



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED06_0.0-0.5	SED06_2.0-2.5	SED05_0.0-0.5	SED05_1.0-1.5	SED04_0.0-0.1
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-001	ES1829588-005	ES1829588-010	ES1829588-012	ES1829588-013	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg	50	60	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	820	900	560	550	380	
>C34 - C40 Fraction	----	100	mg/kg	210	280	240	220	160	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	1080	1240	800	770	540	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	60	<50	<50	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	3	4	3	2	<1	
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg	11.7	0.8	8.3	4.4	4.6	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	82.8	79.3	79.1	77.7	81.0	
2-Chlorophenol-D4	93951-73-6	0.5	%	84.1	81.3	80.4	79.2	81.8	
2,4,6-Tribromophenol	118-79-6	0.5	%	66.0	61.8	61.8	62.9	61.4	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	92.1	86.0	86.6	85.7	88.2	
Anthracene-d10	1719-06-8	0.5	%	94.6	88.4	90.4	89.5	92.1	
4-Terphenyl-d14	1718-51-0	0.5	%	83.6	79.0	80.6	71.3	81.9	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	84.8	84.1	90.5	74.8	89.8	
Toluene-D8	2037-26-5	0.2	%	92.0	94.9	92.0	86.8	103	
4-Bromofluorobenzene	460-00-4	0.2	%	89.4	93.8	95.5	85.0	95.7	
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%	48.4	41.4	44.0	42.2	50.7	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_1.0-1.1	FS08	REA01_0.0-0.5	REA01_1.0-1.5	SED04_0.0-0.1
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-015	ES1829588-024	ES1829588-029	ES1829588-031	ES1829588-037	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	50.2	18.6	51.7	38.8	54.8	
EA150: Particle Sizing									
+75µm	----	1	%	8	----	10	61	7	
+150µm	----	1	%	3	----	4	54	3	
+300µm	----	1	%	1	----	1	41	1	
+425µm	----	1	%	<1	----	<1	37	1	
+600µm	----	1	%	<1	----	<1	33	<1	
+1180µm	----	1	%	<1	----	<1	16	<1	
+2.36mm	----	1	%	<1	----	<1	3	<1	
+4.75mm	----	1	%	<1	----	<1	<1	<1	
+9.5mm	----	1	%	<1	----	<1	<1	<1	
+19.0mm	----	1	%	<1	----	<1	<1	<1	
+37.5mm	----	1	%	<1	----	<1	<1	<1	
+75.0mm	----	1	%	<1	----	<1	<1	<1	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	23	----	22	14	22	
Silt (2-60 µm)	----	1	%	61	----	61	21	63	
Sand (0.06-2.00 mm)	----	1	%	16	----	17	58	15	
Gravel (>2mm)	----	1	%	<1	----	<1	7	<1	
Cobbles (>6cm)	----	1	%	<1	----	<1	<1	<1	
EA152: Soil Particle Density									
∅ Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.31	----	2.40	2.79	2.37	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	18	<5	42	77	20	
Cadmium	7440-43-9	1	mg/kg	1	<1	3	8	<1	
Chromium	7440-47-3	2	mg/kg	95	4	115	369	97	
Copper	7440-50-8	5	mg/kg	175	12	3280	4180	338	
Lead	7439-92-1	5	mg/kg	198	10	548	1930	205	
Nickel	7440-02-0	2	mg/kg	25	<2	25	69	20	
Zinc	7440-66-6	5	mg/kg	794	27	1210	12300	876	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	0.6	<0.1	0.8	3.6	0.5	
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	1	mg/kg	4	<1	<2	12	3	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_1.0-1.1	FS08	REA01_0.0-0.5	REA01_1.0-1.5	SED04_0.0-0.1
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-015	ES1829588-024	ES1829588-029	ES1829588-031	ES1829588-037	
				Result	Result	Result	Result	Result	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	20	<20	<20	30	<20	
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%	7.38	0.41	3.60	2.64	6.92	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	13.9	<0.5	5.5	11.1	9.9	
Acenaphthylene	208-96-8	0.5	mg/kg	1.4	<0.5	<0.8	1.0	0.9	
Acenaphthene	83-32-9	0.5	mg/kg	<0.8	<0.5	<0.8	<0.5	<0.8	
Fluorene	86-73-7	0.5	mg/kg	1.7	<0.5	<0.8	0.7	0.9	
Phenanthrene	85-01-8	0.5	mg/kg	5.8	<0.5	2.8	2.8	3.6	
Anthracene	120-12-7	0.5	mg/kg	2.0	<0.5	0.8	0.8	1.2	
Fluoranthene	206-44-0	0.5	mg/kg	6.4	<0.5	5.0	2.9	4.5	
Pyrene	129-00-0	0.5	mg/kg	5.5	<0.5	4.2	3.3	4.1	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	2.8	<0.5	2.3	1.1	2.0	
Chrysene	218-01-9	0.5	mg/kg	2.9	<0.5	2.2	1.1	2.1	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	5.0	<0.5	3.6	1.8	3.4	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.1	<0.5	1.3	0.6	1.1	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	4.1	<0.5	3.0	1.4	2.8	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.1	<0.5	1.4	0.7	1.3	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.8	<0.5	<0.8	<0.5	<0.8	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.4	<0.5	1.6	0.8	1.6	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	58.1	<0.5	33.7	30.1	39.4	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	5.4	<0.5	3.9	1.8	3.6	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	5.6	0.6	4.1	2.1	3.9	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	5.8	1.2	4.4	2.3	4.1	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	480	<100	390	1070	270	
C29 - C36 Fraction	----	100	mg/kg	460	<100	440	740	290	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	940	<50	830	1810	560	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_1.0-1.1	FS08	REA01_0.0-0.5	REA01_1.0-1.5	SED04_0.0-0.1
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-015	ES1829588-024	ES1829588-029	ES1829588-031	ES1829588-037	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	90	<50	
>C16 - C34 Fraction	----	100	mg/kg	780	<100	690	1620	460	
>C34 - C40 Fraction	----	100	mg/kg	320	<100	300	340	220	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	1100	<50	990	2050	680	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	90	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	1	<1	<1	<1	2	
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg	8.4	<0.5	3.6	1.6	5.9	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	76.4	81.8	81.2	78.5	77.0	
2-Chlorophenol-D4	93951-73-6	0.5	%	77.8	82.8	82.1	80.0	78.5	
2,4,6-Tribromophenol	118-79-6	0.5	%	59.6	57.4	63.1	64.3	59.3	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	83.1	87.5	88.7	86.4	83.4	
Anthracene-d10	1719-06-8	0.5	%	85.6	91.4	92.4	88.1	87.0	
4-Terphenyl-d14	1718-51-0	0.5	%	70.1	82.6	82.5	78.4	76.6	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	87.5	96.4	73.7	78.8	92.6	
Toluene-D8	2037-26-5	0.2	%	105	107	79.9	89.0	108	
4-Bromofluorobenzene	460-00-4	0.2	%	99.2	105	78.3	85.6	104	
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%	36.0	69.0	40.4	40.9	39.7	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_1.0-1.5	FS06	REA02_0.0-0.5	REA02_2.0-2.5	SED01_0.0-0.5
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-039	ES1829588-042	ES1829588-043	ES1829588-047	ES1829588-049	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	49.3	49.6	23.7	23.6	54.6	
EA150: Particle Sizing									
+75µm	----	1	%	6	----	81	69	45	
+150µm	----	1	%	2	----	74	50	37	
+300µm	----	1	%	<1	----	38	12	29	
+425µm	----	1	%	<1	----	13	8	26	
+600µm	----	1	%	<1	----	4	6	22	
+1180µm	----	1	%	<1	----	2	4	15	
+2.36mm	----	1	%	<1	----	1	3	9	
+4.75mm	----	1	%	<1	----	<1	2	5	
+9.5mm	----	1	%	<1	----	<1	<1	<1	
+19.0mm	----	1	%	<1	----	<1	<1	<1	
+37.5mm	----	1	%	<1	----	<1	<1	<1	
+75.0mm	----	1	%	<1	----	<1	<1	<1	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	25	----	8	12	19	
Silt (2-60 µm)	----	1	%	67	----	11	16	34	
Sand (0.06-2.00 mm)	----	1	%	8	----	80	69	36	
Gravel (>2mm)	----	1	%	<1	----	1	3	11	
Cobbles (>6cm)	----	1	%	<1	----	<1	<1	<1	
EA152: Soil Particle Density									
∅ Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.33	----	2.62	2.54	2.34	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	19	17	<5	54	15	
Cadmium	7440-43-9	1	mg/kg	1	1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	92	90	8	20	86	
Copper	7440-50-8	5	mg/kg	159	159	22	309	251	
Lead	7439-92-1	5	mg/kg	202	198	17	431	176	
Nickel	7440-02-0	2	mg/kg	24	24	3	13	19	
Zinc	7440-66-6	5	mg/kg	784	772	58	475	676	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	0.5	0.4	<0.1	0.5	0.3	
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	1	mg/kg	4	4	<1	3	<2	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_1.0-1.5	FS06	REA02_0.0-0.5	REA02_2.0-2.5	SED01_0.0-0.5
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-039	ES1829588-042	ES1829588-043	ES1829588-047	ES1829588-049	
				Result	Result	Result	Result	Result	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	30	30	<20	<20	<20	
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%	7.47	7.48	0.67	2.98	6.26	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	11.4	11.6	0.5	0.8	9.8	
Acenaphthylene	208-96-8	0.5	mg/kg	1.2	1.2	<0.5	<0.5	0.9	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.8	
Fluorene	86-73-7	0.5	mg/kg	1.3	1.3	<0.5	<0.5	0.9	
Phenanthrene	85-01-8	0.5	mg/kg	4.9	4.8	<0.5	<0.5	3.6	
Anthracene	120-12-7	0.5	mg/kg	1.7	1.7	<0.5	<0.5	1.2	
Fluoranthene	206-44-0	0.5	mg/kg	6.2	6.0	0.5	0.7	4.3	
Pyrene	129-00-0	0.5	mg/kg	5.5	5.3	<0.5	0.7	4.0	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	2.7	2.6	<0.5	<0.5	1.9	
Chrysene	218-01-9	0.5	mg/kg	2.8	2.7	<0.5	<0.5	2.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	4.7	4.6	<0.5	<0.5	3.3	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.8	1.4	<0.5	<0.5	1.1	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	3.9	3.8	<0.5	<0.5	2.7	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.8	1.8	<0.5	<0.5	1.2	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	0.6	0.6	<0.5	<0.5	<0.8	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.1	2.1	<0.5	<0.5	1.4	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	52.6	51.5	1.0	2.2	38.3	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	5.6	5.5	<0.5	<0.5	3.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	5.6	5.5	0.6	0.6	3.7	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	5.6	5.5	1.2	1.2	4.0	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	440	420	<100	150	280	
C29 - C36 Fraction	----	100	mg/kg	380	360	<100	120	280	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	820	780	<50	270	560	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_1.0-1.5	FS06	REA02_0.0-0.5	REA02_2.0-2.5	SED01_0.0-0.5
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829588-039	ES1829588-042	ES1829588-043	ES1829588-047	ES1829588-049	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	710	680	<100	240	470	
>C34 - C40 Fraction	----	100	mg/kg	220	210	<100	<100	200	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	930	890	<50	240	670	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	3	2	<1	<1	1	
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg	25.5	17.4	0.7	<0.5	4.9	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	76.8	78.4	79.2	79.2	81.3	
2-Chlorophenol-D4	93951-73-6	0.5	%	77.9	79.8	81.4	80.6	82.2	
2,4,6-Tribromophenol	118-79-6	0.5	%	62.3	62.4	57.3	59.8	59.2	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	83.1	85.6	85.8	85.5	88.5	
Anthracene-d10	1719-06-8	0.5	%	87.9	90.2	90.0	89.6	91.7	
4-Terphenyl-d14	1718-51-0	0.5	%	69.2	69.4	79.8	81.2	80.4	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	86.6	74.8	114	83.0	75.7	
Toluene-D8	2037-26-5	0.2	%	85.2	81.6	120	86.6	82.1	
4-Bromofluorobenzene	460-00-4	0.2	%	88.0	76.8	119	93.7	79.1	
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%	74.3	42.6	69.2	46.5	40.3	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED02_0.5-0.5	SED03_0.0-0.5	SED07_0.0-0.5	----	----
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES1829588-052	ES1829588-055	ES1829588-057	-----	-----	
				Result	Result	Result	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	56.8	54.8	55.3	----	----	
EA150: Particle Sizing									
+75µm	----	1	%	9	15	19	----	----	
+150µm	----	1	%	4	8	8	----	----	
+300µm	----	1	%	2	4	3	----	----	
+425µm	----	1	%	<1	2	1	----	----	
+600µm	----	1	%	<1	1	<1	----	----	
+1180µm	----	1	%	<1	<1	<1	----	----	
+2.36mm	----	1	%	<1	<1	<1	----	----	
+4.75mm	----	1	%	<1	<1	<1	----	----	
+9.5mm	----	1	%	<1	<1	<1	----	----	
+19.0mm	----	1	%	<1	<1	<1	----	----	
+37.5mm	----	1	%	<1	<1	<1	----	----	
+75.0mm	----	1	%	<1	<1	<1	----	----	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	26	26	22	----	----	
Silt (2-60 µm)	----	1	%	55	49	53	----	----	
Sand (0.06-2.00 mm)	----	1	%	19	25	25	----	----	
Gravel (>2mm)	----	1	%	<1	<1	<1	----	----	
Cobbles (>6cm)	----	1	%	<1	<1	<1	----	----	
EA152: Soil Particle Density									
∅ Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.37	2.39	2.39	----	----	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	19	18	17	----	----	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----	
Chromium	7440-47-3	2	mg/kg	84	82	79	----	----	
Copper	7440-50-8	5	mg/kg	233	239	262	----	----	
Lead	7439-92-1	5	mg/kg	169	171	175	----	----	
Nickel	7440-02-0	2	mg/kg	20	18	18	----	----	
Zinc	7440-66-6	5	mg/kg	669	684	675	----	----	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	0.3	0.3	0.3	----	----	
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	1	mg/kg	<2	<2	2	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED02_0.5-0.5	SED03_0.0-0.5	SED07_0.0-0.5	----	----
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES1829588-052	ES1829588-055	ES1829588-057	-----	-----	
				Result	Result	Result	----	----	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	----	----	
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%	6.90	8.88	7.79	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	8.5	2.5	7.0	----	----	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.8	<0.8	<0.8	----	----	
Acenaphthene	83-32-9	0.5	mg/kg	<0.8	<0.8	<0.8	----	----	
Fluorene	86-73-7	0.5	mg/kg	<0.8	<0.8	<0.8	----	----	
Phenanthrene	85-01-8	0.5	mg/kg	3.0	1.0	2.8	----	----	
Anthracene	120-12-7	0.5	mg/kg	1.0	<0.8	1.0	----	----	
Fluoranthene	206-44-0	0.5	mg/kg	3.6	1.8	3.7	----	----	
Pyrene	129-00-0	0.5	mg/kg	3.3	1.6	3.4	----	----	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	1.6	0.9	1.8	----	----	
Chrysene	218-01-9	0.5	mg/kg	1.7	0.9	1.8	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.7	1.3	2.8	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.9	<0.8	1.0	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.2	0.9	2.3	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.0	<0.8	1.1	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.8	<0.8	<0.8	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.1	0.9	1.2	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	30.6	11.8	29.9	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	2.8	1.1	3.0	----	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	3.1	1.4	3.2	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	3.3	1.7	3.5	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----	
C15 - C28 Fraction	----	100	mg/kg	220	<100	210	----	----	
C29 - C36 Fraction	----	100	mg/kg	210	<100	210	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	430	<50	420	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED02_0.5-0.5	SED03_0.0-0.5	SED07_0.0-0.5	----	----
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES1829588-052	ES1829588-055	ES1829588-057	-----	-----	
				Result	Result	Result	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	----	----	
>C16 - C34 Fraction	----	100	mg/kg	370	200	340	----	----	
>C34 - C40 Fraction	----	100	mg/kg	140	<100	160	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	510	200	500	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	1	<1	----	----	
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg	10.1	99.7	8.2	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	80.3	89.3	81.8	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	81.6	88.9	82.7	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	58.3	78.7	59.4	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	86.8	86.7	88.2	----	----	
Anthracene-d10	1719-06-8	0.5	%	90.4	83.8	91.6	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	79.0	83.5	81.9	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	78.0	84.4	91.8	----	----	
Toluene-D8	2037-26-5	0.2	%	89.4	81.6	109	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	90.4	81.4	106	----	----	
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%	41.2	73.2	47.0	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	RN02	----	----	----	----
Client sampling date / time				06-Oct-2018 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1829588-023	-----	-----	-----	-----	
				Result	----	----	----	----	
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----	
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----	
Benzo(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----	
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----	
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	RN02	----	----	----	----
Client sampling date / time				06-Oct-2018 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1829588-023	-----	-----	-----	-----	
				Result	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	20.3	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	39.5	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	57.0	----	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	82.8	----	----	----	----	
Anthracene-d10	1719-06-8	1.0	%	81.3	----	----	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	91.2	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	105	----	----	----	----	
Toluene-D8	2037-26-5	2	%	113	----	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	104	----	----	----	----	



