



Job No: 8599/48
Our Ref: 8599/48-AA
7 December 2020

Daracon Contractors Pty Ltd
184 Adderley Street
AUBURN NSW 2144
Email: SimpsonW@daracon.com.au

Attention: Mr S Wong

Dear Sir

re: **Newpark – Precinct 6C, Marsden Park
Post Earthworks Salinity Assessment – Exposure Classification**

At your request, Geotech Testing Pty Ltd conducted a salinity assessment at the above site after completion of earthworks. This report provides exposure classification of a number of residential lots (Lots 1 to 51) at the above-mentioned residential subdivision.

Field Work

Field work for this investigation was carried out on 23rd November 2020 under the full time supervision of a Geotechnical Engineer from this company and consisted of the following:

- Carry out a walk over survey to assess existing geological and geotechnical conditions within and in the vicinity of the site.
- Excavate twenty-six (26) test pits to depths up to 1.5m using a small 5 tonne excavator. Test pits were excavated along the boundary lines between lots and their locations are shown on the attached Drawing No 8599/47-AA1.
- Recovery of the representative soil samples from test pits for laboratory testing.

The field work was supervised by a Geotechnical Engineer from this company, who was responsible for nominating test pit locations, recovering samples and preparation of field logs.

Site Conditions

The site (Precinct 6C) is of rectangular shape and located within the Elara subdivision. The site is bounded by other stages of the newly developed subdivision. At the time of investigation, earthworks for the lots had been completed and the construction of internal roads was mostly completed. The topography of the site is generally flat with a mild slope towards westerly direction. The ground surface was generally void of vegetation.

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Sub-surface Conditions

Sub-surface conditions encountered at the site are detailed in the attached Table A and summarised below in Table 1.

Table 1: Sub-surface Conditions

Test Pit	Termination Depth (m)	Topsoil (m)	Fill (m)	Natural (m)	Bedrock (m)
TP1	1.5	0.0-0.2	0.2-0.4	0.4-1.5	NE
TP2	1.5	0.0-0.2	0.2-0.3	0.3-1.5	NE
TP3	1.5	0.0-0.2	0.2-0.4	0.4-1.5	NE
TP123	1.5	NE	0.0-1.5	NE	NE
TP124	1.5	NE	0.0-1.5	NE	NE
TP125	1.5	NE	0.0-1.5	NE	NE

NE: Not encountered to the termination depth

The materials encountered in the test pits can be generalised as below:

Fill	Clayey Silt, low plasticity, brown
Natural	Silty CLAY, high plasticity, brown, with cobbles Silty CLAY, high plasticity, mottled brown and orange Silty Gravelly CLAY, medium to high plasticity, mottled brown and grey Silty Clayey GRAVEL, fine grain, dense with ironstone fragments
Bedrock	CONGLOMERATE, low to medium strength, distinctly, weathered

Groundwater Condition

Groundwater was not observed in the test pits during the short time that they remained open. It must be noted that fluctuations in the level of groundwater might occur due to variations in rainfall, temperature, and/or other factors not evident during investigation.

Exposure Classification

Laboratory Testing

During field work, a total of 51 soil samples were collected for chemical testing in the NATA accredited laboratory of SGS for salinity and acidity properties. The laboratory test results certificates from SGS are attached at the end of this report and summarised in Table 2 along with exposure classification.

Table 2: Laboratory Test Results

Test Pit	Depth (m)	pH	EC (µS/cm)	Multiplying Factor	ECe (dS/m)	Exposure Classification
TP1	0.3-0.4	4.8	360	8	2.88	A2
TP1	0.8-0.9	5	250	8	2	A2
TP2	0.3-0.4	4.9	350	8	2.8	A2
TP2	0.8-0.9	5.3	150	8	1.2	A2
TP3	0.3-0.4	5	510	8	4.08	A2
TP3	0.9-1.0	5	440	8	3.52	A2

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Test Pit	Depth (m)	pH	EC (µS/cm)	Multipling Factor	ECe (dS/m)	Exposure Classification
TP4	0.3-0.4	4.5	740	8	5.92	B1
TP4	1.1-1.2	5.3	630	8	5.04	A2
TP5	0.3-0.4	5.3	170	8	1.36	A2
TP6	0.3-0.4	5	370	8	2.96	A2
TP6	0.8-0.9	5.7	130	8	1.04	A1
TP7	0.2-0.3	5.1	120	8	0.96	A2
TP7	0.5-0.6	5.3	100	8	0.8	A2
TP8	0.1-0.2	4.8	360	8	2.88	A2
TP8	0.4-0.5	4.7	440	8	3.52	A2
TP9	0.3-0.4	4.6	540	8	4.32	A2
TP9	0.8-0.9	5.2	610	8	4.88	A2
TP10	0.3-0.4	4.5	790	8	6.32	B1
TP10	0.8-0.9	4.8	550	8	4.4	A2
TP11	0.3-0.4	5.2	430	8	3.44	A2
TP11	1.1-1.2	5.3	550	8	4.4	A2
TP12	0.3-0.4	4.5	690	8	5.52	B1
TP12	1.3-1.4	5.3	160	8	1.28	A2
TP13	0.3-0.4	4.9	570	8	4.56	A2
TP13	0.8-0.9	4.5	650	8	5.2	B1
TP14	0.3-0.4	5	180	8	1.44	A2
TP14	0.8-0.9	5.1	170	8	1.36	A2
TP15	0.3-0.4	5	270	8	2.16	A2
TP15	0.8-0.9	4.9	610	8	4.88	A2
TP16	0.2-0.3	4.8	420	8	3.36	A2
TP16	0.8-0.9	5	500	8	4	A2
TP17	0.3-0.4	4.9	240	8	1.92	A2
TP17	0.8-0.9	4.4	530	8	4.24	B1
TP18	0.3-0.4	5.5	96	8	0.768	A2
TP18	0.8-0.9	4.9	220	8	1.76	A2
TP19	0.3-0.4	5.2	440	8	3.52	A2
TP19	0.8-0.9	4.8	320	8	2.56	A2
TP20	0.3-0.4	5.3	170	8	1.36	A2
TP20	0.7-0.8	5.4	150	8	1.2	A2
TP21	0.3-0.4	5.3	110	8	0.88	A2
TP21	0.8-0.9	6	130	8	1.04	A1

