - NATA Site # 23736 - Mayfield Laboratory - NATA Site # 25079 - External Laboratory - NATA Site # 25079 - 10 RFS_SWAB2 Jun 17, 2021 Paint 11 RFS_SWAB3 Jun 17, 2021 Paint N21-Jn44563 X 12 RFS_SWAB4 Jun 17, 2021 Paint N21-Jn44565 X 13 STP_SWAB1 Jun 17, 2021 Paint N21-Jn44566 X 14 STP_SWAB2 Jun 17, 2021 Paint N21-Jn44566 X 15 STP_SWAB4 Jun 17, 2021 Paint N21-Jn44567 X 15 STP_SWAB4 Jun 17, 2021 Paint N21-Jn44568 X 16 STP_SWAB4 Jun 17, 2021 Paint N21-Jn44569 X 17 SWAB OA01 Jun 17, 2021 Paint N21-Jn44569 X	Melbourne Laborator	y - NATA Site # 1254										
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Maynetic Laboratory - NATA Site # 25079 External Laboratory Image: Subscript of the system	Perth Laboratory - NA	NATA Site # 23/36										
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19 SWAB_RB Jun 17, 2021 Paint N21-Jn44572 X	19 SWAB_RB J	lun 17, 2021	Paint	N21-Jn44572		Х						
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ABN: 50 005 085 521 web: w	ww.eurofins.com.a	au email: EnviroSales@eurofins.	com Site # 1254	N	IATA # 1	1261 Site # 18217		Site # 23736	NATA # 1261 Site # 25079		
Company Name: Address:	Ramboll Au Level 3/100 North Sydn NSW 2060	istralia Pty Ltd) Pacific Highway ey			O R(Pl Fa	rder No.: eport #: hone: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	PM
Project Name: Project ID:	CAPTAINS 318001193	FLAT LEAD MANAGEN	IENT PLAN						Eurofins Analytical S	ervices Manager : Ar	drew Black
	S	ample Detail		HOLD	Lead (% w/w)						
Melbourne Laborator	y - NATA Site	e # 1254									
Sydney Laboratory -	NATA Site #	18217		Х	х						
Brisbane Laboratory	- NATA Site	# 20794									
Perth Laboratory - NA	ATA Site # 23	3736				-					
Mayfield Laboratory -	- NATA Site #	‡ 25079				-					
External Laboratory	=					-					
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21 MS_VAC1 、	Jun 17, 2021	Paint	N21-Jn44574	Х		-					
22 MS_VAC2	Jun 17, 2021	Paint	N21-Jn44575	Х		-					
23 MS_VAC3	Jun 17, 2021	Paint	N21-Jn44576	Х							
24 CH_VAC1	Jun 17, 2021	Paint	N21-Jn44577	Х							
25 CH_VAC2	Jun 17, 2021	Paint	N21-Jn44578	Х		-					
26 CH_VAC3	Jun 17, 2021	Paint	N21-Jn44579	Х							
27 RFS_VAC1	Jun 17, 2021	Paint	N21-Jn44580	Х		1					
28 RFS_VAC2	Jun 17, 2021	Paint	N21-Jn44581	Х		1					
29 RFS_VAC3	Jun 17, 2021	Paint	N21-Jn44582	Х							

🔅 eurofins		Environment Testing		Australia							New Zealand		
				Melbourne 6 Monterey Road Dandenong South VIC 3 Phone : +61 3 8564 5000 NATA # 1261 Sito # 1264	175 1 0 L F	Sydney Jnit F3, I 16 Mars Lane Cor Phone : -	Building F Road ve West NSW 2066 ⊧61 2 9900 8400 1261 5∺p # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 22726	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 767 Phone : 0800 856 450 IANZ # 1290	
ABN: 50 005 085 521 web:	www.euronns	.com.au	i email: EnviroSales	@euronns.com	Sile # 1254	r	NATA #	1201 Sile # 18217		Sile # 23736	NATA # 1261 Sile # 25079		
Company Name: Address:	Rambo Level 3 North NSW 2	oll Aus 3/100 Sydne 2060	stralia Pty Ltd Pacific Highway y	/			O R Pi Fi	rder No.: eport #: hone: ax:	318001193 804978 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jun 23, 2021 12:30 Jun 30, 2021 5 Day Stephen Maxwell	PM
Project Name: Project ID:	CAPT/ 31800	AINS F 1193	FLAT LEAD MA	NAGEMEN	T PLAN						Eurofins Analytical Se	ervices Manager : An	drew Black
		Sa	imple Detail			HOLD	Lead (% w/w)						
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Perth Laboratory - NATA Site # 23736					4								
Mayfield Laboratory	/ - NATA \$	Site #	25079					-					
External Laboratory		0.04	.	Delat				4					
30 STP_VAC1	Jun 17, 2	2021		Paint	N21-Jn44583	X		4					
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						12	20						