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP090S: Organotin Surrogate			
Tripropyltin	----	35	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

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

Attention: Jacqui Hallchurch

Report **621469-S**
 Project name 21-27477-TASK 3J FOR CONTAMINATION
 Project ID 2127477
 Received Date Oct 08, 2018

Client Sample ID			FD08
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Oc09111
Date Sampled			Oct 05, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	53
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5

Client Sample ID			FD08
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Oc09111
Date Sampled			Oct 05, 2018
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	81
p-Terphenyl-d14 (surr.)	1	%	86
Ammonia (as N)			
	5	mg/kg	7.4
Cyanide (total)			
	5	mg/kg	< 5
Total Organic Carbon			
	0.1	%	0.6
% Moisture			
	1	%	22
Heavy Metals			
Arsenic	2	mg/kg	5.3
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	8.9
Copper	5	mg/kg	28
Lead	5	mg/kg	19
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	5.9
Zinc	5	mg/kg	49

Sample History

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

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
Eurofins mgt Suite B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 09, 2018	14 Day
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Melbourne	Oct 09, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 09, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 09, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Oct 09, 2018	14 Day
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 09, 2018	28 Days
Ammonia (as N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Melbourne	Oct 09, 2018	7 Day
Cyanide (total) - Method: LTM-INO-4020 Total Free WAD Cyanide by CFA	Melbourne	Oct 09, 2018	14 Day
Total Organic Carbon - Method: APHA 5310B Total Organic Carbon	Melbourne	Oct 11, 2018	28 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Oct 08, 2018	14 Day

Company Name: GHD Pty Ltd NSW	Order No.:	Received: Oct 8, 2018 3:11 PM
Address: Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #: 621469	Due: Oct 11, 2018
	Phone: 02 9239 7100	Priority: 3 Day
	Fax: 02 9239 7199	Contact Name: Jacqui Hallchurch
Project Name: 21-27477-TASK 3J FOR CONTAMINATION		
Project ID: 2127477		

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Ammonia (as N)	Cyanide (total)	HOLD	Total Organic Carbon	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	FD08	Oct 05, 2018		Soil	S18-Oc09111	X	X		X	X	X
2	FD06	Oct 05, 2018		Soil	S18-Oc09112			X			
Test Counts						1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	mg/kg	< 20		20	Pass	
TRH C10-C14	mg/kg	< 20		20	Pass	
TRH C15-C28	mg/kg	< 50		50	Pass	
TRH C29-C36	mg/kg	< 50		50	Pass	
Method Blank						
BTEX						
Benzene	mg/kg	< 0.1		0.1	Pass	
Toluene	mg/kg	< 0.1		0.1	Pass	
Ethylbenzene	mg/kg	< 0.1		0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2		0.2	Pass	
o-Xylene	mg/kg	< 0.1		0.1	Pass	
Xylenes - Total	mg/kg	< 0.3		0.3	Pass	
Method Blank						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	mg/kg	< 0.5		0.5	Pass	
TRH C6-C10	mg/kg	< 20		20	Pass	
TRH >C10-C16	mg/kg	< 50		50	Pass	
TRH >C16-C34	mg/kg	< 100		100	Pass	
TRH >C34-C40	mg/kg	< 100		100	Pass	
Method Blank						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	mg/kg	< 0.5		0.5	Pass	
Acenaphthylene	mg/kg	< 0.5		0.5	Pass	
Anthracene	mg/kg	< 0.5		0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5		0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5		0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5		0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5		0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5		0.5	Pass	
Chrysene	mg/kg	< 0.5		0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5		0.5	Pass	
Fluoranthene	mg/kg	< 0.5		0.5	Pass	
Fluorene	mg/kg	< 0.5		0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5		0.5	Pass	
Naphthalene	mg/kg	< 0.5		0.5	Pass	
Phenanthrene	mg/kg	< 0.5		0.5	Pass	
Pyrene	mg/kg	< 0.5		0.5	Pass	
Method Blank						
Ammonia (as N)	mg/kg	< 5		5	Pass	
Total Organic Carbon	%	< 0.1		0.1	Pass	
Method Blank						
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Mercury	mg/kg	< 0.1		0.1	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
LCS - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions								
TRH C6-C9	%	92			70-130	Pass		
TRH C10-C14	%	84			70-130	Pass		
LCS - % Recovery								
BTEX								
Benzene	%	89			70-130	Pass		
Toluene	%	87			70-130	Pass		
Ethylbenzene	%	82			70-130	Pass		
m&p-Xylenes	%	85			70-130	Pass		
Xylenes - Total	%	87			70-130	Pass		
LCS - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions								
Naphthalene	%	100			70-130	Pass		
TRH C6-C10	%	88			70-130	Pass		
TRH >C10-C16	%	114			70-130	Pass		
LCS - % Recovery								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	%	104			70-130	Pass		
Acenaphthylene	%	113			70-130	Pass		
Anthracene	%	107			70-130	Pass		
Benz(a)anthracene	%	79			70-130	Pass		
Benzo(a)pyrene	%	89			70-130	Pass		
Benzo(b&j)fluoranthene	%	78			70-130	Pass		
Benzo(g,h,i)perylene	%	92			70-130	Pass		
Benzo(k)fluoranthene	%	90			70-130	Pass		
Chrysene	%	108			70-130	Pass		
Dibenz(a,h)anthracene	%	82			70-130	Pass		
Fluoranthene	%	84			70-130	Pass		
Fluorene	%	104			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	92			70-130	Pass		
Naphthalene	%	102			70-130	Pass		
Phenanthrene	%	98			70-130	Pass		
Pyrene	%	83			70-130	Pass		
LCS - % Recovery								
Total Organic Carbon	%	99			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Arsenic	%	107			80-120	Pass		
Cadmium	%	104			80-120	Pass		
Chromium	%	115			80-120	Pass		
Copper	%	115			80-120	Pass		
Lead	%	109			80-120	Pass		
Mercury	%	103			75-125	Pass		
Nickel	%	115			80-120	Pass		
Zinc	%	108			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	Z18-Oc08210	NCP	%	91		70-130	Pass	
TRH C10-C14	B18-Oc09051	NCP	%	87		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	Z18-Oc08210	NCP	%	95		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	Z18-Oc08210	NCP	%	90			70-130	Pass	
Ethylbenzene	Z18-Oc08210	NCP	%	84			70-130	Pass	
m&p-Xylenes	Z18-Oc08210	NCP	%	89			70-130	Pass	
o-Xylene	Z18-Oc08210	NCP	%	91			70-130	Pass	
Xylenes - Total	Z18-Oc08210	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	Z18-Oc08210	NCP	%	109			70-130	Pass	
TRH C6-C10	Z18-Oc08210	NCP	%	86			70-130	Pass	
TRH >C10-C16	B18-Oc09051	NCP	%	103			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Oc07791	NCP	%	82			70-130	Pass	
Acenaphthylene	M18-Oc07791	NCP	%	88			70-130	Pass	
Anthracene	M18-Oc07791	NCP	%	84			70-130	Pass	
Benz(a)anthracene	M18-Oc07791	NCP	%	88			70-130	Pass	
Benzo(a)pyrene	M18-Oc07791	NCP	%	101			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Oc07791	NCP	%	81			70-130	Pass	
Benzo(g,h,i)perylene	M18-Oc07791	NCP	%	93			70-130	Pass	
Benzo(k)fluoranthene	M18-Oc07791	NCP	%	112			70-130	Pass	
Chrysene	M18-Oc07791	NCP	%	118			70-130	Pass	
Dibenz(a,h)anthracene	M18-Oc07791	NCP	%	91			70-130	Pass	
Fluoranthene	M18-Oc07791	NCP	%	92			70-130	Pass	
Fluorene	M18-Oc07791	NCP	%	87			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M18-Oc07791	NCP	%	93			70-130	Pass	
Naphthalene	M18-Oc07791	NCP	%	81			70-130	Pass	
Phenanthrene	M18-Oc07791	NCP	%	75			70-130	Pass	
Pyrene	M18-Oc07791	NCP	%	92			70-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	S18-Oc08536	NCP	%	60			70-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Oc05234	NCP	%	99			75-125	Pass	
Cadmium	M18-Oc05234	NCP	%	103			75-125	Pass	
Chromium	M18-Oc05234	NCP	%	111			75-125	Pass	
Copper	M18-Oc05234	NCP	%	114			75-125	Pass	
Lead	M18-Oc05234	NCP	%	108			75-125	Pass	
Mercury	M18-Oc05234	NCP	%	121			70-130	Pass	
Nickel	M18-Oc05234	NCP	%	112			75-125	Pass	
Zinc	M18-Oc05234	NCP	%	108			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	Z18-Oc08209	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Oc09964	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Oc09964	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Oc09964	NCP	mg/kg	95	65	38	30%	Fail	Q15
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	Z18-Oc08209	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	Z18-Oc08209	NCP	mg/kg	0.8	0.7	15	30%	Pass	
Ethylbenzene	Z18-Oc08209	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	Z18-Oc08209	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate								
BTEX				Result 1	Result 2	RPD		
o-Xylene	Z18-Oc08209	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	Z18-Oc08209	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	Z18-Oc08209	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	Z18-Oc08209	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	M18-Oc09964	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	M18-Oc09964	NCP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	M18-Oc09964	NCP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1.2.3-cd)pyrene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S18-Oc05759	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Cyanide (total)	S18-Oc08535	NCP	mg/kg	< 5	< 5	<1	30%	Pass
% Moisture	M18-Oc09188	NCP	%	6.0	6.0	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-Oc04380	NCP	mg/kg	7.1	6.6	8.0	30%	Pass
Cadmium	M18-Oc04380	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M18-Oc04380	NCP	mg/kg	23	21	13	30%	Pass
Copper	M18-Oc04380	NCP	mg/kg	30	31	5.0	30%	Pass
Lead	M18-Oc04380	NCP	mg/kg	22	21	2.0	30%	Pass
Mercury	M18-Oc04381	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M18-Oc04380	NCP	mg/kg	38	36	5.0	30%	Pass
Zinc	M18-Oc04380	NCP	mg/kg	50	49	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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)


Glenn Jackson
National Operations 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 | mgt 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 | mgt 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.

Certificate of Analysis

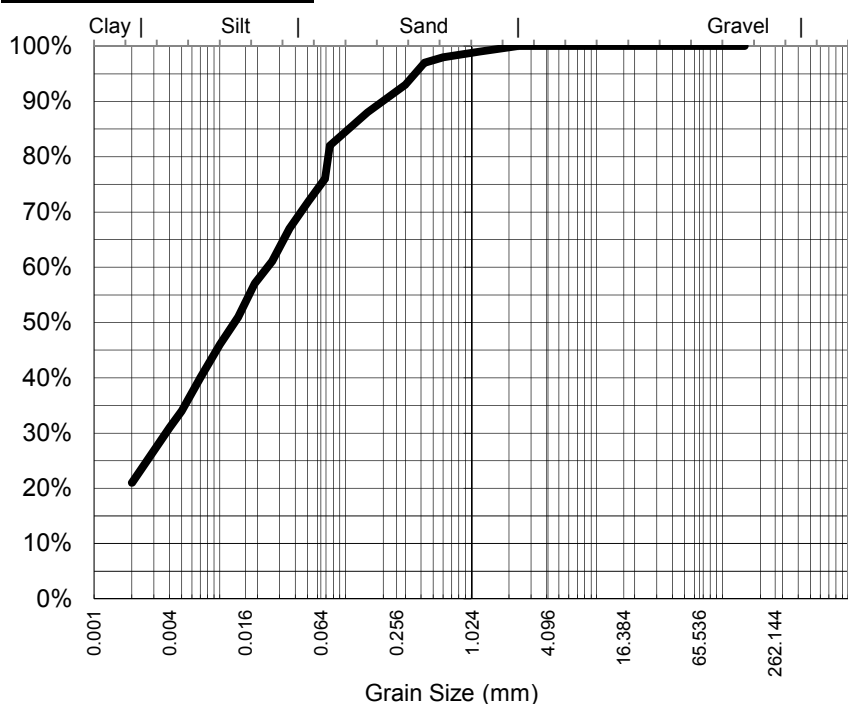
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-001 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED06_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	98%
0.425	97%
0.300	93%
0.150	88%
0.075	82%
Particle Size (microns)	
51	72%
36	67%
26	61%
19	57%
14	51%
10	46%
7	40%
5	34%
2	21%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.013
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.22 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

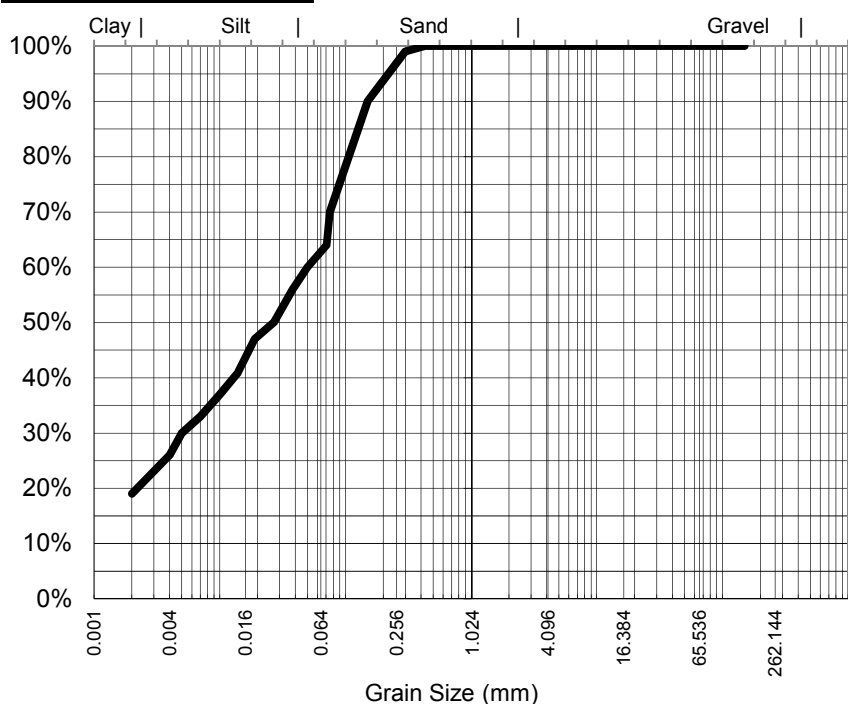
ALS Laboratory Group Pty Ltd
 5/585 Maitland Road
 Mayfield West, NSW 2304
 pH 02 4014 2500
 fax 02 4968 0349
 samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-005 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED06_2.0-2.5

Particle Size Distribution



Particle Size (mm)	% Passing
0.425	100%
0.300	99%
0.150	90%
0.075	70%
Particle Size (microns)	
50	60%
38	56%
27	50%
19	47%
14	41%
10	37%
7	33%
5	30%
2	19%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.027
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.54 g/cm³

NATA Accreditation: 825 Site: Newcastle
 This document is issued in accordance with NATA's accreditation requirements.
 Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



Dianne Blane
 Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

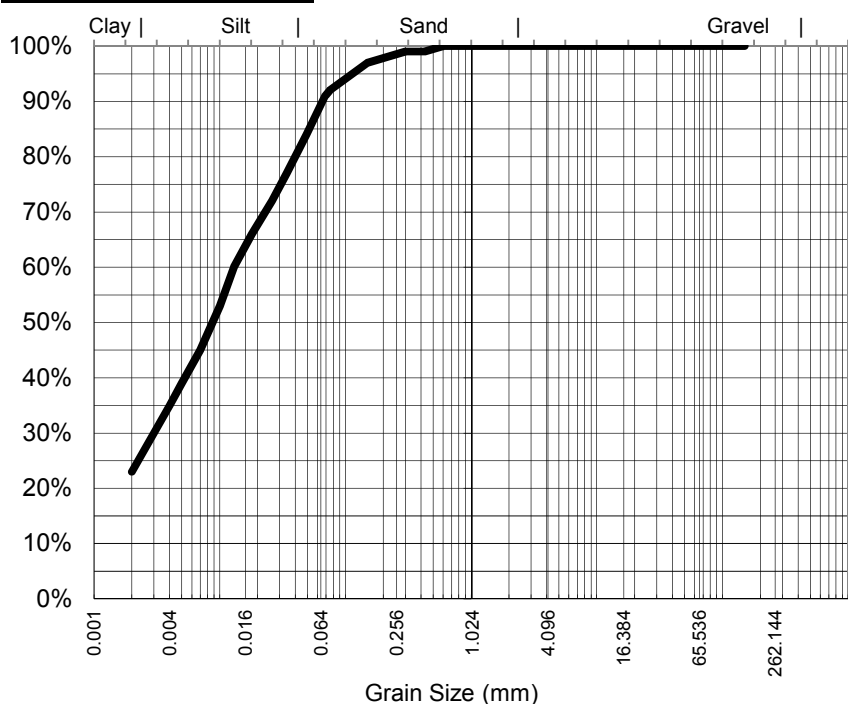
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-010 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED05_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	99%
0.150	97%
0.075	92%
Particle Size (microns)	
49	84%
34	77%
26	72%
18	66%
13	60%
10	53%
7	45%
5	39%
2	23%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.009
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.34 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