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Test Pit	Depth (m)	pH	EC (µS/cm)	Multiplying Factor	ECe (dS/m)	Exposure Classification
TP22	0.3-0.4	5.8	53	8	0.424	A1
TP22	0.8-0.9	5.2	220	8	1.76	A2
TP23	0.3-0.4	4.8	400	8	3.2	A2
TP23	0.8-0.9	4.7	290	8	2.32	A2
TP24	0.3-0.4	5.3	110	8	0.88	A2
TP24	0.8-0.9	4.7	360	8	2.88	A2
TP25	0.3-0.4	4.8	320	8	2.56	A2
TP25	0.8-0.9	4.8	550	8	4.4	A2
TP26	0.3-0.4	5	240	8	1.92	A2
TP26	0.5-0.6	4.7	240	8	1.92	A2

* The multiplication factor (MF) is a function of the soil texture and description (Site Investigations for Urban Salinity – 2002)

Specifications

Electrical Conductivity (EC) testing was carried out to assess soil salinity, as outlined in the Department of Environment and Heritage (DEH) publication, “Site Investigations for Urban Salinity - 2002”. The test conducted on a soil sample for salinity is generally made up of 1:5 soil water suspension, which is one part air dried soil to five parts distilled water. The determined EC is multiplied by a factor based on the texture of the soil sample (varying from 6 to 17) to obtain Corrected Electrical Conductivity designated as EC_e. Based on site observation, a multiplication factor of 8 was used for the soil encountered during field work. The DEH publication defines various classes of saline soils as follows:

Classification	EC _e (dS/m)	Exposure Classification AS2870-2011
Non-saline	<2	A1
Slightly saline	2 – 4	
Moderately saline	4 – 8	A2
Very saline	8 – 16	B1
Highly saline	>16	B2

Acidity (pH) testing was also conducted to determine the aggressivity of the soils to steel and concrete. The various classes of aggressive soils are defined as follows according to AS2870-2011.

Classification	pH	Exposure Classification AS2870-2011
Non-aggressive	>5.5	A1
Mild	4.5-5.5	A2
Moderate	4.0-4.5	B1
Severe	<4.0	B2

Based on the results, it is assessed that soils at the site are generally non-saline to slightly saline and non-aggressive to mildly aggressive to steel and concrete.

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Conclusion

Based on the procedures described in AS2870-2011 the exposure classifications for the proposed lots are shown in Table 3.

Table 3 – Site Exposure Classifications (AS2870-2011)

Lot	Site Classification	Lot	Site Classification
1	A2	27	A2
2	A2	28	A2
3	A2	29	A2
4	A2	30	B1
5	A2	31	B1
6	A2	32	A2
7	A2	33	A2
8	B1	34	A2
9	B1	35	A2
10	A2	36	A2
11	A2	37	A2
12	A2	38	A2
13	A2	39	A2
14	A2	40	A2
15	A2	41	A2
16	A2	42	A2
17	B1	43	A2
18	B1	44	A2
19	B1	45	A2
20	B1	46	A2
21	A2	47	A2
22	A2	48	A2
23	B1	49	A2
24	B1	50	A2
25	A2	51	A2
26	A2		

Based on the results of the post site works salinity assessment, the site is suitable for the residential subdivision development. The construction requirements for A1, A2 & B1 classifications are shown below (AS2870-2011, Table 5.3).

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Classification	Minimum Design Characteristic Strength	Minimum Initial Curing
A1	20 MPa	3 days
A2	25 MPa	3 days
B1	32 MPa	7 days
B2	40 MPa	7 days

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECH TESTING PTY LTD



RAM RAVI-INDRAN
Geotechnical Engineer

Attached Drawing No 8599/47-AA1 - Test Pit Location Plan
Table A – Summary of Test Pits
SGS Laboratory Test Results



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NOTES

1. Site features are indicative and are not to scale.
2. This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing

Daracon Contractors Pty Ltd
Residential Development
Newpark Precinct 6C
Marsden Park

Test Pit Locations

Drawing No: 8599/47-AA1
Job No: 8599/47
Drawn By: MH
Date: 3 December 2020
Checked By: RR