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site 1. 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.
- 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.
- This report replaces any interim results previously issued. 9.

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
СР	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.
- 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 5. 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									
Lead	Total ug	< 1			1	Pass			
LCS - % Recovery									
Heavy Metals									
Lead	%	99			80-120	Pass			



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
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

Authorised by:

Andrew Black John Nguyen Analytical Services Manager 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.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Grace Tuckwell

From:	#AU04_Enviro_Sample_NSW
Subject:	FW: 5 DAY TAT ADDITIONAL ANALYSIS: FW: Extra analyses of dust samples from
	Eurofins ref: 804978
Attachments:	804978_summary.pdf

From: Stephen Maxwell <<u>SMAXWELL@ramboll.com</u>>
Sent: Monday, 19 July 2021 9:32 AM
To: Andrew Black <<u>AndrewBlack@eurofins.com</u>>
Cc: Nathan McGuire <<u>NMCGUIRE@ramboll.com</u>>
Subject: Extra analyses of dust samples from Eurofins ref: 804978

EXTERNAL EMAIL*

Hi Andrew

Can we co-ordinate analyses of dust samples MS_VAC1 – MSVAC3 described under the attached work summary to be analysed for lead (mg/kg). If sufficient volume exists can we also analyse for titanium and sulfur?

Kind regards Stephen Maxwell

Lead Consultant 3182675 - Hunter

D +61 478658194 M +61 478658194 smaxwell@ramboll.com

Connect with us

Ramboll Level 2, Suite 18 Eastpoint 50 Glebe Road PO Box 435 The Junction NSW 2291 Australia https://ramboll.com

Ramboll Australia Pty Ltd. ACN 095 437 442 ABN 49 095 437 442

* WARNING - EXTERNAL: This email originated from outside of Eurofins. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!



ABN: 50 005 085 521

www.eurofins.com.au

EnviroSales@eurofins.com

New Zealand

Australia

Melbourne 6 Monterey Road Dandenong South VIC 3175 16 Mars Road Phone : +61 3 8564 5000 Lane Cove We NATA # 1261 Site # 1254

Sydney Unit F3, Building F Brisbane NATA # 1261 Site # 18217

 Muraris Road
 Muraris QLD 4172

 Lane Cove West NSW 2066
 Phone : +61 7 3902 4600

 Phone : +61 2 9900 8400
 NATA # 1261 Site # 10017
 1/21 Smallwood Place NATA # 1261 Site # 20794

Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736

Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079

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

Sample Receipt Advice

Ramboll Australia Pty Ltd
Stephen Maxwell
ADDITONAL CAPTAINS FLAT LEAD MANAGEMENT PLAN
318001193
5 Day
Jul 19, 2021 9:32 AM
811512

Sample Information

- 1 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. 1
- 1 COC has been completed correctly.
- N/A Attempt to chill was evident.
- 1 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.
- X Split sample sent to requested external lab.
- X Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Stephen Maxwell - smaxwell@ramboll.com.

Note: A copy of these results will also be delivered to the general Ramboll Australia Pty Ltd email address.