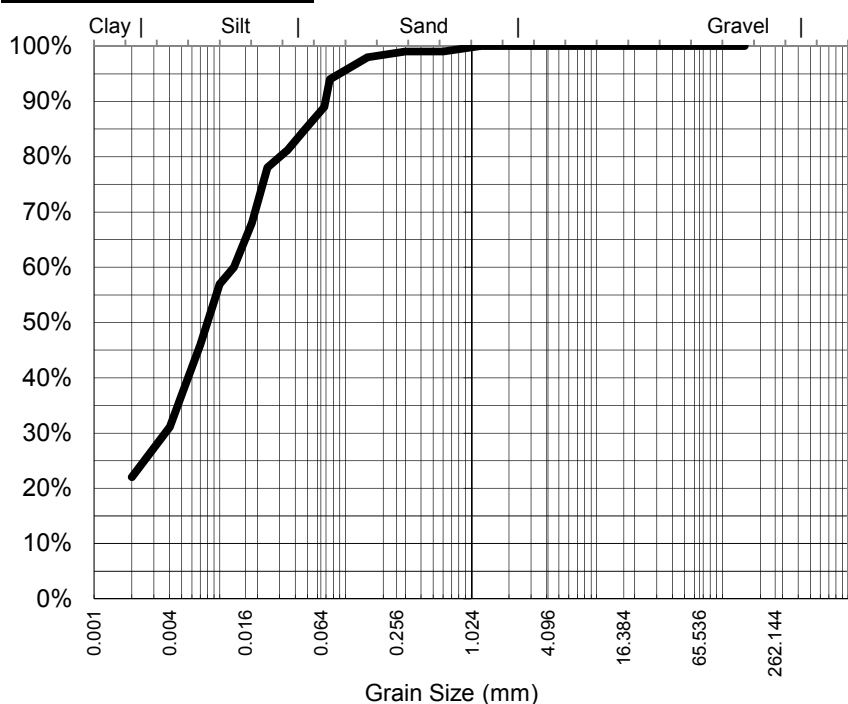
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-012 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED05_1.0-1.5

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	99%
0.150	98%
0.075	94%
Particle Size (microns)	
48	85%
34	81%
24	78%
18	68%
13	60%
10	57%
7	46%
5	37%
2	22%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.008
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.31 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

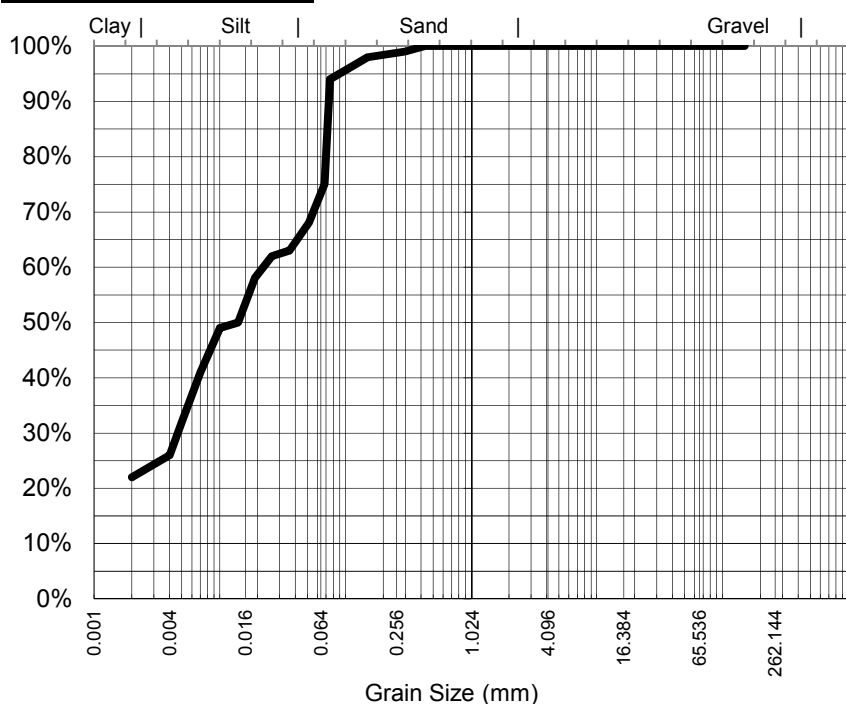
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-013 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED04_0.0-0.1

Particle Size Distribution



Particle Size (mm)	% Passing
0.425	100%
0.300	99%
0.150	98%
0.075	94%
Particle Size (microns)	
51	68%
36	63%
26	62%
19	58%
14	50%
10	49%
7	41%
5	32%
2	22%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.014
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.36 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

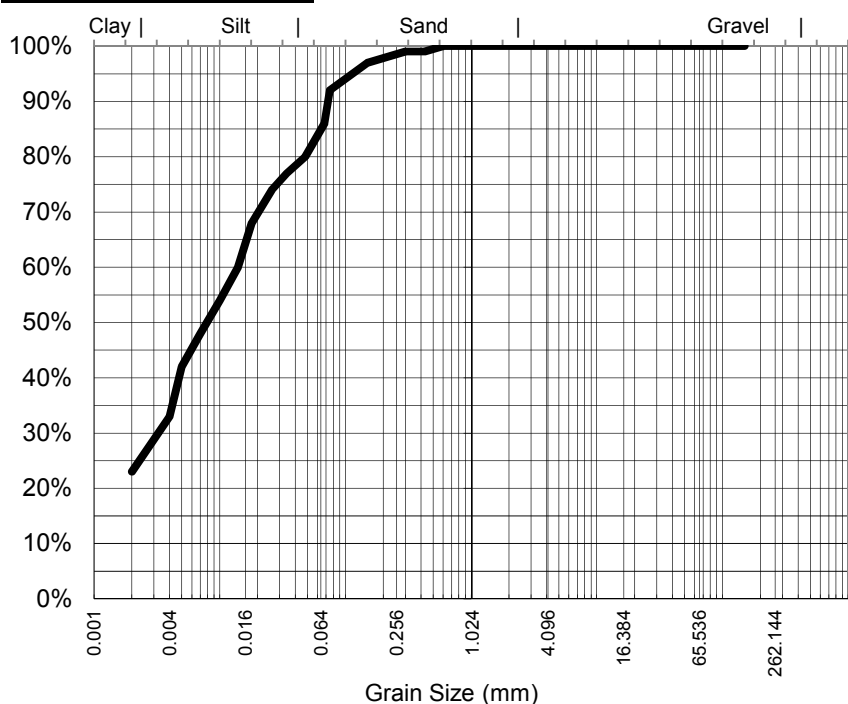
ALS Laboratory Group Pty Ltd
 5/585 Maitland Road
 Mayfield West, NSW 2304
 pH 02 4014 2500
 fax 02 4968 0349
 samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-015 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED04_1.0-1.1

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	99%
0.150	97%
0.075	92%
Particle Size (microns)	
48	80%
34	77%
26	74%
18	68%
14	60%
10	54%
7	48%
5	42%
2	23%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.008
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.31 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
 Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

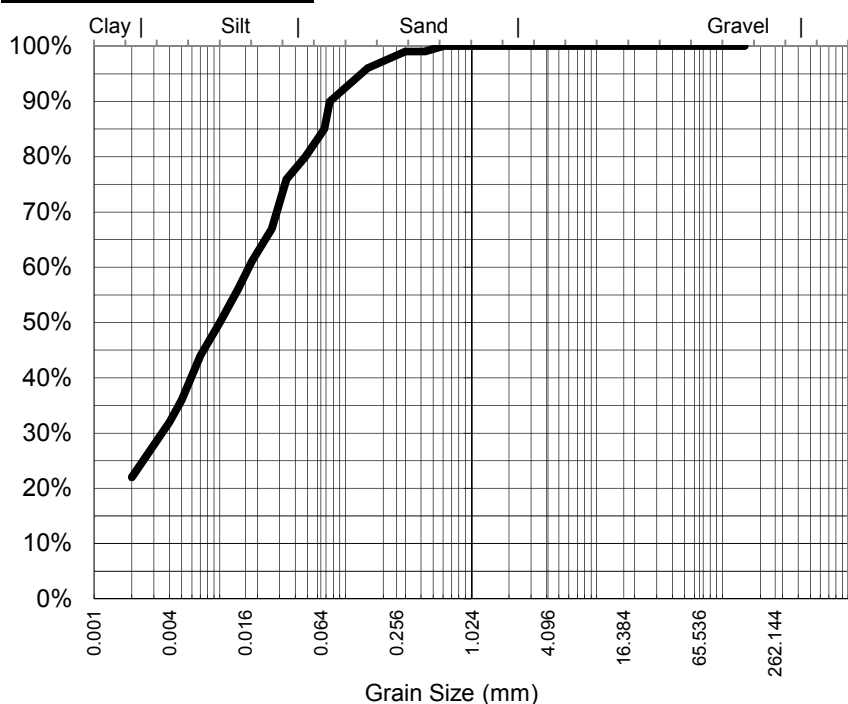
ALS Laboratory Group Pty Ltd
 5/585 Maitland Road
 Mayfield West, NSW 2304
 pH 02 4014 2500
 fax 02 4968 0349
 samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-029 / PSD
PROJECT: 21-27477 **SAMPLE ID:** REA01_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	99%
0.150	96%
0.075	90%
Particle Size (microns)	
48	80%
34	76%
26	67%
18	61%
14	56%
10	50%
7	44%
5	36%
2	22%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.010
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.4 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
 Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

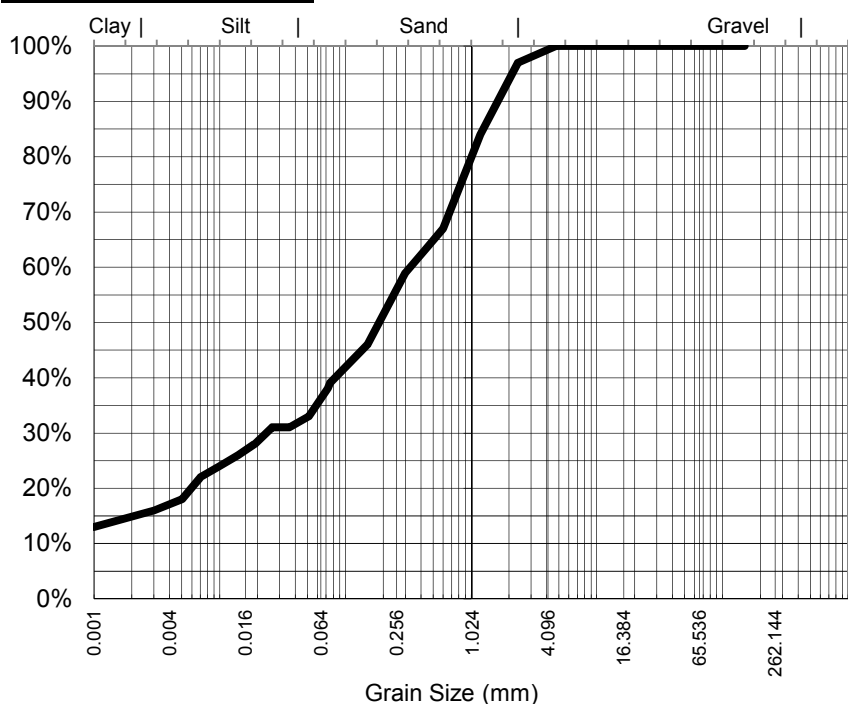
ALS Laboratory Group Pty Ltd
 5/585 Maitland Road
 Mayfield West, NSW 2304
 pH 02 4014 2500
 fax 02 4968 0349
 samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-031 / PSD
PROJECT: 21-27477 **SAMPLE ID:** REA01_1.0-1.5

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	97%
1.18	84%
0.600	67%
0.425	63%
0.300	59%
0.150	46%
0.075	39%
Particle Size (microns)	
51	33%
36	31%
26	31%
19	28%
14	26%
10	24%
7	22%
5	18%
1	13%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.196
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.79 g/cm³

NATA Accreditation: 825 Site: Newcastle
 This document is issued in accordance with NATA's accreditation requirements.
 Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
 Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

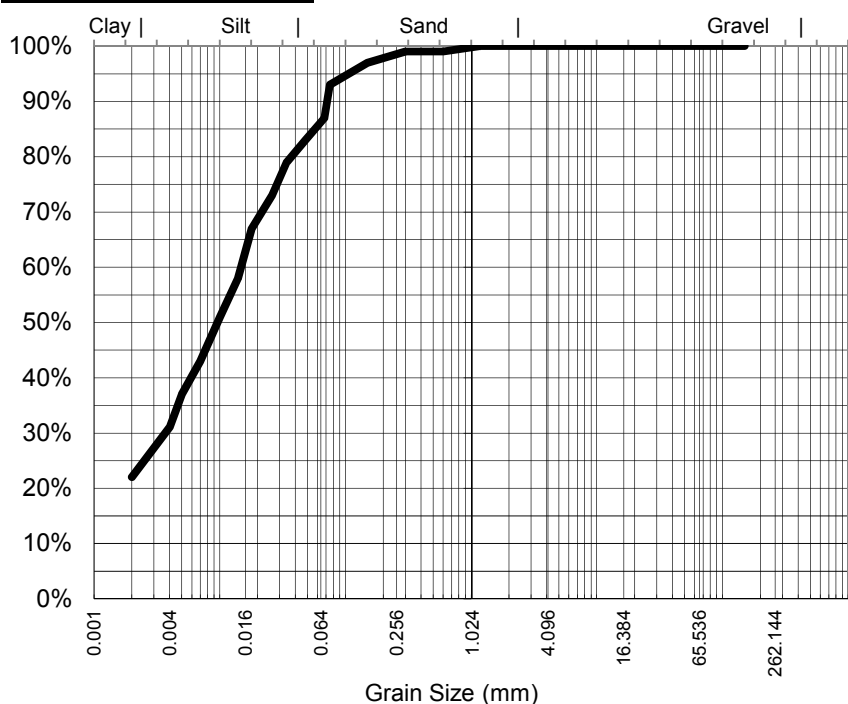
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-037 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED04_0.0-0.1

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	99%
0.150	97%
0.075	93%
Particle Size (microns)	
48	83%
34	79%
26	73%
18	67%
14	58%
10	51%
7	43%
5	37%
2	22%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.010
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.37 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

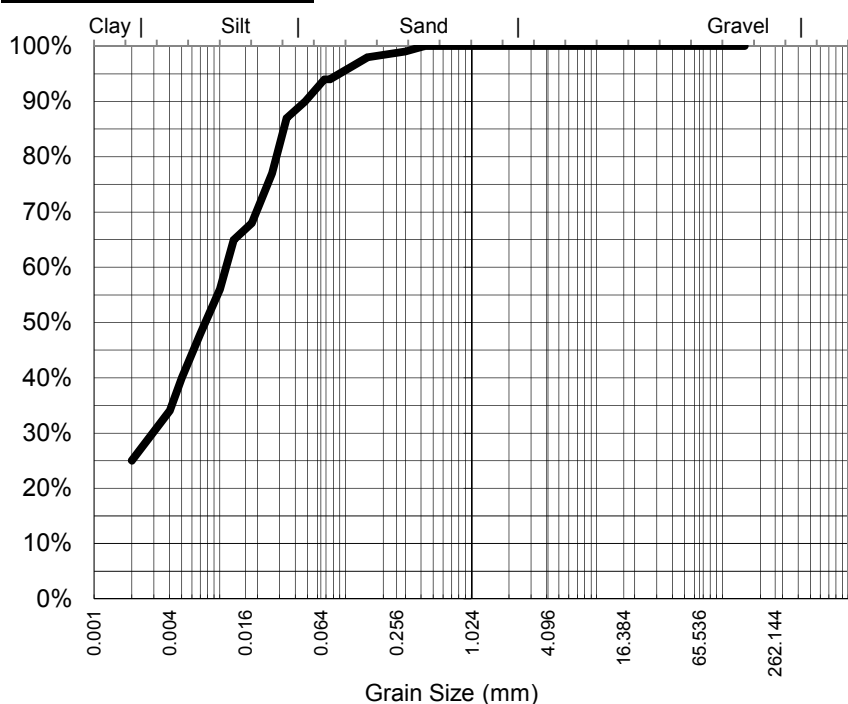
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-039 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED04_1.0-1.5