File No: 8599-47
Layers: 0, AA1

TABLE A

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP1	0.0-0.3		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.3-1.5	0.3-0.4 (DS)	(CH) Silty CLAY, medium to high plasticity, brown, with cobbles, M<PL, very stiff to hard
		0.8-0.9 (DS)	
TP2	0.0-0.3		TOPSOIL: Clayey Silt, low plasticity, brown, with root fibres
	0.3-1.5	0.3-0.4 (DS)	(CH) Silty CLAY, medium to high plasticity, mottled brown and orange, M<PL, very stiff to hard
		0.3-0.6 (U ₅₀)	
		0.8-0.9 (DS)	
TP3	0.0-0.3		TOPSOIL: Clayey Silt, low plasticity, brown, with root fibres
	0.3-0.9	0.3-0.4 (DS)	(CH) Silty CLAY, medium to high plasticity, brown, with cobbles, M<PL, very stiff to hard
	0.9-1.5	0.9-1.0 (DS)	(CH) Silty CLAY, high plasticity, mottled brown and orange, M<PL, very stiff to hard
TP4	0.0-0.3		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.3-1.1	0.3-0.4 (DS)	(CH) Silty CLAY, medium to high plasticity, brown, with cobbles, M<PL, very stiff to hard,
	1.1-1.4	1.1-1.2 (DS)	(CH) Silty CLAY, high plasticity, mottled brown and orange, M<PL, very stiff to hard
	1.4-1.5		SHALE/CONGLOMERATE, grey, low to medium strength, distinctly weathered
	0.2-0.4	0.3-0.4 (DS)	(CI-CH) Silty Gravely CLAY, medium to high plasticity, mottled brown and grey, M<PL, stiff
	0.4-0.5		SHALE/CONGLOMERATE, grey, low to medium strength, distinctly, weathered

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP6	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-0.8	0.3-0.4 (DS)	(CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	0.8-1.5	0.8-0.9 (DS)	(CH) Silty CLAY, high plasticity, mottled brown and orange, M<PL, very stiff to hard
TP7	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-0.5	0.2-0.3 (DS)	(CI-CH) Silty Gravely CLAY, medium to high plasticity, mottled brown and grey, M<PL, stiff
	0.5-0.6	0.5-0.6 (DS)	Silty Clayey GRAVEL, fine grain, dense, with ironstone fragments
	0.6-0.7		SHALE/CONGLOMERATE, grey, low to medium strength, distinctly weathered
TP8	0.0-0.1		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.1-0.3	0.1-0.2 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	0.3-1.5	0.4-0.5 (DS)	(CI-CH) Silty Gravely CLAY, medium to high plasticity, mottled brown and grey, M<PL, stiff
TP9	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-0.8	0.3-0.4 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	0.8-1.5	0.8-0.9 (DS)	Silty Clayey GRAVEL, fine grain, dense with ironstone fragments

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP10	0.0-0.1		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.1-0.5	0.3-0.4 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	0.5-1.5	0.8-0.9 (DS)	(CI) Silty CLAY, medium plasticity, red mottled grey, with ironstone fragments, M<PL, very stiff
	0.2-1.1	0.3-0.4 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	1.1-1.5	1.1-1.2 (DS)	Silty Clayey GRAVEL, fine grain, dense with ironstone fragments
TP12	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.3	0.3-0.4 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	1.3-1.5	1.3-1.4 (DS)	Silty Clayey GRAVEL, fine grain, dense with ironstone fragments
TP13	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.5	0.3-0.4 (DS) 0.8-0.9 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
TP14	0.0-0.3		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.3-1.5	0.3-0.4 (DS) 0.8-0.9 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	0.2-0.8	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown with gravels, M<OMC, well compacted
	0.8-1.5	0.8-0.9 (DS)	(CI-CH) Silty Sandy CLAY, medium to high plasticity, mottled grey and brown. M<PL, very stiff

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP16	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.5	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown with gravels, M<OMC, well compacted
		0.8-0.9 (DS)	
TP17	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-0.6	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown, with gravels, M<OMC, well compacted
	0.6-1.5	0.8-0.9 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
TP18	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.2	0.3-0.4 (DS)	FILL: Silty Gravely Clay, low to medium plasticity, brown, M<OMC, well compacted
	1.3-1.5	0.8-0.9 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
TP19	0.0-0.3		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.3-1.5	0.3-0.4 (DS)	FILL: Silty Clay, high plasticity, brown, with cobbles and gravels, M<OMC, very stiff to hard
		0.8-0.9 (DS)	
	0.2-0.6	0.3-0.4 (DS)	FILL: Silty Clay, high plasticity, brown, with cobbles and gravels, M<OMC, very stiff to hard
	0.6-1.5	0.7-0.8 (DS)	Silty Clayey GRAVEL, fine grain, dense with ironstone fragments

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP21	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.5	0.3-0.4 (DS)	FILL: Silty Clay, high plasticity, brown, with cobbles and gravels, M<OMC, very stiff to hard
		0.8-0.9 (DS)	
TP22	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-0.8	0.3-0.4 (DS)	FILL: Silty Clay, high plasticity, brown, with cobbles and gravels, M<OMC, very stiff to hard
	0.8-1.5	0.8-0.9 (DS)	(CI-CH) Silty Gravely CLAY, medium to high plasticity, mottled brown and grey, M<PL, stiff
TP23	0.0-0.3		FILL: Silty Clay, low plasticity, brown, with gravels, M<OMC, well compacted
	0.3-1.3	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown with gravels, M<OMC, well compacted
		0.8-0.9 (DS)	
	1.3-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
TP24	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.4	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown with gravels, M<OMC, well compacted
		0.5-0.8 (U ₅₀)	
		0.8-0.9 (DS)	
	1.4-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP25	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-1.2	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown with gravels, M<OMC, well compacted
		0.8-0.9 (DS)	
	1.2-1.5		(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
TP26	0.0-0.2		FILL: Clayey Silt, low plasticity, brown, M<OMC, well compacted
	0.2-0.4	0.3-0.4 (DS)	FILL: Silty Clay, medium plasticity, brown, with gravels, M<OMC, well compacted
	0.4-0.9	0.5-0.6 (DS)	(CI-CH) Silty CLAY, medium to high plasticity, brown, with gravels, M<PL, very stiff to hard
	0.9-1.0		SILTSTONE: low strength, grey, distinctly weathered