Global Leader - Results you can trust

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com		Australia									New Zealand		
		u email: EnviroSales@eurofins.com		Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254		Sydney Unit F3, Building F 5 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217		W 2066 3400 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone: - 664 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 76 Phone: 0800 856 450 IANZ # 1290
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Project Name: Project ID:	ADDITONAL 318001193	CAPTAINS F	LAT LEAD MA	ANAGEMENT PLA	N						Eurofins Analytical S	ervices Manager : An	drew Black
	Sa	mple Detail			Lead	Sulphur	Titanium						
Melbourne Laborato	ry - NATA Site	# 1254				Х							
Sydney Laboratory -	NATA Site # 1	8217			Х		Х						
Brisbane Laboratory	- NATA Site #	20794											
Perth Laboratory - N	ATA Site # 237	736											
Mayfield Laboratory - NATA Site # 25079													
External Laboratory													
No Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
	Jun 17, 2021		Dust	S21-JI34967	Х	Х	Х						
1 MS_VAC1	001111,2021				×	X	Х						
1 MS_VAC1 2 MS_VAC2	Jun 17, 2021		Dust	S21-JI34968	^	~							
1 MS_VAC1 2 MS_VAC2 3 MS_VAC3	Jun 17, 2021 Jun 17, 2021		Dust	S21-JI34968 S21-JI34969	X	X	X						



Ramboll Environ Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060



NATA Accred Accreditation Site Number

NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Stephen Maxwell

Report Project name Project ID Received Date 811512-S ADDITONAL CAPTAINS FLAT LEAD MANAGEMENT PLAN 318001193 Jul 19, 2021

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			MS_VAC1 Dust S21-JI34967 Jun 17, 2021	MS_VAC2 Dust S21-JI34968 Jun 17, 2021	MS_VAC3 Dust S21-JI34969 Jun 17, 2021
Test/Reference	LOR	Unit			
Sulphur	5	mg/kg	1000	1100	990
Heavy Metals					
Lead	5	mg/kg	360	270	300
Titanium	10	mg/kg	170	180	150



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Sulphur	Melbourne	Jul 20, 2021	7 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
Heavy Metals	Sydney	Jul 23, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins			2		Australia							New Zealand		
ABN: 5	0 005 085 521 web: w	vww.eurofins.c	Envir com.au er	onment	Testing s@eurofins.com	Melbourne 6 Monterey Road Dandenong South VIC : Phone : +61 3 8564 500 NATA # 1261 Site # 1254	1 3175 1 00 L F	Sydney Unit F3, I 16 Mars Lane Co Phone : - NATA #	Building Road ve Wes +61 2 9 1261 Si	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 066 Phone : +61 7 3902 4600 0 NATA # 1261 Site # 2079 17	Perth 46-48 Banksia Road Welshpool WA 6106 0 Phone : +61 8 9251 9600 94 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 76 Phone : 0800 856 450 IANZ # 1290
Company Name: Ramboll Australia Pty Ltd Address: Level 3/100 Pacific Highway North Sydney NSW 2060							O R F	rder eport hone ax:	811512 02 9954 8118 02 9954 8150		Received: Due: Priority: Contact Name:	Jul 19, 2021 9:32 A Jul 26, 2021 5 Day Stephen Maxwell	М	
Project Name:ADDITONAL CAPTAINS FLAT LEAD MANAGEMENT PLAProject ID:318001193					N					Eurofins Analytical S	ervices Manager : Ar	ndrew Black		
			Sam	ple Detail			Lead	Sulphur	Titanium					
Melb	ourne Laborato	ry - NATA	Site #	1254				Х						
Sydr	ney Laboratory -	NATA Sit	e # 182	217			Х		Х					
Bris	bane Laboratory	- NATA S	Site # 2	0794										
Perth Laboratory - NATA Site # 23736								_						
Mayfield Laboratory - NATA Site # 25079							_							
Exte	rnal Laboratory							_	-					
No	Sample ID	Sample D	Date	Sampling Time	Matrix	LAB ID								
1	MS_VAC1	Jun 17, 20)21		Dust	S21-JI34967	Х	x	Х					
2	MS_VAC2	Jun 17, 20)21		Dust	S21-JI34968	Х	X	Х					
~	MS VAC3	.lun 17_20	121		Dust	S21-JI34969	Х	X	Х					
3	100_07.000	0 an 17, 20			Duot									



Internal Quality Control Review and Glossary

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- 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.
- 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.
- This report replaces any interim results previously issued. 9.