Particle Size Distribution



Particle Size (mm)	% Passing
0.425	100%
0.300	99%
0.150	98%
0.075	94%
Particle Size (microns)	
48	90%
34	87%
26	77%
18	68%
13	65%
10	56%
7	48%
5	40%
2	25%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.008
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.33 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

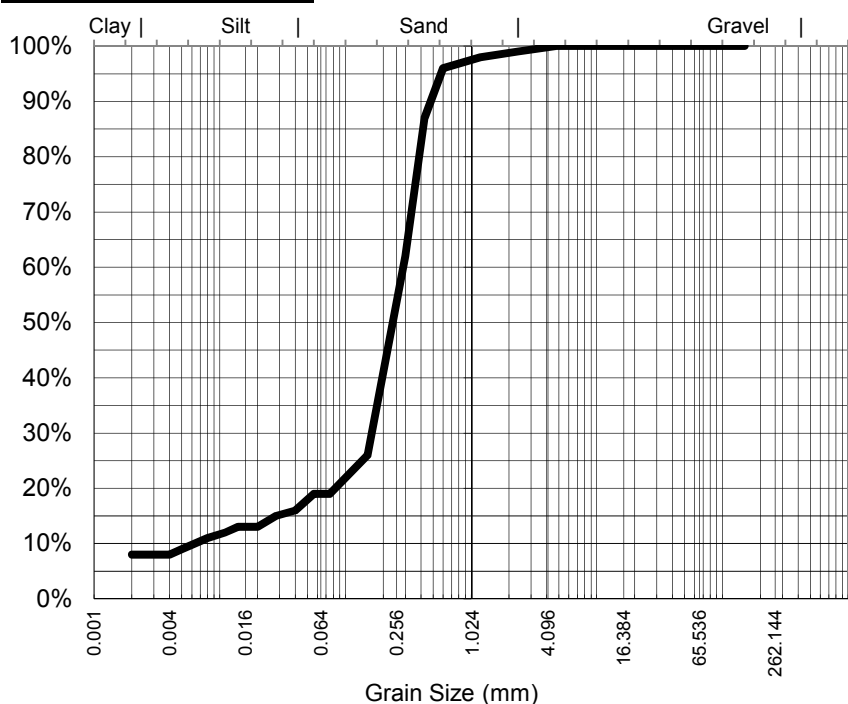
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-043 / PSD
PROJECT: 21-27477 **SAMPLE ID:** REA02_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	98%
0.600	96%
0.425	87%
0.300	62%
0.150	26%
0.075	19%
Particle Size (microns)	
56	19%
40	16%
28	15%
20	13%
14	13%
11	12%
8	11%
5	9%
2	8%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.250
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.62 g/cm³

NATA Accreditation: 825 Site: Newcastle
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

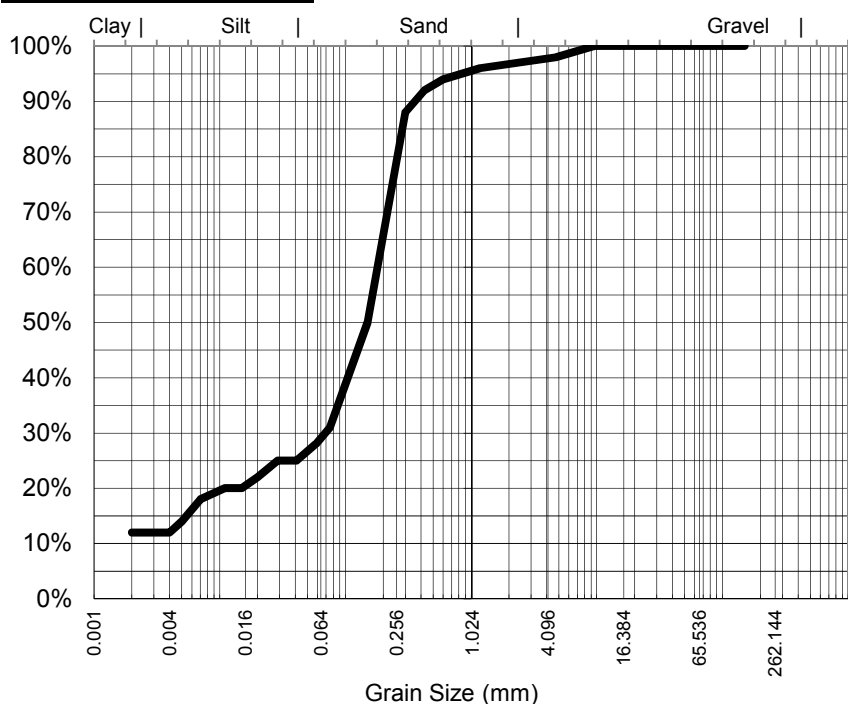
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-047 / PSD
PROJECT: 21-27477 **SAMPLE ID:** REA02_2.0-2.5

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	98%
2.36	97%
1.18	96%
0.600	94%
0.425	92%
0.300	88%
0.150	50%
0.075	31%
Particle Size (microns)	
58	28%
41	25%
29	25%
20	22%
15	20%
11	20%
7	18%
5	14%
2	12%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.150
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND, SHELLS

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.54 g/cm³

NATA Accreditation: 825 Site: Newcastle
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

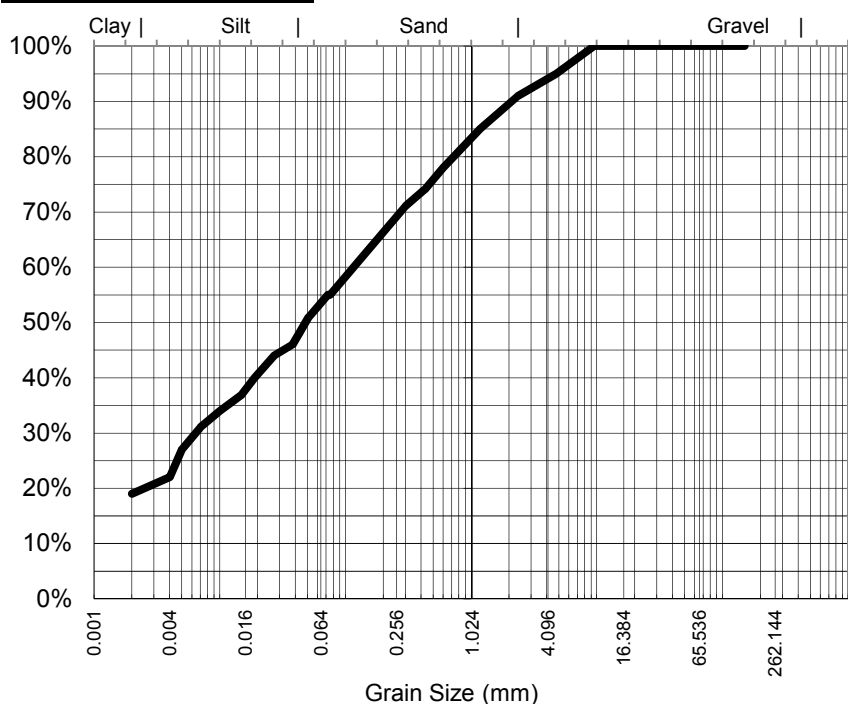
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-049 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED01_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	95%
2.36	91%
1.18	85%
0.600	78%
0.425	74%
0.300	71%
0.150	63%
0.075	55%
Particle Size (microns)	
51	51%
38	46%
27	44%
19	40%
15	37%
10	34%
7	31%
5	27%
2	19%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.048
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND, GRAVEL

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.34 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

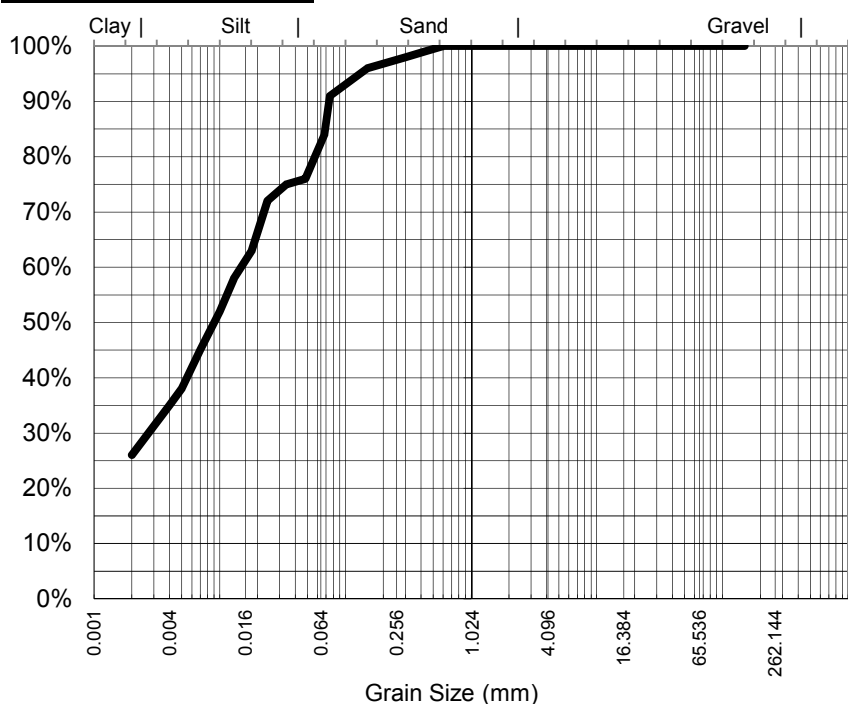
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-052 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED02_0.5-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	98%
0.150	96%
0.075	91%
Particle Size (microns)	
48	76%
34	75%
24	72%
18	63%
13	58%
10	52%
7	45%
5	38%
2	26%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.009
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.37 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

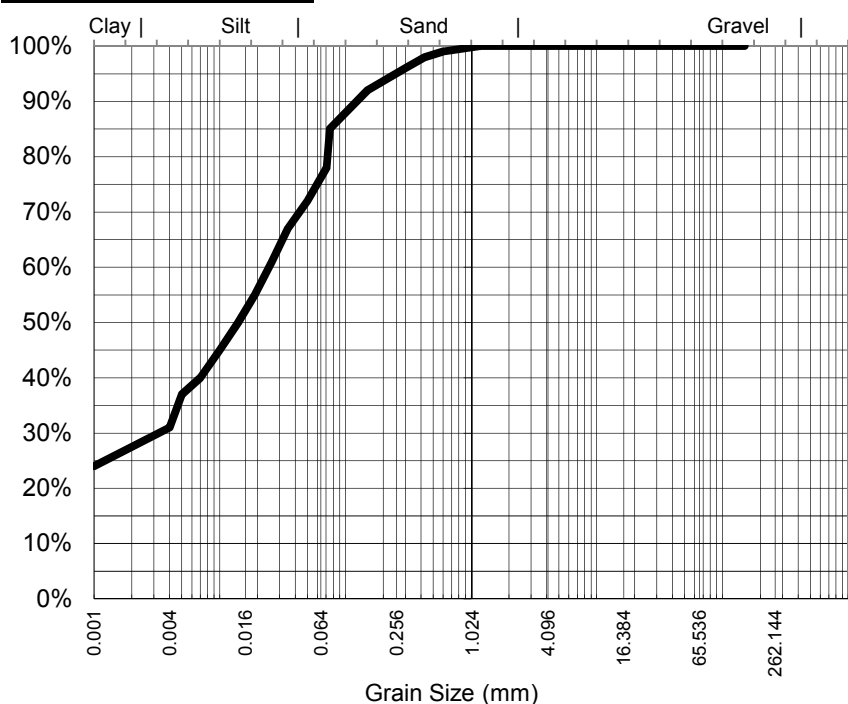
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 18-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-055 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED03_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	98%
0.300	96%
0.150	92%
0.075	85%
Particle Size (microns)	
50	72%
35	67%
26	61%
19	55%
14	50%
10	45%
7	40%
5	37%
1	24%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.014
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.39 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

Certificate of Analysis

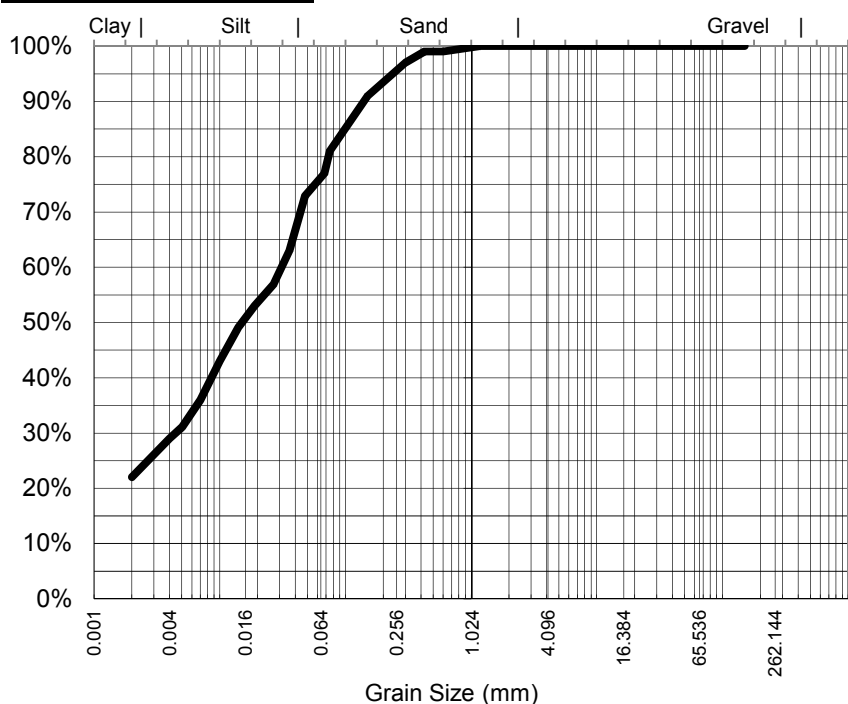
ALS Laboratory Group Pty Ltd
5/585 Maitland Road
Mayfield West, NSW 2304
pH 02 4014 2500
fax 02 4968 0349
samples.newcastle@alsenviro.com

ALS Environmental
Newcastle, NSW



CLIENT: Jacqui Hallchurch **DATE REPORTED:** 15-Oct-2018
COMPANY: GHD PTY LTD **DATE RECEIVED:** 5-Oct-2018
ADDRESS: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY **REPORT NO:** ES1829588-057 / PSD
PROJECT: 21-27477 **SAMPLE ID:** SED07_0.0-0.5

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	97%
0.150	91%
0.075	81%
Particle Size (microns)	
48	73%
36	63%
27	57%
19	53%
14	49%
10	43%
7	36%
5	31%
2	22%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.015
----------------------------	-------

Sample Comments:

Analysed: 10-Oct-18

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description: FINES, SAND

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Hydrometer Type ASTM E100

Soil Particle Density (<2.36mm) 2.39 (2.45)* g/cm³

NATA Accreditation: 825 Site: Newcastle

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.



D Blane

Dianne Blane
Laboratory Coordinator
Authorised Signatory

ANALYSIS

Client	GHD PTY LTD	Laboratory :	Environmental Division Sydney	1 of 15
Contact	MS JACQUI HALLCHURCH	Contact	CUSTOMER.SERVICES.ES	Work Order: ES1890029
Address:	LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address:	277-289 Woodpark Road Smithfield NSW 2164 Australia	

Project	21-27477	Quote #	---	Received:	4 Oct 2018
Order #	- Not provided -			Issued	23 Oct 2018
C-O-C #	- Not provided -				
Site	- Not provided -				
E-mail	jacqui.hallchurch@ghd.com	E-mail	ALSEnviro.Sydney@alsglobal.com	Number of Samples	
Phone	9239 7100	Phone	+61-2-8784 8555	Received:	14
Fax	9239 7199	Fax	+61-2-8784 8500	Analysed:	14

Notes
 LOR = Limit of reporting
 I-TEF = International toxic equivalency factor
 I-TEQ = International toxic equivalence
 WHO-TEF = World Health Organistaion toxic equivalency factor
 WHO-TEQ = World Health Organisation toxic equivalence
 Samples analysed 'as received', results reported on 'dry weight' basis.

- 1 I-TEQ_(zero) and WHO-TEQ_(zero) calculated treating <LOR as zero concentration
- 2 I-TEQ_(0.5 LOR) and WHO-TEQ_(0.5 zero) calculated treating <LOR as 0.5 LoR concentration
- 3 I-TEQ_(LOR) and WHO-TEQ_(LOR) calculated treating <LOR as LoR concentration
- 4 Totals LORs are calculated by multiplying the number of peaks by the individual LOR per compound
- 5 13C12 Rec(%) = The absolute recovery of Isotopically labelled compound added by the Laboratory to both quantitate and measure extraction efficiency.

T = tetra
 Pe = penta
 Hx = hexa
 Hp =hepta
 O = octa
 CDD, dioxin = chlorinated dibenzo-p-dioxin
 CDF, furan = chlorinated dibenzofuran

ALSE - Excellence in Analytical Testing



NATA Accredited Laboratory - 825

This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IEC 17025

This document has been digitally signed by those names that appear on this report and are the authorised signatories. Digital signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Position	Department
Peter Blow	HRMS Chemist	GC/HR-MS - NATA 825 (818 - Brisbane)

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029001 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED06_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.50	1	0.00	0.25	0.50	102.5
12378-PeCDD	<2.5	2.5	1	0.00	1.24	2.49	0.5	0.00	0.62	1.24	94.4
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	60.7
123678-HxCDD	3.9	2.5	0.1	0.39	0.39	0.39	0.1	0.39	0.39	0.39	86.9
123789-HxCDD	7.0	2.5	0.1	0.70	0.70	0.70	0.1	0.70	0.70	0.70	-
1234678-HpCDD	159.0	2.5	0.01	1.59	1.59	1.59	0.01	1.59	1.59	1.59	53.6
OCDD	7480.0	9.9	0.0003	2.24	2.24	2.24	0.001	7.48	7.48	7.48	20.0
2378-TCDF	2.6	0.5	0.1	0.26	0.26	0.26	0.1	0.26	0.26	0.26	88.0
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	82.1
23478-PeCDF	<2.5	2.5	0.3	0.00	0.37	0.75	0.5	0.00	0.62	1.24	75.5
123478-HxCDF	3.8	2.5	0.1	0.38	0.38	0.38	0.1	0.38	0.38	0.38	64.0
123678-HxCDF	2.9	2.5	0.1	0.29	0.29	0.29	0.1	0.29	0.29	0.29	92.8
234678-HxCDF	2.8	2.5	0.1	0.28	0.28	0.28	0.1	0.28	0.28	0.28	74.8
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	106.0
1234678-HpCDF	16.9	2.5	0.01	0.17	0.17	0.17	0.01	0.17	0.17	0.17	41.4
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	50.7
OCDF	34.1	5.0	0.0003	0.01	0.01	0.01	0.001	0.03	0.03	0.03	-
Total TEQ	-	-	-	6.33	8.49	10.65	-	11.59	13.40	15.21	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	144.0	5.5	11
Penta-Dioxins	72.6	19.9	8
Hexa-Dioxins	567.0	19.9	8
Hepta-Dioxins	794.0	5.0	2
Octa-Dioxin	7480.0	9.9	1
Tetra-Furans	44.4	11.4	23
Penta-Furans	29.3	27.3	11
Hexa-Furans	<29.8	29.8	12
Hepta-Furans	38.8	9.9	4
Octa-Furan	34.1	5.0	1
Σ PCDD/Fs	9204.2		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029002 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED06_2.2-2.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.50	1	0.00	0.25	0.50	100.8
12378-PeCDD	<2.5	2.5	1	0.00	1.24	2.49	0.5	0.00	0.62	1.24	128.0
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	53.0
123678-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	84.7
123789-HxCDD	3.3	2.5	0.1	0.33	0.33	0.33	0.1	0.33	0.33	0.33	-
1234678-HpCDD	75.3	2.5	0.01	0.75	0.75	0.75	0.01	0.75	0.75	0.75	59.9
OCDD	3570.0	9.9	0.0003	1.07	1.07	1.07	0.001	3.57	3.57	3.57	33.9
2378-TCDF	1.9	0.5	0.1	0.19	0.19	0.19	0.1	0.19	0.19	0.19	100.4
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	95.5
23478-PeCDF	<2.5	2.5	0.3	0.00	0.37	0.75	0.5	0.00	0.62	1.24	98.1
123478-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	48.5
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	71.0
234678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	64.9
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	62.7
1234678-HpCDF	8.8	2.5	0.01	0.09	0.09	0.09	0.01	0.09	0.09	0.09	41.9
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	49.4
OCDF	14.2	5.0	0.0003	0.00	0.00	0.00	0.001	0.01	0.01	0.01	-
Total TEQ	-	-	-	2.44	5.10	7.75	-	4.95	7.26	9.57	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	74.0	7.0	14
Penta-Dioxins	49.3	22.4	9
Hexa-Dioxins	273.0	22.4	9
Hepta-Dioxins	359.0	5.0	2
Octa-Dioxin	3570.0	9.9	1
Tetra-Furans	39.5	9.9	20
Penta-Furans	25.7	24.9	10
Hexa-Furans	<24.9	24.9	10
Hepta-Furans	20.0	9.9	4
Octa-Furan	14.2	5.0	1
Σ PCDD/Fs	4424.7		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029003 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED05_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	1.1	0.5	1	1.06	1.06	1.06	1	1.06	1.06	1.06	95.4
12378-PeCDD	<2.5	2.5	1	0.00	1.25	2.50	0.5	0.00	0.62	1.25	91.6
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	53.9
123678-HxCDD	3.9	2.5	0.1	0.39	0.39	0.39	0.1	0.39	0.39	0.39	79.8
123789-HxCDD	7.1	2.5	0.1	0.71	0.71	0.71	0.1	0.71	0.71	0.71	-
1234678-HpCDD	155.0	2.5	0.01	1.55	1.55	1.55	0.01	1.55	1.55	1.55	54.0
OCDD	8820.0	10.0	0.0003	2.65	2.65	2.65	0.001	8.82	8.82	8.82	25.5
2378-TCDF	3.2	0.5	0.1	0.32	0.32	0.32	0.1	0.32	0.32	0.32	83.0
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	87.5
23478-PeCDF	2.7	2.5	0.3	0.82	0.82	0.82	0.5	1.36	1.36	1.36	83.8
123478-HxCDF	3.8	2.5	0.1	0.38	0.38	0.38	0.1	0.38	0.38	0.38	44.0
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	68.4
234678-HxCDF	2.5	2.5	0.1	0.25	0.25	0.25	0.1	0.25	0.25	0.25	63.5
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	64.5
1234678-HpCDF	14.9	2.5	0.01	0.15	0.15	0.15	0.01	0.15	0.15	0.15	37.8
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	46.0
OCDF	24.3	5.0	0.0003	0.01	0.01	0.01	0.001	0.02	0.02	0.02	-
Total TEQ	-	-	-	8.27	9.95	11.62	-	15.01	16.08	17.16	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	123.0	5.5	11
Penta-Dioxins	102.0	25.0	10
Hexa-Dioxins	556.0	20.0	8
Hepta-Dioxins	857.0	5.0	2
Octa-Dioxin	8820.0	10.0	1
Tetra-Furans	58.5	9.5	19
Penta-Furans	32.9	22.5	9
Hexa-Furans	<25.0	25.0	10
Hepta-Furans	29.6	10.0	4
Octa-Furan	24.3	5.0	1
Σ PCDD/Fs	10603.3		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029004 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED05_1.0-1.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	0.5	0.5	1	0.50	0.50	0.50	1	0.50	0.50	0.50	100.2
12378-PeCDD	<2.4	2.4	1	0.00	1.21	2.42	0.5	0.00	0.61	1.21	92.7
123478-HxCDD	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	53.2
123678-HxCDD	3.1	2.4	0.1	0.31	0.31	0.31	0.1	0.31	0.31	0.31	80.2
123789-HxCDD	4.8	2.4	0.1	0.48	0.48	0.48	0.1	0.48	0.48	0.48	-
1234678-HpCDD	124.0	2.4	0.01	1.24	1.24	1.24	0.01	1.24	1.24	1.24	53.5
OCDD	7430.0	9.7	0.0003	2.23	2.23	2.23	0.001	7.43	7.43	7.43	28.2
2378-TCDF	2.9	0.5	0.1	0.29	0.29	0.29	0.1	0.29	0.29	0.29	71.6
12378-PeCDF	<2.4	2.4	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	72.2
23478-PeCDF	3.2	2.4	0.3	0.95	0.95	0.95	0.5	1.59	1.59	1.59	75.3
123478-HxCDF	3.4	2.4	0.1	0.34	0.34	0.34	0.1	0.34	0.34	0.34	46.1
123678-HxCDF	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	72.8
234678-HxCDF	3.1	2.4	0.1	0.31	0.31	0.31	0.1	0.31	0.31	0.31	63.2
123789-HxCDF	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	71.8
1234678-HpCDF	17.1	2.4	0.01	0.17	0.17	0.17	0.01	0.17	0.17	0.17	37.4
1234789-HpCDF	<2.4	2.4	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	49.6
OCDF	30.6	4.8	0.0003	0.01	0.01	0.01	0.001	0.03	0.03	0.03	-
Total TEQ	-	-	-	6.84	8.46	10.08	-	12.70	13.74	14.78	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	92.8	6.8	14
Penta-Dioxins	67.8	19.4	8
Hexa-Dioxins	450.0	21.8	9
Hepta-Dioxins	708.0	4.8	2
Octa-Dioxin	7430.0	9.7	1
Tetra-Furans	64.6	9.2	19
Penta-Furans	43.7	26.6	11
Hexa-Furans	<26.6	26.6	11
Hepta-Furans	36.5	9.7	4
Octa-Furan	30.6	4.8	1
Σ PCDD/Fs	8924.0		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029008 Qc Lot Number: 4533954 Date Sampled: 05-Oct-2018
 Client Sample ID: REA01_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.50	1	0.00	0.25	0.50	93.3
12378-PeCDD	<2.5	2.5	1	0.00	1.24	2.48	0.5	0.00	0.62	1.24	97.5
123478-HxCDD	2.5	2.5	0.1	0.25	0.25	0.25	0.1	0.25	0.25	0.25	53.8
123678-HxCDD	4.8	2.5	0.1	0.48	0.48	0.48	0.1	0.48	0.48	0.48	87.4
123789-HxCDD	7.2	2.5	0.1	0.72	0.72	0.72	0.1	0.72	0.72	0.72	-
1234678-HpCDD	171.0	2.5	0.01	1.71	1.71	1.71	0.01	1.71	1.71	1.71	63.3
OCDD	5720.0	9.9	0.0003	1.72	1.72	1.72	0.001	5.72	5.72	5.72	38.8
2378-TCDF	4.6	0.5	0.1	0.46	0.46	0.46	0.1	0.46	0.46	0.46	69.1
12378-PeCDF	5.3	2.5	0.03	0.16	0.16	0.16	0.05	0.26	0.26	0.26	76.9
23478-PeCDF	8.7	2.5	0.3	2.62	2.62	2.62	0.5	4.36	4.36	4.36	79.0
123478-HxCDF	12.8	2.5	0.1	1.28	1.28	1.28	0.1	1.28	1.28	1.28	44.5
123678-HxCDF	8.4	2.5	0.1	0.84	0.84	0.84	0.1	0.84	0.84	0.84	77.0
234678-HxCDF	9.3	2.5	0.1	0.93	0.93	0.93	0.1	0.93	0.93	0.93	68.0
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	70.8
1234678-HpCDF	44.4	2.5	0.01	0.44	0.44	0.44	0.01	0.44	0.44	0.44	42.8
1234789-HpCDF	6.9	2.5	0.01	0.07	0.07	0.07	0.01	0.07	0.07	0.07	54.5
OCDF	72.5	5.0	0.0003	0.02	0.02	0.02	0.001	0.07	0.07	0.07	-
Total TEQ	-	-	-	11.68	13.29	14.90	-	17.59	18.58	19.57	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	82.5	5.5	11
Penta-Dioxins	75.2	19.8	8
Hexa-Dioxins	479.0	17.3	7
Hepta-Dioxins	738.0	5.0	2
Octa-Dioxin	5720.0	9.9	1
Tetra-Furans	74.5	10.4	21
Penta-Furans	85.3	29.7	12
Hexa-Furans	70.3	24.8	10
Hepta-Furans	80.3	9.9	4
Octa-Furan	72.5	5.0	1
Σ PCDD/Fs	7477.6		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029009 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: REA01_1.0-1.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	0.9	0.5	1	0.88	0.88	0.88	1	0.88	0.88	0.88	87.3
12378-PeCDD	3.7	2.5	1	3.71	3.71	3.71	0.5	1.86	1.86	1.86	97.1
123478-HxCDD	5.6	2.5	0.1	0.56	0.56	0.56	0.1	0.56	0.56	0.56	46.7
123678-HxCDD	9.5	2.5	0.1	0.95	0.95	0.95	0.1	0.95	0.95	0.95	72.5
123789-HxCDD	17.0	2.5	0.1	1.70	1.70	1.70	0.1	1.70	1.70	1.70	-
1234678-HpCDD	289.0	2.5	0.01	2.89	2.89	2.89	0.01	2.89	2.89	2.89	54.4
OCDD	15000.0	10.0	0.0003	4.50	4.50	4.50	0.001	15.00	15.00	15.00	30.2
2378-TCDF	4.3	0.5	0.1	0.43	0.43	0.43	0.1	0.43	0.43	0.43	72.1
12378-PeCDF	4.6	2.5	0.03	0.14	0.14	0.14	0.05	0.23	0.23	0.23	77.4
23478-PeCDF	8.9	2.5	0.3	2.66	2.66	2.66	0.5	4.44	4.44	4.44	78.8
123478-HxCDF	11.8	2.5	0.1	1.18	1.18	1.18	0.1	1.18	1.18	1.18	38.2
123678-HxCDF	7.5	2.5	0.1	0.75	0.75	0.75	0.1	0.75	0.75	0.75	65.1
234678-HxCDF	8.7	2.5	0.1	0.87	0.87	0.87	0.1	0.87	0.87	0.87	56.8
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	62.8
1234678-HpCDF	42.8	2.5	0.01	0.43	0.43	0.43	0.01	0.43	0.43	0.43	34.5
1234789-HpCDF	4.2	2.5	0.01	0.04	0.04	0.04	0.01	0.04	0.04	0.04	48.0
OCDF	49.0	5.0	0.0003	0.01	0.01	0.01	0.001	0.05	0.05	0.05	-
Total TEQ	-	-	-	21.69	21.82	21.94	-	32.24	32.36	32.49	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	211.0	5.5	11
Penta-Dioxins	162.0	22.4	9
Hexa-Dioxins	1190.0	19.9	8
Hepta-Dioxins	1630.0	5.0	2
Octa-Dioxin	15000.0	10.0	1
Tetra-Furans	79.8	9.5	19
Penta-Furans	81.7	27.4	11
Hexa-Furans	65.1	27.4	11
Hepta-Furans	78.4	10.0	4
Octa-Furan	49.0	5.0	1
Σ PCDD/Fs	18547.0		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300

Laboratory Sample ID: ES1890029010
 Client Sample ID: SED04_0.0-0.5

Qc Lot Number: 4533955
 Sample Matrix: SOIL

Date Sampled: 05-Oct-2018
 Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.49	1	0.00	0.25	0.49	98.5
12378-PeCDD	<2.5	2.5	1	0.00	1.23	2.47	0.5	0.00	0.62	1.23	99.7
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	54.1
123678-HxCDD	3.7	2.5	0.1	0.37	0.37	0.37	0.1	0.37	0.37	0.37	84.1
123789-HxCDD	7.6	2.5	0.1	0.76	0.76	0.76	0.1	0.76	0.76	0.76	-
1234678-HpCDD	149.0	2.5	0.01	1.49	1.49	1.49	0.01	1.49	1.49	1.49	63.5
OCDD	8540.0	9.9	0.0003	2.56	2.56	2.56	0.001	8.54	8.54	8.54	34.5
2378-TCDF	2.4	0.5	0.1	0.24	0.24	0.24	0.1	0.24	0.24	0.24	83.3
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	92.6
23478-PeCDF	2.6	2.5	0.3	0.77	0.77	0.77	0.5	1.29	1.29	1.29	95.3
123478-HxCDF	2.7	2.5	0.1	0.27	0.27	0.27	0.1	0.27	0.27	0.27	45.8
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	72.8
234678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	69.6
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	68.5
1234678-HpCDF	12.7	2.5	0.01	0.13	0.13	0.13	0.01	0.13	0.13	0.13	42.0
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	52.2
OCDF	24.4	4.9	0.0003	0.01	0.01	0.01	0.001	0.02	0.02	0.02	-
Total TEQ	-	-	-	6.60	8.62	10.64	-	13.11	14.54	15.97	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	121.0	5.9	12
Penta-Dioxins	101.0	19.7	8
Hexa-Dioxins	537.0	19.7	8
Hepta-Dioxins	831.0	4.9	2
Octa-Dioxin	8540.0	9.9	1
Tetra-Furans	41.1	9.4	19
Penta-Furans	<32.1	32.1	13
Hexa-Furans	<19.7	19.7	8
Hepta-Furans	26.9	9.9	4
Octa-Furan	24.4	4.9	1
Σ PCDD/Fs	10222.4		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029011 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED04_1.0-1.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.50	1	0.00	0.25	0.50	93.9
12378-PeCDD	<2.5	2.5	1	0.00	1.25	2.50	0.5	0.00	0.62	1.25	96.3
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	46.3
123678-HxCDD	3.6	2.5	0.1	0.36	0.36	0.36	0.1	0.36	0.36	0.36	73.9
123789-HxCDD	7.6	2.5	0.1	0.76	0.76	0.76	0.1	0.76	0.76	0.76	-
1234678-HpCDD	138.0	2.5	0.01	1.38	1.38	1.38	0.01	1.38	1.38	1.38	52.5
OCDD	7490.0	10.0	0.0003	2.25	2.25	2.25	0.001	7.49	7.49	7.49	28.9
2378-TCDF	2.6	0.5	0.1	0.26	0.26	0.26	0.1	0.26	0.26	0.26	69.5
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	75.1
23478-PeCDF	2.6	2.5	0.3	0.77	0.77	0.77	0.5	1.28	1.28	1.28	75.0
123478-HxCDF	3.5	2.5	0.1	0.35	0.35	0.35	0.1	0.35	0.35	0.35	39.1
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	63.0
234678-HxCDF	2.7	2.5	0.1	0.27	0.27	0.27	0.1	0.27	0.27	0.27	58.2
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	55.5
1234678-HpCDF	14.9	2.5	0.01	0.15	0.15	0.15	0.01	0.15	0.15	0.15	36.6
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	50.3
OCDF	30.5	5.0	0.0003	0.01	0.01	0.01	0.001	0.03	0.03	0.03	-
Total TEQ	-	-	-	6.55	8.47	10.39	-	12.33	13.65	14.97	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	83.7	6.0	12
Penta-Dioxins	58.2	17.5	7
Hexa-Dioxins	448.0	29.9	12
Hepta-Dioxins	698.0	5.0	2
Octa-Dioxin	7490.0	10.0	1
Tetra-Furans	36.4	9.5	19
Penta-Furans	29.2	25.0	10
Hexa-Furans	<32.4	32.4	13
Hepta-Furans	32.7	10.0	4
Octa-Furan	30.5	5.0	1
Σ PCDD/Fs	8906.7		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029013 Qc Lot Number: 4533954 Date Sampled: 05-Oct-2018
 Client Sample ID: REA02_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.49	1	0.00	0.25	0.49	45.1
12378-PeCDD	<2.5	2.5	1	0.00	1.24	2.47	0.5	0.00	0.62	1.24	52.9
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	33.3
123678-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	50.1
123789-HxCDD	3.1	2.5	0.1	0.31	0.31	0.31	0.1	0.31	0.31	0.31	-
1234678-HpCDD	64.6	2.5	0.01	0.65	0.65	0.65	0.01	0.65	0.65	0.65	40.3
OCDD	3430.0	9.9	0.0003	1.03	1.03	1.03	0.001	3.43	3.43	3.43	24.8
2378-TCDF	<0.5	0.5	0.1	0.00	0.02	0.05	0.1	0.00	0.02	0.05	36.1
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	41.6
23478-PeCDF	<2.5	2.5	0.3	0.00	0.37	0.74	0.5	0.00	0.62	1.24	42.3
123478-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	28.2
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	46.3
234678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	39.7
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	42.9
1234678-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	27.4
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	37.8
OCDF	<4.9	4.9	0.0003	0.00	0.00	0.00	0.001	0.00	0.00	0.00	-
Total TEQ	-	-	-	1.98	4.66	7.35	-	4.38	6.72	9.06	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	137.0	4.0	8
Penta-Dioxins	77.5	17.3	7
Hexa-Dioxins	532.0	14.8	6
Hepta-Dioxins	685.0	4.9	2
Octa-Dioxin	3430.0	9.9	1
Tetra-Furans	<7.9	7.9	16
Penta-Furans	<27.2	27.2	11
Hexa-Furans	<19.8	19.8	8
Hepta-Furans	<4.9	4.9	2
Octa-Furan	<4.9	4.9	1
Σ PCDD/Fs	4861.5		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029015 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED01_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.49	1	0.00	0.25	0.49	99.0
12378-PeCDD	<2.5	2.5	1	0.00	1.23	2.46	0.5	0.00	0.61	1.23	98.6
123478-HxCDD	2.7	2.5	0.1	0.27	0.27	0.27	0.1	0.27	0.27	0.27	54.3
123678-HxCDD	4.7	2.5	0.1	0.47	0.47	0.47	0.1	0.47	0.47	0.47	77.9
123789-HxCDD	8.9	2.5	0.1	0.89	0.89	0.89	0.1	0.89	0.89	0.89	-
1234678-HpCDD	171.0	2.5	0.01	1.71	1.71	1.71	0.01	1.71	1.71	1.71	59.4
OCDD	10100.0	9.8	0.0003	3.03	3.03	3.03	0.001	10.10	10.10	10.10	34.5
2378-TCDF	3.3	0.5	0.1	0.33	0.33	0.33	0.1	0.33	0.33	0.33	78.8
12378-PeCDF	2.6	2.5	0.03	0.08	0.08	0.08	0.05	0.13	0.13	0.13	87.3
23478-PeCDF	5.1	2.5	0.3	1.54	1.54	1.54	0.5	2.57	2.57	2.57	83.3
123478-HxCDF	5.3	2.5	0.1	0.53	0.53	0.53	0.1	0.53	0.53	0.53	45.2
123678-HxCDF	4.3	2.5	0.1	0.43	0.43	0.43	0.1	0.43	0.43	0.43	69.0
234678-HxCDF	5.2	2.5	0.1	0.52	0.52	0.52	0.1	0.52	0.52	0.52	65.3
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	64.1
1234678-HpCDF	27.9	2.5	0.01	0.28	0.28	0.28	0.01	0.28	0.28	0.28	40.7
1234789-HpCDF	2.7	2.5	0.01	0.03	0.03	0.03	0.01	0.03	0.03	0.03	57.4
OCDF	38.3	4.9	0.0003	0.01	0.01	0.01	0.001	0.04	0.04	0.04	-
Total TEQ	-	-	-	10.11	11.70	13.30	-	18.28	19.26	20.24	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	118.0	5.9	12
Penta-Dioxins	87.6	17.2	7
Hexa-Dioxins	591.0	22.1	9
Hepta-Dioxins	974.0	4.9	2
Octa-Dioxin	10100.0	9.8	1
Tetra-Furans	51.0	9.8	20
Penta-Furans	43.4	24.6	10
Hexa-Furans	46.1	31.9	13
Hepta-Furans	52.6	9.8	4
Octa-Furan	38.3	4.9	1
Σ PCDD/Fs	12102.0		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029016 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED02_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.24	0.49	1	0.00	0.24	0.49	98.1
12378-PeCDD	<2.4	2.4	1	0.00	1.22	2.44	0.5	0.00	0.61	1.22	112.6
123478-HxCDD	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	52.4
123678-HxCDD	3.9	2.4	0.1	0.39	0.39	0.39	0.1	0.39	0.39	0.39	79.7
123789-HxCDD	7.7	2.4	0.1	0.77	0.77	0.77	0.1	0.77	0.77	0.77	-
1234678-HpCDD	132.0	2.4	0.01	1.32	1.32	1.32	0.01	1.32	1.32	1.32	58.1
OCDD	9230.0	9.8	0.0003	2.77	2.77	2.77	0.001	9.23	9.23	9.23	29.1
2378-TCDF	2.5	0.5	0.1	0.25	0.25	0.25	0.1	0.25	0.25	0.25	87.9
12378-PeCDF	<2.4	2.4	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	89.8
23478-PeCDF	2.8	2.4	0.3	0.84	0.84	0.84	0.5	1.40	1.40	1.40	96.5
123478-HxCDF	3.1	2.4	0.1	0.31	0.31	0.31	0.1	0.31	0.31	0.31	42.4
123678-HxCDF	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	74.1
234678-HxCDF	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	66.5
123789-HxCDF	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	62.9
1234678-HpCDF	12.9	2.4	0.01	0.13	0.13	0.13	0.01	0.13	0.13	0.13	39.6
1234789-HpCDF	<2.4	2.4	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	50.6
OCDF	23.9	4.9	0.0003	0.01	0.01	0.01	0.001	0.02	0.02	0.02	-
Total TEQ	-	-	-	6.78	8.78	10.78	-	13.82	15.23	16.65	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	114.0	4.9	10
Penta-Dioxins	86.6	24.4	10
Hexa-Dioxins	548.0	19.5	8
Hepta-Dioxins	834.0	4.9	2
Octa-Dioxin	9230.0	9.8	1
Tetra-Furans	43.3	9.8	20
Penta-Furans	23.6	17.1	7
Hexa-Furans	<26.8	26.8	11
Hepta-Furans	28.1	9.8	4
Octa-Furan	23.9	4.9	1
Σ PCDD/Fs	10931.5		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029017 Qc Lot Number: 4533955 Date Sampled: 05-Oct-2018
 Client Sample ID: SED03_0.0-0.5 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	1.1	0.5	1	1.05	1.05	1.05	1	1.05	1.05	1.05	98.1
12378-PeCDD	3.5	2.5	1	3.48	3.48	3.48	0.5	1.74	1.74	1.74	106.4
123478-HxCDD	4.2	2.5	0.1	0.42	0.42	0.42	0.1	0.42	0.42	0.42	55.8
123678-HxCDD	7.5	2.5	0.1	0.75	0.75	0.75	0.1	0.75	0.75	0.75	78.2
123789-HxCDD	16.3	2.5	0.1	1.63	1.63	1.63	0.1	1.63	1.63	1.63	-
1234678-HpCDD	282.0	2.5	0.01	2.82	2.82	2.82	0.01	2.82	2.82	2.82	65.6
OCDD	11000.0	9.9	0.0003	3.30	3.30	3.30	0.001	11.00	11.00	11.00	42.6
2378-TCDF	3.6	0.5	0.1	0.36	0.36	0.36	0.1	0.36	0.36	0.36	92.8
12378-PeCDF	2.5	2.5	0.03	0.07	0.07	0.07	0.05	0.12	0.12	0.12	91.7
23478-PeCDF	3.6	2.5	0.3	1.09	1.09	1.09	0.5	1.81	1.81	1.81	95.8
123478-HxCDF	3.2	2.5	0.1	0.32	0.32	0.32	0.1	0.32	0.32	0.32	57.8
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	64.8
234678-HxCDF	2.8	2.5	0.1	0.28	0.28	0.28	0.1	0.28	0.28	0.28	68.0
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	69.5
1234678-HpCDF	16.4	2.5	0.01	0.16	0.16	0.16	0.01	0.16	0.16	0.16	46.4
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	69.1
OCDF	36.3	4.9	0.0003	0.01	0.01	0.01	0.001	0.04	0.04	0.04	-
Total TEQ	-	-	-	15.76	16.02	16.28	-	22.52	22.78	23.04	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	150.0	5.4	11
Penta-Dioxins	117.0	27.2	11
Hexa-Dioxins	614.0	19.8	8
Hepta-Dioxins	1190.0	4.9	2
Octa-Dioxin	11000.0	9.9	1
Tetra-Furans	49.6	8.9	18
Penta-Furans	40.5	22.3	9
Hexa-Furans	<32.1	32.1	13
Hepta-Furans	36.4	9.9	4
Octa-Furan	36.3	4.9	1
Σ PCDD/Fs	13233.8		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300

Laboratory Sample ID: ES1890029018
 Client Sample ID: SED07_0.0-0.5

Qc Lot Number: 4533954
 Sample Matrix: SOIL

Date Sampled: 05-Oct-2018
 Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	<0.5	0.5	1	0.00	0.25	0.50	1	0.00	0.25	0.50	105.9
12378-PeCDD	<2.5	2.5	1	0.00	1.25	2.49	0.5	0.00	0.62	1.25	117.2
123478-HxCDD	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	59.2
123678-HxCDD	4.0	2.5	0.1	0.40	0.40	0.40	0.1	0.40	0.40	0.40	81.4
123789-HxCDD	7.9	2.5	0.1	0.79	0.79	0.79	0.1	0.79	0.79	0.79	-
1234678-HpCDD	150.0	2.5	0.01	1.50	1.50	1.50	0.01	1.50	1.50	1.50	64.1
OCDD	7540.0	10.0	0.0003	2.26	2.26	2.26	0.001	7.54	7.54	7.54	36.9
2378-TCDF	3.1	0.5	0.1	0.31	0.31	0.31	0.1	0.31	0.31	0.31	94.1
12378-PeCDF	<2.5	2.5	0.03	0.00	0.04	0.07	0.05	0.00	0.06	0.12	92.9
23478-PeCDF	3.1	2.5	0.3	0.93	0.93	0.93	0.5	1.56	1.56	1.56	96.3
123478-HxCDF	3.4	2.5	0.1	0.34	0.34	0.34	0.1	0.34	0.34	0.34	44.0
123678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	73.5
234678-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	68.1
123789-HxCDF	<2.5	2.5	0.1	0.00	0.12	0.25	0.1	0.00	0.12	0.25	64.5
1234678-HpCDF	12.8	2.5	0.01	0.13	0.13	0.13	0.01	0.13	0.13	0.13	44.9
1234789-HpCDF	<2.5	2.5	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	64.9
OCDF	27.6	5.0	0.0003	0.01	0.01	0.01	0.001	0.03	0.03	0.03	-
Total TEQ	-	-	-	6.66	8.70	10.74	-	12.58	14.02	15.47	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	106.0	7.0	14
Penta-Dioxins	79.0	19.9	8
Hexa-Dioxins	444.0	22.4	9
Hepta-Dioxins	777.0	5.0	2
Octa-Dioxin	7540.0	10.0	1
Tetra-Furans	42.9	10.0	20
Penta-Furans	32.9	24.9	10
Hexa-Furans	<29.9	29.9	12
Hepta-Furans	27.9	10.0	4
Octa-Furan	27.6	5.0	1
Σ PCDD/Fs	9077.3		

Client : GHD PTY LTD
 Project : 21-27477

Work Order : ES1890029
 ALS Quote Reference : ---



ANALYTICAL RESULTS FOR DIOXINS AND FURANS

Method Code EP300 Laboratory Sample ID: ES1890029019 Qc Lot Number: 4533954 Date Sampled: 04-Oct-2018
 Client Sample ID: REA02_2.0-2.1 Sample Matrix: SOIL Date Extracted: 19-Oct-2018
 Date Analysed: 19-Oct-2018

Compound	Conc pg/g	LOR pg/g	WHO-TEF	WHO-TEQ ₁ (zero)	WHO-TEQ ₂ (0.5 LOR)	WHO-TEQ ₃ (LOR)	I-TEF	I-TEQ ₁ (zero)	I-TEQ ₂ (0.5 LOR)	I-TEQ ₃ (LOR)	¹³ C ₁₂ Rec(%)
2378-TCDD	0.7	0.5	1	0.66	0.66	0.66	1	0.66	0.66	0.66	91.2
12378-PeCDD	<2.4	2.4	1	0.00	1.22	2.44	0.5	0.00	0.61	1.22	101.6
123478-HxCDD	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	51.0
123678-HxCDD	3.3	2.4	0.1	0.33	0.33	0.33	0.1	0.33	0.33	0.33	73.8
123789-HxCDD	6.5	2.4	0.1	0.65	0.65	0.65	0.1	0.65	0.65	0.65	-
1234678-HpCDD	124.0	2.4	0.01	1.24	1.24	1.24	0.01	1.24	1.24	1.24	56.5
OCDD	7170.0	9.8	0.0003	2.15	2.15	2.15	0.001	7.17	7.17	7.17	34.2
2378-TCDF	1.6	0.5	0.1	0.16	0.16	0.16	0.1	0.16	0.16	0.16	80.9
12378-PeCDF	2.8	2.4	0.03	0.08	0.08	0.08	0.05	0.14	0.14	0.14	88.3
23478-PeCDF	3.1	2.4	0.3	0.93	0.93	0.93	0.5	1.56	1.56	1.56	90.0
123478-HxCDF	5.5	2.4	0.1	0.55	0.55	0.55	0.1	0.55	0.55	0.55	44.6
123678-HxCDF	2.9	2.4	0.1	0.29	0.29	0.29	0.1	0.29	0.29	0.29	69.6
234678-HxCDF	3.3	2.4	0.1	0.33	0.33	0.33	0.1	0.33	0.33	0.33	62.7
123789-HxCDF	<2.4	2.4	0.1	0.00	0.12	0.24	0.1	0.00	0.12	0.24	64.5
1234678-HpCDF	18.2	2.4	0.01	0.18	0.18	0.18	0.01	0.18	0.18	0.18	39.5
1234789-HpCDF	<2.4	2.4	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	57.1
OCDF	17.1	4.9	0.0003	0.01	0.01	0.01	0.001	0.02	0.02	0.02	-
Total TEQ	-	-	-	7.57	9.05	10.52	-	13.28	14.14	15.01	-

Group Totals	Conc pg/g	LOR ₄ pg/g	No. of Peaks
Tetra-Dioxins	97.4	6.8	14
Penta-Dioxins	74.8	19.5	8
Hexa-Dioxins	425.0	19.5	8
Hepta-Dioxins	687.0	4.9	2
Octa-Dioxin	7170.0	9.8	1
Tetra-Furans	36.0	10.3	21
Penta-Furans	39.8	29.3	12
Hexa-Furans	28.4	22.0	9
Hepta-Furans	31.4	9.8	4
Octa-Furan	17.1	4.9	1
Σ PCDD/Fs	8606.9		

Company Name: GHD Pty Ltd NSW Address: Level 15, 133 Castlereagh Street Sydney NSW 2000 Project Name: 21-27477-TASK 3J FOR CONTAMINATION Project ID: 2127477	Order No.: Report #: 621580 Phone: 02 9239 7100 Fax: 02 9239 7199	Received: Oct 8, 2018 3:11 PM Due: Oct 22, 2018 Priority: 10 Day Contact Name: Jacqui Hallchurch
---	--	---

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Organotins	Tributyl Tin (as Sn)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory						X	X
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	FD08	Oct 05, 2018		Soil	S18-Oc09704	X	X
Test Counts						1	1

Eurofins Environment Testing Australia Pty Ltd
attn. Results
2-5 Kingston Town Close
Vic 3166 Oakleigh
AUSTRALIEN

Person in charge Mr. F. Schmidt
ASM Mr. F. Schmidt

Report date 18.10.2018

Page 1/3

Analytical report AR-18-GF-039085-01



Sample Code 710-2018-21046001

Reference	SOIL
	FD08
Sample sender	Mr. Onur Mehmet
Reception date time	12.10.2018
Transport by	DHL
Client Purchase order nr.	18-128-621580
Purchase order date	09.10.2018
Client sample code	18-Oc09704
Number of containers	1
Reception temperature	room temperature
End analysis	18.10.2018

Test results

GFDRY	Dry Residue (°) (#)		
Method	Internal, , Gravimetry		
dry residue		80.7	%
GFU04	polychlorinated dibenzodioxins and -furans (17 PCDD/F): (wet) sewage sludge, slag, ash, soil (°) (#)		
Method	Internal, GLS DF 130, GC-HRMS		
2,3,7,8-TetraCDD		< 0.191	ng/kg dw
1,2,3,7,8-PentaCDD		< 0.255	ng/kg dw
1,2,3,4,7,8-HexaCDD		< 0.510	ng/kg dw
1,2,3,6,7,8-HexaCDD		0.940	ng/kg dw
1,2,3,7,8,9-HexaCDD		1.96	ng/kg dw
1,2,3,4,6,7,8-HeptaCDD		56.5	ng/kg dw
OctaCDD		3910	ng/kg dw

The results of examination refer exclusively to the checked samples.
 Duplicates - even in parts - must be authorized by the test laboratory in written form.
 Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg
 Headquarters: Eurofins GfA Lab Service GmbH – Neuländer Kamp 1a D-21079 Hamburg
 HRB 115907 AG Hamburg
 General Managers: Dr. Scarlett Biselli
 VAT No.: DE 275912372
 Hypovereinsbank • Bank code: 207 300 17 • Account No.: 7000002400 • SWIFT-BIC: HYVEDEMM33
 IBAN: DE12 2073 0017 7000 0024 00



Durch die Deutsche Akkreditierungsstelle GmbH (DAKKS) akkreditiertes Prüflaboratorium

DIN EN ISO/IEC 17025:2005

Die Akkreditierung gilt nur für die in der Urkunde aufgeführten Prüfverfahren

2,3,7,8-TetraCDF	0.531	ng/kg dw
1,2,3,7,8-PentaCDF	< 0.467	ng/kg dw
2,3,4,7,8-PentaCDF	< 0.467	ng/kg dw
1,2,3,4,7,8-HexaCDF	< 0.425	ng/kg dw
1,2,3,6,7,8-HexaCDF	0.429	ng/kg dw
1,2,3,7,8,9-HexaCDF	< 0.425	ng/kg dw
2,3,4,6,7,8-HexaCDF	< 0.425	ng/kg dw
1,2,3,4,6,7,8-HeptaCDF	1.88	ng/kg dw
1,2,3,4,7,8,9-HeptaCDF	< 0.404	ng/kg dw
OctaCDF	5.04	ng/kg dw
WHO(2005)-PCDD/F TEQ (lower-bound)	2.14	ng/kg dw
WHO(2005)-PCDD/F TEQ (upper-bound)	2.93	ng/kg dw
I-TEQ (NATO/CCMS) (lower-bound)	4.88	ng/kg dw
I-TEQ (NATO/CCMS) (upper-bound)	5.64	ng/kg dw

GFU61 organotin compounds (8 OTC): environmental material, soil, solids, sludge, liquids (°) (#)

Method Internal, GLS OC 600, GC-MS

Monobutyltin (MBT)	2.4	µg/kg dw
Monobutyltin (MBT) - Sn	1.6	µg/kg dw
Dibutyltin (DBT)	3.9	µg/kg dw
Dibutyltin (DBT) - Sn	2.0	µg/kg dw
Tributyltin (TBT)	4.7	µg/kg dw
Tributyltin (TBT) - Sn	1.9	µg/kg dw
Tetrabutyltin (TTBT)	< 0.64	µg/kg dw
Tetrabutyltin (TTBT) - Sn	< 0.22	µg/kg dw
Monooctyltin (MOT)	< 0.64	µg/kg dw
Monooctyltin (MOT) - Sn	< 0.33	µg/kg dw
Dioctyltin (DOT)	< 0.64	µg/kg dw
Dioctyltin (DOT) - Sn	< 0.22	µg/kg dw
Triphenyltin (TPhT)	< 0.64	µg/kg dw
Triphenyltin (TPhT) - Sn	< 0.22	µg/kg dw
Tricyclohexyltin (TCyT)	< 1.3	µg/kg dw
Tricyclohexyltin (TCyT) - Sn	< 0.41	µg/kg dw

(°) = The test was performed at the laboratory site: Am Neuländer Gewerbepark 4


(#) = Eurofins GfA Lab Service GmbH (Hamburg) is accredited for this test.

< - Concentration below the indicated limit of quantification (LOQ)



Analytical Services Manager, ASM (Dieter Stegemann)

10.10.18
confirmed



CHAIN OF CUSTODY
ALS Laboratory:
please tick →

ADELAIDE 21 Burma Road Pootara SA 5095
Ph: 08 8359 0890 E: ade@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callamandah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE 2-4 Wesall Road Springvale VIC 3171
Ph: 03 8549 9500 E: samples.melbourne@alsglobal.com

MUDGEE 27 Sydney Road Mudgee NSW 2950
Ph: 02 6372 6735 E: mudgee@mail@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4850
Ph: 07 4795 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembia@alsglobal.com

CLIENT: GHD Pty Ltd		TURNAROUND REQUIREMENT: <input type="checkbox"/> Standard TAT (List due date):		Expected 3 days.		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Level 15, 133 Castlereagh St, Sydney		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		<input checked="" type="checkbox"/> Non Standard or urgent TAT (List due date):		Custody Seal intact? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (N)	
PROJECT: 21-27477 - Task 3J for Contamination		ALS QUOTE NO.: SY-236-18		COC SEQUENCE NUMBER (Circle)		Free Ca / frozen ice blocks present upon receipt? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (N/A)	
ORDER NUMBER: 2127477				COC: ① 2 3 4 5 6 7 OF: 1 2 3 ④ 5 6 7		Random Sample Temperature on Receipt: 14°C	
PROJECT MANAGER: Jacqui Hallichurch		CONTACT PH: 0447 202 580		RECEIVED BY: ANDREW		RECEIVED BY:	
SAMPLER: Sarah Eccleshall		SAMPLER MOBILE: 0459 546 332		DATE/TIME: 4/10/18 9:00 pm		DATE/TIME:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):		RELINQUISHED BY: S. Eccleshall		RELINQUISHED BY:	
Email Reports to: sarah.eccleshall@ghd.com; jacqui.hallichurch@ghd.com				DATE/TIME: 21/10/18 21:00		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):							

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		
	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	pH and pH fox
	1 SEDOG_0.0-0.1	4/10/18 10:15	S	ASS	1	X
	2 SEDOG_0.5-0.6	4/10/18 10:30	S	ASS	1	X
	3 SEDOG-1.0-1.1	4/10/18	S		1	
	4 SEDOG-1.5-1.6				1	
	5 SEDOG-2.0-2.1				1	X
	6 SEDOG-2.5-2.6				1	
	7 SEDOG-3.0-3.1				1	X
	8 SEDOG-3.5-3.6				1	
	9 SEDOG-4.0-4.1				1	
	10 SEDOG-4.3-4.4				1	
	FDO3				1	X
TOTAL						

Environmental Division
Sydney
Work Order Reference
ES1829389



Telephone : + 61-2-8784 8555

Suite Codes must be listed to attract suite price (if required) or Dissolved (field filtered bottle required).

<p>Confirmed fast screen with Sarah</p> <p>EA037</p> <p>Sutton / ...</p> <p>Lab / Analysis: pH Fox - Brisbane</p> <p>Organism / Date:</p> <p>Recovery: ...</p> <p>HT</p> <p>FDO3 FDO1</p> <p>Eushus</p> <p>URGENT</p> <p>Please forward to ew@als.com</p>	<p>Hold</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>
---	---

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



CHAIN OF CUSTODY

ALS Laboratory
please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callernindah Drive Clinton QLD 4680
Ph: 07 4771 5600 E: gladstone@alsglobal.com

MACKAY 76 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 8735 E: mudgee@mail@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 5555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Dasma Court Bohle QLD 4818
Ph: 07 4795 0500 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: perth@alsglobal.com

CLIENT: GHD Pty Ltd		TURNAROUND REQUIREMENT: <input type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input checked="" type="checkbox"/> Non Standard or urgent TAT (List due date):			FOR LABORATORY USE ONLY (Circle) Custody Seal intact? Yes No N/A Free ice / frozen ice blocks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: C Other comment:		
OFFICE: level 15, 133 Castlereagh St, Sydney		ALS QUOTE NO.: SY-236-18					
PROJECT: 21-27477 - Task 3J for Contamination		ORDER NUMBER: 2127477					
PROJECT MANAGER: Jacqui Halchurch		CONTACT PH: 0447 202 580					
SAMPLER: Sarah Eccleshall		SAMPLER MOBILE: 0459 546 332		RELINQUISHED BY: S. Eccleshall		RECEIVED BY:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):		DATE/TIME: 4/10/18 21:00		DATE/TIME:	
Email Reports to: sarah.eccleshall@ghd.com; jacqui.halchurch@ghd.com							
Email Invoice to (will default to PM if no other addresses are listed):							

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).															
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	pH	1	2	3	4	5	6	7	8	9	10	11	12	Hold	
	11	SE005_0.0-0.1	4/10/18	S	ASS	1	X														
	12	SE005_0.5-0.6				1															X
	13	SE005_1.0-1.1				1	X														
	14	SE005_1.5-1.6				1															X
	15	SE005_2.0-2.1				1	X														
	16	SE005_2.5-2.6				1															X
	17	FS01				1	X														
	18	FS02				1															X
	19	FS03				1	X														
	-	FD01				1	X														
	20	FD02				1															X
TOTAL																					

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1829389

Client	: GHD PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MS JACQUI HALLCHURCH	Contact	: Brenda Hong
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jacqui.hallchurch@ghd.com	E-mail	: Brenda.Hong@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: (02) 8784 8504
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 2127477	Page	: 1 of 3
Order number	: 2127477	Quote number	: ES2018GHDSER0015 (SY/236/18)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Task 3J for Contamination		
Sampler	: Sarah Eccleshall		

Dates

Date Samples Received	: 04-Oct-2018 21:00	Issue Date	: 05-Oct-2018
Client Requested Due Date	: 10-Oct-2018	Scheduled Reporting Date	: 10-Oct-2018

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 1.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 35 / 14

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Samples FD03 and FD01 have been forwarded to Eurofins as per COC request.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- pH f and pH fox Analysis to be conducted by ALS Brisbane.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA037 ASS Field Screening Analysis
ES1829389-001	04-Oct-2018 10:15	SED06_0.0-0.1		✓
ES1829389-002	04-Oct-2018 10:30	SED06_0.5-0.6	✓	
ES1829389-003	04-Oct-2018 00:00	SED06_1.0-1.1	✓	
ES1829389-004	04-Oct-2018 00:00	SED06_1.5-1.6	✓	
ES1829389-005	04-Oct-2018 00:00	SED06_2.0-2.1		✓
ES1829389-006	04-Oct-2018 00:00	SED06_2.5-2.6	✓	
ES1829389-007	04-Oct-2018 00:00	SED06_3.0-3.1		✓
ES1829389-008	04-Oct-2018 00:00	SED06_3.5-3.6	✓	
ES1829389-009	04-Oct-2018 00:00	SED06_4.0-4.1	✓	
ES1829389-010	04-Oct-2018 00:00	SED06_4.3-4.4	✓	
ES1829389-011	04-Oct-2018 00:00	SED05_0.0-0.1		✓
ES1829389-012	04-Oct-2018 00:00	SED05_0.5-0.6	✓	
ES1829389-013	04-Oct-2018 00:00	SED05_1.0-1.1		✓
ES1829389-014	04-Oct-2018 00:00	SED05_1.5-1.6	✓	
ES1829389-015	04-Oct-2018 00:00	SED05_2.0-2.1		✓
ES1829389-016	04-Oct-2018 00:00	SED05_2.5-2.6	✓	
ES1829389-017	04-Oct-2018 00:00	FS01		✓
ES1829389-018	04-Oct-2018 00:00	FS02	✓	
ES1829389-019	04-Oct-2018 00:00	FS03		✓
ES1829389-020	04-Oct-2018 00:00	FD02	✓	
ES1829389-021	04-Oct-2018 00:00	REA01_0.0-0.1		✓
ES1829389-022	04-Oct-2018 00:00	REA01_0.5-0.6	✓	
ES1829389-023	04-Oct-2018 00:00	REA01_1.0-1.1		✓
ES1829389-024	04-Oct-2018 00:00	REA01_1.5-1.6	✓	
ES1829389-025	04-Oct-2018 00:00	REA01_2.0-2.1		✓
ES1829389-026	04-Oct-2018 00:00	REA01_2.5-2.6	✓	
ES1829389-027	04-Oct-2018 00:00	REA01_3.0-3.1	✓	
ES1829389-028	04-Oct-2018 00:00	REA01_3.4-3.5	✓	
ES1829389-029	04-Oct-2018 00:00	REA02_0.0-0.1		✓
ES1829389-030	04-Oct-2018 00:00	REA02_0.5-0.6	✓	
ES1829389-031	04-Oct-2018 00:00	REA02_1.0-1.1		✓
ES1829389-032	04-Oct-2018 00:00	REA02_1.5-1.6	✓	
ES1829389-033	04-Oct-2018 00:00	REA02_2.0-2.1		✓
ES1829389-034	04-Oct-2018 00:00	REA02_2.5-2.6	✓	
ES1829389-035	04-Oct-2018 00:00	REA02_3.0-3.1	✓	

CERTIFICATE OF ANALYSIS

Work Order	: ES1829389	Page	: 1 of 5
Client	: GHD PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MS JACQUI HALLCHURCH	Contact	: Brenda Hong
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: (02) 8784 8504
Project	: 2127477	Date Samples Received	: 04-Oct-2018 21:00
Order number	: 2127477	Date Analysis Commenced	: 11-Oct-2018
C-O-C number	: ----	Issue Date	: 11-Oct-2018 16:37
Sampler	: Sarah Eccleshall		
Site	: Task 3J for Contamination		
Quote number	: SY/236/18		
No. of samples received	: 35		
No. of samples analysed	: 14		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
~ = Indicates an estimated value.

- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED06_0.0-0.1	SED06_2.0-2.1	SED06_3.0-3.1	SED05_0.0-0.1	SED05_1.0-1.1
Client sampling date / time				04-Oct-2018 10:15	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829389-001	ES1829389-005	ES1829389-007	ES1829389-011	ES1829389-013	
				Result	Result	Result	Result	Result	
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.5	8.4	8.4	8.3	8.5	
pH (Fox)	----	0.1	pH Unit	6.4	8.0	6.5	6.4	7.2	
Reaction Rate	----	1	-	3	4	4	3	4	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED05_2.0-2.1	FS01	FS03	REA01_0.0-0.1	REA01_1.0-1.1
Client sampling date / time				04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829389-015	ES1829389-017	ES1829389-019	ES1829389-021	ES1829389-023	
				Result	Result	Result	Result	Result	
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.8	8.5	8.8	8.7	8.8	
pH (Fox)	----	0.1	pH Unit	7.2	5.1	7.6	7.6	7.5	
Reaction Rate	----	1	-	4	4	4	4	4	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	REA01_2.0-2.1	REA02_0.0-0.1	REA02_1.0-1.1	REA02_2.0-2.1	----
Client sampling date / time				04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	ES1829389-025	ES1829389-029	ES1829389-031	ES1829389-033	-----	-----
				Result	Result	Result	Result	----	----
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.4	8.6	8.5	8.4	----	----
pH (Fox)	----	0.1	pH Unit	2.3	6.5	6.6	7.8	----	----
Reaction Rate	----	1	-	4	3	4	4	----	----

Company Name: GHD Pty Ltd NSW Address: Level 15, 133 Castlereagh Street Sydney NSW 2000 Project Name: 21-27477- TASK 3J FOR CONTAMINATION Project ID: 2127477	Order No.: Report #: 621432 Phone: 02 9239 7100 Fax: 02 9239 7199	Received: Oct 8, 2018 3:11 PM Due: Oct 11, 2018 Priority: 3 Day Contact Name: Jacqui Hallchurch
Eurofins mgt Analytical Services Manager : Nibha Vaidya		

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						X
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	FD03	Oct 04, 2018		Soil	S18-Oc08877	X
2	FD01	Oct 04, 2018		Soil	S18-Oc08878	X
Test Counts						2

Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

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

Attention: Jacqui Hallchurch

Report **621416-S**
 Project name 21-27477- TASK 3J FOR CONTAMINATION
 Project ID 2127477
 Received Date Oct 08, 2018

Client Sample ID			FD04
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Oc08815
Date Sampled			Oct 05, 2018
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.8
Reaction Ratings* ^{S05}		comment	4.0

Sample History

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

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

Acid Sulfate Soils Field pH Test

Testing Site

Brisbane

Extracted

Oct 09, 2018

Holding Time

7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

Company Name: GHD Pty Ltd NSW Address: Level 15, 133 Castlereagh Street Sydney NSW 2000 Project Name: 21-27477- TASK 3J FOR CONTAMINATION Project ID: 2127477	Order No.: Report #: 621416 Phone: 02 9239 7100 Fax: 02 9239 7199	Received: Oct 8, 2018 3:11 PM Due: Oct 11, 2018 Priority: 3 Day Contact Name: Jacqui Hallchurch
Eurofins mgt Analytical Services Manager : Nibha Vaidya		

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						X
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	FD04	Oct 05, 2018		Soil	S18-Oc08815	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-Oc08815	CP	pH Units	8.9	8.8	pass	30%	Pass	
Reaction Ratings*	S18-Oc08815	CP	comment	4.0	4.0	pass	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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)



Glenn Jackson

National Operations 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 | mgt 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 | mgt 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.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1829587

Client	: GHD PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Jacqui Hallchurch	Contact	: Brenda Hong
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: Jacqui.hallchurch@ghd.com	E-mail	: Brenda.Hong@alsglobal.com
Telephone	: 02 9239 7046	Telephone	: (02) 8784 8504
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 2127477	Page	: 1 of 3
Order number	: 2127477	Quote number	: ES2018GHDSER0015 (SY/236/18)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: SARAH ECCLESHALL		

Dates

Date Samples Received	: 05-Oct-2018 20:30	Issue Date	: 08-Oct-2018
Client Requested Due Date	: 11-Oct-2018	Scheduled Reporting Date	: 11-Oct-2018

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 5.2' C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 17

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Samples FD05 was received extra and placed on hold.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **pHfox analysis will be conducted by ALS Brisbane.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA037 ASS Field Screening Analysis
ES1829587-001	05-Oct-2018 00:00	SED01_0.0-0.1		✓
ES1829587-002	05-Oct-2018 00:00	SED01_0.0-0.5		✓
ES1829587-003	05-Oct-2018 00:00	SED01_0.5-0.65		✓
ES1829587-004	05-Oct-2018 00:00	SED02_0.0-0.1		✓
ES1829587-005	05-Oct-2018 00:00	SED02_0.0-0.5		✓
ES1829587-006	05-Oct-2018 00:00	SED02_0.55-0.65		✓
ES1829587-007	05-Oct-2018 00:00	SED03_0.0-0.1		✓
ES1829587-008	05-Oct-2018 00:00	SED03_0.0-0.5		✓
ES1829587-009	05-Oct-2018 00:00	SED03_0.5-0.65		✓
ES1829587-010	05-Oct-2018 00:00	SED07_0.0-0.65		✓
ES1829587-011	05-Oct-2018 00:00	SED04_0.0-0.1		✓
ES1829587-012	05-Oct-2018 00:00	SED04_0.5-0.6		✓
ES1829587-013	05-Oct-2018 00:00	SED04_1.0-1.1		✓
ES1829587-014	05-Oct-2018 00:00	SED04_1.5-1.6		✓
ES1829587-015	05-Oct-2018 00:00	SED04_2.0-2.1		✓
ES1829587-016	05-Oct-2018 00:00	SED04_2.5-2.6		✓
ES1829587-017	05-Oct-2018 00:00	FS04		✓
ES1829587-018	06-Oct-2018 00:00	FD05	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

CERTIFICATE OF ANALYSIS

Work Order : ES1829587 Client : GHD PTY LTD Contact : Jacqui Hallchurch Address : LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000 Telephone : 02 9239 7046 Project : 2127477 Order number : 2127477 C-O-C number : ---- Sampler : SARAH ECCLESHALL Site : ---- Quote number : SY/236/18 No. of samples received : 18 No. of samples analysed : 17	Page : 1 of 6 Laboratory : Environmental Division Sydney Contact : Brenda Hong Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 Telephone : (02) 8784 8504 Date Samples Received : 05-Oct-2018 20:30 Date Analysis Commenced : 10-Oct-2018 Issue Date : 10-Oct-2018 16:12
---	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
~ = Indicates an estimated value.

- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED01_0.0-0.1	SED01_0.0-0.5	SED01_0.5-0.65	SED02_0.0-0.1	SED02_0.0-0.5
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1829587-001	ES1829587-002	ES1829587-003	ES1829587-004	ES1829587-005	
				Result	Result	Result	Result	Result	
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.2	8.4	8.4	8.2	8.2	
pH (Fox)	----	0.1	pH Unit	6.3	6.3	6.4	6.3	6.2	
Reaction Rate	----	1	-	4	4	4	4	4	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED02_0.55-0.65	SED03_0.0-0.1	SED03_0.0-0.5	SED03_0.5-0.65	SED07_0.0-0.65
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00
Compound	CAS Number	LOR	Unit	ES1829587-006	ES1829587-007	ES1829587-008	ES1829587-009	ES1829587-010	
				Result	Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.6	8.4	8.6	8.4	8.5	
pH (Fox)	----	0.1	pH Unit	6.2	6.3	6.3	6.4	6.4	
Reaction Rate	----	1	-	4	4	4	4	4	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_0.0-0.1	SED04_0.5-0.6	SED04_1.0-1.1	SED04_1.5-1.6	SED04_2.0-2.1
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00	05-Oct-2018 00:00
Compound	CAS Number	LOR	Unit	ES1829587-011	ES1829587-012	ES1829587-013	ES1829587-014	ES1829587-015	ES1829587-015
				Result	Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.6	8.4	8.8	8.9	8.8	8.8
pH (Fox)	----	0.1	pH Unit	6.2	6.4	6.2	6.5	7.2	7.2
Reaction Rate	----	1	-	4	4	4	4	4	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED04_2.5-2.6	FS04	----	----	----
Client sampling date / time				05-Oct-2018 00:00	05-Oct-2018 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1829587-016	ES1829587-017	-----	-----	-----	
				Result	Result	----	----	----	
EA037: Ass Field Screening Analysis									
pH (F)	----	0.1	pH Unit	8.2	8.8	----	----	----	
pH (Fox)	----	0.1	pH Unit	6.1	6.6	----	----	----	
Reaction Rate	----	1	-	4	4	----	----	----	

Company Name: GHD Pty Ltd NSW Address: Level 15, 133 Castlereagh Street Sydney NSW 2000 Project Name: 21-27477- TASK 3J FOR CONTAMINATION Project ID: 2127477	Order No.: Report #: 621416 Phone: 02 9239 7100 Fax: 02 9239 7199	Received: Oct 8, 2018 3:11 PM Due: Oct 11, 2018 Priority: 3 Day Contact Name: Jacqui Hallchurch
Eurofins mgt Analytical Services Manager : Nibha Vaidya		

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						X
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	FD04	Oct 05, 2018		Soil	S18-Oc08815	X
Test Counts						1

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Jacqui Hallchurch**

Report **621432-S**
 Project name 21-27477- TASK 3J FOR CONTAMINATION
 Project ID 2127477
 Received Date Oct 08, 2018

Client Sample ID			FD03	FD01
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-Oc08877	S18-Oc08878
Date Sampled			Oct 04, 2018	Oct 04, 2018
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	8.8	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.9	6.9
Reaction Ratings* ^{S05}		comment	4.0	4.0

Sample History

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

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

Acid Sulfate Soils Field pH Test

Testing Site

Brisbane

Extracted

Oct 09, 2018

Holding Time

7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

Company Name: GHD Pty Ltd NSW Address: Level 15, 133 Castlereagh Street Sydney NSW 2000 Project Name: 21-27477- TASK 3J FOR CONTAMINATION Project ID: 2127477	Order No.: Report #: 621432 Phone: 02 9239 7100 Fax: 02 9239 7199	Received: Oct 8, 2018 3:11 PM Due: Oct 11, 2018 Priority: 3 Day Contact Name: Jacqui Hallchurch
Eurofins mgt Analytical Services Manager : Nibha Vaidya		

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						X
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	FD03	Oct 04, 2018		Soil	S18-Oc08877	X
2	FD01	Oct 04, 2018		Soil	S18-Oc08878	X
Test Counts						2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-Oc08815	NCP	pH Units	8.9	8.8	pass	30%	Pass	
Reaction Ratings*	S18-Oc08815	NCP	comment	4.0	4.0	pass	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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)



Glenn Jackson

National Operations 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 | mgt 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 | mgt 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.

Hi Brenda,

Based on the results of the field screen for acid sulfate samples:
Can I please get the following samples analysed for CrS.

	Sample name
1	REA01_0.0-0.1
2	REA01_2.0-2.1
3	REA02_0.0-0.1
4	SED01_0.0-0.1
5	SED02_0.0-0.1
6	SED03_0.0-0.1
7	SED07_0.0-0.65
8	SED04_0.0-0.1
9	SED04_1.5-1.6
10	SED05_0.0-0.1
11	SED06_0.0-0.1
12	SED06_3.0-3.1
13	FS01
14	FS04

Can the CrS also be requested from FD01 and FD04 which were forwarded to Eurofins.

Many thanks,
Sarah

Sarah Eccleshall
MSc, BSc (Hons)
Contamination & Environmental Management

GHD
Proudly employee owned
T: +61 2 9239 7715 | M: +61 459 546 332 | E: sarah.eccleshall@ghd.com
Level 15 133 Castlereagh Street Sydney NSW 2000 Australia | www.ghd.com

Connect



[WATER](#) | [ENERGY & RESOURCES](#) | [ENVIRONMENT](#) | [PROPERTY & BUILDINGS](#) | [TRANSPORTATION](#)

Please consider our environment before printing this email

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its

Environmental Division
Brisbane
Work Order Reference
EB1824725



Telephone : +61-7-3243 7222



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB1824725**

Client	: GHD PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: SARAH ECCLESHALL	Contact	: Caroline Hill
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: sarah.eccleshall@ghd.com	E-mail	: Caroline.Hill@Alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: 2127477	Page	: 1 of 3
Order number	:	Quote number	: ES2018GHDSER0015 (SY/236/18)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 04-Oct-2018 14:23	Issue Date	: 12-Oct-2018
Client Requested Due Date	: 18-Oct-2018	Scheduled Reporting Date	: 18-Oct-2018

Delivery Details

Mode of Delivery	: Samples On Hand	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	: Rebatch	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **This work order has been created to rebatch samples from ES1829389, ES1829587**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA033 Chromium Suite for Acid Sulphate Soils
EB1824725-001	04-Oct-2018 00:00	REA01_0.0-0.1	✓
EB1824725-002	04-Oct-2018 00:00	REA01_2.0-2.1	✓
EB1824725-003	04-Oct-2018 00:00	REA02_0.0-0.1	✓
EB1824725-004	04-Oct-2018 00:00	SED01_0.0-0.1	✓
EB1824725-005	04-Oct-2018 00:00	SED02_0.0-0.1	✓
EB1824725-006	04-Oct-2018 00:00	SED03_0.0-0.1	✓
EB1824725-007	04-Oct-2018 00:00	SED07_0.0-0.65	✓
EB1824725-008	04-Oct-2018 00:00	SED04_0.0-0.1	✓
EB1824725-009	04-Oct-2018 00:00	SED04_1.5-1.6	✓
EB1824725-010	04-Oct-2018 00:00	SED05_0.0-0.1	✓
EB1824725-011	04-Oct-2018 00:00	SED06_0.0-0.1	✓
EB1824725-012	04-Oct-2018 00:00	SED06_3.0-3.1	✓
EB1824725-013	04-Oct-2018 00:00	FS01	✓
EB1824725-014	04-Oct-2018 00:00	FS04	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

CERTIFICATE OF ANALYSIS

Work Order : **EB1824725**
Client : **GHD PTY LTD**
Contact : SARAH ECCLESHALL
Address : LEVEL 15, 133 CASTLEREAGH STREET
 SYDNEY NSW, AUSTRALIA 2000

Telephone : ----
Project : 2127477
Order number :
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : SY/236/18
No. of samples received : 14
No. of samples analysed : 14

Page : 1 of 5
Laboratory : Environmental Division Brisbane
Contact : Caroline Hill
Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222
Date Samples Received : 04-Oct-2018 14:23
Date Analysis Commenced : 17-Oct-2018
Issue Date : 18-Oct-2018 16:50



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m³ in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m³'.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	REA01_0.0-0.1	REA01_2.0-2.1	REA02_0.0-0.1	SED01_0.0-0.1	SED02_0.0-0.1
Client sampling date / time				04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	EB1824725-001	EB1824725-002	EB1824725-003	EB1824725-004	EB1824725-005	
				Result	Result	Result	Result	Result	
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	8.7	8.0	9.0	8.1	8.5	
Titration Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2	
sulfidic - Titration Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02	
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.677	6.29	0.113	0.271	0.142	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	422	3920	70	169	89	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	38.8	6.74	2.65	5.43	4.65	
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	7760	1350	529	1080	929	
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	12.4	2.16	0.85	1.74	1.49	
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5	
Net Acidity (sulfur units)	----	0.02	% S	<0.02	4.85	<0.02	<0.02	<0.02	
Net Acidity (acidity units)	----	10	mole H+ / t	<10	3020	<10	<10	<10	
Liming Rate	----	1	kg CaCO3/t	<1	227	<1	<1	<1	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.68	6.29	0.11	0.27	0.14	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	422	3920	70	169	89	
Liming Rate excluding ANC	----	1	kg CaCO3/t	32	294	5	13	7	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SED03_0.0-0.1	SED07_0.0-0.65	SED04_0.0-0.1	SED04_1.5-1.6	SED05_0.0-0.1
Client sampling date / time				04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	
Compound	CAS Number	LOR	Unit	EB1824725-006	EB1824725-007	EB1824725-008	EB1824725-009	EB1824725-010	
				Result	Result	Result	Result	Result	
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	8.5	8.6	8.5	8.4	8.6	
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	<2	
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02	
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.129	0.112	0.163	0.368	0.103	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	81	70	102	230	64	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	5.14	5.06	5.08	5.27	4.95	
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1030	1010	1020	1050	989	
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.64	1.62	1.63	1.69	1.58	
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	1.5	
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02	
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	<10	<10	<10	
Liming Rate	----	1	kg CaCO3/t	<1	<1	<1	<1	<1	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.13	0.11	0.16	0.37	0.10	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	81	70	102	230	64	
Liming Rate excluding ANC	----	1	kg CaCO3/t	6	5	8	17	5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SED06_0.0-0.1	SED06_3.0-3.1	FS01	FS04	----
Client sampling date / time			04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	04-Oct-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EB1824725-011	EB1824725-012	EB1824725-013	EB1824725-014	-----
				Result	Result	Result	Result	----
EA033-A: Actual Acidity								
pH KCl (23A)	----	0.1	pH Unit	8.6	8.3	8.2	8.4	----
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	<2	<2	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	----
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.122	0.636	3.38	0.399	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	76	397	2110	249	----
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	4.78	3.79	15.2	5.19	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	954	757	3040	1040	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.53	1.21	4.87	1.66	----
EA033-E: Acid Base Accounting								
ANC Fineness Factor	----	0.5	-	1.5	1.5	1.5	1.5	----
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.13	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	81	<10	----
Liming Rate	----	1	kg CaCO3/t	<1	<1	6	<1	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.12	0.64	3.38	0.40	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	76	397	2110	249	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	6	30	158	19	----

GHD

Level 11, Crown Tower
Sydney NSW 2000

T: 61 2 4222 2300 E: wolmail@ghd.com

© GHD 2018

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

2127477-

41974/<https://projects.ghd.com/oc/Sydney1/eastcoastlngterminal/Delivery/Documents/2127477-REP-Sediment Contamination.docx>

www.ghd.com