CLIENT DETAILS

Contact Ram Ravi-Ingran
Client Geotech Testing Pty Ltd
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 PENRITH
 NSW 2751

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Project **8599/48 MARSDEN PARK**
Order Number (Not specified)
Samples 51

LABORATORY DETAILS

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SGS Reference **SE214031 R0**
Date Received 25/11/2020
Date Reported 1/12/2020

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Huong CRAWFORD
 Production Manager



Shane MCDERMOTT
 Inorganic/Metals Chemist

pH in soil (1:5) [AN101] Tested: 27/11/2020

PARAMETER	UOM	LOR	TP1	TP1	TP2	TP2	TP3
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.001	SE214031.002	SE214031.003	SE214031.004	SE214031.005
pH	pH Units	0.1	4.8	5.0	4.9	5.3	5.0

PARAMETER	UOM	LOR	TP3	TP4	TP4	TP5	TP6
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.9-1.0	0.3-0.4	1.1-1.2	0.3-0.4	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.006	SE214031.007	SE214031.008	SE214031.009	SE214031.010
pH	pH Units	0.1	5.0	4.5	5.3	5.3	5.0

PARAMETER	UOM	LOR	TP6	TP7	TP7	TP8	TP8
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.2-0.3	0.5-0.6	0.1-0.2	0.4-0.5
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.011	SE214031.012	SE214031.013	SE214031.014	SE214031.015
pH	pH Units	0.1	5.7	5.1	5.3	4.8	4.7

PARAMETER	UOM	LOR	TP9	TP9	TP10	TP10	TP11
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.016	SE214031.017	SE214031.018	SE214031.019	SE214031.020
pH	pH Units	0.1	4.6	5.2	4.5	4.8	5.2

PARAMETER	UOM	LOR	TP11	TP12	TP12	TP13	TP13
			SOIL	SOIL	SOIL	SOIL	SOIL
			1.1-1.2	0.3-0.4	1.3-1.4	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.021	SE214031.022	SE214031.023	SE214031.024	SE214031.025
pH	pH Units	0.1	5.3	4.5	5.3	4.9	4.5

PARAMETER	UOM	LOR	TP14	TP14	TP15	TP15	TP16
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.2-0.3
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.026	SE214031.027	SE214031.028	SE214031.029	SE214031.030
pH	pH Units	0.1	5.0	5.1	5.0	4.9	4.8

PARAMETER	UOM	LOR	TP16	TP17	TP17	TP18	TP18
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.031	SE214031.032	SE214031.033	SE214031.034	SE214031.035
pH	pH Units	0.1	5.0	4.9	4.4	5.5	4.9

pH in soil (1:5) [AN101] Tested: 27/11/2020 (continued)

PARAMETER	UOM	LOR	TP19	TP19	TP20	TP20	TP21
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.7-0.8	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.036	SE214031.037	SE214031.038	SE214031.039	SE214031.040
pH	pH Units	0.1	5.2	4.8	5.3	5.4	5.3

PARAMETER	UOM	LOR	TP21	TP22	TP22	TP23	TP23
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.041	SE214031.042	SE214031.043	SE214031.044	SE214031.045
pH	pH Units	0.1	6.0	5.8	5.2	4.8	4.7

PARAMETER	UOM	LOR	TP24	TP24	TP25	TP25	TP26
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.046	SE214031.047	SE214031.048	SE214031.049	SE214031.050
pH	pH Units	0.1	5.3	4.7	4.8	4.8	5.0

PARAMETER	UOM	LOR	TP26
			SOIL
			0.5-0.6
			24/11/2020
			SE214031.051
pH	pH Units	0.1	4.7

Conductivity and TDS by Calculation - Soil [AN106] Tested: 27/11/2020

PARAMETER	UOM	LOR	TP1	TP1	TP2	TP2	TP3
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.001	SE214031.002	SE214031.003	SE214031.004	SE214031.005
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	360	250	350	150	510

PARAMETER	UOM	LOR	TP3	TP4	TP4	TP5	TP6
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.9-1.0	0.3-0.4	1.1-1.2	0.3-0.4	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.006	SE214031.007	SE214031.008	SE214031.009	SE214031.010
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	440	740	630	170	370

PARAMETER	UOM	LOR	TP6	TP7	TP7	TP8	TP8
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.2-0.3	0.5-0.6	0.1-0.2	0.4-0.5
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.011	SE214031.012	SE214031.013	SE214031.014	SE214031.015
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	130	120	100	360	440

PARAMETER	UOM	LOR	TP9	TP9	TP10	TP10	TP11
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.016	SE214031.017	SE214031.018	SE214031.019	SE214031.020
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	540	610	790	550	430

PARAMETER	UOM	LOR	TP11	TP12	TP12	TP13	TP13
			SOIL	SOIL	SOIL	SOIL	SOIL
			1.1-1.2	0.3-0.4	1.3-1.4	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.021	SE214031.022	SE214031.023	SE214031.024	SE214031.025
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	550	690	180	570	650

PARAMETER	UOM	LOR	TP14	TP14	TP15	TP15	TP16
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.2-0.3
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.026	SE214031.027	SE214031.028	SE214031.029	SE214031.030
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	180	170	270	610	420