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

renns	
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
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сос	Chain of Custody
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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.
- 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 5. 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									
Lead			mg/kg	< 5			5	Pass	
Titanium			mg/kg	< 10			10	Pass	
LCS - % Recovery									
Heavy Metals									
Lead			%	100			80-120	Pass	
Titanium			%	97			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery							-		
Heavy Metals				Result 1					
Lead	S21-JI28844	NCP	%	106			75-125	Pass	
Titanium	N21-JI33907	NCP	%	91			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate							-		
Heavy Metals			Result 1	Result 2	RPD				
Lead	S21-JI29409	NCP	mg/kg	17	18	5.0	30%	Pass	
Titanium	S21-JI29409	NCP	mg/kg	< 10	< 10	<1	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
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

Authorised by:

Andrew Black Emily Rosenberg John Nguyen Analytical Services Manager Senior Analyst-Metal (VIC) 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.

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Attachment 3 – Lead Exposure Assessment Captains Flat Men's Shed



Attachment 3: Lead Exposure Assessment: Captains Flat Men's Shed

The Tier 1 risk assessment for members of the Men's Shed using the Foxlow Street building is presented under the results section of the Captains Flat Men's Shed Lead Investigation Report. A lead exposure assessment specific to the current use of the Captains Flat Men's Shed is presented below and was undertaken due to exceedance of the nationally applicable Tier 1 dust guideline values.

Table 1 presents an assessment of standard work hours, work hours adopted for the development of the nationally applicable Tier 1 (HIL-D) guideline values and details of how Men's Shed members use the site. Site specific durations and frequencies are based on Ramboll discussions with a representative of the Captains Flat Men's Shed 22 – 23 November 2021.

Work Time	Units	Standard Workday hrs	HIL-D hrs	Men's Shed Usage of Site hrs ¹	Comments	
Time Spent Outdoors	hours/d	-	1	1	Assumed that Men's Shed members spend 1 hour outside per day.	
Time Spent indoors	hours/d	-	8	5.5	Assumed that Men's Shed members spend 5.5 hours indoors where possible dust exposure may occur	
Total work hours/day	hours/d	8	9	6.5	Total indoor and outdoor time for Men's Shed members personnel	
Workdays/week	days/wk	5	5	2	Assumes Men's Shed members use the facility both days each weekend	
Total work hours/week	hours/wk	40	45	13	Assumes standard workdays per	
Workdays/year	days/yr	240	240	240	year. Exposure at Men's Shed is about 3.5-times lower than	
Total work hours/year	hours/yr	9600	10800	3120	under HIL-D hours	

Table 1: Exposure assessment against standard work hours

¹Men's Shed usage of the compound presented in Table 1 is based on anecdotal account from a Men's Shed representative.

Assessment of Men's Shed site usage against generic site usage shows that potential exposure for Men's Shed members is about 3-times lower than workers undertaking standard work hours. Therefore, based on this exposure assessment, the following can be summarised:

- The average lead loading is considered to represent a realistic exposure scenario and relevant indoor dust loading (µg/m²) guidelines are exceeded by about 3.5-times, while HIL-D guidelines (mg/kg) applied to indoor dust are not exceeded
- Cumulative potential exposure for Men's Shed members to indoor and outdoor lead dust would be 3-times lower than potential exposure during normal work hours
- It is expected that outdoor dusts will primarily be generated from surface soils, and therefore potential outdoor exposure risk to Men's Shed members is from lead in surface soil. HIL-D (1500 mg/kg) assumes standard work hours and given that Men's Shed members are at the site for a third of the time (three times less), applicable site-specific soil guideline value (SSGV) would be three times higher (i.e 1,500 x 3 = 4,500 mg/kg).
- While it is noted that lead loading in internal dust measured at the Men's Shed exceeded Tier 1 guidelines by up to seven times, lead concentrations in internal dust are less than 10% of the site-specific guideline. Furthermore, integrated assessment of indoor and outdoor lead concentrations indicates the maximum concentration (560 mg/kg) is approximately nine times



lower than the site-specific guideline. Based on these lines of evidence the potential exposure risks from lead in indoor dust and/or outdoor soil are considered to be low and acceptable.