PARAMETER	UOM	LOR	TP16	TP17	TP17	TP18	TP18
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.031	SE214031.032	SE214031.033	SE214031.034	SE214031.035
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	500	240	530	96	220

Conductivity and TDS by Calculation - Soil [AN106] Tested: 27/11/2020 (continued)

PARAMETER	UOM	LOR	TP19	TP19	TP20	TP20	TP21
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.7-0.8	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.036	SE214031.037	SE214031.038	SE214031.039	SE214031.040
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	440	320	170	150	110

PARAMETER	UOM	LOR	TP21	TP22	TP22	TP23	TP23
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.041	SE214031.042	SE214031.043	SE214031.044	SE214031.045
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	130	53	220	400	290

PARAMETER	UOM	LOR	TP24	TP24	TP25	TP25	TP26
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.046	SE214031.047	SE214031.048	SE214031.049	SE214031.050
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	110	360	320	550	240

PARAMETER	UOM	LOR	TP26
			SOIL
			0.5-0.6
			24/11/2020
			SE214031.051
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	240

Moisture Content [AN002] Tested: 25/11/2020

PARAMETER	UOM	LOR	TP1	TP1	TP2	TP2	TP3
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.001	SE214031.002	SE214031.003	SE214031.004	SE214031.005
% Moisture	%w/w	1	22.4	18.1	22.1	14.4	19.7

PARAMETER	UOM	LOR	TP3	TP4	TP4	TP5	TP6
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.9-1.0	0.3-0.4	1.1-1.2	0.3-0.4	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.006	SE214031.007	SE214031.008	SE214031.009	SE214031.010
% Moisture	%w/w	1	16.8	18.6	13.2	18.4	23.8

PARAMETER	UOM	LOR	TP6	TP7	TP7	TP8	TP8
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.2-0.3	0.5-0.6	0.1-0.2	0.4-0.5
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.011	SE214031.012	SE214031.013	SE214031.014	SE214031.015
% Moisture	%w/w	1	9.3	16.8	13.5	15.5	16.7

PARAMETER	UOM	LOR	TP9	TP9	TP10	TP10	TP11
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.016	SE214031.017	SE214031.018	SE214031.019	SE214031.020
% Moisture	%w/w	1	19.5	13.5	17.9	13.6	14.5

PARAMETER	UOM	LOR	TP11	TP12	TP12	TP13	TP13
			SOIL	SOIL	SOIL	SOIL	SOIL
			1.1-1.2	0.3-0.4	1.3-1.4	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.021	SE214031.022	SE214031.023	SE214031.024	SE214031.025
% Moisture	%w/w	1	13.8	17.8	16.7	18.6	19.6

PARAMETER	UOM	LOR	TP14	TP14	TP15	TP15	TP16
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.2-0.3
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.026	SE214031.027	SE214031.028	SE214031.029	SE214031.030
% Moisture	%w/w	1	17.1	13.9	15.5	12.9	16.4

PARAMETER	UOM	LOR	TP16	TP17	TP17	TP18	TP18
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.031	SE214031.032	SE214031.033	SE214031.034	SE214031.035
% Moisture	%w/w	1	16.3	18.2	17.1	12.4	18.8

Moisture Content [AN002] Tested: 25/11/2020 (continued)

PARAMETER	UOM	LOR	TP19	TP19	TP20	TP20	TP21
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.7-0.8	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.036	SE214031.037	SE214031.038	SE214031.039	SE214031.040
% Moisture	%w/w	1	14.8	19.5	16.0	15.1	16.2

PARAMETER	UOM	LOR	TP21	TP22	TP22	TP23	TP23
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.041	SE214031.042	SE214031.043	SE214031.044	SE214031.045
% Moisture	%w/w	1	18.3	4.8	16.1	14.6	16.3

PARAMETER	UOM	LOR	TP24	TP24	TP25	TP25	TP26
			SOIL	SOIL	SOIL	SOIL	SOIL
			0.3-0.4	0.8-0.9	0.3-0.4	0.8-0.9	0.3-0.4
			24/11/2020	24/11/2020	24/11/2020	24/11/2020	24/11/2020
			SE214031.046	SE214031.047	SE214031.048	SE214031.049	SE214031.050
% Moisture	%w/w	1	8.9	15.4	15.1	18.9	14.2

PARAMETER	UOM	LOR	TP26
			SOIL
			0.5-0.6
			24/11/2020
			SE214031.051
% Moisture	%w/w	1	22.5

METHOD

METHODOLOGY SUMMARY

AN002

The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.

AN101

pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl₂) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.

AN106

Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract of as received sample with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2510 B.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE214031 R0

CLIENT DETAILS

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Project **8599/48 MARSDEN PARK**
Order Number (Not specified)
Samples 51

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SGS Reference **SE214031 R0**
Date Received 25 Nov 2020
Date Reported 01 Dec 2020

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Analysis Date

Moisture Content

31 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Client	Sample cooling method	None
Samples received in correct containers	Yes	Sample counts by matrix	51 Soil
Date documentation received	25/11/2020	Type of documentation received	COC
Number of eskies/boxes received		Samples received in good order	Yes
Samples received without headspace	N/A	Sample temperature upon receipt	26°C
Sufficient sample for analysis	Yes	Turnaround time requested	Standard

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-ENVJAN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1	SE214031.001	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP1	SE214031.002	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP2	SE214031.003	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP2	SE214031.004	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP3	SE214031.005	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP3	SE214031.006	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP4	SE214031.007	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP4	SE214031.008	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP5	SE214031.009	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP6	SE214031.010	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP6	SE214031.011	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP7	SE214031.012	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP7	SE214031.013	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP8	SE214031.014	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP8	SE214031.015	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP9	SE214031.016	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP9	SE214031.017	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP10	SE214031.018	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP10	SE214031.019	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP11	SE214031.020	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	01 Dec 2020	30 Nov 2020
TP11	SE214031.021	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP12	SE214031.022	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP12	SE214031.023	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP13	SE214031.024	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP13	SE214031.025	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP14	SE214031.026	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP14	SE214031.027	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP15	SE214031.028	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP15	SE214031.029	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP16	SE214031.030	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP16	SE214031.031	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP17	SE214031.032	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP17	SE214031.033	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP18	SE214031.034	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP18	SE214031.035	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP19	SE214031.036	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP19	SE214031.037	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP20	SE214031.038	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP20	SE214031.039	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP21	SE214031.040	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP21	SE214031.041	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP22	SE214031.042	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP22	SE214031.043	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP23	SE214031.044	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP23	SE214031.045	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP24	SE214031.046	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP24	SE214031.047	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP25	SE214031.048	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP25	SE214031.049	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP26	SE214031.050	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020
TP26	SE214031.051	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	01 Dec 2020

Moisture Content

Method: ME-(AU)-ENVJAN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1	SE214031.001	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP1	SE214031.002	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP2	SE214031.003	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP2	SE214031.004	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP3	SE214031.005	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP3	SE214031.006	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content (continued)

Method: ME-(AU)-ENVJAN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP4	SE214031.007	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP4	SE214031.008	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP5	SE214031.009	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP6	SE214031.010	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP6	SE214031.011	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP7	SE214031.012	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP7	SE214031.013	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP8	SE214031.014	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP8	SE214031.015	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP9	SE214031.016	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP9	SE214031.017	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP10	SE214031.018	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP10	SE214031.019	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP11	SE214031.020	LB214278	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	30 Nov 2020
TP11	SE214031.021	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP12	SE214031.022	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP12	SE214031.023	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP13	SE214031.024	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP13	SE214031.025	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP14	SE214031.026	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP14	SE214031.027	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP15	SE214031.028	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP15	SE214031.029	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP16	SE214031.030	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP16	SE214031.031	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP17	SE214031.032	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP17	SE214031.033	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP18	SE214031.034	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP18	SE214031.035	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP19	SE214031.036	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP19	SE214031.037	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP20	SE214031.038	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP20	SE214031.039	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP21	SE214031.040	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP21	SE214031.041	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP22	SE214031.042	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP22	SE214031.043	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP23	SE214031.044	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP23	SE214031.045	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP24	SE214031.046	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP24	SE214031.047	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP25	SE214031.048	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP25	SE214031.049	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP26	SE214031.050	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†
TP26	SE214031.051	LB214279	24 Nov 2020	25 Nov 2020	08 Dec 2020	25 Nov 2020	30 Nov 2020	01 Dec 2020†

pH in soil (1:5)

Method: ME-(AU)-ENVJAN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1	SE214031.001	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP1	SE214031.002	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP2	SE214031.003	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP2	SE214031.004	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP3	SE214031.005	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP3	SE214031.006	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP4	SE214031.007	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP4	SE214031.008	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP5	SE214031.009	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP6	SE214031.010	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP6	SE214031.011	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP7	SE214031.012	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

pH in soil (1:5) (continued)

Method: ME-(AU)-ENVJAN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP7	SE214031.013	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP8	SE214031.014	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP8	SE214031.015	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP9	SE214031.016	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP9	SE214031.017	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP10	SE214031.018	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP10	SE214031.019	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP11	SE214031.020	LB214431	24 Nov 2020	25 Nov 2020	01 Dec 2020	27 Nov 2020	28 Nov 2020	27 Nov 2020
TP11	SE214031.021	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP12	SE214031.022	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP12	SE214031.023	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP13	SE214031.024	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP13	SE214031.025	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP14	SE214031.026	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP14	SE214031.027	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP15	SE214031.028	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP15	SE214031.029	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP16	SE214031.030	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP16	SE214031.031	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP17	SE214031.032	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP17	SE214031.033	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP18	SE214031.034	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP18	SE214031.035	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP19	SE214031.036	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP19	SE214031.037	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP20	SE214031.038	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP20	SE214031.039	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP21	SE214031.040	LB214541	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP21	SE214031.041	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP22	SE214031.042	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP22	SE214031.043	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP23	SE214031.044	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP23	SE214031.045	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP24	SE214031.046	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP24	SE214031.047	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP25	SE214031.048	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP25	SE214031.049	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP26	SE214031.050	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020
TP26	SE214031.051	LB214544	24 Nov 2020	25 Nov 2020	01 Dec 2020	30 Nov 2020	01 Dec 2020	30 Nov 2020

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-(ENV)QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB214431.001	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	0.67
LB214541.001	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	0.7
LB214544.001	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	0.23

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-ENVJAN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE214031.010	LB214431.014	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	370	38.480500544	31	8
SE214031.020	LB214431.025	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	430	36.607127024	30	2
SE214031.030	LB214541.014	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	420	13.666943620	30	3
SE214031.040	LB214541.025	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	110	08.318408195	32	2
SE214031.050	LB214544.014	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	240	82.091816367	31	14

Moisture Content

Method: ME-(AU)-ENVJAN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE214031.010	LB214278.011	% Moisture	%w/w	1	23.8	24.4	34	2
SE214031.020	LB214278.022	% Moisture	%w/w	1	14.5	15.4	37	6
SE214031.030	LB214279.011	% Moisture	%w/w	1	16.4	17.5	36	7
SE214031.040	LB214279.022	% Moisture	%w/w	1	16.2	19.6	36	19
SE214031.050	LB214279.033	% Moisture	%w/w	1	14.2	14.7	37	4
SE214031.051	LB214279.035	% Moisture	%w/w	1	22.5	21.0	35	7

pH in soil (1:5)

Method: ME-(AU)-ENVJAN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE214031.010	LB214431.014	pH	pH Units	0.1	5.0	5.0	32	1
SE214031.020	LB214431.025	pH	pH Units	0.1	5.2	5.1	32	2
SE214031.030	LB214541.014	pH	pH Units	0.1	4.8	4.7	32	2
SE214031.040	LB214541.025	pH	pH Units	0.1	5.3	5.3	32	0
SE214031.050	LB214544.014	pH	pH Units	0.1	5.0	5.0	32	1

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB214431.002	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	NA	303	85 - 115	94
LB214541.002	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	NA	303	85 - 115	94
LB214544.002	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	NA	303	85 - 115	95

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB214431.003	pH	pH Units	0.1	7.4	7.415	98 - 102	100
LB214541.003	pH	pH Units	0.1	7.4	7.415	98 - 102	100
LB214544.003	pH	pH Units	0.1	7.4	7.415	98 - 102	99

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-(ENV)QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : https://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf

- * NATA accreditation does not cover the performance of this service .
 - ** Indicative data, theoretical holding time exceeded.
 - *** Indicates that both * and ** apply.
 - Sample not analysed for this analyte.
 - IS Insufficient sample for analysis.
 - LNR Sample listed, but not received.
 - LOR Limit of reporting.
 - QFH QC result is above the upper tolerance.
 - QFL QC result is below the lower tolerance.
-
- ① At least 2 of 3 surrogates are within acceptance criteria.
 - ② RPD failed acceptance criteria due to sample heterogeneity.
 - ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
 - ④ Recovery failed acceptance criteria due to matrix interference.
 - ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
 - ⑥ LOR was raised due to sample matrix interference.
 - ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
 - ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
 - ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
 - ⑩ LOR was raised due to high conductivity of the sample (required dilution).
 - † Refer to relevant report comments for further information.

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GEOTECH TESTING PTY LTD

Laboratory Test Request / Chain of Custody Record

Lemko Place
PENRITH NSW 2750

P O Box 880
PENRITH NSW 2751

Tel: (02) 4722 2700
Fax: (02) 4722 6161
email: info@geotech.com.au

Page

1 of 1

TO: SGS ENVIRONMENTAL SERVICES UNIT 16 33 MADDOX STREET ALEXANDRIA NSW 2015		Sampling By: JH		Job No: 8599/48	
PH: 02 8594 0400		Project Manager: RR		Project: Residential Subdivision	
ATTN: Ms Emily Yin		Location: MARSDEN PARK			

Sampling details

Results required by:

Location	Depth	Soil	Water	EC (1:5)	pH	Sulphate	Chloride	ESP				Notes	Keep Sample
TP1	0.3-0.4	DSP		✓	✓							ESP=Exchnageable Sodium Percentage	
TP1	0.8-0.9	DSP		✓	✓								
TP2	0.3-0.4	DSP		✓	✓								
TP2	0.8-0.9	DSP		✓	✓								
TP3	0.3-0.4	DSP		✓	✓								
TP3	0.9-1.0	DSP		✓	✓								
TP4	0.3-0.4	DSP		✓	✓								
TP4	1.1-1.2	DSP		✓	✓								
TP5	0.3-0.4	DSP		✓	✓								
TP6	0.3-0.4	DSP		✓	✓								
TP6	0.8-0.9	DSP		✓	✓								
TP7	0.2-0.3	DSP		✓	✓								
TP7	0.5-0.6	DSP		✓	✓								
TP8	0.1-0.2	DSP		✓	✓								
TP8	0.4-0.5	DSP		✓	✓								
TP9	0.3-0.4	DSP		✓	✓								
TP9	0.8-0.9	DSP		✓	✓								
TP10	0.3-0.4	DSP		✓	✓								
TP10	0.8-0.9	DSP		✓	✓								
TP11	0.3-0.4	DSP		✓	✓								
TP11	1.1-1.2	DSP		✓	✓								
TP12	0.3-0.4	DSP		✓	✓								
TP12	1.3-1.4	DSP		✓	✓								
TP13	0.3-0.4	DSP		✓	✓								
TP13	0.8-0.9	DSP		✓	✓								
TP14	0.3-0.4	DSP		✓	✓								
TP14	0.8-0.9	DSP		✓	✓								
TP15	0.3-0.4	DSP		✓	✓								
TP15	0.8-0.9	DSP		✓	✓								
TP16	0.2-0.3	DSP		✓	✓								
TP16	0.8-0.9	DSP		✓	✓								
TP17	0.3-0.4	DSP		✓	✓								
TP17	0.8-0.9	DSP		✓	✓								
TP18	0.3-0.4	DSP		✓	✓								
TP18	0.8-0.9	DSP		✓	✓								
TP19	0.3-0.4	DSP		✓	✓								
TP19	0.8-0.9	DSP		✓	✓								
TP20	0.3-0.4	DSP		✓	✓								
TP20	0.7-0.8	DSP		✓	✓								
TP21	0.3-0.4	DSP		✓	✓								
TP21	0.8-0.9	DSP		✓	✓								
TP22	0.3-0.4	DSP		✓	✓								
TP22	0.8-0.9	DSP		✓	✓								
TP23	0.3-0.4	DSP		✓	✓								
TP23	0.8-0.9	DSP		✓	✓								
TP24	0.3-0.4	DSP		✓	✓								
TP24	0.8-0.9	DSP		✓	✓								
TP25	0.3-0.4	DSP		✓	✓								
TP25	0.8-0.9	DSP		✓	✓								
TP26	0.3-0.4	DSP		✓	✓								
TP26	0.5-0.6	DSP		✓	✓								

SGS EHS Sydney COC
SE214031



Please Use Geotechnical Engineering Template for Reporting

Relinquished by		Received by	
Name Jack Herben	Signature JH	Name George Zhi	Signature [Signature]
Date 24/11/2020		Date 24/11/2020	

Legend:

WG	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)	* Purge & Trap
WP	DSG	Disturbed soil sample (glass jar)	✓	Test required	# Geotechnique Screen



SAMPLE RECEIPT ADVICE

SE214031

CLIENT DETAILS

Contact Ram Ravi-Ingran
Client Geotech Testing Pty Ltd
Address P.O. Box 880
PENRITH
NSW 2751

Telephone 02 4722 2700
Facsimile 02 4722 6161
Email ram@geotech.com.au

Project **8599/48 MARSDEN PARK**
Order Number (Not specified)
Samples 51

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

Samples Received Wed 25/11/2020
Report Due Wed 2/12/2020
SGS Reference **SE214031**

SUBMISSION DETAILS

This is to confirm that 51 samples were received on Wednesday 25/11/2020. Results are expected to be ready by COB Wednesday 2/12/2020. Please quote SGS reference SE214031 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Client	Sample cooling method	None
Samples received in correct containers	Yes	Sample counts by matrix	51 Soil
Date documentation received	25/11/2020	Type of documentation received	COC
Number of eskies/boxes received		Samples received in good order	Yes
Samples received without headspace	N/A	Sample temperature upon receipt	26°C
Sufficient sample for analysis	Yes	Turnaround time requested	Standard

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

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CLIENT DETAILS

Client **Geotech Testing Pty Ltd**

Project **8599/48 MARSDEN PARK**

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Soil	Moisture Content	pH in soil (1:5)
001	TP1 0.3-0.4	1	1	1
002	TP1 0.8-0.9	1	1	1
003	TP2 0.3-0.4	1	1	1
004	TP2 0.8-0.9	1	1	1
005	TP3 0.3-0.4	1	1	1
006	TP3 0.9-1.0	1	1	1
007	TP4 0.3-0.4	1	1	1
008	TP4 1.1-1.2	1	1	1
009	TP5 0.3-0.4	1	1	1
010	TP6 0.3-0.4	1	1	1
011	TP6 0.8-0.9	1	1	1
012	TP7 0.2-0.3	1	1	1
013	TP7 0.5-0.6	1	1	1
014	TP8 0.1-0.2	1	1	1
015	TP8 0.4-0.5	1	1	1
016	TP9 0.3-0.4	1	1	1
017	TP9 0.8-0.9	1	1	1
018	TP10 0.3-0.4	1	1	1
019	TP10 0.8-0.9	1	1	1
020	TP11 0.3-0.4	1	1	1
021	TP11 1.1-1.2	1	1	1
022	TP12 0.3-0.4	1	1	1
023	TP12 1.3-1.4	1	1	1
024	TP13 0.3-0.4	1	1	1

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.

The numbers shown in the table indicate the number of results requested in each package.

Please indicate as soon as possible should your request differ from these details .

Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Client **Geotech Testing Pty Ltd**

Project **8599/48 MARSDEN PARK**

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Soil	Moisture Content	pH in soil (1:5)
025	TP13 0.8-0.9	1	1	1
026	TP14 0.3-0.4	1	1	1
027	TP14 0.8-0.9	1	1	1
028	TP15 0.3-0.4	1	1	1
029	TP15 0.8-0.9	1	1	1
030	TP16 0.2-0.3	1	1	1
031	TP16 0.8-0.9	1	1	1
032	TP17 0.3-0.4	1	1	1
033	TP17 0.8-0.9	1	1	1
034	TP18 0.3-0.4	1	1	1
035	TP18 0.8-0.9	1	1	1
036	TP19 0.3-0.4	1	1	1
037	TP19 0.8-0.9	1	1	1
038	TP20 0.3-0.4	1	1	1
039	TP20 0.7-0.8	1	1	1
040	TP21 0.3-0.4	1	1	1
041	TP21 0.8-0.9	1	1	1
042	TP22 0.3-0.4	1	1	1
043	TP22 0.8-0.9	1	1	1
044	TP23 0.3-0.4	1	1	1
045	TP23 0.8-0.9	1	1	1
046	TP24 0.3-0.4	1	1	1
047	TP24 0.8-0.9	1	1	1
048	TP25 0.3-0.4	1	1	1

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
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Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .



SAMPLE RECEIPT ADVICE

SE214031

CLIENT DETAILS

Client **Geotech Testing Pty Ltd**

Project **8599/48 MARSDEN PARK**

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Soil	Moisture Content	pH in soil (1:5)
049	TP25 0.8-0.9	1	1	1
050	TP26 0.3-0.4	1	1	1
051	TP26 0.5-0.6	1	1	1

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .