Appendix A: VGT Surface Sampling

Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

Legend: FNS = Found no sample

Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
1	1	398825	6405175	FNS			
2	1	398875	6405175	FNS			
3	1	398925	6405175	FNS			
4	1	398975	6405175	FNS			
5	1	399025	6405175	FNS			
6	2	398725	6405125	Large boulder nearby too. Floats	HRT	Fresh. Creamy - white plagioclase laths, opaque - clear quartz, mica crystals set in a pink - red fine grained matrix. Possibly orthoclase and/or haematite.	
7	2	398775	6405125	Outcrop but float	HRT		
8	2	398825	6405125	FNS			
9	2	398875	6405125	FNS			
10	2	398925	6405125	FNS			
11	2	398975	6405125	FNS			
12	2	399025	6405125	FNS			
13	2	399075	6405125	FNS			
14	3	398675	6405075		HRT	Weathered. Plag, Qtz, Mica set in cream - brown matrix.	
15	3	398725	6405075	Insitu. Hard	HRT	Fresh.	
16	3	398775	6405075	Floats, Insitu too hard	HRT	Slightly weathered.	
17	3	398825	6405075	FNS			
18	3	398875	6405075	FNS			
19	3	398925	6405075	FNS			
20	3	398975	6405075	FNS			
21	3	399025	6405075	FNS			
22	3	399075	6405075	FNS			

Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

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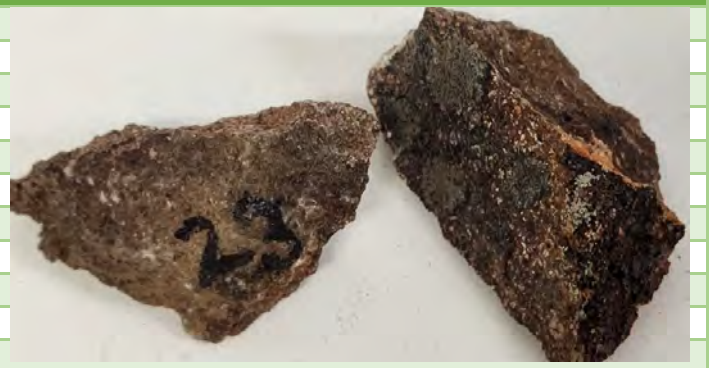
Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
23	4	398625	6405025		HRT	Slightly weathered.	
24	4	398675	6405025	No Sample. Hard			
25	4	398725	6405025	No Sample. Hard			
26	4	398775	6405025	FNS			
27	4	398825	6405025	FNS			
28	4	398875	6405025	No Sample. Float			
29	4	398925	6405025	Float	HRT	Fresh.	
30	4	398975	6405025	FNS			
31	4	399025	6405025	FNS			
32	4	399075	6405025	FNS			
33	4	399125	6405025	FNS			
34	5	398575	6404975		HRT	Weathered.	
35	5	398625	6404975		HRT	Weathered.	
36	5	398675	6404975		HRT	Weathered.	
37	5	398725	6404975	Outcrop too hard to sample. Floaters nearby	HRT	(1) Weathered. (2) Slightly weathered, pink - brown matrix	
38	5	398775	6404975	Float	HRT	Fresh.	
39	5	398825	6404975	Outcrop too hard to sample. Floaters nearby	HRT	Fresh.	
40	5	398875	6404975		HRT	Fresh. Minor iron staining.	
41	5	398925	6404975		HRT	Slightly weathered. Pink - brown matrix.	
42	5	398975	6404975	Lone sample in paddock. Float	HRT	Fresh.	
43	5	399025	6404975		HRT	Slightly weathered.	
44	5	699075	6404975	FNS			

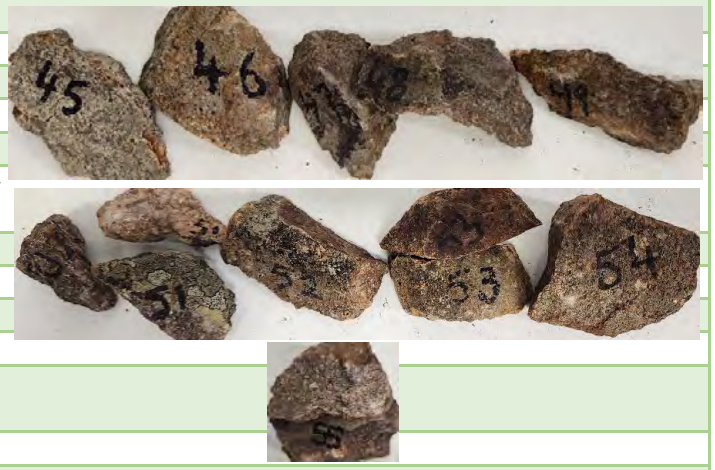


Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

Legend: FNS = Found no sample

Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
45	6	398475	6404925		HRT	Fresh.	
46	6	398525	6404925		HRT	Weathered.	
47	6	398575	6404925		HRT	Slightly weathered.	
48	6	398625	6404925		HRT	Slightly weathered.	
49	6	398675	6404925		HRT	Weathered.	
50	6	398725	6404925		HRT	Fresh. Secondary iron staining (silver - grey)	
51	6	398775	6404925		HRT	Fresh.	
52	6	398825	6404925		HRT	Slightly weathered.	
53	6	398875	6404925	Floats (?)	HRT	Weathered.	
54	6	398925	6404925		HRT	Slightly weathered.	
55	6	398975	6404925	Paddock sample. Float	HRT	Slightly weathered.	
56	6	399025	6404925	FNS			
57	6	399075	6404925	FNS			



Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

Legend: FNS = Found no sample

Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
58	7	398475	6404875	FNS			
59	7	398525	6404875		HRT	Weathered. HRT(?)	
60	7	398575	6404875	Insitu. Hard	HRT	Weathered.	
61	7	396625	6404875	Float	HRT	Fresh.	
62	7	398575	6404875	Float. Outcrop too hard	HRT	Slightly weathered.	
63	7	398726	6404875	(Bit more sediments in this area). Float	HRT	Fresh.	
64	7	398775	6404875	Float. A lot of float around	HRT	Fresh.	
65	7	398825	6404875		HRT	Fresh.	
66	7	398875	6404875		HRT	Slightly weathered.	
67	7	398925	6404875	Float. Steep paddock.	HRT	Fresh.	
68	7	398975	6404875	FNS			
69	7	399025	6404875	One single boulder	HRT	Slightly weathered.	
70	7	399075	6404875	FNS			
71	7	399125	6404875	FNS			

Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

Legend: FNS = Found no sample

Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
72	8	398475	6404825		HRT	Weathered.	
73	8	398525	6404825	(Bit more sediments in this area). Float	HRT	Slightly weathered.	
74	8	398575	6404825	Insitu. Hard	HRT	Fresh.	
75	8	398625	6404825		HRT	Fresh.	
76	8	398675	6404825		HRT	Fresh.	
77	8	398725	6404825	Outcrop Insitu. Sample is edge off larger rock	HRT	Slightly weathered.	
78	8	398775	6404825	Float. Lots of float here	HRT	Slightly weathered.	
79	8	398825	6404825		HRT	Slightly weathered.	
80	8	398875	6404825		HRT	Slightly weathered.	
81	8	398925	6404825	FNS			
82	8	398975	6404825	Float	HRT	Slightly weathered.	
83	8	399025	6404825	FNS			
84	8	399075	6404825	FNS			
85	8	399125	6404825	FNS			
86	8	399175	6404825	FNS			

Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

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Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
87	9	398475	6404775	Float on grazed paddock	HRT	Fresh.	
88	9	398525	6404775	Insitu. Hard	HRT	Slightly weathered.	
89	9	398575	6404775		HRT	Fresh.	
90	9	398625	6404775		HRT	Fresh. With qtz lithic fragment ~2cm	
91	9	398675	6404775		HRT	Fresh. Dense. Silver - grey iron	
92	9	398725	6404775	Hard outcrop. Insitu	HRT	Slightly weathered.	
93	9	398775	6404775		HRT	Slightly weathered.	
94	9	398825	6404775		HRT	Fresh.	
95	9	398875	6404775	FNS			
96	9	398925	6404775		HRT	Fresh.	
97	9	398975	6404775	FNS			
98	9	399025	6404775	FNS			
99	9	399075	6404775	FNS			
100	9	399125	6404775	FNS			
101	9	399175	6404775	FNS			

Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

Legend: FNS = Found no sample

Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
102	10	398475	6404725	Float in paddock	HRT	Fresh.	
103	10	398525	6404725	Float in paddock gully	HRT	Slightly weathered	
104	10	398575	6404725		HRT	Fresh. Slightly brown, hard	
105	10	398625	6404725		HRT	Slightly weathered	
106	10	398675	6404725		HRT	Fresh. Brown matrix	
107	10	398725	6404725	Insitu. Steep outcrop	HRT	Fresh. Pink - brown matrix	
108	10	398775	6404725		HRT	Fresh.	
109	10	398825	6404725	Insitu. Flake off edge.	HRT	Fresh.	
110	10	398875	6404725	Altered conglomerate	HRT (?)	Very weathered.	
111	10	398925	6404725	Altered sheet flow in gully, spring	HRT (a) / Qtz	(a) Fresh. (b) Highly weathered Qtzite	
112	10	398975	6404725	FNS			
113	10	399025	6404725	FNS			
114	10	399075	6404725	FNS			
115	10	399125	6404725	FNS			

Hillview Surface Mapping June 2020

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Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
116	11	398475	6404675	Outcrop	HRT	Slightly weathered. Brown matrix	
117	11	398525	6404675		HRT	Fresh. Grey - brown matrix	
118	11	398575	6404675		HRT	Fresh. Brown matrix	
119	11	398625	6404675		HRT	Fresh. Red matrix	
120	11	398675	6404675		HRT	Fresh. Lt brown matrix	
121	11	398725	6404675		HRT	Weathered.	
122	11	398775	6404675	FNS			
123	11	398825	6404675		HRT	Slightly weathered. Red matrix	
124	11	398875	6404675	Float. No sample			
125	11	398925	6404675	Float. No sample			
126	11	398975	6404675	Float	HRT	Slightly weathered. Green matrix	
127	11	399025	6404675	FNS			
128	11	399075	6404675	FNS			
129	11	399125	6404675	FNS			
130	12	398475	6404625	Float	HRT	Fresh.	
131	12	398525	6404625		HRT	Fresh.	
132	12	398575	6404625		HRT	Fresh.	
133	12	398625	6404625		HRT	Fresh.	
134	12	398675	6404625	Float. Insitu too hard to sample	HRT	Fresh.	
135	12	398725	6404625		HRT	Fresh.	
136	12	398775	6404625	FNS			
137	12	398825	6404625	Float. No outcrop	HRT	Fresh.	
138	12	398875	6404625	Steep gully. Dull hit / altered V?	HRT / Qtz	(a) Iron rich Qtz vein (?). (c) Iron rich HRT (?)	
139	12	398925	6404625	Float	HRT	Fresh.	
140	12	398975	6404625	Float	HRT	Fresh.	
141	12	399025	6404625	Float	HRT	Weathered. Green matrix	
142	12	399075	6404625	Float	HRT	Slightly weathered	
143	12	399125	6404625	Insitu.	HRT	Fresh. Brown matrix	
144	12	399175	6404625	Float	HRT	Fresh	





Hillview Surface Mapping June 2020

HRT = Haematized Rhyolitic Tuff

Legend: FNS = Found no sample

Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
145	13	398475	6404575	Float	HRT	Fresh. Brown matrix	
146	13	398525	6404575		HRT	Fresh. Brown matrix	
147	13	398575	6404575		HRT	Fresh.	
148	13	398625	6404575		HRT	Slightly weathered.	
149	13	398675	6404575	Outcrop. Insitu	HRT	Fresh	
150	13	398725	6404575		HRT	Fresh	
151	13	398775	6404575	FNS			
152	13	398825	6404575	FNS			
153	13	398875	6404575	FNS			
154	13	398925	6404575	FNS			
155	13	398975	6404575	FNS			
156	13	399025	6404575	Large outcrop	HRT	Fresh	
157	13	399075	6404575	Outcrop and float	HRT	Fresh	
158	13	399125	6404575	Float - ridge top / saddle	HRT	Fresh	
159	14	398475	6404525	Float	HRT	Slightly weathered. Brown matrix	
160	14	398525	6404525	Float	HRT	Fresh. Brown matrix	
161	14	398575	6404525		HRT	Fresh.	
162	14	398625	6404525	Float. No sample			
163	14	398675	6404525	Outcrop. Insitu	HRT	Fresh. Brown matrix	
164	14	398725	6404525		HRT (?)	Very weathered. Volcanic (?)	
165	14	398775	6404525		HRT	Very - extreme weathered	
166	14	398825	6404525	FNS			
167	14	398875	6404525	Float. No sample (Volcanics)			
168	14	398925	6404525	Insitu. Volcanic conglomerate	VCG	Volcanoclastic conglomerate	
169	14	398975	6404525	FNS			
170	14	399025	6404525	Insitu	HRT	(a) Fresh. Brown matrix (b) Fine grained volcanic, qtz crystals in grey matrix. (c) Weathered	

Hillview Surface Mapping June 2020

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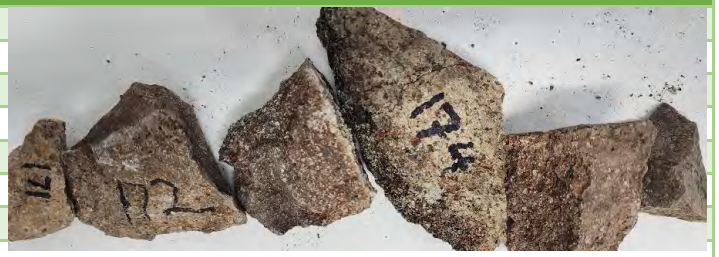
Grid Square No	Transect No	Eastings	Northings	Sampling Comments	Lithology	Specimen Comment	Transect Photo
171	15	398525	6404475		HRT	Weathered. Light brown matrix	
172	15	398575	6404475		HRT	Fresh. Brown matrix	
173	15	398625	6404475		HRT	Slightly weathered. Brown matrix	
174	15	398675	6404475		HRT	Fresh. Brown matrix	
175	15	398725	6404475	Float (?)	HRT	Fresh.	
176	15	398775	6404475		HRT	Weathered. Brown matrix	
177	15	398825	6404475	FNS			
178	15	398875	6404475	FNS			
179	15	398925	6404475	FNS			
180	16	398625	6404425	FNS			
181	16	398675	6404425	Float, no outcrop	HRT	Weathered. Brown matrix	
182	16	398725	6404425	Insitu	HRT	Fresh.	
183	16	398875	6404475	FNS			



Appendix B: VGT Test Pit Logs

Hillview Hard Rock Quarry: Test Pit Sampling Tables

Test Pit 2

Eastings	399060.57	Elevation	108m
Northings	6404597.77	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.2**	Rock at base?	Volcanic, extremely weathered

From	To	Thickness	Description
0	0.3m	0.3m	A1 soil horizon, brown clay
0.3m	1.2m	0.9m	B1 soil horizon, grey brown sandy clay
1.2m			Extremely weathered volcanic rock at base, end of hole.


Test pit 2

Test Pit 5

Eastings	398915.09	Elevation	106.5m
Northings	6404611.88	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**0.5**	Rock at base?	Volcanic, fresh

From	To	Thickness	Description
0	0.13m	0.13m	Dark brown clay/sand
0.13m	0.5m	0.27m	B1 soil horizon, grey brown sandy clay
0.5m			Fresh, red volcanic rock – end of hole 0.5m


Test pit 5

Test Pit 6

Eastings	398954.77	Elevation	101m
Northings	6404643.31	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**2.2**	Rock at base?	Volcanic, slightly weathered

From	To	Thickness	Description
0	1.0m	1.0m	A1 soil horizon, dark brown sandy clay
1.0m	2.2m	1.2m	Grey, silty and hard with green rock
2.2m			Hard volcanic rock – end of hole at 2.2m

Test pit 6

Test Pit 7

Eastings	398921.42	Elevation	108.2m
Northings	6404698.42	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.4**	Rock at base?	Volcanic, moderately weathered

From	To	Thickness	Description
0	0.7m	0.7m	Dark brown high quality soil
0.7m	1.4m	0.7mm	Yellow/grey clay
1.4m			Hard volcanic rock – end of hole 1.4m

Test pit 7

Test Pit 8

Eastings	398961.09	Elevation	101.8m
Northings	6404690.73	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.5**	Rock at base?	Volcanic, highly weathered

From	To	Thickness	Description
0	0.3m	0.3m	Dark brown muddy soil
0.3m	1.5m	1.2m	Yellow/grey clay
1.5m			Weathered rock, End of hole at 1.5m

Test pit 8

Test Pit 10

Eastings	398978.86	Elevation	106.43m
Northings	6404783.10	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.8**	Rock at base?	Volcanic, slightly weathered

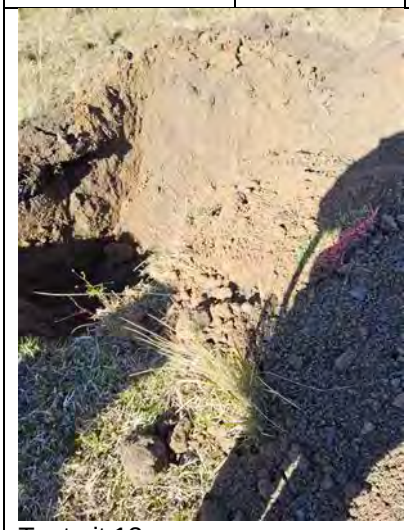
From	To	Thickness	Description
0	0.3m	0.3m	Dark brown mud, A1 soil horizon
0.3m	1.5m	1.2m	Yellow/grey clay
1.5m	1.8m	0.3m	Hard volcanic rock, end of hole 1.8m

Test pit 10

Test Pit 13

Eastings	399026.22	Elevation	107.04m
Northings	6404872.50	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.1m**	Rock at base?	Volcanic, highly weathered

From	To	Thickness	Description
0	1.1m	1.1m	Grey / brown clay
1.1m			Weathered rock, End of hole



Test pit 13

Test Pit 17

Eastings	399100.70	Elevation	103.41m
Northings	6404645.24	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**0.6m**	Rock at base?	Volcanic, moderately weathered

From	To	Thickness	Description
0	0.15m	0.15m	A1 soil horizon, dark brown clay
0.15m	0.35m	0.2m	A2 – grey brown clay
0.35m	0.55m	0.2m	B1 horizon, orange sandy clay
0.55m	0.6m	0.05m	Rock at base, end of hole 0.6m

Test pit 17

Test Pit 20

Eastings	398983.28	Elevation	110m
Northings	6404521.67	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**3.2m**	Rock at base?	Volcanic, extremely weathered

From	To	Thickness	Description
0	0.5m	0.5m	A1 soil horizon, dark brown clay
0. 5m	2.0m	1.5m	Sandy orange brown clay
2.0m	3.2m	1.2m	Increasing sand in clay
3.2m			Equipment refusal, extremely weathered rock at base, end of hole 3.2m


Test pit 20

Test Pit 21

Eastings	399013.05	Elevation	106.55m
Northings	6404564.65	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.6m**	Rock at base?	Volcanic, extremely weathered

From	To	Thickness	Description
0	0.4m	0.4m	Brown sandy clay, A1 soil horizon
0.4m	1.4m	1.0m	Brown/grey streaky clay
1.4m	1.6m	0.2m	Pale grey clay
1.6m			Extremely weathered rock at base, end of hole 1.6m


Test pit 21

Test Pit 22

Eastings	399006.47	Elevation	100.34m
Northings	6404627.59	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**2.4m**	Rock at base?	Volcanic, extremely weathered

From	To	Thickness	Description
0	0.3m	0.3m	Brown sandy clay, A1 soil horizon
0.3m	1.9m	1.6m	Brown / orange clay
1.9m	2.4m	0.5m	Extremely weathered & soft volcanic rock
2.4m			Equipment refusal, end of hole

Test pit 22

Test Pit 23

Eastings	398918.75	Elevation	110.33m
Northings	6404556.60	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**2.5m**	Rock at base?	Volcanic, Moderately weathered

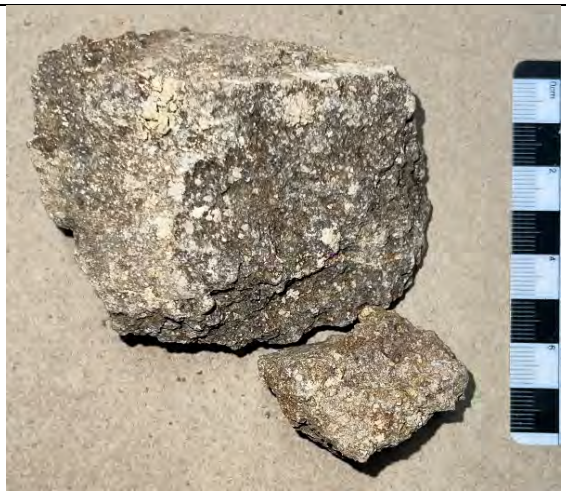
From	To	Thickness	Description
0	0.4m	0.4m	Dark brown sandy soil, A1 soil horizon
0.4m	2.5m	2.1m	Brown / orange clay
2.5m			Volcanic rock at 2.5m, end of hole

Test pit 23

Test Pit 24

Eastings	399064.29	Elevation	103.75m
Northings	6404939.68	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.2m**	Rock at base?	Volcanic, slightly weathered

From	To	Thickness	Description
0	0.5m	0.5m	Dark brown good quality soil, A1 soil horizon
0.5m	1.2m	0.7m	Red / brown clay
1.2m			Very hard volcanic rock at 1.2m, end of hole



Test pit 24

Test Pit 25

Eastings	399185.14	Elevation	95.82m
Northings	6404861.94	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.1m**	Rock at base?	Volcanic, fresh

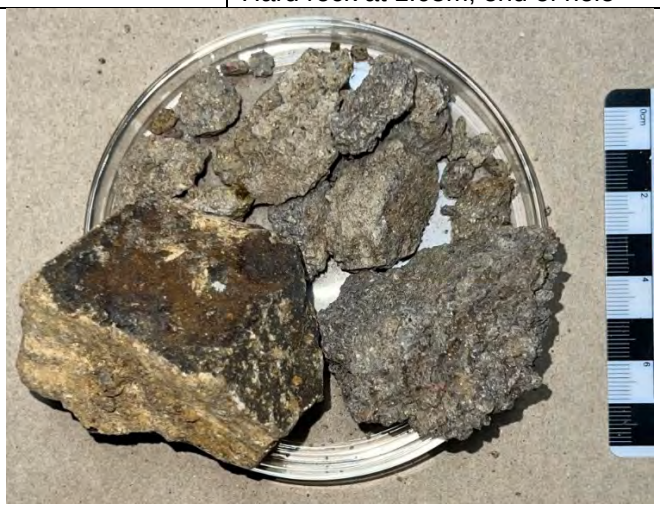
From	To	Thickness	Description
0	0.5m	0.5m	Dark brown soil, A1 soil horizon
0.5m	1.0m	0.5m	Red / brown clay
1.0m	1.1m	0.1m	Hard, red volcanic rock at 1.1m, end of hole

Test pit 25

Test Pit 26

Eastings	399164.73	Elevation	102.22m
Northings	6404798.70	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.05m**	Rock at base?	Volcanic, moderate weathering

From	To	Thickness	Description
0	0.3m	0.3m	Dark brown soil, A1 soil horizon
0.3m	0.6m	0.3m	Brown clay
0.6m	1.05m	0.45m	Sandy clay
1.05m			Hard rock at 1.05m, end of hole

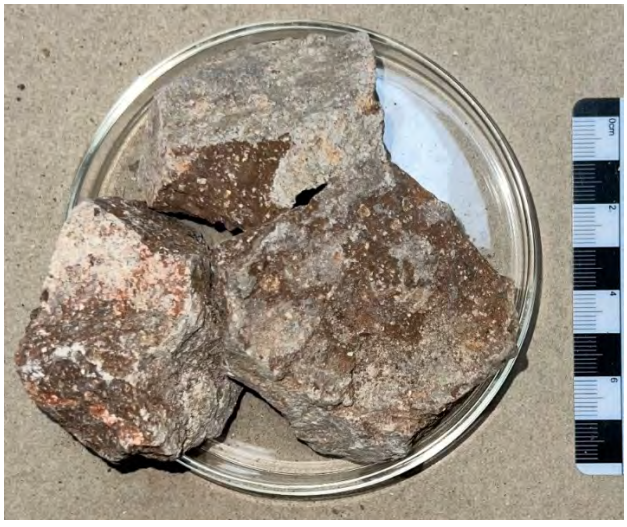


Test pit 26

Test Pit 27

Eastings	399164.18	Elevation	111.31m
Northings	6404635.28	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**0.9m**	Rock at base?	Volcanic, fresh

From	To	Thickness	Description
0	0.3m	0.3m	Dark brown soil, A1 soil horizon
0.3m	0.7m	0.4m	Red/brown streaky clay
0.7m	0.9m	0.2m	Weathered red volcanic rock
0.9m			Hard red rock at 0.9m, end of hole

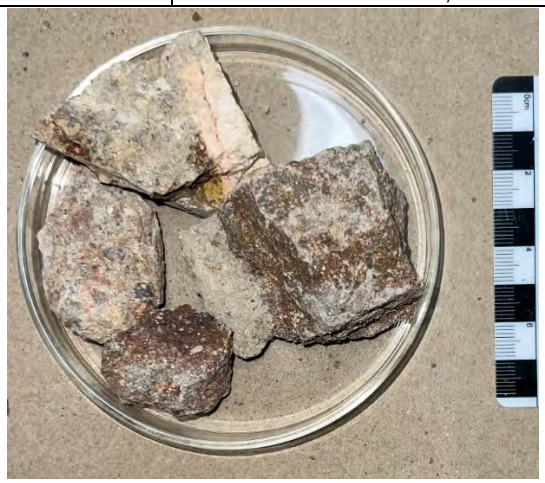


Test pit 27

Test Pit 28

Eastings	399136.57	Elevation	114.79m
Northings	6404585.88	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**0.9m**	Rock at base?	Volcanic, slightly weathered

From	To	Thickness	Description
0	0.3m	0.3m	Dark brown soil, A1 soil horizon
0.3m	0.7m	0.4m	Grey clay
0.7m	0.9m	0.2m	Weathered red volcanic rock
0.9m			Hard red rock at 0.9m, end of hole

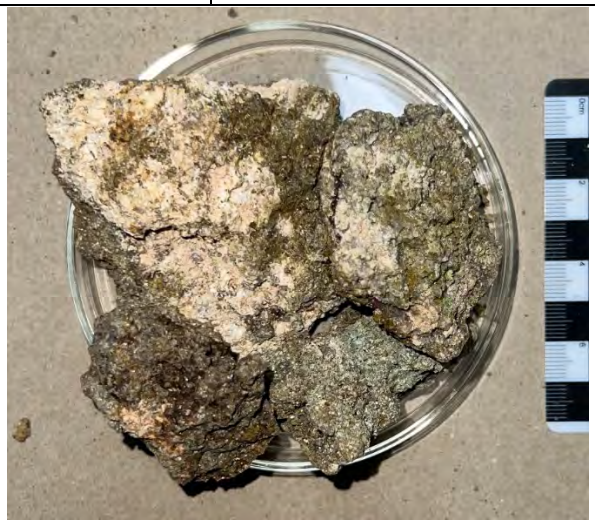


Test pit 28

Test Pit 29

Eastings	399040.60	Elevation	98.47m
Northings	6404662.08	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**2.1m**	Rock at base?	Volcanic, extremely weathered

From	To	Thickness	Description
0	0.4m	0.4m	Grey / brown sandy soil, A1 soil horizon
0.4m	2.1 m	1.7m	Red / orange and brown clay
1.7m			Weathered red volcanic rock, end of hole 1.7m



Test pit 29

Test Pit 30

Eastings	399025.27	Elevation	111.92m
Northings	6404526.61	Date	17.07.2024
Logged By	TF	Checked	RG
Depth	**1.1m**	Rock at base?	Volcanic, Fresh

From	To	Thickness	Description
0	0.4m	0.4m	Dark brown soil, A1 soil horizon
0.4m	1.1 m	0.7m	Sandy orange grey clay
1.1m			Weathered red volcanic rock, end of hole 1.1m

Test pit 30

Appendix C: VGT Drill Logs

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 0-5m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 3/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P1	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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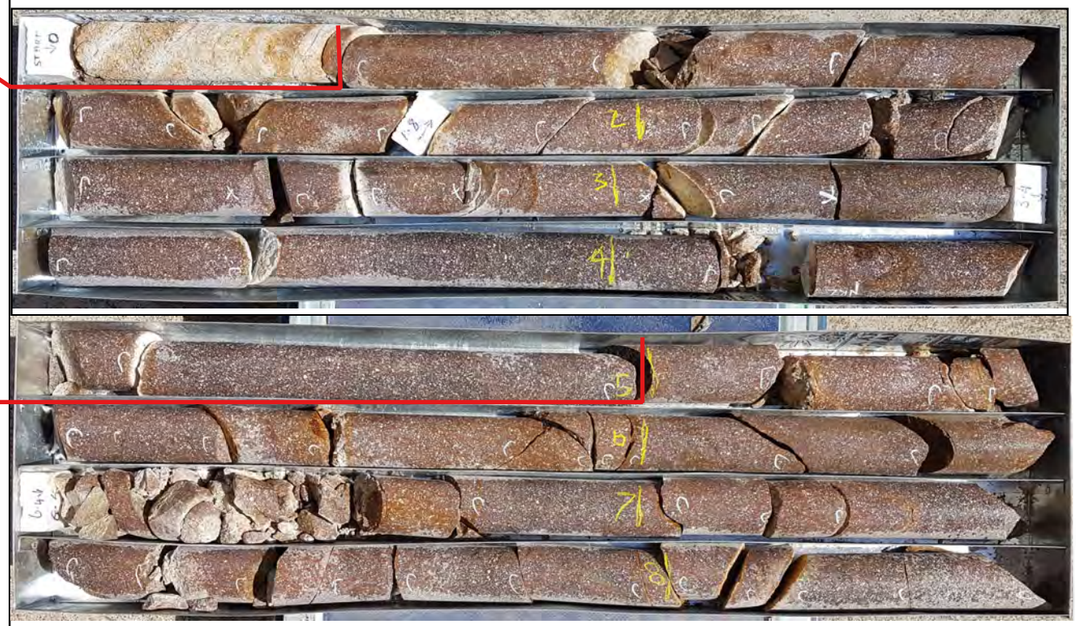
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Auger	189	0	60	0.74	0.76		2			Hematized Rhyolitic Tuff- brown,grey to pink, weathered, porphrytic	Becoming competent
		1									
Diamond Drill	188	2	95	10.11	5.62		5				
	187	3	100				>5				
	186	4	100				3				
			95	8.95	8	215	3			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	
	185	5									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 5-10m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P2	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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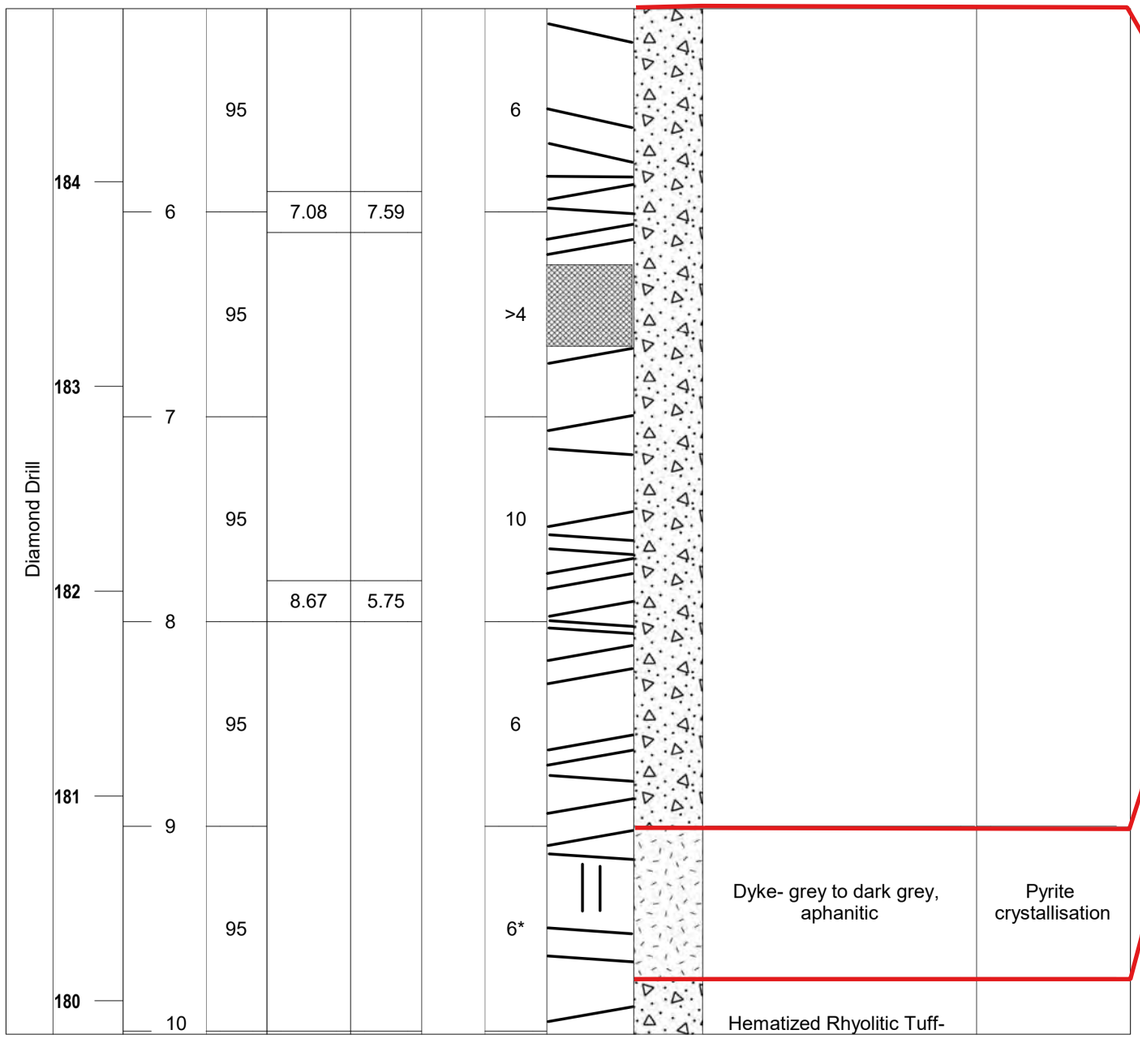
BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions



Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 10-15m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P3	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	179	11	95	9.54	5.28		4*			dark red to pink, porphrytic	
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Feldspathic veining
			95	4.51	2.85		5			Hematized Rhyolitic Tuff- orange to pink, weathered, porphrytic	Plagioclase alteration
	178	12								Dyke- grey to dark grey, aphanitic	Some pyrite crystallisation
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Some weathering on upper contact
			100				7				
	177	13								Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Feldspathic veining
			95				1*				
	176	14		9.65	8.76					Hematized Rhyolitic Tuff-dark red, porphrytic	
			95				>6				
	175	15								Hematized Rhyolitic Tuff-	

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 15-20m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P4	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	174	16	95	3.54	3.09		6			orange, weathered, friable, porphrytic	
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic,	
			85				>6			Hematized Rhyolitic Tuff- orange, weathered, friable, porphrytic	
	173	17		6.79	5.54					Dyke- grey to dark grey, aphanitic	Some pyrite crystallisation
			95				7				
	172	18								Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Some feldspathic veining
			85	10.39	7.26		6				
	171	19									
			95				7			Hematized Rhyolitic Tuff- grey to dark red, porphrytic	
	170	20								Hematized Rhyolitic Tuff- dark red to pink, porphrytic	

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 20-25m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V1 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P5	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	169	21	80	0.29	0.17		8			Dyke- grey to dark grey, aphanitic	Dyke, some pyrite crystallisation, weathered at base
			90				7*				
	168	22								Hematized Rhyolitic Tuff- dark red to pink. porphrytic	
			90	11.82	9.71		4*				
	167	23									
			95				11			Hematized Rhyolitic Tuff- grey to dark red, porphrytic	
	166	24									
			95				4*			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	
	165	25		9.44	9.72	209					

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 25-30m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P6	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	164	26	95				10			Hematized Rhyolitic Tuff- grey to pink, porphrytic	Calcite veining
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic	
										Dyke- grey to dark grey, aphanitic	Dyke, some pyrite crystallisation, weathered at base
	163	27	90	6.05	4.15		>5				
	162	28	90				6			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Weathered at base
			75	11.85	7.32		3				
	161	29	90				7				
	160	30									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 30-35m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P7	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	159	31	90	7.06	6.37		5			Dyke- grey to dark grey, aphanitic	Weathered at top contact, Hematized Rhyolitic Tuff inclusions at base of sequence
	158	32	95				10			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Weathered at base
	157	33	75	3.33	1.94		>5			Dyke- grey to dark grey, aphanitic	Some pyrite crystallisation, weathered at top contact
	156	34	100				2				
	155	35	100				4				

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 35-40m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P8	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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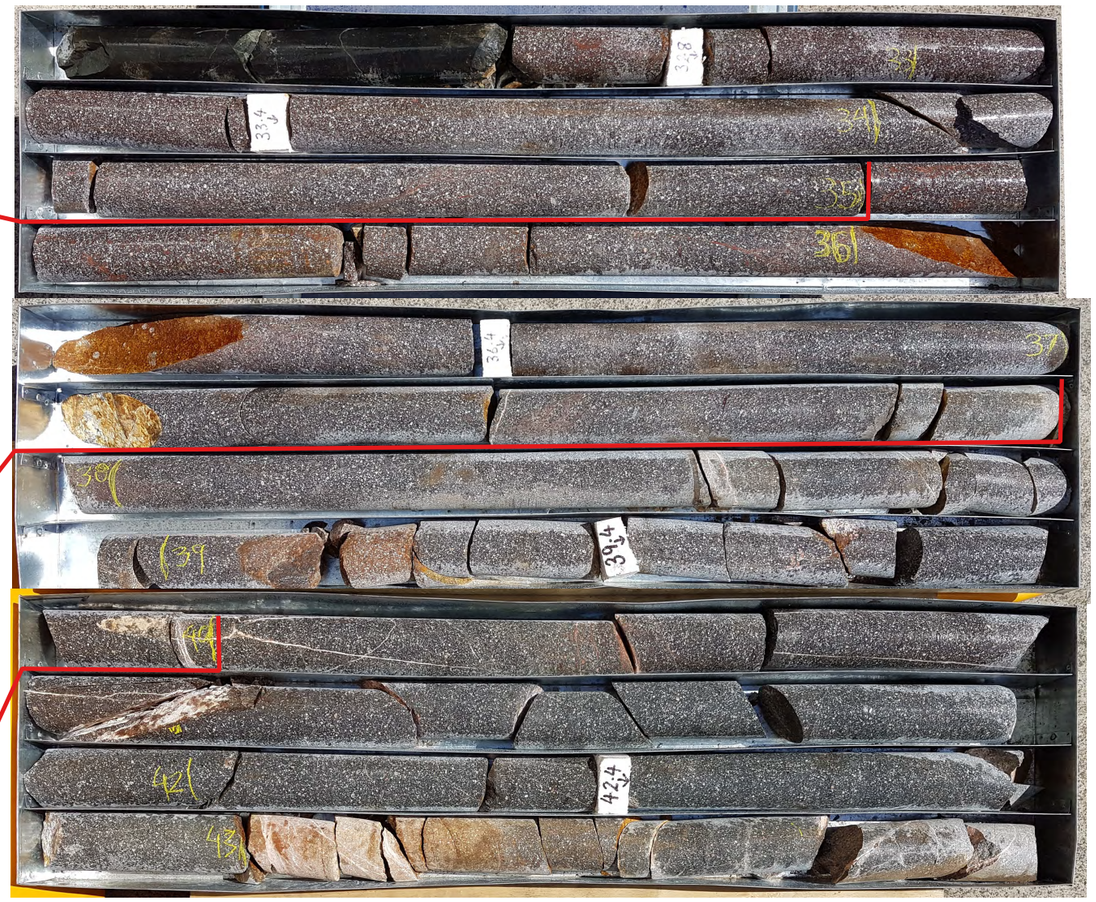
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	154	36	100	11.82	4.14		0			Hematized Rhyolitic Tuff- dark red to grey, porphrytic	Machine fractures at 35-36m
	153	37	100	9.26	7.85		2				
	152	38	100				3				
			95				5				
	151	39	90	11.79	6.95		6				
	150	40									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 40-45m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P9	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	149	41	95				2*			Rhyolitic Tuff- dark grey to grey, porphrytic	Hematized Rhyolitic Tuff inclusions?, weathered 39.1-39.26
			97	11.79	9.14		4*				
	148	42	100				2				
	147	43	97	1.06	1.42		11			Rhyolitic Tuff- orange to brown, weathered, porphrytic	
										Rhyolitic Tuff- dark grey to grey, porphrytic	Calcite veining
	146	44	90				9			Rhyolitic Tuff- orange to brown, porphrytic	Calcite veining
	145	45		5.12	4.97	201					

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	Identification	Durable	Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 45-50m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P10	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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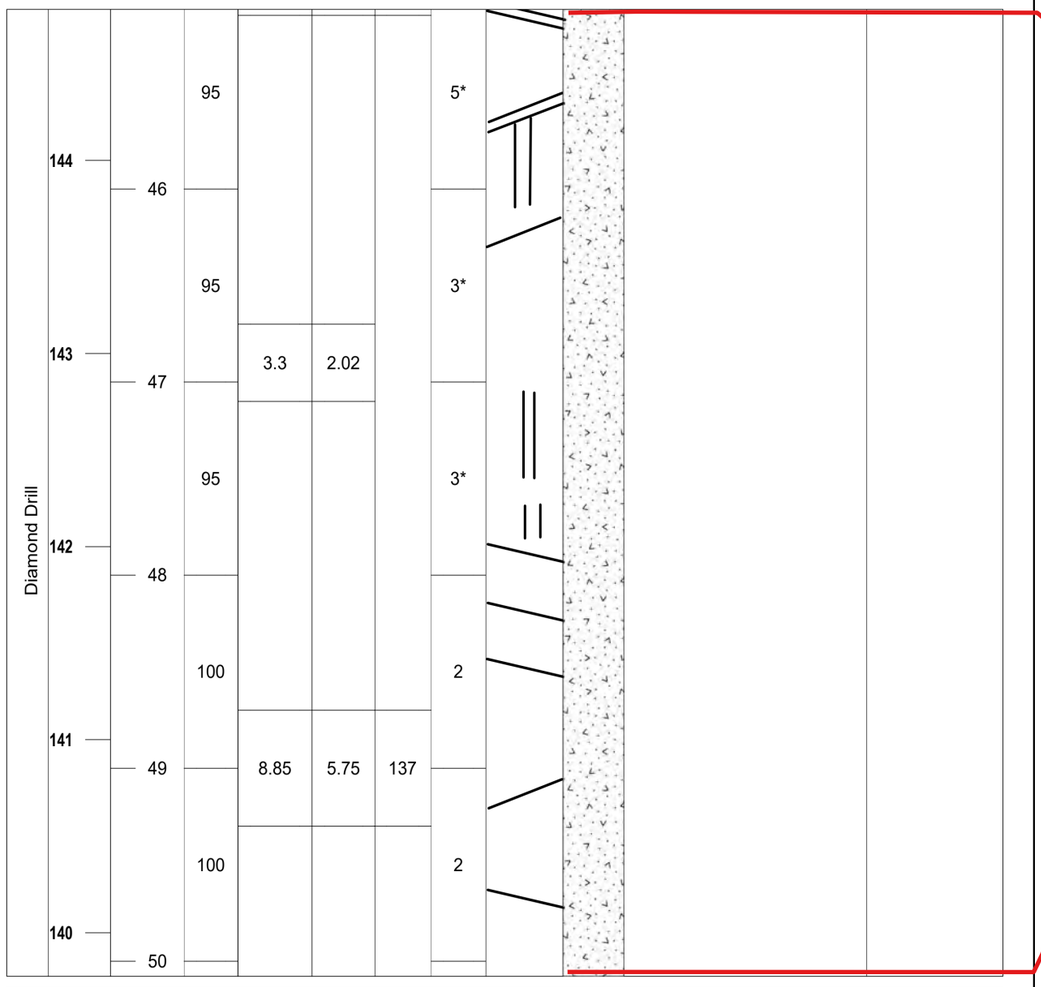
BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

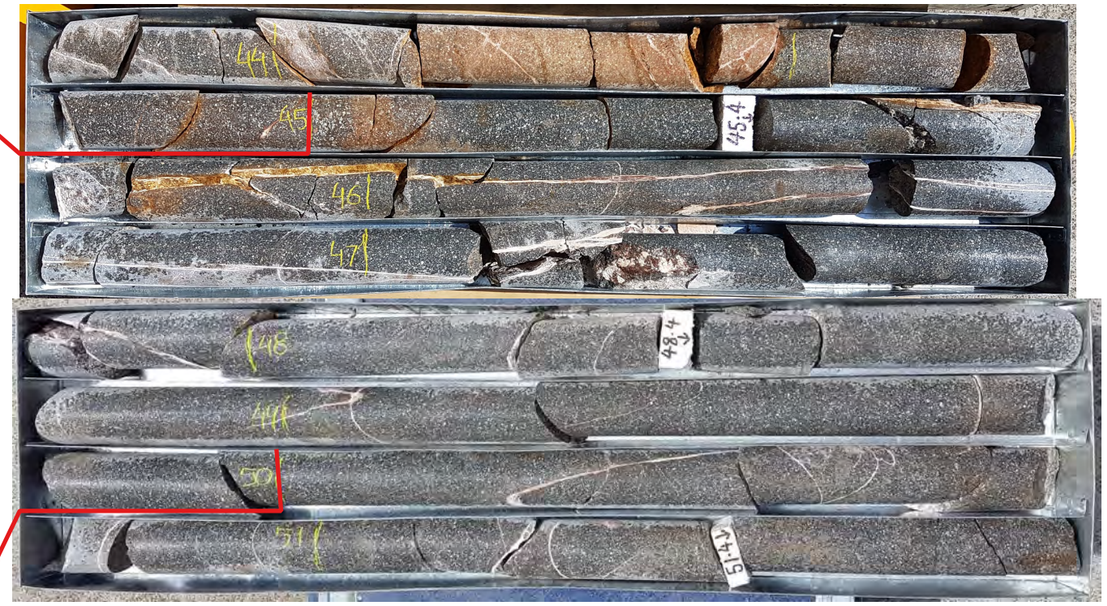
Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions



Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	Version: 3430_HQ_GA_DDH2_V3



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 50-55m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P11	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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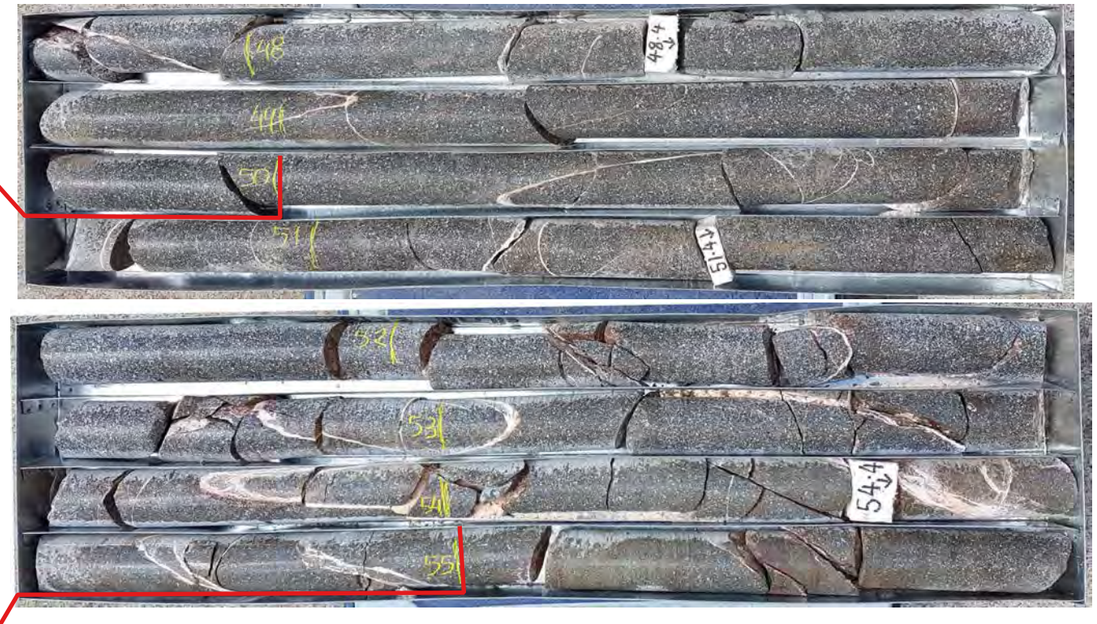
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	139	51	100				5			Rhyolitic Tuff- grey to blue, porphrytic,	Calcite veining, machine fractures at 46-47m
				7.67	5.29						
	138	52	100				4				
			95				8*				
	137	53		11.79	10.43						
			95				8*				
	136	54									
			95				8*				
	135	55									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 55-60m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V04 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P12	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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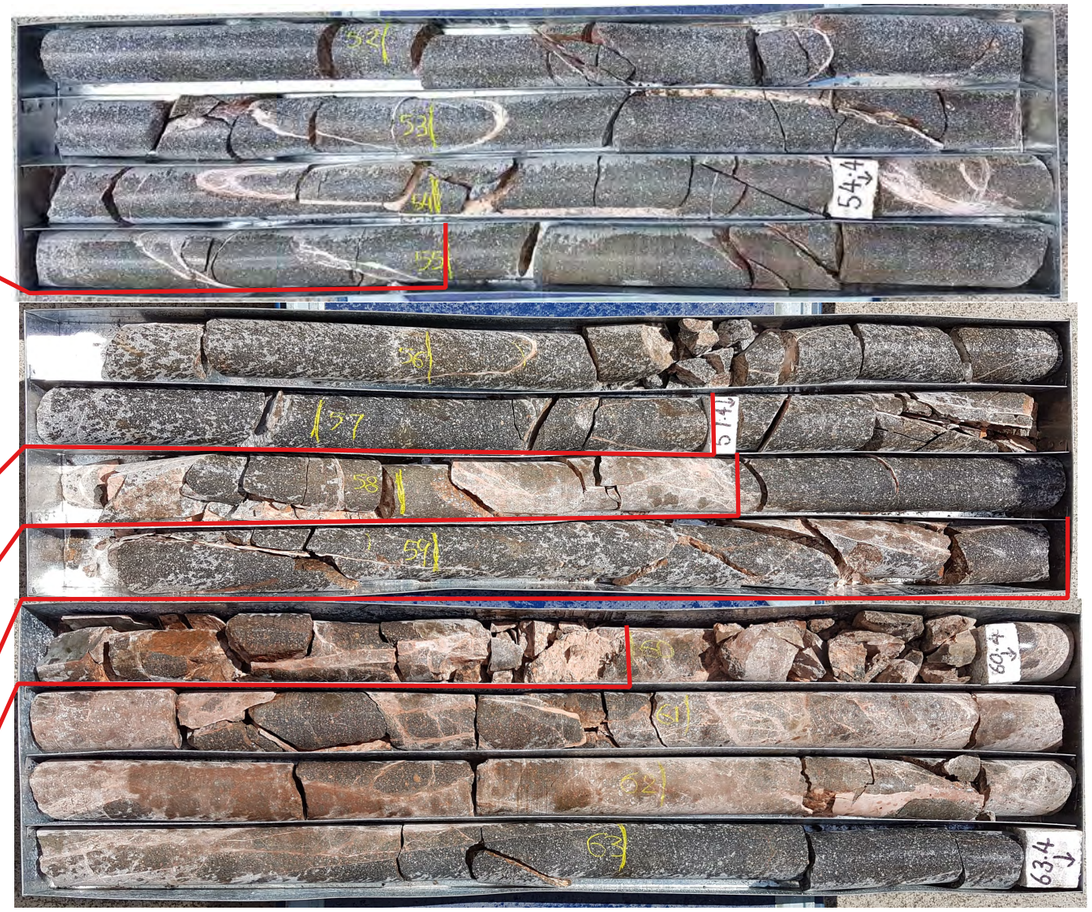
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	134	56	95	5.57	5.81		1				
	133	57	90	9.95	8.76		>5				
	132	58	85				4*			Rhyolitic tuff- grey to blue, Porphrytic, significant calcite veining	Rubble zone present
	131	59	90	6.9	3.98		3*			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	130	60	85				>8				

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 60-65m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P13	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	129	61	80				>7			Rhyolitic Tuff- grey to blue, porphrytic, calcite veining	Rubble zone present
				1.27	1.45						
	128	62	95				3			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	127	63	95				4				
				11.79	8.34						
			100				0				
	126	64									
			95				3				
	125	65									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 65-70m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P14	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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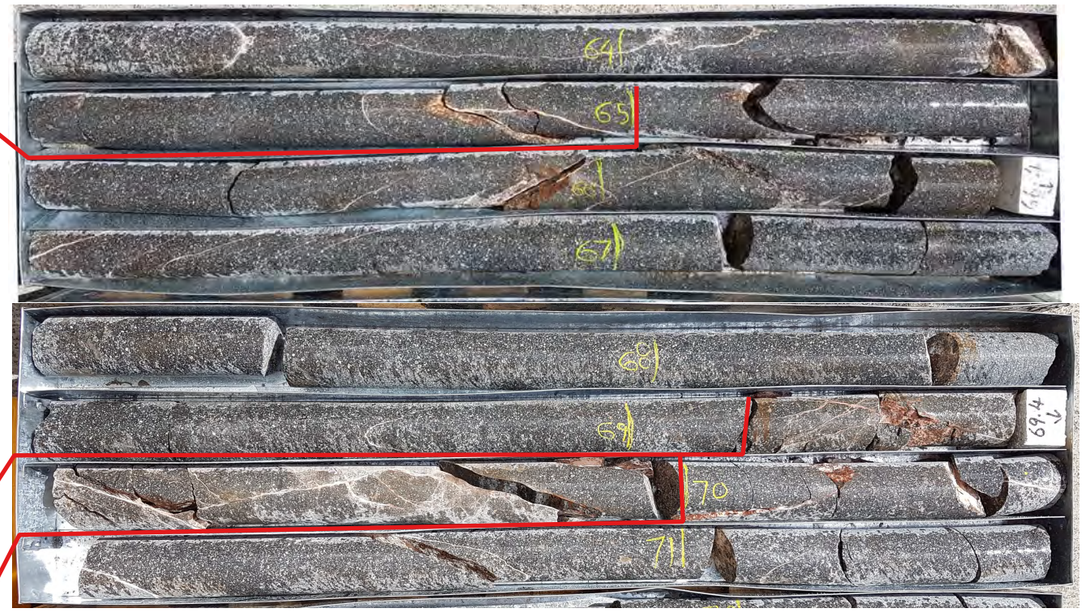
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	124	66	95	5.09	4.45		3			Rhyolitic Tuff- grey to blue, porphrytic, some veins	Machine fractures at 63-64m
			95				1				
	123	67									
			100	9.1	9.25		0				
	122	68									
			100				1				
	121	69		10.55	4.09						
			90				3			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	120	70									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	Identification	Durable	Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 70-75m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P15	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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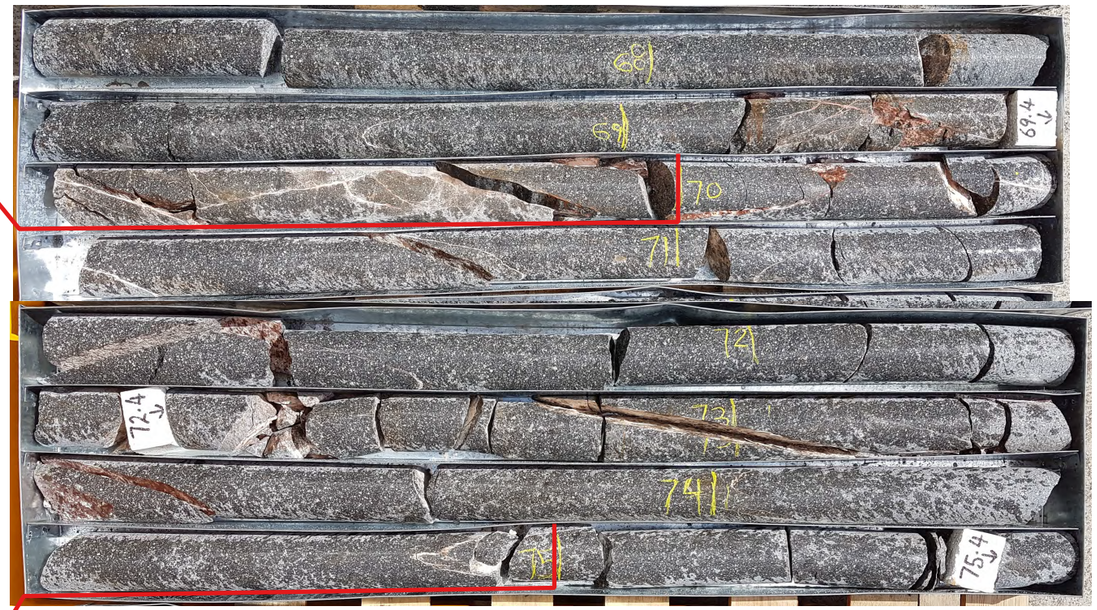
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	119	71	95	5.41	1.67		3*				
			90				2*				
	118	72									
			90	9.69	1.07		6*				
	117	73									
			95				2*				
	116	74									
			95				0				
	115	75									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 75-80m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P16	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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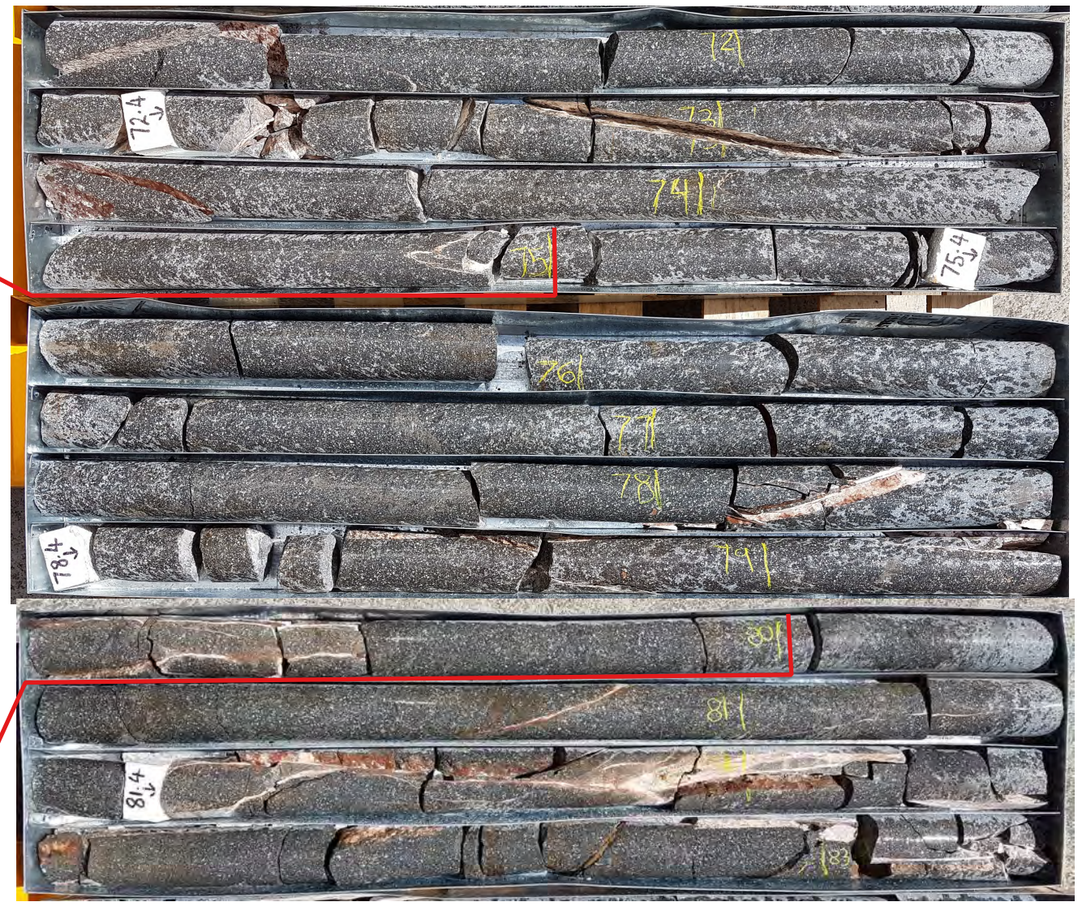
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	114	76	95	8.5	3.98		2			Rhyolitic Tuff- grey to blue, porphrytic, some veins	Machine fractures 78-81.4m
			100				4				
	113	77		9.89	5.25						
			100				3*				
	112	78									
			95				1*				
	111	79		9.63	3.7						
			100				2*				
	110	80									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 80-85m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P17	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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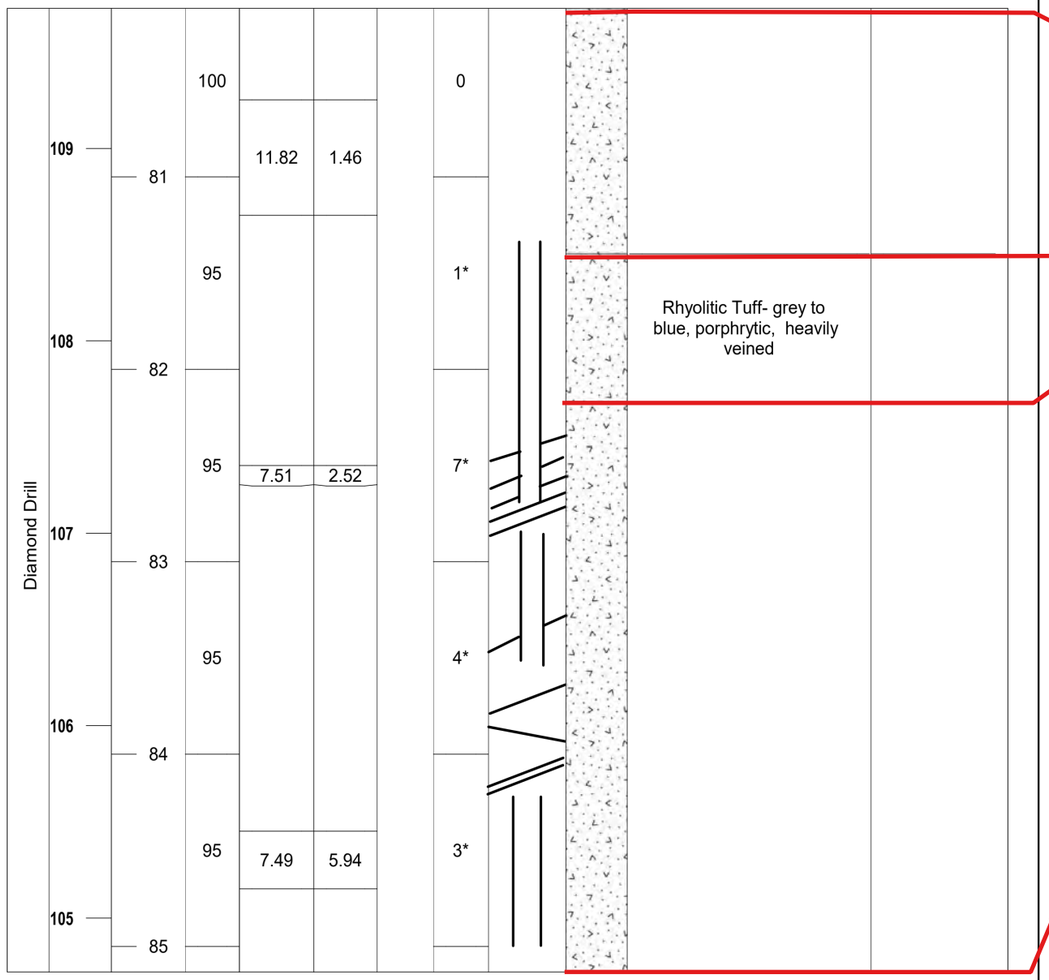
BOREHOLE LOG

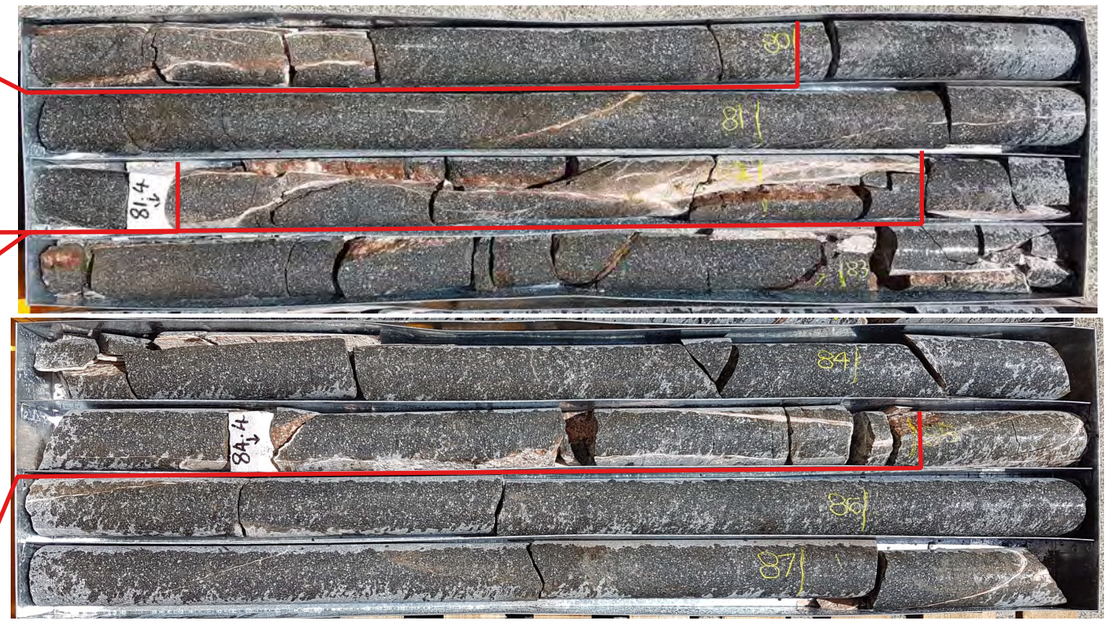
Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions





Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 85-90m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P18	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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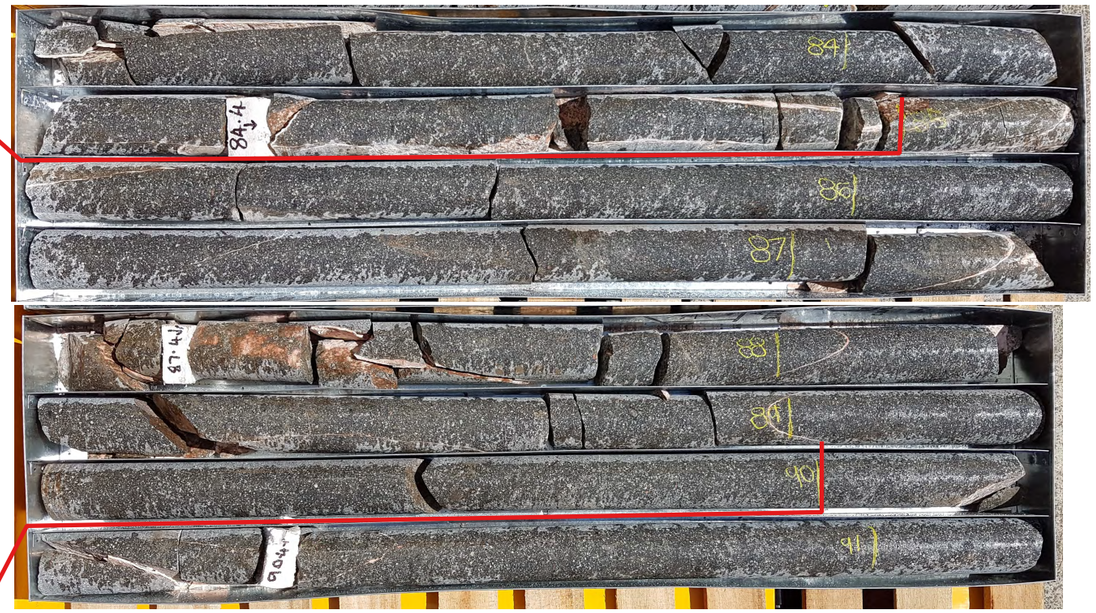
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	104	86	100				0			Rhyolitic Tuff- grey to blue, porphrytic, some veins	
	103	87	100	9.2	3.9		0				
	102	88	85				>4*				
	101	89	95				3*				
	100	90	100	10.29	8.13		1				

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 90-95m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P19	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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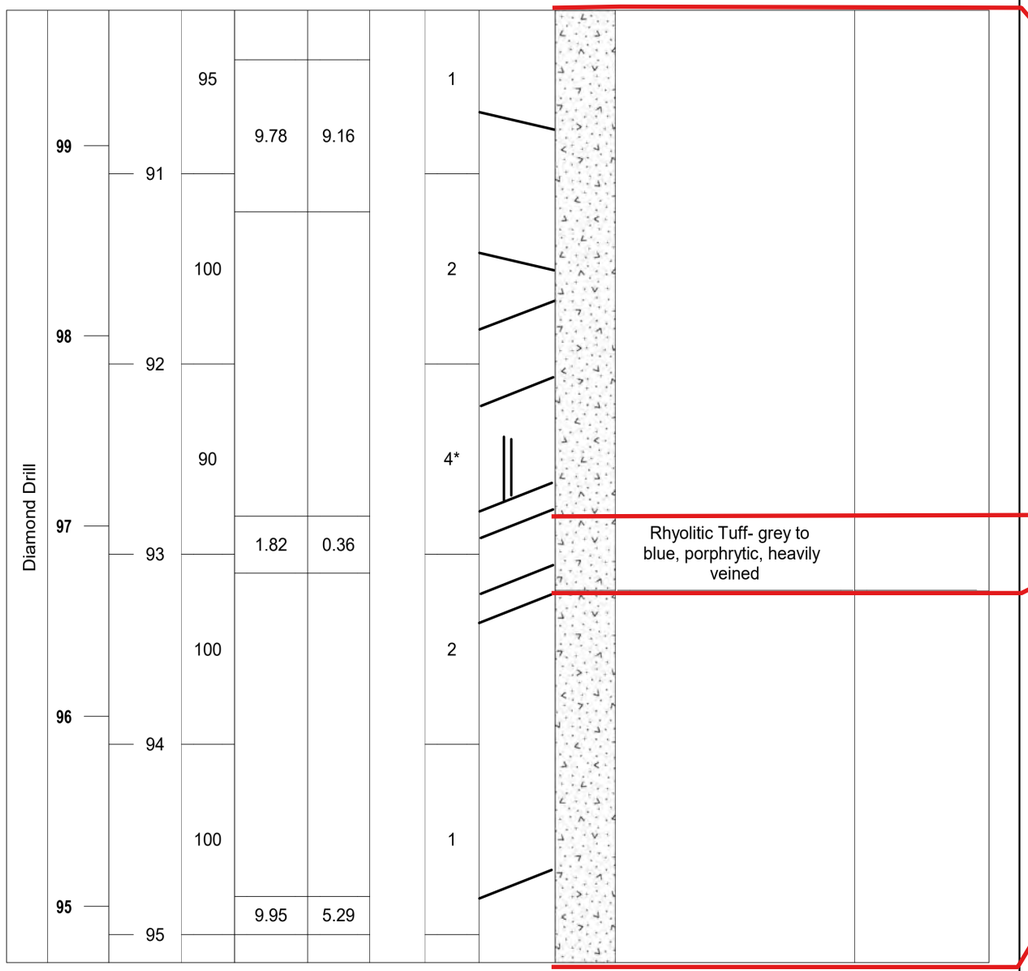
BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions



Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	Identification	Durable	Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 95-100m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P20	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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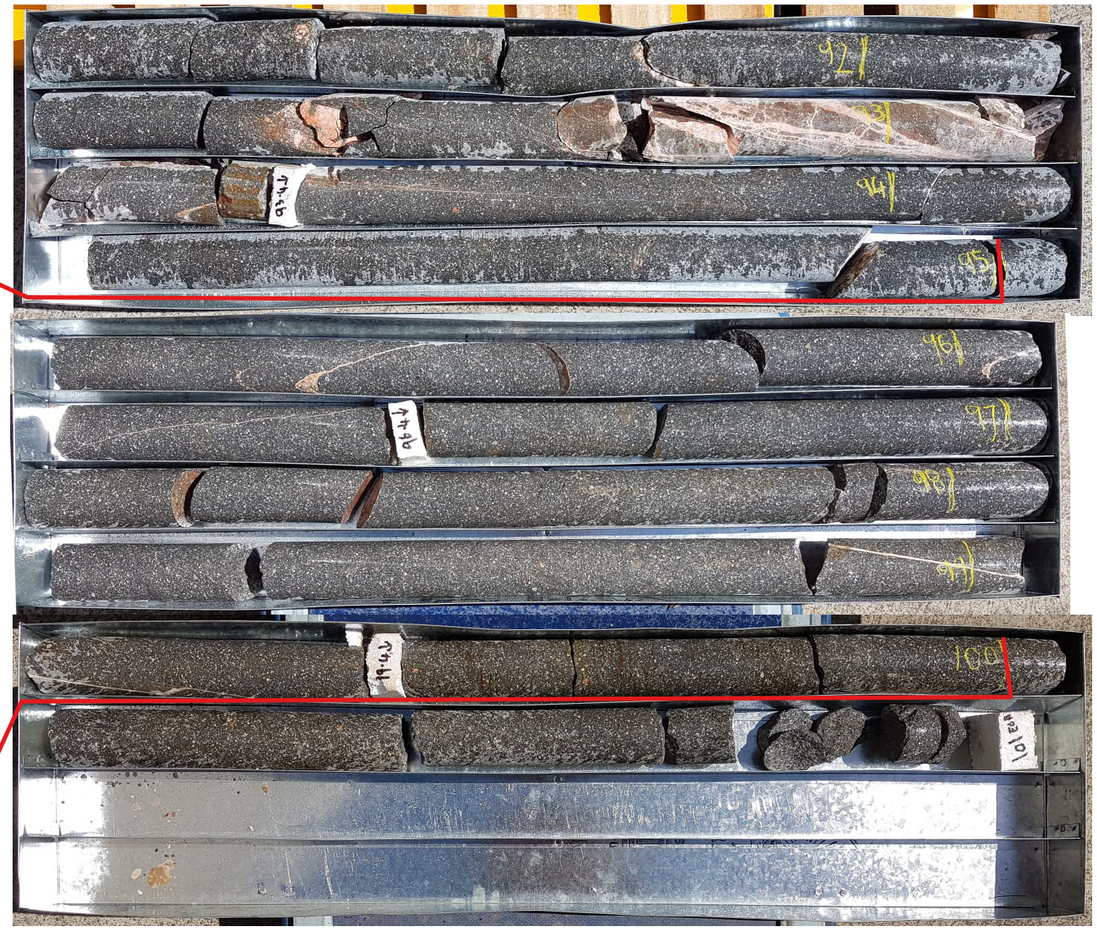
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	94	96	100				2			Rhyolitic Tuff- grey to blue, porphrytic, some veins	
	93	97	100				1				
	92	98	100	10.69	10.65		4				
	91	99	100				0				
	90	100	100	11.85	7.2	228	2				

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

Sample Number	Identification	Durable	Potential Product Suitability: Concrete Aggregate	Concrete Sand	Road Base	Asphaltic/ Sealing Aggregate	Rail Ballast	Rip Rap	Select Fill
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - Drill Hole Log (DDH2) 100-101m**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	Drill logs and Qualtest reports	**Plan By:**	TO
Figure:	**XXXX**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GT
Version/ Date:	V4 4/04/2023	**Tenure:**	N/A	**Projection:**	Not applicable		
Our Ref:	1195_HV_DDH2 Log_P21	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

vgt environmental compliance solutions and laboratories

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview
Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

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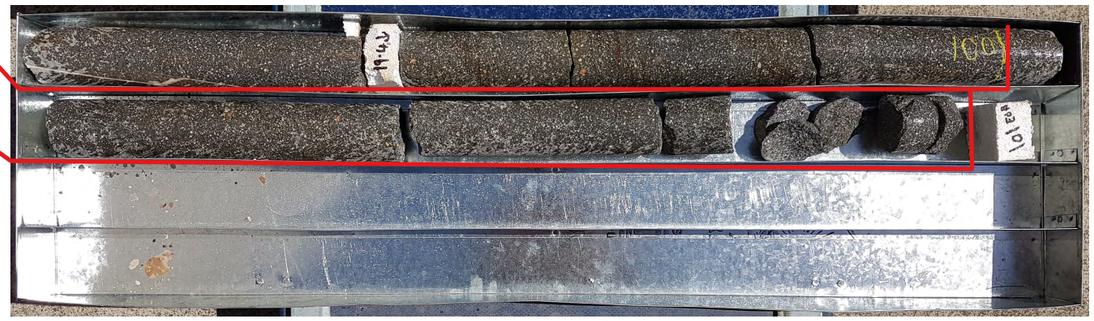
Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	89	101	85				0			Hole Terminated at Target Depth	
	88	102									
	87	103									
	86	104									
	85	105									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**



Qualtest Resource Material Testing Assessment Extract

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

Plan of:	**Hillview Quarry - BBH2 Core Photos**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	VGT Photography 2023	**Plan By:**	TO
Figure:	**Page 1**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GVT
Version/ Date:	V0 21/02/2023	**Tenure:**	Not Applicable	**Projection:**	Not applicable		
Our Ref:	1195_HV_SEARS_Q008_V0_BHH2 Core Box 1 to 6	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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This figure may be based on third party data which has not been verified by vgt and may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and vgt does not warrant its accuracy.

Plan of:	**Hillview Quarry - BBH2 Core Photos**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	VGT Photography 2023	**Plan By:**	TO
Figure:	**Page 2**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GVT
Version/ Date:	V0 21/02/2023	**Tenure:**	Not Applicable	**Projection:**	Not applicable		
Our Ref:	1195_HV_SEARS_Q008_V0_BHH2 Core Box 7 to 12	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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Plan of:	**Hillview Quarry - BBH2 Core Photos**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	VGT Photography 2023	**Plan By:**	TO
Figure:	**Page 3**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GVT
Version/ Date:	V0 21/02/2023	**Tenure:**	Not Applicable	**Projection:**	Not applicable		
Our Ref:	1195_HV_SEARS_Q008_V0_BHH2 Core Box 13 to 18	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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Plan of:	**Hillview Quarry - BBH2 Core Photos**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	VGT Photography 2023	**Plan By:**	TO
Figure:	**Page 4**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GVT
Version/ Date:	V0 21/02/2023	**Tenure:**	Not Applicable	**Projection:**	Not applicable		
Our Ref:	1195_HV_SEARS_Q008_V0_BHH2 Core Box 19 to 24	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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Plan of:	**Hillview Quarry - BBH2 Core Photos**	**Location:**	Off Maytoms Lane, Booral, NSW	**Source:**	VGT Photography 2023	**Plan By:**	TO
Figure:	**Page 5**	**Council:**	Great Lakes Shire Council	**Survey:**	Not applicable	**Project Manager:**	GVT
Version/ Date:	V0 21/02/2023	**Tenure:**	Not Applicable	**Projection:**	Not applicable		
Our Ref:	1195_HV_SEARS_Q008_V0_BHH2 Core Box 25 to 26	**Client:**	Tricon Mining Equipment Pty Ltd	**Contour Interval:**	Not applicable		

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BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Auger	189	0	60	0.74	0.76		2			Hematized Rhyolitic Tuff- brown,grey to pink, weathered, porphrytic	Becoming competent
		1	95				5				
	188	2		10.11	5.62						
Diamond Drill			100				>5				
	187	3	100				3				
	186	4		8.95	8	215					
			95				3			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	
	185	5									

Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	184	6	95	7.08	7.59		6				
	183	7	95				>4				
	182	8	95	8.67	5.75		10				
	181	9	95				6				
	180	10	95				6*			Dyke- grey to dark grey, aphanitic	Pyrite crystallisation
										Hematized Rhyolitic Tuff-	

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	179	11	95	9.54	5.28		4*			dark red to pink, porphrytic	
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Feldspathic veining
	178	12	95	4.51	2.85		5			Hematized Rhyolitic Tuff- orange to pink, weathered, porphrytic	Plagioclase alteration
										Dyke- grey to dark grey, aphanitic	Some pyrite crystallisation
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Some weathering on upper contact
	177	13	100				7			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Feldspathic veining
			95				1*			Hematized Rhyolitic Tuff-dark red, porphrytic	
	176	14		9.65	8.76						
			95				>6				
	175	15								Hematized Rhyolitic Tuff-	

Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	174	16	95	3.54	3.09		6			orange, weathered, friable, porphrytic Hematized Rhyolitic Tuff- dark red to pink, porphrytic,	
			85				>6			Hematized Rhyolitic Tuff- orange, weathered, friable, porphrytic Dyke- grey to dark grey, aphanitic	Some pyrite crystallisation
	173	17		6.79	5.54						
			95				7			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Some feldspathic veining
	172	18									
			85	10.39	7.26		6				
	171	19									
			95				7			Hematized Rhyolitic Tuff- grey to dark red, porphrytic	
	170	20								Hematized Rhyolitic Tuff- dark red to pink, porphrytic	

Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

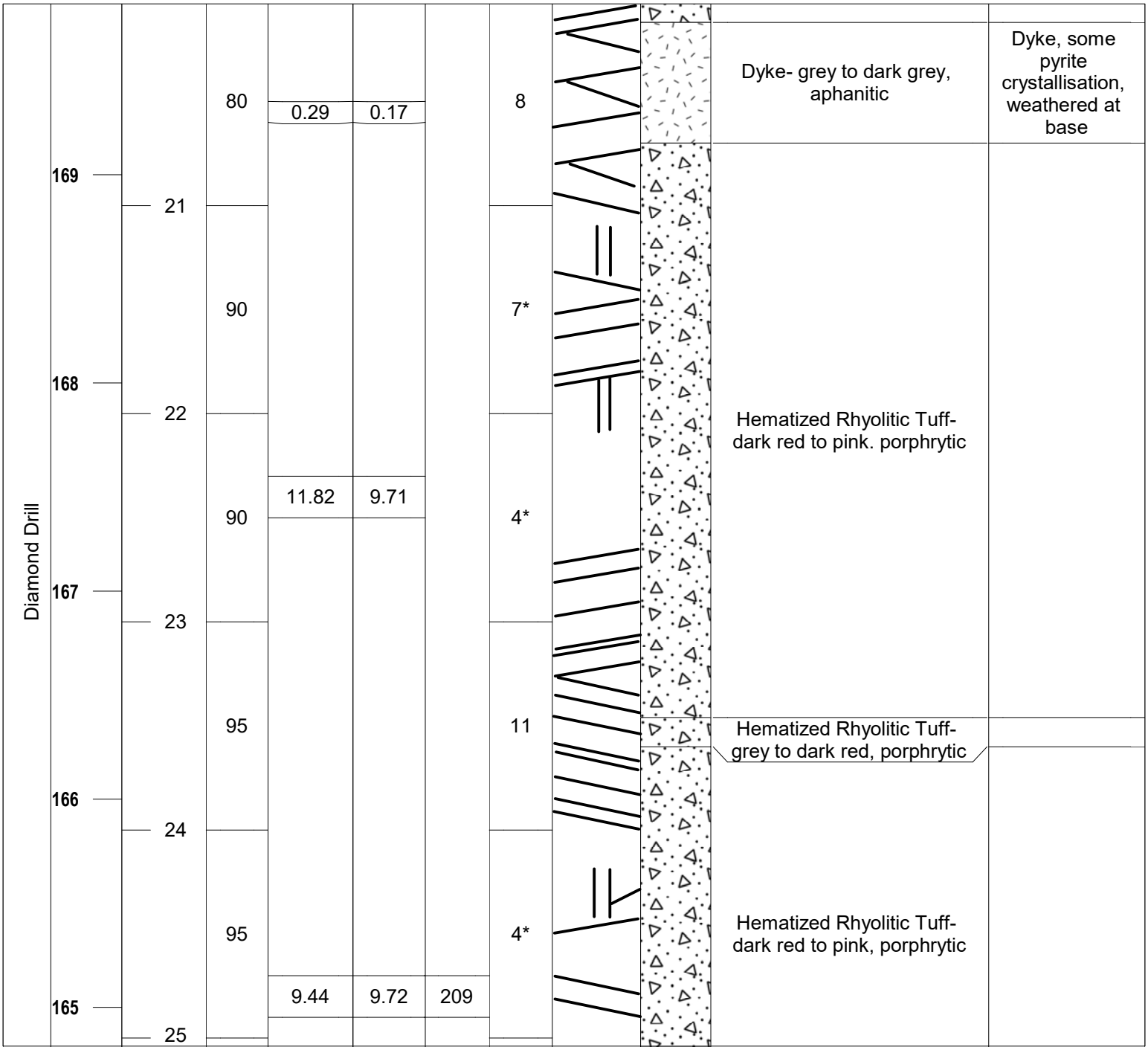
Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions



Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	164	26	95				10			Hematized Rhyolitic Tuff- grey to pink, porphrytic	Calcite veining
										Hematized Rhyolitic Tuff- dark red to pink, porphrytic	
										Dyke- grey to dark grey, aphanitic	Dyke, some pyrite crystallisation, weathered at base
	163	27	90	6.05	4.15		>5				
							6				
	162	28	90							Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Weathered at base
			75	11.85	7.32		3				
	161	29									
			90				7				
	160	30									

Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	159	31	90	7.06	6.37		5			Dyke- grey to dark grey, aphanitic	Weathered at top contact, Hematized Rhyolitic Tuff inclusions at base of sequence
	158	32	95				10			Hematized Rhyolitic Tuff- dark red to pink, porphrytic	Weathered at base
	157	33	75	3.33	1.94		>5			Dyke- grey to dark grey, aphanitic	Some pyrite crystallisation, weathered at top contact
	156	34	100				2				
	155	35	100				4				

Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	154	36	100	11.82	4.14		0			Hematized Rhyolitic Tuff- dark red to grey, porphrytic	Machine fractures at 35-36m
	153	37	100	9.26	7.85		2				
	152	38	95				3				
	151	39	90	11.79	6.95		5				
	150	40					6				

Other information:
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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
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Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	149	41	95				2*			Rhyolitic Tuff- dark grey to grey, porphrytic	Hematized Rhyolitic Tuff inclusions?, weathered 39.1-39.26
			97	11.79	9.14		4*				
	148	42									
			100				2				
	147	43		1.06	1.42					Rhyolitic Tuff- orange to brown, weathered, porphrytic	
			97				11			Rhyolitic Tuff- dark grey to grey, porphrytic	Calcite veining
	146	44									
			90				9			Rhyolitic Tuff- orange to brown, porphrytic	Calcite veining
	145	45		5.12	4.97	201					

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	144	46	95				5*				
			95				3*				
	143	47		3.3	2.02						
			95				3*				
	142	48									
			100				2				
	141	49		8.85	5.75	137					
			100				2				
	140	50									

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
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Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	139	51	100				5			Rhyolitic Tuff- grey to blue, porphrytic,	Calcite veining, machine fractures at 46-47m
			100	7.67	5.29		4				
	138	52									
			95				8*				
	137	53		11.79	10.43						
			95				8*				
	136	54									
			95				8*				
	135	55									

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
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Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	134	56	95	5.57	5.81		1				
			90				>5				
	133	57		9.95	8.76						
			85				4*			Rhyolitic tuff- grey to blue, Porphrytic, significant calcite veining	Rubble zone present
	132	58									
			90				3*			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	131	59		6.9	3.98						
			85				>8				
	130	60									

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		

BOREHOLE LOG

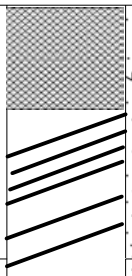
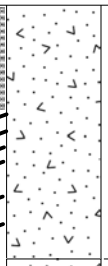
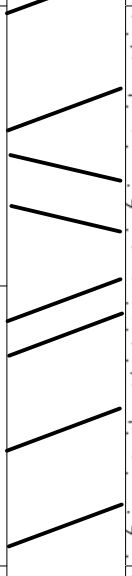
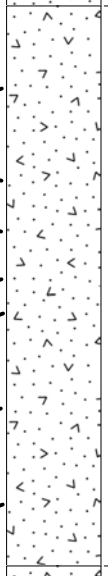
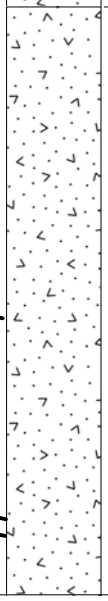
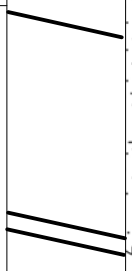
Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	129	61	80				>7			Rhyolitic Tuff- grey to blue, porphrytic, calcite veining	Rubble zone present
			95	1.27	1.45		3			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	128	62									
			95				4				
	127	63		11.79	8.34						
			100				0				
	126	64									
			95				3				
	125	65									

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	124	66	95	5.09	4.45		3			Rhyolitic Tuff- grey to blue, porphrytic, some veins	Machine fractures at 63-64m
			95				1				
	123	67									
			100	9.1	9.25		0				
	122	68									
			100				1				
	121	69		10.55	4.09						
			90				3			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	120	70									

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	119	71	95	5.41	1.67		3*				
	118	72	90				2*				
	117	73	90	9.69	1.07		6*				
	116	74	95				2*				
	115	75	95				0				

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	114	76	95	8.5	3.98		2			Rhyolitic Tuff- grey to blue, porphrytic, some veins	Machine fractures 78-81.4m
	113	77	100	9.89	5.25		4				
	112	78	100				3*				
	111	79	95	9.63	3.7		1*				
	110	80	100				2*				

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	109	81	100	11.82	1.46		0				
	108	82	95				1*			Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
	107	83	95	7.51	2.52		7*				
	106	84	95				4*				
	105	85	95	7.49	5.94		3*				

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
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Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	104	86	100				0			Rhyolitic Tuff- grey to blue, porphrytic, some veins	
			100				0				
	103	87		9.2	3.9						
			85				>4*				
	102	88									
			95				3*				
	101	89		10.29	8.13						
			100				1				
	100	90									

Other information:

Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3
Log updated 03/04/2023 following ADW Survey Data		

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	99	91	95	9.78	9.16		1				
			100				2				
	98	92									
			90				4*				
	97	93		1.82	0.36					Rhyolitic Tuff- grey to blue, porphrytic, heavily veined	
			100				2				
	96	94									
			100				1				
	95	95		9.95	5.29						

Other information:

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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK **Log updated 03/04/2023 following ADW Survey Data**	**Checked By: SK**	**Version: 3430_HQ_GA_DDH2_V3**

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	94	96	100				2			Rhyolitic Tuff- grey to blue, porphrytic, some veins	
	93	97	100				1				
	92	98	100	10.69	10.65		4				
	91	99	100				0				
	90	100	100	11.85	7.2	228	2				

Other information:
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*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: DDH2

Project Number: 3430
Client: Tricon Mining Equipment
Project: Geological Assessment
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Logged: 03/01/2017
Date Commenced: 08/12/2016
Date Completed: 13/12/2016
Surface RL: 189.85 AHD
Coordinates: E:398672.97 N:6404803.67
Drilling Contractor: D and E Drilling

Environmental Compliance Solutions

Drilling Method	Elevation (RL)	Depth (m)	Core Recovery (%)	Diametral Strength (Mpa)	Axial Strength (Mpa)	UCS Strength (Mpa)	Fracture Frequency /m	Fracture Log	Graphic Log	Lithological Description	Additional Information
Diamond Drill	89	101	85				0				
	88	102								Hole Terminated at Target Depth	
	87	103									
	86	104									
	85	105									

Other information:
Data included within this log have been sourced from field observations and geotechnical data collected and provided by Qualtest Laboratories.
*: Sub Vertical Joint
>1: Rubble zone with multiple joints

Prepared By: MA/SK Log updated 03/04/2023 following ADW Survey Data	Checked By: SK	Version: 3430_HQ_GA_DDH2_V3

BOREHOLE LOG

Name of Hole: PH 3

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced:27/09/2016
Date Completed: 29/09/2016
Surface RL: 194.38m AHD
Coordinates: E: 398601 N:6404686
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Water Level	Photo Log	Graphic Log	Description	Additional Information
Hammer	194–175	0–20				Weathered Hematized Rhyolitic Tuff - Dark Red/Red, porphyritic.	
						Weathered Hematized Rhyolitic Tuff- Dark Red/Red, porphyritic	Carbonate clay
						Weathered Hematized Rhyolitic Tuff- Dark Red/red, porphrytic	
						Hematized Rhyolitic Tuff- dark purple/grey,	Some weathering

Other Information: No Piezometer installed
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA/SK	Checked By: SK	3430_TH_GA_LOG_PH3_V2

BOREHOLE LOG

Name of Hole: PH 3

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced:27/09/2016
Date Completed: 29/09/2016
Surface RL: 194.38m AHD
Coordinates: E: 398601 N:6404686
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Water Level	Photo Log	Graphic Log	Description	Additional Information
Hammer	174	21					
	173	22					
	172	23					
	171	24					
	170	25					
	169	26					
	168	27				Rhyolitic Tuff, dark purple/grey, porphyritic	
	167	28					
	166	29					
	165	30					
	164	31					
	163	32					
	162	33					
	161	34					
	160	35					
	159	36				Hematized Rhyolitic Tuff/ Dyke-light grey to dark grey, porphrytic to aphanitic	Calcite precipitation
	158	37				Dyke- dark grey to blue, aphanitic	Pyrite crystalisation, magnetic,calcite precipitation
	157	38				Weathered Rhyolitic Tuff- dark blue/grey, porphyritic	
	156	39					
	155	40					

Other Information: No Piezometer installed
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA/SK	Checked By: SK	3430_TH_GA_LOG_PH3_V2

BOREHOLE LOG

Name of Hole: PH 3

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced:27/09/2016
Date Completed: 29/09/2016
Surface RL: 194.38m AHD
Coordinates: E: 398601 N:6404686
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Water Level	Photo Log	Graphic Log	Description	Additional Information
Hammer	154	41				Rhyolitic Tuff, dark blue/grey, porphyritic	
	153	42					
	152	43					
	151	44					
	150	45					
	149	46					
	148	47					
	147	48					
	146	49					
	145	50					
	144	51					
	143	52					
	142	53					
	141	54				Weathered Rhyolitic Tuff- dark blue/grey, porphyritic	
	140	55					
	139	56					
	138	57					
	137	58					
	136	59					
	135	60					

Other Information: No Piezometer installed
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA/SK	Checked By: SK	3430_TH_GA_LOG_PH3_V2

BOREHOLE LOG

Name of Hole: PH 3

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced:27/09/2016
Date Completed: 29/09/2016
Surface RL: 194.38m AHD
Coordinates: E: 398601 N:6404686
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Water Level	Photo Log	Graphic Log	Description	Additional Information
Hammer	134 to 115	61 to 80				Rhyolitic Tuff- Grey/blue to red, porphyritic.	

Other Information: No Piezometer installed
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA/SK	Checked By: SK	3430_TH_GA_LOG_PH3_V2

BOREHOLE LOG

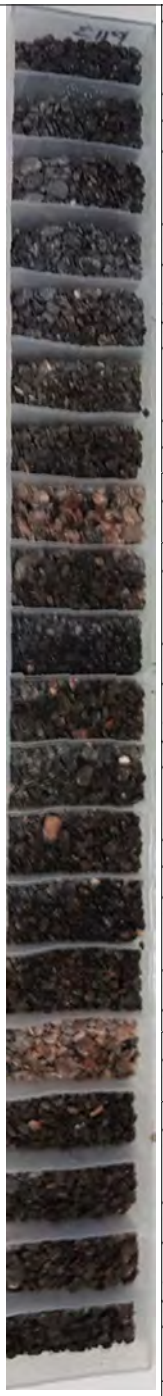
Name of Hole: PH 3

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced:27/09/2016
Date Completed: 29/09/2016
Surface RL: 194.38m AHD
Coordinates: E: 398601 N:6404686
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Water Level	Photo Log	Graphic Log	Description	Additional Information
Hammer	114 / 113 / 112 / 111 / 110 / 109 / 108 / 107 / 106 / 105 / 104 / 103 / 102 / 101 / 100 / 99 / 98 / 97 / 96 / 95 / 94	81 / 82 / 83 / 84 / 85 / 86 / 87 / 88 / 89 / 90 / 91 / 92 / 93 / 94 / 95 / 96 / 97 / 98 / 99 / 100				Rhyolitic Tuff- Grey/blue to red, porphyritic.	Some weathering, magnetic, calcite veining
						Rhyolitic Tuff, dark blue/grey, porphyritic	
						Rhyolitic Tuff Grey/blue to red, porphyritic.	Some weathering, magnetic, calcite veining
						Rhyolitic Tuff, dark blue/grey, porphyritic	

Other Information: No Piezometer installed
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA/SK	Checked By: SK	3430_TH_GA_LOG_PH3_V2

BOREHOLE LOG

Name of Hole: PH 3

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced:27/09/2016
Date Completed: 29/09/2016
Surface RL: 194.38m AHD
Coordinates: E: 398601 N:6404686
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Water Level	Photo Log	Graphic Log	Description	Additional Information
Hammer	94	101				Rhyolitic Tuff, dark blue/grey, porphyritic	Possible sample contamination, weathered chip draw down
	93	102					
	92	103					
	91	104					
	90	105					
	89	106					
	88	107					
	87	108					
	86	109					
	85	110					
	84	111					
	83	112					
	82	113					
	81	114				Hole terminated due to difficult drilling conditions	
	80	115					
	79	116					
	78	117					
	77	118					
	76	119					
	75	120					

Other Information: No Piezometer installed
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA/SK	Checked By: SK	3430_TH_GA_LOG_PH3_V2

BOREHOLE LOG

Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	189	0–1				Weathered Hematized Rhyolitic Tuff- Cream to red in colour, porphrytic.	Clayey
	188	1–2				Hematized Rhyolitic Tuff/Dyke- red to grey/black aphanitic to porphrytic	
	187	2–3				Hematized Rhyolitic Tuff- Red to purple, porphrytic	
	186	3–4					
	185	4–5					
	184	5–6					
	183	6–7					
	182	7–8					
	181	8–9				Hematized Rhyolitic Tuff/Dyke- red to grey/black aphanitic to porphrytic	Dykes, magnetic
	180	9–10					
	179	10–11					
	178	11–12				Hematized Rhyolitic Tuff- red/purple, porphrytic	
	177	12–13					
	176	13–14					
	175	14–15					
	174	15–16					
	173	16–17					
	172	17–18					
	171	18–19				Fines- brown to cream in colour, isolated fragments of Rhyolitic Tuff	Magnetic, possible fault/shear zone?
	170	19–20					

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

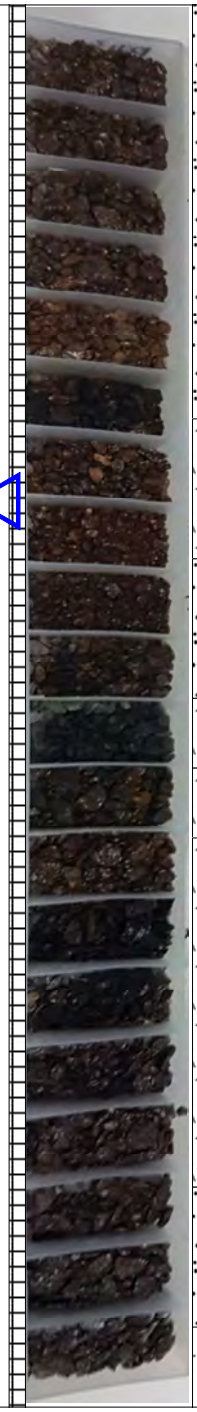
Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	169–150	21–40					
						Hematized Rhyolitic Tuff- red/purple, porphrytic	Minute traces of calcite
						Hematized Rhyolitic Tuff/Dyke- red to grey/black aphanitic to porphrytic	Dyke, magnetic
						Hematized Rhyolitic Tuff- red to purple porphrytic	
						Hematized Rhyolitic Tuff/Dyke- red to grey/black aphanitic to porphrytic	
						Dyke- black to dark grey, fine crystal size, aphanitic texture.	Pyrite crystallisation
						Hematized Rhyolitic Tuff/Dyke- red to grey/black aphanitic to porphrytic	Calcite precipitation at 35-36m, magnetic
						Hematized Rhyolitic Tuff - red in Colour, porphrytic	Calcite precipitation, magnetic
						Rhyolitic Tuff- grey/blue to brown,	

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	149–130	41–60				Altered, porphrytic,	
						Rhyolitic Tuff- grey to blue in colour, porphrytic	Magnetic
						Rhyolitic Tuff- grey to blue in colour, porphrytic	Magnetic, calcite precipitation
						Rhyolitic Tuff- grey blue to red, slightly weathered, porphrytic	Magnetic, calcite precipitation, some quartz veining
						Rhyolitic Tuff- grey to blue in colour, porphrytic	Calcite precipitation, magnetic, some quartz veining

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	129 – 110	61 – 80				Rhyolitic Tuff- grey blue to red, slightly weathered, porphrytic	Quartz Veining, magnetic, calcite precipitation
	117 – 116	73 – 74				Rhyolitic Tuff- grey to blue in colour, porphrytic	Possible fault

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	109 – 90	81 – 100				Rhyolitic Tuff- grey to blue/ red, porphrytic	Slight weathering, quartz veined, calcite precipitation, magnetic

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	89 to 70	101 to 120					

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

Name of Hole: PH 4

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 04/10/2016
Date Completed: 11/10/2016
Surface RL: 189.83 AHD
Coordinates: E: 398671.72 N: 6404803.76
Drilling Contractor: Total Drilling

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Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	69 to 50	121 to 140				Dyke- black to dark grey, aphanitic	Calcite veining, magnetic
						Rhyolitic Tuff- grey to blue slightly red, porphrytic	Slight Weathering, quartz veined, magnetic

Other Information: Hole Drilled to 140m, Piezo Installed to RL 123m due to blockage.
Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_LOG_PH4_V2

BOREHOLE LOG

Name of Hole: PH 5

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 12/10/2016
Date Completed: 27/10/2016
Surface RL:180.93 m AHD
Coordinates: E: 398462.10 N: 6404674.32
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	180	0–1				Weathered Hematized Rhyolitic Tuff- orange to red, porphrytic,	Clayey
	179–161	1–20				Hematized Rhyolitic Tuff-Red to orange, porphrytic	Magnetic, some weathering
	161	20				Hematized Rhyolitic Tuff- orange, red to blue, dark grey, porphrytic	Magnetic, some weathering

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By:SK	Version: 3430_TH_GA_LOG_PH5_V3

BOREHOLE LOG

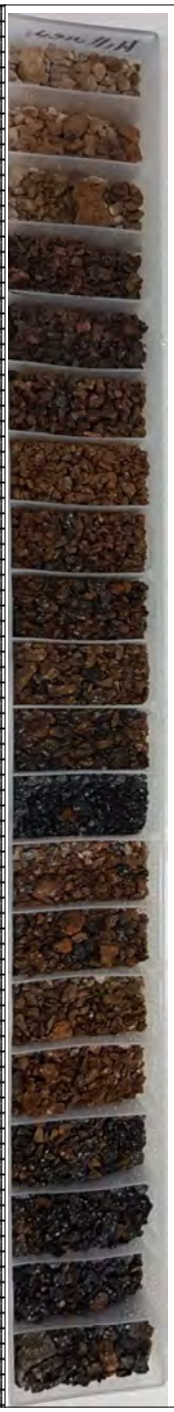
Name of Hole: PH 5

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 12/10/2016
Date Completed: 27/10/2016
Surface RL:180.93 m AHD
Coordinates: E: 398462.10 N: 6404674.32
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	160 – 141	21 – 40				Hematized Rhyolitic Tuff- orange red to purple, porphrytic	Magnetic, some weathering

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By:SK	Version: 3430_TH_GA_LOG_PH5_V3

BOREHOLE LOG

Name of Hole: PH 5

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 12/10/2016
Date Completed: 27/10/2016
Surface RL:180.93 m AHD
Coordinates: E: 398462.10 N: 6404674.32
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	140 – 121	41 – 60				Rhyolitic Tuff-grey/blue to orange, porphrytic	Magnetic, some weathering, possible hole contamination

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By:SK	Version: 3430_TH_GA_LOG_PH5_V3

BOREHOLE LOG

Name of Hole: PH 5

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 12/10/2016
Date Completed: 27/10/2016
Surface RL:180.93 m AHD
Coordinates: E: 398462.10 N: 6404674.32
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	120	61					
	119	62					
	118	63					
	117	64					
	116	65					
	115	66					
	114	67					
	113	68					
	112	69					
	111	70					
	110	71					
	109	72					
	108	73					
	107	74					
	106	75					
	105	76					
	104	77					
	103	78					
	102	79					
	101	80					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By:SK	Version: 3430_TH_GA_LOG_PH5_V3

BOREHOLE LOG

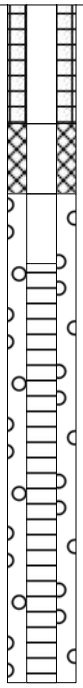
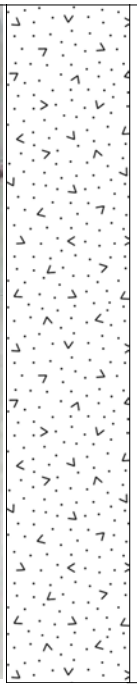
Name of Hole: PH 5

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 12/10/2016
Date Completed: 27/10/2016
Surface RL:180.93 m AHD
Coordinates: E: 398462.10 N: 6404674.32
Drilling Contractor: Total Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	100 – 91	81 – 90				Hematized Rhyolitic Tuff/Dyke - Red to dark grey/dark blue, porphrytic to anphinitic	Possible fault/shear zone, some weathering

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By:SK	Version: 3430_TH_GA_LOG_PH5_V3

BOREHOLE LOG

Name of Hole: PH7

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 07/12/2016
Date Completed: 07/12/2016
Surface RL: 190.25m AHD
Coordinates: E:398673.19 N:6404802.76
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Auger	189	0–1				Weathered Rhyodacite- pink to brown, Porphrytic	20cm topsoil
Hammer	188–186	1–4				Hematized Rhyolitic Tuff- Pink to orange, porphyritic	Some weathering
	185–182	5–8				Hematized Rhyolitic Tuff, pink, purple to orange, porphrytic	Slight weathering,
	181–178	9–12				Hematized Rhyolitic Tuff/ Dyke- pink, purple to dark grey/blue, porphrytic to aphanitic	Multiple small dykes?,magnetic
	177–173	13–17				Hematized Rhyolitic Tuff- pink, purple to orange, porphrytic	Slight weathering
	173–172	17–18				Hematized Rhyolitic Tuff/ Dyke- pink, purple to dark grey/blue, porphrytic to aphanitic	Hematite nodule?, dykes, magnetic
	171	19				Hematized Rhyolitic Tuff- pink to purple, porphrytic	
	170	20				Hematized Rhyolitic Tuff/ Dyke- pink, purple	

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH7_V3

BOREHOLE LOG

Name of Hole: PH7

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 07/12/2016
Date Completed: 07/12/2016
Surface RL: 190.25m AHD
Coordinates: E:398673.19 N:6404802.76
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	169–150	21–40				to dark grey/blue, porphrytic to aphanitic	Dyke
						Weathered Hematized Rhyolitic Tuff- pink to brown, porphrytic	
						Hematized Rhyolitic Tuff- pink to purple, porphrytic	
						Hematized Rhyolitic Tuff- pink, purple to orange, porphrytic	Some weathering
						Hematized Rhyolitic Tuff/ Dyke- pink, purple to dark grey/blue, porphrytic to aphanitic	Magnetic
						Hematized Rhyolitic Tuff, pink, purple to orange, porphrytic	Some weathering
						Hematized Rhyolitic Tuff/ Dyke- pink, purple to dark grey/blue, porphrytic to aphanitic	Dyke
						Dyke- dark grey to dark blue, aphanitic	Magnetic
						Hematized Rhyolitic Tuff/ Dyke- pink, purple to dark grey/blue, porphrytic to aphanitic	Dyke

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH7_V3

BOREHOLE LOG

Name of Hole: PH7

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 07/12/2016
Date Completed: 07/12/2016
Surface RL: 190.25m AHD
Coordinates: E:398673.19 N:6404802.76
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	149	41				Rhyolitic tuff/Dyke- Dark grey to dark blue, porphrytic to aphanitic	Dyke
	148	42					
	147	43				Rhyolitic tuff - dark grey/blue to orange, Porphrytic	Quartz veining, some weathering, some water intercepted @ 44m
	146	44					
	145	45					
	144	46				Hole Terminated at Target Depth	
	143	47					
	142	48					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH7_V3

BOREHOLE LOG

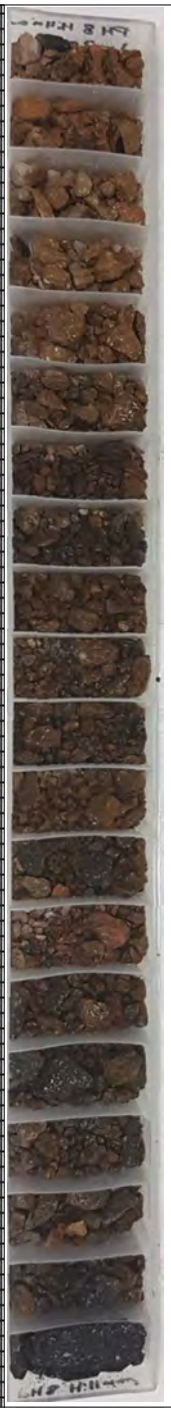
Name of Hole: PH 8

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 13/12/2016
Date Completed: 13/12/2016
Surface RL: 181.15m AHD
Coordinates: E:398463.58 N: 6404673.63
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	181	0				Weathered Hematized Rhyolitic Tuff- orange to brown, porphrytic	Dyke, Some weathering
	180	1					
	179	2					
	178	3					
	177	4				Hematized Rhyolitic Tuff- brown to orange, porphrytic	Some weathering
	176	5					
	175	6				Weathered Dyke/Hematized Rhyolitic Tuff- orange, brown to grey, porphrytic to aphanitic	Magnetic
	174	7					
	173	8					
	172	9				Hematized Rhyolitic Tuff- dark purple, grey to orange, porphrytic	Slight weathering
	171	10					
	170	11					
	169	12					
	168	13					
	167	14					
	166	15					
	165	16					
	164	17					
	163	18					
	162	19				Rhyolitic Tuff- dark grey to blue, porphrytic	
		20					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH8_V3

BOREHOLE LOG

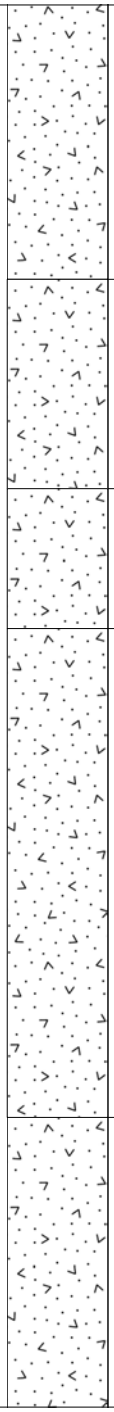
Name of Hole: PH 8

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 13/12/2016
Date Completed: 13/12/2016
Surface RL: 181.15m AHD
Coordinates: E:398463.58 N: 6404673.63
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	161–141	21–40				Rhyolitic Tuff- dark blue, grey to orange, porphrytic	Some weathering
						Weathered Rhyolitic Tuff- brown to orange, porphrytic	
						Rhyolitic Tuff- dark blue, grey to orange, porphrytic	Some weathering
						Rhyolitic Tuff- dark grey to blue, porphrytic	Some weathering, calcite veining

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH8_V3

BOREHOLE LOG

Name of Hole: PH 8

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 13/12/2016
Date Completed: 13/12/2016
Surface RL: 181.15m AHD
Coordinates: E:398463.58 N: 6404673.63
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	141 140 139 138 137 136 135 134	41 42 43 44 45 46 47 48				Rhyolitic Tuff- dark blue, grey to orange, Porphrytic Hole Terminated at Taget Depth	Some calcite veining

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH8_V3

BOREHOLE LOG

Name of Hole: PH 9

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 15/12/2016
Date Completed: 15/12/2016
Surface RL:158.04m AHD
Coordinates: E: 398794.30 N: 6404421.15
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Auger	158	0				Weathered Hematized Rhyolitic Tuff- pink to orange, porphrytic	
	157	1					
	156	2					
	155	3					
	154	4				Fines- orange to dark orange, silty, some coarse quartz fragments	
	153	5				Weathered Hematized Rhyolitic Tuff- orange to brown, porphrytic, some fines	
	152	6					
	151	7				Fines- orange to dark orange, silty, some coarse quartz fragments and black aphanitic textured fragments	
	150	8					
Hammer	149	9				Weathered Hematized Rhyolitic Tuff pink to orange, porphrytic	
	148	10					
	147	11				Fines- orange to dark orange, silty, some coarse quartz fragments	
	146	12				Weathered- pink to orange, porphrytic	
	145	13					
	144	14				Fines- orange to dark orange, silty, aphanitic textured fragments	
	143	15					
	142	16				Weathered Hematized Rhyolitic Tuff- orange to brown, porphrytic	
	141	17				Weathered Hematized Rhyolitic Tuff- orange to brown, porphrytic	
	140	18					
	139	19					
	138	20					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH9_V3

BOREHOLE LOG

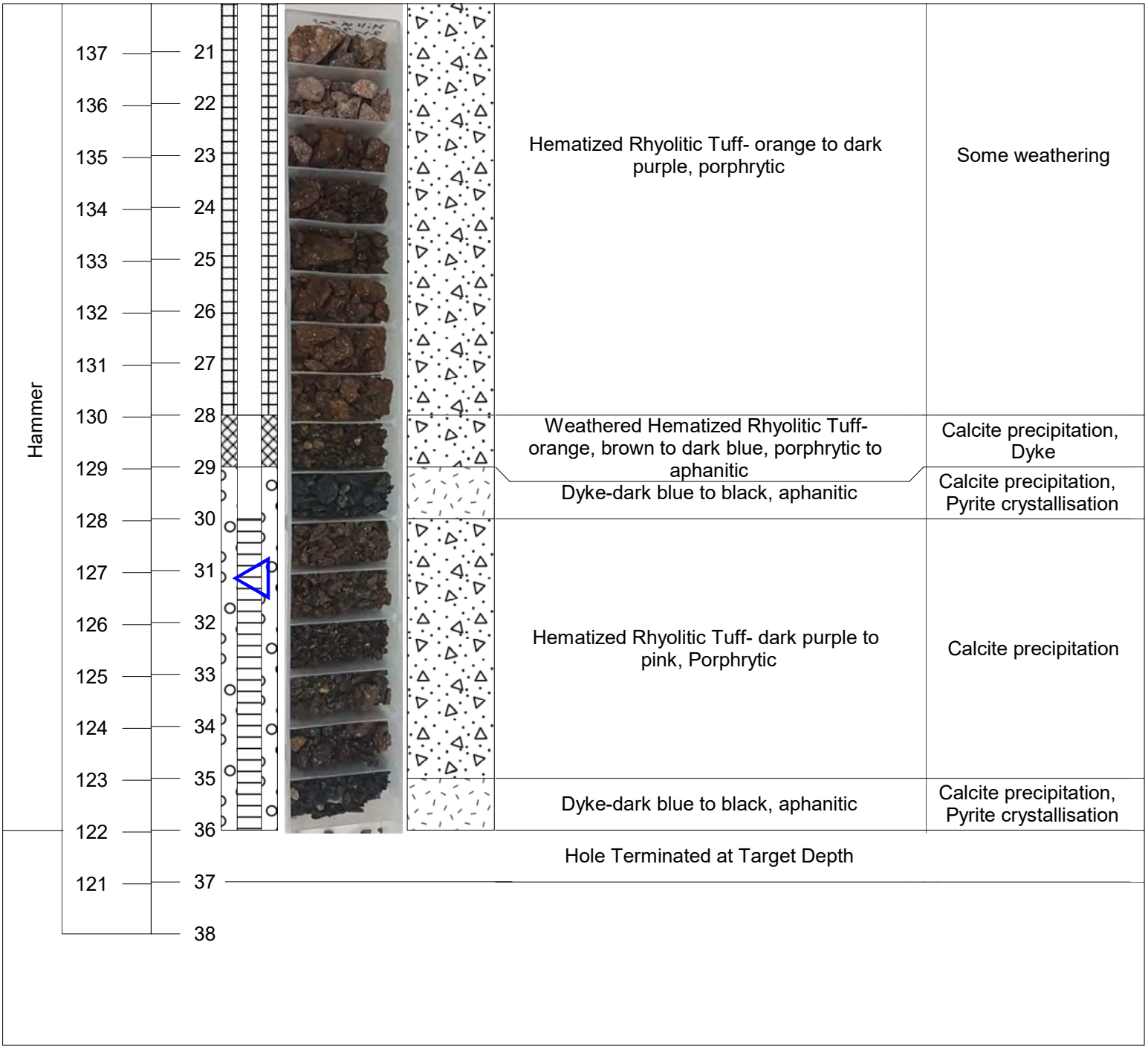
Name of Hole: PH 9

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hillview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 15/12/2016
Date Completed: 15/12/2016
Surface RL:158.04m AHD
Coordinates: E: 398794.30 N: 6404421.15
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions



Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH9_V3

BOREHOLE LOG

Name of Hole: PH 10

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 14/12/2016
Date Completed: 14/12/2016
Surface RL: 157.98m AHD
Coordinates: E: 398794.41 N:6404422.35
Drilling Contractor: D andE Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	157	0–1				Weathered Hematized Rhyolitic Tuff- brown, red to light orange, porphrytic	
	156–155	1–3					
	154–153	3–5				Weathered Hematized Rhyolitic Tuff- brown, red to light orange, porphrytic	
	152	5–6				Weathered Hematized Rhyolitic Tuff/ Dyke- red, orange to dark grey, porphrytic to aphanitic	
	151	6–7				Weathered Hematized Rhyolitic Tuff/ Dyke- red, orange to dark grey, porphrytic to aphanitic	Calcite precipitation
	150–143	7–15				Weathered Hematized Rhyolitic Tuff- brown, red to light orange, porphrytic	Hardness increasing @12m
	142–138	15–20				Weathered Hematized Rhyolitic Tuff- brown, red to light orange, porphrytic	

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH10_V3

BOREHOLE LOG

Name of Hole: PH 10

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 14/12/2016
Date Completed: 14/12/2016
Surface RL: 157.98m AHD
Coordinates: E: 398794.41 N:6404422.35
Drilling Contractor: D andE Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	137–118	21–40				Hematized Rhyolitic Tuff- orange to dark red, porphrytic	Some weathering
						Weathered Hematized Rhyolitic Tuff/ Dyke-orange, red to grey, blue, porphrytic to aphanitic	Calcite precipitation
						Dyke- dark grey to blue, aphanitic	Pyrite crystalation, calcite precipitation
						Hematized Rhyolitic Tuff- dark red to light purple, porphrytic	Some weathering
						Weathered Hematized Rhyolitic Tuff/ Dyke-dark red, purple to dark grey, porphrytic to aphanitic	Calcite precipitation

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH10_V3

BOREHOLE LOG

Name of Hole: PH 10

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 14/12/2016
Date Completed: 14/12/2016
Surface RL: 157.98m AHD
Coordinates: E: 398794.41 N:6404422.35
Drilling Contractor: D andE Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	117	41				Hematized Rhyolitic Tuff- dark purple to dark grey, porphrytic	Calcite precipitation, some weathering
	116	42					
	115	43					
	114	44				Rhyolitic Tuff- light grey to blue, porphrytic	Calcite precipitation
	113	45					
	112	46					
	111	47					
	110	48					
	109	49					
	108	50				Dyke- dark grey to blue, aphanitic	Pyrite crystalisation, magnetic, calcite precipitation
	107	51					
	106	52				Rhyolitic Tuff- light grey, porphrytic	
	105	53				Dyke- dark grey to blue, aphanitic	Dyke, pyrite crystalisation, magnetic, calcite precipitation
	104	54				Hematized Rhyolitic Tuff/ Dyke- light grey to dark grey, porphrytic to aphanitic	Magnetic, calcite precipitation
	103	55					
	102	56				Rhyolitic Tuff- light grey, porphrytic	Water intersected
	101	57				Rhyolitic Tuff/ Dyke- light grey to dark grey, porphrytic to aphanitic	Magnetic, calcite precipitation
	100	58					
	99	59				Dyke- dark grey to blue, aphanitic	Dyke, pyrite crystallisation, magnetic, calcite precipitation, some
	98	60					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH10_V3

BOREHOLE LOG

Name of Hole: PH 10

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 14/12/2016
Date Completed: 14/12/2016
Surface RL: 157.98m AHD
Coordinates: E: 398794.41 N:6404422.35
Drilling Contractor: D andE Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	97	61					weathering
	96	62				Rhyolitic Tuff/ Basalt- light grey to dark grey, porphrytic to aphanitic	Magnetic, calcite precipitation
	95	63					
	94	64					
	93	65					
	92	66					
	91	67					
	90	68				Rhyolitic Tuff- dark purple to grey, porphrytic	
	89	69					
	88	70					
	87	71					
	86	72					
	85	73					
	84	74				Rhyolitic Tuff/ Basalt- light grey to dark grey, Porphrytic to aphanitic	Magnetic, calcite precipitation
	83	75					
	82	76				Hole Terminated at Target Depth	

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH10_V3

BOREHOLE LOG

Name of Hole: PH 11

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 19/12/2016 (Collected)
Date Completed: 19/12/2016
Surface RL: 113.57m AHD
Coordinates: E:399018.56 N:6404504.41
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	113 to 94	0 to 20				Hematized Rhyolitic Tuff- orange to brown, porphrytic	
						Weathered Rhyolitic Tuff/ Dyke-orange, brown to dark grey, porphrytic to aphanitic	Calcite precipitation
						Weathered Rhyodacite- orange to	

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH11_V3

BOREHOLE LOG

Name of Hole: PH 11

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 19/12/2016 (Collected)
Date Completed: 19/12/2016
Surface RL: 113.57m AHD
Coordinates: E:399018.56 N:6404504.41
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
	93	21				brown, porphrytic	
	92	22					
	91	23					
	90	24				Hole Terminated	
	89	25					
	88	26					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH11_V3

BOREHOLE LOG

Name of Hole: PH 12

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 19/12/2016 (collected)
Date Completed: 19/12/2016
Surface RL: 88.15m AHD
Coordinates: E: 399114.48 N: 6404843.48
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	88	0				Weathered Rhyolitic Tuff - brown to purple	
	87	1					
	86	2				Weathered Hematized Rhyolitic Tuff- brown, dark purple to orange, porphrytic	
	85	3	<				
	84	4				Hematized Rhyolitic Tuff-dark purple to orange, porphrytic	Some weathering
	83	5					
	82	6					
	81	7				Fines- brown, some isolated fragments of weathered Hematized Rhyolitic Tuff	Possible fault or shear zone?
	80	8					
	79	9				Hematized Rhyolitic Tuff-dark purple to orange, porphrytic	Some weathering, some calcite veining
	78	10					
	77	11					
	76	12					
	75	13					
	74	14					
	73	15					
	72	16					
	71	17					
	70	18					
	69	19					
		20					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH12_V3

BOREHOLE LOG

Name of Hole: PH 12

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 19/12/2016 (collected)
Date Completed: 19/12/2016
Surface RL: 88.15m AHD
Coordinates: E: 399114.48 N: 6404843.48
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
		20					

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH12_V3

BOREHOLE LOG

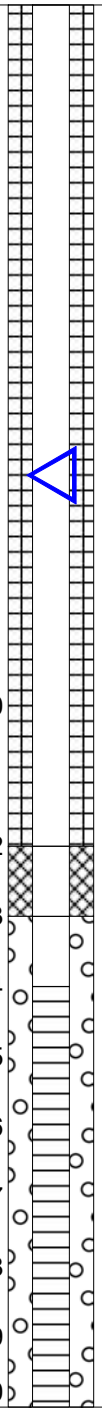
Name of Hole: PH 13

Project Number: 3430
Client: Tricon Mining Equipment
Project: Hilview Geological Investigation
Location: Off Maytoms Lane, Booral
Logged by: MA/SK

Hillview

Date Commenced: 19/12/2016 (Collected)
Date Completed: 19/12/2016
Surface RL: 100.24m AHD
Coordinates: E: 398919.44 N: 6405189.27
Drilling Contractor: D and E Drilling

vgt Environmental Compliance Solutions

Drill Type	Elevation (RL)	Depth (m)	Piezometer Design	Photo Log	Graphic Log	Description	Additional Information
Hammer	100 to 81	0 to 20				Weathered Hematized Rhyolitic Tuff- pink, orange to brown, porphrytic	Clay, possible joints?
						Weathered Hematized Rhyolitic Tuff- pink, orange to brown, porphrytic	Some Clay, possible joints?
						Hematized Rhyolitic Tuff/ Dyke- dark red, purple to grey, dark grey, porphrytic to aphanitic	Calcite precipitation
						Hematized Rhyolitic Tuff- dark red, purple to orange, porphrytic	Some Weathering
						Hematized Rhyolitic Tuff/ zdyke- dark red, purple to grey, dark grey, porphrytic to aphanitic	Calcite precipitation
						Hematized Rhyolitic Tuff- dark red, purple to orange, porphrytic	Some Weathering
						Dyke- dark grey, aphanitic, some calcite veining	Calcite precipitation, some pyrite mineralisation

Other Information: Log updated 03/04/2023 following ADW Survey Data

Logged By: MA	Checked By: SK	Version: 3430_TH_GA_LOG_PH13_V3

Appendix D: Qualtest Resource Material Testing

Resource Material Testing Assessment

Hillview Quarry, Karuah

NEW15P-0045-AC
13 April 2017

Qualtest
LABORATORY (NSW) PTY LTD

GEOTECHNICAL I LABORATORY I EARTHWORKS I QUARRY I CONSTRUCTION MATERIAL TESTING

13 April 2017

Tricon Mining Equipment Pty Ltd
RMB1085 Pacific Highway
Somersby NSW 2250

Attention: Greg Thompson

Dear Greg,

RE: PROPOSED RESOURCE DEVELOPMENT – HILLVIEW QUARRY, KARUAH
MATERIAL TESTING ASSESSMENT

Please find enclosed our Material Testing Assessment report for the proposed Quarry Resource Development located at Karuah and referred to as Hillview Quarry.

The report includes test results, descriptions and discussion of the engineering properties of the range of rock types encountered during investigation drilling performed within the resource. A broad range of tests were performed to demonstrate the engineering properties of the resource, primarily for use as construction aggregate in the concrete, asphalt, sealing and road building industry.

If you have any questions regarding this report, please do not hesitate to contact Alan Cullen or the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd

Jason Lee
Principal Geotechnical Engineer

Alan Cullen
Principal Geotechnician

Table of Contents:

Attachments:

1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) is pleased to present this report on behalf of Tricon Mining Equipment Pty Ltd (Tricon) for the proposed resource development located at Karuah and referred to as Hillview Quarry.

This report presents the results of laboratory testing conducted by Qualtest and other specialist laboratories on samples obtained from the recent drilling investigations performed by VGT Pty Ltd - Environmental Compliance Solutions (VGT), together with discussion and recommendations on the engineering properties of the resource, primarily for use as construction aggregate in the concrete, asphalt, sealing and road building industry.

2.0 Scope of Testing

The following scope of testing was undertaken on samples retrieved from cored boreholes. The scope performed was aimed at providing a broad suite of testing to cover as many potential markets within the construction materials industry. Tests were chosen to give an overall performance comparison with current Australian Standards (AS2758) and NSW Roads and Maritime Services (RMS) standards. The tests covered physical characteristics, durability, geological properties, and chemical performance of the recovered samples. The scope of testing performed on samples of potential quarry materials provided included:

- AS1141.4 Bulk Density
- AS1141.5 Fine Particle Density & Absorption
- AS1141.6 Coarse Particle Density & Absorption
- AS1141.6.1 Coarse & Fine Weighted Bulk Density & Absorption
- AS1141.11 Particle Size Distribution
- AS1141.12 Material finer than 75 micron
- AS1141.14 Particle Shape
- AS1141.22 Wet/Dry Strength Variation
- AS1141.23 Los Angeles Abrasion
- AS1141.24 Sodium Sulphate Soundness
- AS1141.35 Sugar in Aggregates
- AS1141.41/42 Polished Aggregate Friction Test
- AS1012.20 Chlorides and Sulphates
- AS4133.4.1 Point Load Strength
- AS4133.4.2.1 Uniaxial Compressive Strength of Rock
- AS1289.3.1.1,3.2.1,3.3.1,3.4.1 Atterberg Limits including Plasticity Index
- RMS T219 Acid soluble Sulphates
- RMS T363 Alkali Reactivity
- RMST659 Methylene Blue Value
- ASTM C 295 Petrographic analysis

The purpose of the study was to assess the available rock types, and potential uses of each material within the construction industry. The scope of tests listed above was carried out on a selection of composite rock core samples considered to be representative of the potential resource, sampled from between 0.0 and 100.0m from recovered core from Borehole DDH 2 across the varying depths.

The resource identified two representative rock types based upon the Petrographic Analysis results as summarised in Table 1. A composite of representative samples were selected and tested based on their potential material qualities and potential suitability for use as construction industry material.

Table 1 – Description of Representative Rock Types and Samples Tested

Sample ID	Depth (m)	Rock Type
DDH2 P-1	Composite Sample	Hematized Rhyolitic Tuff
DDH2 P-2	Composite Sample	Rhyolitic Tuff

3.0 Results

3.1 Bulk Density (AS1141.4)

Bulk Density is defined as the mass of particles divided by the total volume they occupy. The total volume includes particle volume, inter-particle void volume and internal pore volume.

Table 2 – Bulk Density Results (AS1141.4)

Sample ID	Rock Type	Uncompacted Bulk Density (t/m³)	Compacted Bulk Density (t/m³)	AS2758 Concrete Aggregate Spec.
DDH2 (0.0 to 100.0m)	Rhyolitic Tuff	1.33	1.50	> 1.2 t/m³

3.2 Particle Density and Water Absorption (AS1141.5, 6 & 6.1)

The Particle Density and Water Absorption test is universally accepted within the Australian Construction Industry as the definitive measure of fine & coarse aggregate density and water absorption. It is used to determine these properties for both coarse grained aggregate and natural and manufactured sands.

The Particle Density test produces results similar to Specific Gravity (Apparent Particle Density), but also takes into account the voids that may be present in the material being tested. At the same time, the amount of water that is held within those voids is calculated and reported as the Water Absorption of the material. The definition of the four reportable parameters which are calculated is set out below: -

Apparent Density: The dry mass of particles divided by their volume, with the volume including only the impermeable voids.

Particle Density – Dry: The dry mass of particles divided by their volume, with the volume including both permeable and impermeable voids.

Particle Density - Saturated Surface Dry (SSD): The SSD mass of particles divided by their volume, with the volume including both permeable and impermeable voids.

Water Absorption: The ratio expressed as a percentage, of the mass of water held in the permeable voids of the particles brought to SSD condition following soaking under water for 24 hours, to the oven dried mass of the material.

The test properties listed above provide key design parameters for concrete and asphalt mixes.

For Concrete mixes, the SSD density which accounts for water contained within permeable voids allows for calculation of the mix yield and concrete voids in the design calculation process. Attempts have been made in some specifications to limit the water absorption of aggregates, to minimise the practical difficulties that arise when dealing with highly absorptive aggregates. Because the density determination has accounted for the water in voids, they do not impede the cement hydration process, thus a more accurate determination of water demand and water-cement ratio design is possible. In other words, whilst low water absorptions are preferable, higher absorptions do not present insurmountable hurdles to concrete and asphalt mix designs.

Table 3 – Particle Density Fine Results (AS1141.5 - <4.75mm)

Sample ID	Rock Type	Particle Density Dry Basis (t/m³)	Particle Density SSD Basis (t/m³)	Apparent Particle Density (t/m³)	Water Absorption (%)	AS2758 Concrete Aggregate Spec. Dry Basis
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	2.47	2.52	2.60	2.1	> 2.1 t/m³

The AS 1141.5 Particle Density test can be used to determine particle density and water absorption properties in natural and manufactured fine materials.

For fine aggregates, the particle density test is carried out on material of size less than 4.75mm and a test portion of about 500g. This portion is immersed in water at room temperature for at least 24 hours and agitated in a manner that removes all the entrapped air. This is to ensure the pores are filled with water. The sample is then dried back to a point where the SSD condition can be determined.

This point is normally determined by using a cone apparatus and tamping rod.

When the material is Surface Saturated Dry (SSD), it should collapse on removal of the supporting cone. If it fails to collapse, it is deemed to still be too wet and further drying is required. This procedure of determining SSD works well for rounded natural sands with low quantities of passing 75 micron fines.

The results indicate that the fines produced are below the preferable limit of 3% in RMS 3152 for Asphalt.

The composite rhyolitic tuff sample tested returned a low water absorption value of 2.1%. The Concrete and Asphalt industry generally prefers materials to have water absorptions less than 2.5%.

Table 4 – Particle Density Coarse Results (AS1141.6 - >4.75 mm to <19.0mm)

Sample ID	Rock Type	Particle Density Dry Basis (t/m³)	Particle Density SSD Basis (t/m³)	Apparent Particle Density (t/m³)	Water Absorption (%)	AS2758 Concrete Aggregate Spec. Dry Basis
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	2.49	2.53	2.58	1.3	> 2.1 t/m³

Whilst the fines portion of Rhyolitic Tuff from DDH2 had an absorption of 2.1%, the coarse fraction produced a lower water absorption of 1.3%. Both results are within acceptable and normal working limits.

When assessing aggregates for mix design purposes that have both fine and coarse portions, it is normal to refer to their weighted ratio density and absorption to get an overall picture of the Particle Density and Water Absorption characteristics as outlined in Table 5.

Table 5 – Particle Density Results (AS1141.6 - Weighted)

Sample ID	Rock Type	Particle Density Dry Basis (t/m³)	Particle Density SSD Basis (t/m³)	Apparent Particle Density (t/m³)	Water Absorption (%)	AS2758 Concrete Aggregate Spec. Dry Basis
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	2.48	2.52	2.59	1.7	> 2.1 t/m³

The particle density and water absorption results obtained from the composite sample of Rhyolitic Tuff from Borehole DDH2 (in either it's fine, coarse or combined weighted state), all meet and are below the normal absorption maximum requirement of 2.5% sought by the concrete and asphalt Industry. The dry density and apparent particle density of material from this source also exceed the minimum density requirements of 2.1 t/m3. This would indicate that the resource density and absorption characteristics are reasonably uniform, and blending or mixing of the resource products during production process (either by design or inadvertently), should not create undue problems.

3.3 Particle Size Distribution (AS1141.11.1)

The Particle Size Distribution or grading of the aggregates tested is primarily a function of the crushing process. The rock core samples provided for testing were crushed in a laboratory "Jaw Crusher" to produce a targeted 20mm minus run of crush product. This crushed product was then graded to produce the particle size distribution results presented in Table 6.

Once graded, certain portions of the graded aggregate and fines were extracted from the total sample to perform the respective testing nominated in the testing schedule.

In the particle size distribution test, the aggregate is dried to a constant mass and then separated through a series of sieves, made with punched plate and woven wire in progressively smaller openings. For samples tested to Australian Standards, the sieves conform to AS1152 and form part of the metric "half Series", where each successive sieve opening is half the size of the next largest sieve in the series.

Once separated, the mass of particles retained on each sieve is measured and compared with the mass of the total sample. Particle size distribution is then expressed as the cumulative mass percentage passing each sieve. Results are presented in a tabulated form or as graphs in a logarithmic format.

The test method for grading used in this assessment is described in AS1141.11.1, and was performed in the material's dried, unwashed state. The percent passing the 75 micron fraction was performed to AS1141.12 method and is a washed method where the dried sample is soaked for 12 hours and then washed over a 75 micron wash sieve.

Particle size distribution, or grading, is one of the most influential and commonly reported characteristics of an aggregate. Grading influences concrete durability, road base compatibility, porosity, workability, cement and water requirements, strength and shrinkage. However, it is the total aggregate grading in the mix that is critical to the mix performance. The grading of an individual component is not critical to the mix performance and an unsuitable grading can be improved by blending with other components. In this case the individual grading is not critical but once the blend is established, the consistency of individual components is critical to the production of a consistent product.

The individual grading percentages presented in Table 6, whilst not comparable to any individual specification, are indicative of a material that when crushed with normal crushing and screening equipment will produce similar material with the same physical characteristics and shape. The shape of individual particles can be changed and improved depending upon the screening and crushing equipment utilised in the production process. Improvement in the shape to a more cubical dimension will ultimately improve some durability aspects associated with the rock crushed from this resource, such as wet /dry variation.

Table 6 – Particle Size Distribution Results (AS1141.11)

Sample ID	Rock Type	Sieve Size (mm)	%Passing
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	19.0	100
		13.2	92
		9.5	73
		6.7	58
		4.75	43
		2.36	26
		1.18	17
		0.60	11
		0.425	8
		0.300	6
		0.150	2
		0.075	0

3.4 Passing 75 Micron in Aggregates – By Washing (AS1141.12)

The percentage passing 75 microns is calculated as the loss on washing expressed as a percentage of the original sample mass.

The 75-micron fraction size is used in Australia as a near approximation to the 60-micron size limit that in geological terms marks the boundary between fine Sand and Silt/Clay.

In natural aggregates, the total passing 75 microns will include the silt and clay fractions and will be composed of silt and clay minerals. In many specifications including AS 2758.1, the percentage passing 75 microns has been specified as a control over clay and silt fines that may cause water and cement demand, shrinkage, cracking, and control the permeability of some materials.

Percent passing results provided in Table 6 give indicative values that may be expected from material crushed in the normal manner.

The percent passing the 75 micron is an indication of the silt and clay fines within a particular crushed product. The percentage returned from crushed rock composite sample DDH2 was 2%, this is expected to consist of predominately silt size fraction as the fines produced were non-plastic when Atterberg limit testing was performed on the recovered fines.

Table 7 – Material Finer Than 75µ Results (AS1141.12)

Sample ID	Rock Type	Material Finer Than 75µ (%)	AS2758 Concrete Aggregate Spec	RMS 3151 Sealing Aggregate Spec
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	2.0	0 – 2	0 - 1

The results indicate that after the primary run of crush process in the laboratory, material passing the 75 micron sieve was equal to the specification limits. In the quarry production environment, this can be improved by either by appropriate screening, dust extraction systems or by washing of the end product. Through implementation of such measures, it is anticipated that specification limits outlined in Table 7 may be met. Manufactured sand for concrete production is generally washed to control the minus 75 micron percentage.

3.5 Particle Shape by Proportional Calliper (AS1141.14)

The shape of the aggregate and crushed fines is primarily influenced by the crushing and screening process. The material processed and tested has been crushed with a primary "jaw crusher" which produces more flaky and elongated shapes than a cone crusher or "Barmac" system.

Aggregate is generally shaped through a series of primary and secondary crushers and recirculated to obtain more cubical, better shaped aggregate for concrete, sealing aggregate and asphalt production.

The shape of individual particles influences not only the durability test results performance, but also the physical flow ability of concrete and the ultimate compatibility and stability of the end product. Improving the shape characteristics of a material to make it more cubical can have a positive influence on these physical and durability test parameters.

The particle shape test determines the percent of Misshapen or poorly shaped less desirable particles within a sample at 2:1 and 3:1 size ratios. The test determines the shape of individual particles and grades them according to their length, breadth and thickness.

The samples tested demonstrated total misshapen particles percentages of 7% to 3%. These well shaped results are not typical of a single run of crush product through a primary jaw crusher. The percentage misshapen should decrease when recirculated over a secondary crushing process such as a "cone crusher", which will generally halve these current percentage misshapen values.

It is assessed that aggregate crushed in the above manner (single run of crush, through a jaw crusher) would be suitable for road base pavement products and certain asphalt applications, but would generally require further processing to be suitable for high strength concrete and superior performance aggregate.

Table 8 – Particle Shape Results (AS1141.14)

Sample ID	Rock Type	Total Misshapen Particles 2:1 (%)	Total Misshapen Particles 3:1 (%)	AS2758 Concrete Aggregate Spec	RMS 3151 Sealing Aggregate Spec	RMS 3152 Asphalt Aggregate Spec
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	7	3	<35%	<35%	<35%

3.6 Wet/Dry Strength Variation (AS1141.22)

The Wet/Dry Strength Variation test determines the load (in KN) required to produce 10% fines in an aggregate sample when tested in its dry (oven), and wet (SSD) conditions. The difference between these two strengths is expressed as a % variation. Wet strength is typically lower than the dry strength due to the presence of moisture within the aggregate particles during crushing, while a large difference between wet and dry conditions indicates potential water sensitivity of the rock when placed in saturated site conditions.

Table 9 – Wet/Dry Strength Variation Results (AS1141.22)

Sample ID	Rock Type	Dry Strength (kN)	Wet Strength (kN)	Wet/Dry Strength Variation (%)	AS2758 Concrete Aggregate Spec
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	246	215	13	<25%

The wet/dry variation test is an excellent method of assessing the durability and wet strength of a product. The wet/dry test performed on a composite sample of the cored rock from DDH2 indicate that despite the crushed rocks shape characteristics, the Rhyolitic Tuff material performed well, further demonstrating the rock deposits high strength and durability characteristics.

It is assessed that in general the Rhyolitic Tuff would be suitable for concrete and asphalt production as it returned results well less than 25%.

DDH2 composite returned a low wet/dry variation result of 13%, however this result is expected to improve further with better shaping which would occurs during actual production.

Based on these wet/dry results the Rhyolitic Tuff rock types are assessed to be hard and durable and suitable for concrete, asphalt and road base applications. Blending of the different rock types in the correct ratios would also improve the overall performance of the end products. Tested DDH2 composite material also complied with the wet strength criteria of greater than 100kN.

3.7 Los Angles Abrasion Value (AS1141.23)

This test involves placing a portion of aggregate in a steel drum, fitted with an internal baffle, with a specified number of steel balls. The drum is rotated a fixed number of times to distress the aggregate by impact loading, with some contribution from self-abrasion.

The test was originally developed in the context of wear resistance in cold areas (where the surfacing is trafficked by studded tyres) and for relatively low strength rocks such as limestone. The test result is determined by sizing the post-test material at a specified sieve size (1.8 mm) with the ratio of the -1.8mm fraction to the original charge mass giving the LA value. The higher the LA value, the less durable the rock. It is generally accepted that results of lower than 25% indicate that the rock is suitable for most construction industry applications.

The results of the testing on the composite sampled material from DDH2 demonstrated that the Rhyolitic Tuff performed well under the Los Angles abrasion test, with values of 17%. There is a general correlation of the Los Angeles Value test results with wet/dry strength variation testing.

Table 10 – Los Angeles Abrasion Value Results (AS1141.23)

Sample ID	Rock Type	Los Angeles Value	AS2758 Concrete Aggregate Spec
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	17	<25%

3.8 Sodium Sulphate Soundness (AS1141.24)

This test is commonly used to assess an aggregate's suitability for use in concrete. Whilst the test is designed for aggregates in concrete, the exposure classifications can be used as a guide when assessing the suitability of source rock for similar applications.

The test is designed to assess the resistance of rock fabric to salt crystallization pressure, which is a measure of the susceptibility of the rock to physical breakdown. The extent of this breakdown is assessed by repeated immersion of the aggregate in a saturated solution of Sodium Sulphate. This is followed by oven drying to dehydrate the salt precipitated in permeable pores and rehydration of the salt during subsequent immersion, which generates crystallization pressure. Internal expansive forces derived from rehydration of the salt on re-immersion, mimic freezing (crystallization of water) or salt action. This provides a measure of the integrity of the rock fabric when subjected to physical weathering associated with the expansion caused by the freezing of water in aggregate pores, and the expansion of salts on rehydration in marine conditions following repeated wetting and drying.

Table 11 – Sodium Sulphate Soundness Results (AS1141.24)

Sample ID	Individual Fractions Tested (mm)	Individual Sample Size Loss (%)
DDH2 - composite (0.0 to 100.0m) Rhyolitic Tuff	Loss 19.0 to 13.2mm	0.1
	Loss 13.2 to 9.5mm	0.3
	Loss 9.5 to 4.75 mm	0.1
	Loss 4.75 to 2.36 mm	0.3
	Loss 2.36 to 1.18 mm	0.4
	Loss 1.18 to 0.600mm	0.5
	Total Weighted Loss	**0.3**

The results of Sodium Sulphate Soundness testing are highly dependent on particle size, a consequence of variation to the surface area/volume ratio and its effect on the degree of saturation achieved during the wetting cycle.

High loss results are a fairly reliable indication of poor durability consequently low losses are an indication of good durability. The Rhyolitic Tuff from this resource has extremely low losses, which demonstrates the sources excellent durability characteristics making it suitable for all concrete and asphalt applications.

AS2758 specification breaks the requirements into 3 sub-classes based on the material's maximum weighted average loss of 6%, 9% and12%. The weighted loss results for the composite sampled material within DDH2 of the resource are all below 6% and are therefore assessed to be suitable for any exposure conditions, including armour rock and dimension stone, providing suitable quarrying methods are used to minimise fractures.

3.9 Stripping and Initial Adhesion (RMS T230 & RMS T238)

Adhesion between bitumen and aggregate is one of the functional properties that guarantee durability of asphalt mixes and seals. Adhesion can be reduced and the cohesion within asphalt lost through the presence of water at the bitumen/stone interface. This is referred to as "stripping".

Adhesion is greatly influenced predominantly by mineral characteristics within parent rock as well as within the properties of the bitumen. Reduced resistance against stripping of certain aggregates can be improved by the addition of hydrated lime (or filler containing hydrated lime) to an asphalt mix. The use of additives in bitumen can improve the adhesion but in general work more selectively and depending on the aggregate/bitumen combination.

The resistance to stripping and initial adhesion test is an assessment of the extent of stripping and initial adhesion between cover aggregates and bituminous binder under wet and dry conditions. The assessment can be performed with or without treatment with pre-coating materials and addition of bitumen agent.

The following results have been performed using standard pre-coat and bitumen additives and show that the crushed aggregate from DDH2 performed well in both the stripping and adhesion tests performed using additive combinations stated.

Bitumen class 170, polyseal S35E bitumen binder and SAMI precoat with 1% redicote422/60 were used in the stripping and adhesion tests performed, with both binder combinations tested returning adhesions of less than 5%, and stripping values of less than 2%.

Table 12 – Stripping and Initial Adhesion (RMS T230 & RMS T238)

Method	Property	Result	Specification RMS 3258
RMS T238	Initial Adhesion using SAMI C170 binder with 7% kerosene, on NEW17W0307-S01 aggregates, precoated with SAMI standard precoat plus 1% redicote 422/60, soaked curing condition and unsoaked curing condition	<5 <5	Maximum 10% Stripping
RMS T230	Resistance to stripping using SAMI C170 binder on same precoated aggregates, plus 1% redicote422/60.Oven temperature for conditioning=68.5Cand tendency for aggregates to crumble when pulled is <2%	<2	Maximum 10% Stripping
RMS T238	Initial Adhesion using Polyseal S35E binder with 8% kerosene, on NEW17W0307-S01 aggregates ,precoated with SAMI standard precoat plus 1% redicote 422/60, soaked curing condition and unsoaked curing condition	<5 <5	Maximum 10% Stripping
RMS T230	Resistance to stripping using polyseal S35E binder on same precoated aggregates, plus 1% redicote422/60.Oven temperature for conditioning=68.5Cand tendency for aggregates to crumble when pulled is <2%	<2	Maximum 10% Stripping

The samples where this testing was performed were relatively flaky and demonstrated more breakdown than would normally be expected from crushed rock of this type in the stripping test. It is considered that if better shaped aggregate was produced, the end test result would have been improved.

3.10 Cerchar Abrasion

The Cerchar Scratch test (1986) was developed in France in the mid-1980s to help predict the wear of cutters on the tunnel boring machines. The test is a useful low cost method of predicting the rate of wear of cutter heads, excavator bucket teeth, and crushing and screening plant. The test is performed on a small freshly broken rock sample, requiring less than 25mm in size. The sample is scratched by a hardened sharp heat treated alloy steel needle of defined geometry over a length of 10mm in 1 second, under a static load of 70N. This provides a wear classification referred to as the Cerchar Abrasivity Index (CAI). The CAI is calculated as the average measure of the worn-flat diameters (in tenths of mm) on the testing needle.

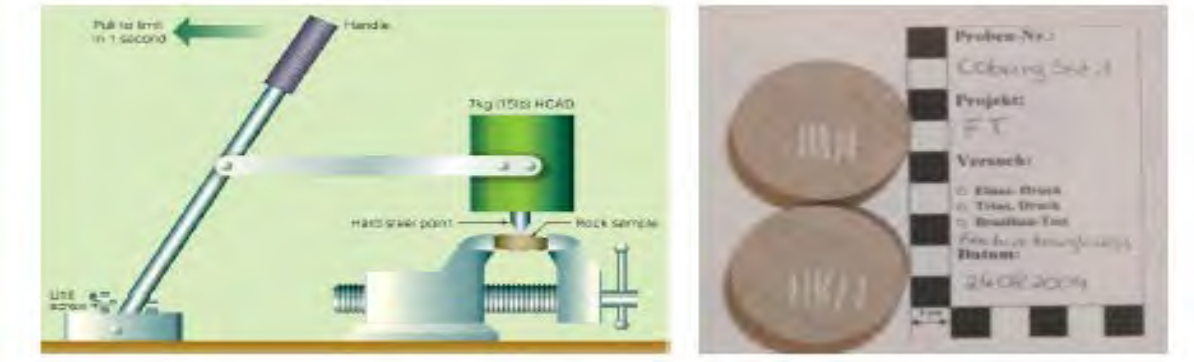


Figure 1 above shows the cerchar abrasivity machine and the 10mm long scratches on rock samples.

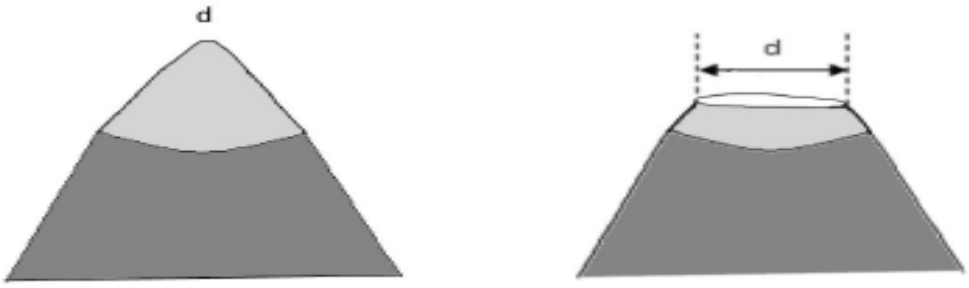


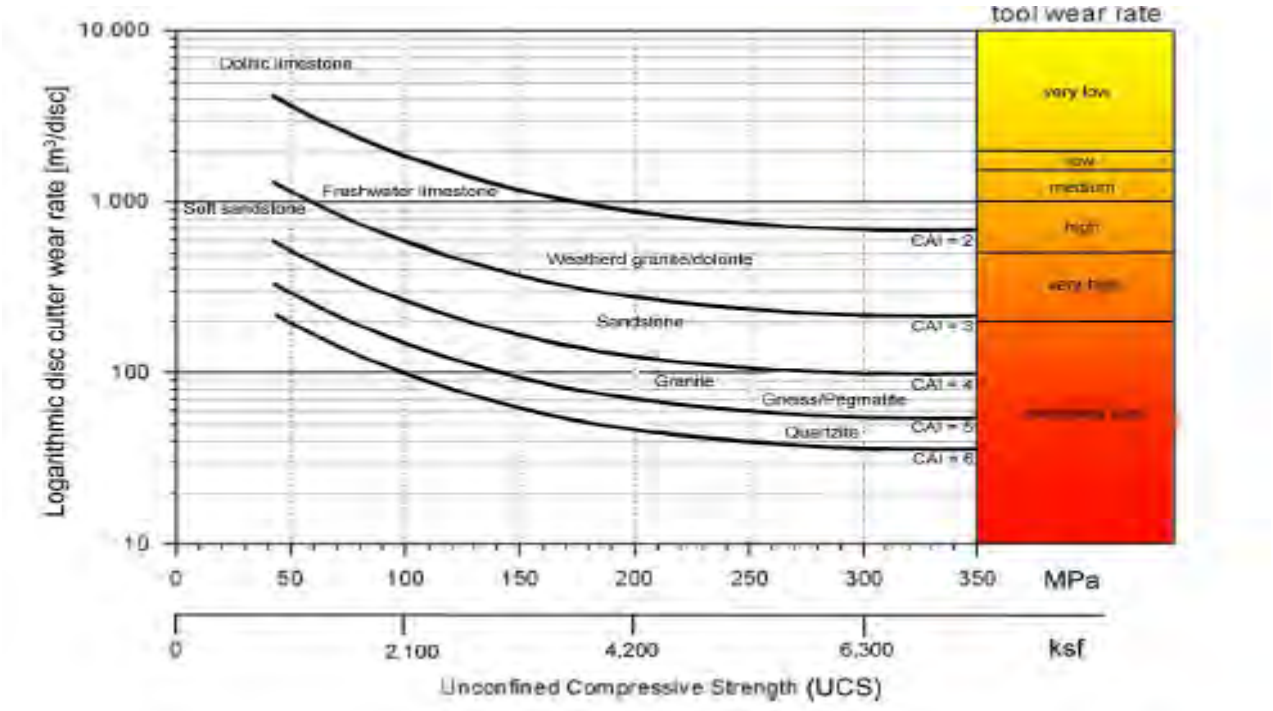
Figure 2 above shows how the CAI is obtained from a steel needle's "sharp point" (left); the test produces a conical blunt surface where its new diameter is measured in integers of 0.1mm, with a scale going from 1 to 6.

The cerchar abrasivity test performed on pieces of aggregate from DDH2 and tested in the manner described above returned a CAI rating of 2.5%. This abrasivity rating places the Rhyolitic Tuff rock from DDH2 in the 'Very High' tool wear bracket of around 500m3 of excavation per cutter disc.

Table 13 – Cerchar Abrasivity Index

Sample ID	Classification	Average CAI_s (HRC55)
DDH2 - composite sample	Rhyolitic Tuff High Abrasiveness	2.71

The table shown below modified from Maidl (2001) shows the comparison of field unconfined compressive strength, tool wear rate and predicted excavated cubic metre wear rate for cutter discs.



3.11 Sugar in Aggregates (AS1141.35)

Sugar retards the set-in concrete; therefore, aggregates are tested to ensure there is no presence of sugar in materials crushed and proposed for use as concrete aggregate. No sugar was detected within any samples of crushed aggregate tested.

Table 14 – Sugar in Aggregates Results (AS1141.35)

Sample ID	Rock Type	Content
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	Not Detected

3.12 Soluble Salts (AS1012.20)

Excessive quantities of some soluble salts may cause efflorescence on concrete, corrosion of reinforcing steel, or disintegration of the mass of concrete. Permissible levels of soluble salts are generally expressed as a proportion of the relevant ion present in the concrete by mass of concrete or by mass of Portland cement.

AS1141.20 determines the chloride ion and sulphate ion content within aggregates proposed for use as concrete aggregate. The total individual percentage of chloride and sulphate ion reportable in aggregate is for amounts in excess of 0.01%. The total combined aggregate chloride salt content should not exceed 0.04% for use in reinforced concrete. The total sulphate ion content allowable within a concrete mix and expressed as SO_3 should not exceed 5% by mass of Portland cement.

Table 15 – Chlorides Results (1012.20)

Sample ID	Rock Type	Chlorides (Cl) (%)	Sulphates (SO_4) (%)
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	0.004	0.001

Table 16 – Sulphates Results (RMS T219)

Sample ID	Rock Type	Sulphates (SO_3) (%)
DDH2 - composite (0.0m to 100.0m)	Rhyolitic Tuff	0.010

Samples from the deposit (depending upon the rock source) demonstrated different content levels of soluble salt ions, but despite slightly elevated sulphates (SO_4) the total sulphates expressed as (SO_3) are below AS2758.1 guideline requirements.

3.13 Alkali Reactivity (RMS T363)

In most concrete, aggregates are more or less chemically inert. However, some aggregates react with the alkali hydroxides in concrete, causing expansion and cracking over a period of many years. This alkali-aggregate reaction has two forms: Alkali-Silica Reaction (ASR) and Alkali-Carbonate Reaction (ACR).

Alkali-Silica Reaction (ASR) is of more concern as aggregates containing reactive silica materials are more common. In ASR, aggregates containing certain forms of silica will react with alkali hydroxide in concrete to form a gel that swells as it adsorbs water from the

surrounding cement paste or the environment. These gels can induce enough expansive pressure to damage concrete.

Alkali-silica reaction can be controlled using certain supplementary cementitious materials. In proper proportions, silica fume, fly ash, and ground granulated blast-furnace slag have significantly reduced or eliminated expansion due to alkali-silica reactivity. In addition, lithium compounds have been used to reduce ASR.

Although potentially reactive aggregates exist throughout Australia, alkali-silica reaction distress in concrete is not that common because of the measures taken to control it. It is also important to note that not all ASR gel reactions produce destructive swelling.

Alkali-Carbonate Reaction (ACR) is observed within certain dolomitic rocks. Dedolomitisation (the breaking down of dolomite) is normally associated with expansion. This reaction and subsequent crystallization of brucite may cause considerable expansion. The deterioration caused by alkali-carbonate reactions is similar to that caused by ASR, however, ACR is relatively rare because aggregates susceptible to this phenomenon are less common and are usually unsuitable for use in concrete for other reasons. Sampled materials are not considered dolomitic rocks so ACR is considered unlikely in regards to material from this source.

The samples obtained from the respective boreholes were crushed and combined with SL-Berrima GP cement and tested for alkali reactivity in accordance with RMS T363 procedures. The mortar bar expansion percentages set out in Table 17 range from a maximum of 0.098% at 10 days, to a maximum of 0.206% at 21 days.

Based on the assessment criteria, the samples are classified as slowly reactive as the sample has less than 0.10% expansion at 10 days (Slowly-Reactive) and have greater than 0.10% expansion (Slowly Reactive) after 21 days.

Table 17– Alkali Reactivity Results (RMS T363)

Sample ID	Rock Type	10 Day Expansion (%)	21 Day Expansion (%)	Classification
DDH2 - composite (0.0 to 100.0m)	Rhyolitic Tuff	0.098	0.206	Slowly Reactive*

Where samples are reactive further testing with fly ash based cements are recommended.

3.14 Polished Aggregate Friction Value (PAFV – AS1141.41/42)

In NSW, the measurement of aggregate polishing values can be obtained from using a horizontal testing wheel/flat mould system and applied to Australian Polished Aggregate Friction Value (PAFV).

An aggregate's resistance to polishing is measured by performing pendulum friction tests on laboratory polished pieces of aggregate and comparing to a known reference sample of 'Panmure Basalt'. The Australian standards relevant to polishing of aggregates are:

AS1141.40-1999: Methods for sampling and testing aggregates – Polished aggregate friction value - Vertical road-wheel machine.

AS1141.41-1999: Methods for sampling and testing aggregates – Polished aggregate friction value – Horizontal bed machine.

AS1141.42-1999: Methods for sampling and testing aggregates – Pendulum friction test.

The first two standards describe alternative methods for accelerated polishing of aggregates in the laboratory, using coarse and then fine abrasive materials to wear away (polish) the aggregate's micro texture. Following polishing by either method, the third standard is used to

determine the friction angle value of the resulting polished aggregate using a pendulum friction test. Depending on the test method used, this value is then reported as the PAFV (AS1141-41 &42, and also NSW RMS 3151 & 3152) or PSV (other states) of the aggregate.

The two polishing regimes in AS1141.40 and AS1141.41 were designed to give results that were comparable between the two methods. However, there are differences between the PAFV and the PSV test, including the coarse abrasive, water and abrasive feed rates, polishing time, reference aggregate and rubber for friction testing. Therefore, PSV and PAFV results may not be directly comparable.

The RMS 3151 and 3152 specification standards for use as sealing aggregates and asphalt aggregate vary slightly with regards to their PAFV requirements. Aggregates with PAFV values of greater than 44 are required for sealing aggregates and greater than 48 for asphalt. The general accepted rule is that the higher the PAFV value, the better the performance of the aggregate in terms of skid resistance. This should also be judged in conjunction with suitable aggregate strength, abrasion and durability results.

Table 18 – PAFV Results (AS1141.41/42)

Sample ID	Rock Type	PAFV Value	RMS 3151 Sealing Aggregate	RMS 3152 Asphalt Aggregate
DDH2 - composite (0.0 to 100.0m)	Rhyolitic Tuff	50	>44	≥48

Samples that were crushed and tested in accordance AS1141.41 and AS1141.42 displayed PAFV values in excess of the specification requirements. It is therefore assessed that all resource material tested may be suitable for use as both sealing and asphalt aggregate.

Whilst all samples tested performed well relating to their strength and abrasion characteristics, durability and mineralogical make up should also be considered when assessing their performance.

The rhyolite materials from DDH2, performed well and are likely to be suitable materials for sealing and asphalt aggregate.

3.15 Methylene Blue Value

Methylene Blue (MB) dye absorption has been used for a considerable period as a means of determining and specifying the presence of clay minerals in aggregates. The test determines the quantity of MB dye required to coat the active agents in the soil in a mono molecular layer.

The test is completed on the passing 75-micron fraction recovered from a sample of fine aggregate of known mass. A MB of 1mg/ml is titrated against slurry of the passing 75-micron material. As each aliquot of MB is added, the sample is tested for end point by removing a small drop of the slurry on a stirring rod and placing the dyed dust and liquid drop onto a filter paper. The filter paper draws off a 'halo' of water from around the dust particles. At the end point, when the dust cannot absorb any further MB, this 'halo' is permanently stained a light blue colour. The Methylene Blue Value (MBV) of the aggregate is reported as the number of milligrams of dye absorbed per gram of material passing 75 microns.

The MBV expresses the quantity of MB required to cover the total surface of the clay fraction with a mono-molecular layer of the MB. It is therefore proportional to the product of the clay content times the specific surface of the clay. However, the result can be affected by the presence of organics, zeolites and iron hydroxides. Some literature also suggests minor absorption by carbonates and unbalanced charged particles on freshly crushed surfaces, but these effects are considered minor. The MB test is used to evaluate the amount and nature of

deleterious fines in a fine aggregate which may cause stripping. The higher the MBI the more susceptible the aggregate or mix will be to stripping.

The ISSA procedure (Bulletin145) recommends that mineral aggregate fillers and fines be rejected if the MBV exceeds 10mg/g for basalt rocks or 7 mg/g for grit stones (meta-Greywackes). RMS specifications for fines used in asphalt (RMS 3152) require further investigation of an aggregate if the MBV exceeds 8mg/g.

Table 19 – Methylene Blue Value Results

Sample ID	Rock Type	Methylene Blue Value (mg/g)	Recommended Limit RMS 3152
DDH2 - composite (0.0 to 100.0m)	Rhyolitic tuff	2.5	8mg/g

The MBV obtained on crushed fines from borehole DDH2 indicate that the clay activity in the samples tested is substantially below recommended limits.

This would indicate that rock quarried from the resource meets the recommended specification requirements and would be unlikely to liberate further fines during the production processes.

3.16 Atterberg Limits (AS1289.3.1.1, 3.2.1, 3.3.1, 3.4.1)

The knowledge of the crushed rock soil consistency is important in defining or classifying a rock type and aids in predicting crushed rock performance when used as a construction material. The soil or crushed rock fines have been assessed for their soil consistency by means of the Atterberg Limit test.

For cohesive soils, there is a range of moisture contents within which the soil (silt or clay) is of a plastic consistency. The Atterberg Limits test provides a means of measuring the plastic range of a cohesive soil in numerical terms.

Water can be added and mixed into cohesive soil until the soil becomes slurry, and behaves as a viscous fluid. This is defined as the liquid state. As the cohesive soil is dried back slowly and evenly it begins to gain strength and offers resistance to deformation. The condition is known as the plastic state. Further reduction of moisture in the soil will cause it to shrink and become stiffer until it shows little plastic condition and the cohesive soil becomes brittle. This is defined as the semi-solid state. With further drying, the soil will continue to shrink until no further moisture can be removed. At this point further drying has no more effect on the volume change and the soil is defined as being in a solid state.

The change from one phase to the next does not occur at a precise time but takes place as a transition over a period of time. The plastic range is then reported in the following terms:

- Liquid Limit (W_L) – Liquid state;
- Plastic Limit (W_P) – Plastic state;
- Plasticity Index (I_P) – Plasticity Index;
- Linear Shrinkage (L_S) – Liquid linear shrinkage.

The plasticity index is not determined by a test, it is the measure of plasticity of a soil as the difference between the Liquid Limit (W_L) and the Plastic Limit (W_P). The liquid Linear Shrinkage (L_S) is defined as the decrease in length, expressed as a percentage of the original length.

The plastic limit test is used throughout engineering specifications and the construction industry as a defining test of materials plasticity.

The test is performed on the material component that passes the 425-micron test sieve. The materials are then moistened and cured and its respective plastic and liquid state determined.

Rock samples obtained from the resource were crushed and the produced fines were collected and tested to determine their plasticity. Atterberg Limit test results are presented in Table 20.

Table 20 – Atterberg Limits Results (AS1289.3.1.1, 3.2.1, 3.3.1, 3.4.1)

Sample ID	Rock Type	Liquid Limit (%)	Plastic limit (%)	Plasticity Index	Linear shrinkage (%)
DDH2 - composite (0.0 to 100.0m)	Rhyolitic Tuff	Not obtainable	Not obtainable	Non-Plastic	0.0

The crushed rock fines produced from the composite sample from DDH2 sources did not display any reaction to the Atterberg Limits test. They were Non-Plastic, meaning that the liquid limit and or plastic limit could not be obtained due to the non- reactive nature of the fines produced.

The production of Non-plastic fines from these source rocks is ideal for the production of good quality aggregate for use as concrete and road sealing purposes, but is not ideal for the production of top quality road base and select which require some plasticity in order to produce a cohesive uniform compactable blend.

Further testing of overburden materials should be performed in order to establish likely blending ratios required going forward for the introduction of plastic fines during the production process whilst producing road base materials.

3.17 Point Load Test (RMS T223)

The point load strength index test is a method developed for determining the strength of rock specimens in the field with portable equipment.

Specimens in the form of either rock core (the diametric and axial test) or irregular lumps (the irregular lump test) are broken by application of a concentrated load using a pair of conical platens. A point load strength index ($Is_{(50)}$) is obtained and may be used to classify rocks by strength. It can also be used to estimate uniaxial compressive strength where index-to-strength conversation factors are used.

The point load test is an accepted rock mechanics testing procedure used for the calculation of a rock strength index. This index can be used to estimate other rock strength parameters. The rock strength determined by the point load test, like the load frame strengths that they estimate, is an indication of the intact rock strength, and not necessarily the strength of the rock mass.

Specimens should be tested at close to their in-situ moisture content and strengths may vary due to sample geometry and rock properties. Rock that is bedded, schistose or otherwise shows observable anisotropy should be tested in both weakest and strongest directions. The uncorrected point load strength is corrected using equivalent core diameter calculation and expressed in MPa as Point Load Index ($Is_{(50)}$).

Table 21 – Typical Point Load Strength Results (RMS T223)

Sample ID	Rock Type	Strength Diametral Is50 (MPa)	Strength Axial Is50 (MPa)	Anisotropy Index
DDH2 (4.20 to 4.35m)	Rhyolitic Tuff	8.95	8.00	1.12
DDH2 (10.00 to 10.20m)		9.54	5.28	1.80
DDH2(22.30 to 22.50m)		11.82	9.71	1.22
DDH2(30.50 to 30.70m)		7.06	6.37	1.11
DDH2 (41.70 to 41.80m)		11.79	9.14	1.29
DDH2 (51.20 to 51.40m)		7.67	5.29	1.45
DDH2 (62.90 to 63.20m)		11.79	8.34	1.41
DDH2 (70.70 to 71.00m)		5.41	1.67	3.25
DDH2 (80.60 to 81.20m)		11.82	1.46	8.10
DDH2 (90.40 to 91.20m)		9.78	9.16	1.07
DDH2 (99.80 to 100.00m)		11.85	7.20	1.65

The point load test results performed on rocks from this resource indicate that the material has I_{s50} strength values range between 1.5 MPa to 12 MPa, placing it in the high strength to extremely high strength classification category. Rock of this strength rating is generally suitable for most construction purposes.

3.18 Uniaxial Compressive Strength (AS4133.4.2.1)

Compressive strength is probably the most widely used and quoted rock engineering parameter. Under uniaxial load conditions, the maximum stress that a rock sample can sustain is referred to as Uniaxial Compressive Strength (UCS). It is one of the most important mechanical properties of rock material, used in design, analysis and modelling of quarry benches and infrastructure design.

The method is based on a rock sample of 54 mm in diameter and with a height from 2.5 to 3 times greater than its diameter. The specimen is placed in the compression test machine and compressive force is applied to the sample. The force should have a constant increase over time until the sample breaks and is disintegrated, while simultaneously axial and lateral deformations are measured. The result is Uniaxial Compressive Strength. If axial deformations are measured, Young's modulus of elasticity can be obtained. Where lateral deformations are measured, the sample's Poisson's coefficient is also obtained.

Table 22– Uniaxial Compressive Strength Results (AS4133.4.2.1)

Sample ID	Rock Type	UCS (MPa)
DDH2(4.20 to 4.35m)	Rhyolitic Tuff	215
DDH2 (24.70 to 24.90m)		209
DDH2 (44.90 to 45.10m)		201
DDH2 (48.70 to 49.30m)		137
DDH2(99.80 to 100.00m)		228

The uniaxial compressive strengths obtained indicate the intact rock strength of the sample to be strong to very strong.

Point load testing indicated that the material is between 1.5 Mpa to 12 MPa (very strong), while Uniaxial Compressive Strength testing performed on a sample of rhyolitic tuff as outlined in Table 22 returned values ranging from 137MPa to 215MPa on samples taken over a range of depths from the surface to a depth of 100m. These results indicate a good correlation with the numerous point load strength tests performed on DDH2. These uniaxial compressive strengths

mirror the Point load testing performed and indicate the rock from DDH2 is in the "very strong" range over the majority of the cored profile.

3.19 Petrographic Examination (ASTM C295)

Petrographic examination of rock and source material is normally conducted in accordance with ASTM C295 by preparation of a petrological thin section of the source rock in question (microns thick), mounted on a glass slide suitable for use in a stereoscopic polarising microscope of high resolution at 500 x magnification.

A point count of approximately 100 individual points on the slide is made by viewing the slide and identifying and classifying each point. Due to the nature of this test, the results can vary significantly from one petrographic to another for the same sample. For this reason, petrographic examination reports are often used as a screening tool only for specifics, to identify potentially deleterious minerals and any classification is normally confirmed or denied based upon subsequent physical, mechanical or chemical tests undertaken on rock samples taken from the source in question.

Selected samples of core of each rock type encountered were dispatched for analysis. Geochempet Services performed Petrographic analysis and geological descriptions for potential uses on the material based on the mineralogical assessment. The results of the petrographic analysis are summarised in the table below.

Table 23 – Petrographic Analysis Results (ASTM C295)

Sample Number	Identification	Durable	Suitable for Concrete Aggregate	Suitable for Concrete Sand	Suitable for Road base	Suitable for Asphaltic/ Sealing Aggregate	Suitable for Rail Ballast	Suitable for Rip Rap	Free Silica Content (%)
DDH2 P-1	Hematized Rhyolitic Tuff	Yes	Yes (i)(ii)	Yes (i)	Yes	Yes	Yes	Yes	29 - 30
DDH2 P-2	Rhyolitic Tuff	Yes	Yes (i)(ii)	Yes (i)	Yes	Yes	Yes	Yes	29

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.

(ii) Quality may be diminished by the presence of about 6% weak minerals, which could increase water demand in concrete products.

4.0 Summary

Based on the laboratory testing and drilling investigation program undertaken the resource primarily consists of two representative rock types of similar quality, varying quantities and depths across the site. Both these materials from an engineering, quarrying and construction perspective are very similar in nature whilst being technically different from a geological viewpoint. The laboratory testing undertaken has been performed on a composite sample of both rock types. The conclusions regarding the geological differences between both rock types are set out below along with summary of the combined properties of both materials from an engineering and construction perspective.

Both rock types presented for petrographic analysis from DDH2 are described as crystal acid tuffs with a composition equivalent broadly to rhyolite or more specifically to rhyodacite (i.e. equivalent to acid volcanic rock) which is now devitrified, only slightly altered, finely crystalline,

unweathered, non - porous and carrying between 2% and 6% weak mineral inclusions. Both rock types characterised are classified as hard, strong and predicted to be durable.

The Hematized Rhyolitic Tuff/ Rhyodacite samples tested had 17% to 19% of finely micro-crystalline quartz and it is predicted to have substantial potential for deleterious alkali-silica reactivity in concrete.

However, if appropriate precautions are taken such as the use of flyash and shrinkage limited cement blends in the production and design phase this can be controlled. RMS T363 accelerated Mortar Bar testing performed by Network Geotechnics on crushed aggregate from DDH2 in combination with Port Kembla GP cement are classified as slowly reactive as the sample has less than 0.10% expansion at 10 days (Slowly-Reactive) and have greater than 0.10% expansion (Slowly Reactive) after 21 days.

Due to the non-porous and unweathered nature of the Hematized Rhyolitic Tuff /Rhyodacite it is also likely to be suitable for use as Dimension Stone and Armour Rock subject to consideration of the impact of jointing or veining from visual inspection of the quarry face.

The rock is considered to have adequate strength and durability for use in Asphaltic / Sealing Aggregate and is also suitable for use as a source of Roadbase, Rail Ballast, and Rip Rap.

The RMS 3151 and 3152 specification standards for use as sealing aggregates and asphalt aggregate vary slightly with regards to their PAFV requirements. Aggregates with PAFV values of greater than 44 are required for sealing aggregates and greater than 48 for asphalt. The general accepted rule is that the higher the PAFV value, the better the performance of the aggregate in terms of skid resistance. This should also be judged in conjunction with suitable aggregate strength, abrasion and durability results.

The sample that was crushed and tested in accordance AS1141.41 and AS1141.42 returned a PAFV value of 50. This is in excess of the specification requirements of either 44 or 48. It is therefore assessed that the resource material tested may be suitable for use as both sealing and asphalt aggregate.

The uniaxial compressive strengths mirror the Point load testing performed and indicate the rock from DDH2 is in the “very strong” range over the majority of the cored profile, with Uniaxial compressive strength testing performed on core samples indicate the material has a compressive strength of 137 to 215 MPa.

The produced fines were non-plastic and water absorption test results indicate that the weighted average performed on coarse and fine material obtained was 1.7%. This is within the specified requirements for concrete & asphalt but is also expected to improve once suitable crushing and processing techniques are implemented.

Chemical testing performed demonstrate the low soluble salts and relatively low Methylene Blue Adsorption rates are consistent with material suitable for use as Concrete Sand and Asphalt filler.

The free silica content within both samples is about 29% to 30% with 10% and 12% as common Quartz and17% to 19% as finely micro-crystalline quartz all locked within crystalline rock. Cerchar abrasivity index testing also indicates that material from this source will be highly abrasive on plant and equipment.

The products may be won either separately or in conjunction with each other and blended to meet individual specification requirements. Table 25 below outlines the potential suitability for each material source.

Table 24 – Material Suitability Summary

			Potential Product Suitability						
Sample Number	**Identification**	**Durable**	**Concrete Aggregate**	**Concrete Sand**	**Road Base**	**Asphaltic/ Sealing Aggregate**	**Rail Ballast**	**Rip Rap**	**Select Fill**
DDH2	Hematized Rhyolitic Tuff/ Ryhodacite (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes
DDH2 S-2	Rhyolitic Tuff Trachyte (ii)	Yes	Yes (i)	Yes (i)	Yes	Yes	Yes	Yes	Yes

(i) Provided that the appropriate precautions are taken in mix and engineering design to take into account the potential for mild or slow deleterious alkali-silica reactivity.
(ii) The Rhyolitic Tuff/ Rhyodacite are likely to be suitable for dimension stone and marine armour rock, if defect spacing is minimal and suitable boulders are procured.

5.0 Limitations

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical design practices and standards. To our knowledge, they represent a reasonable interpretation of the general conditions of the site.

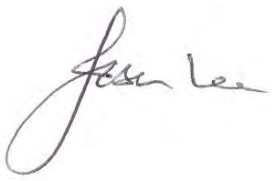
The extent of testing associated with this assessment is limited to discrete borehole locations. It should be noted that subsurface conditions between and away from the borehole locations may be different to those observed during the field work and used as the basis of the recommendations contained in this report.

If subsurface conditions encountered during construction differ from those given in this report, further advice should be sought without delay.

Data and opinions contained within the report may not be used in other contexts or for any other purposes without prior review and agreement by Qualtest. If this report is reproduced, it must be in full.

If you have any further questions regarding this report, please do not hesitate to contact Alan Cullen or the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd



Jason Lee
Principal Geotechnical Engineer

Alan Cullen
Principal Geotechnician

Attachments:

Appendix A: Results of Laboratory Testing – Qualtest (2017)
Appendix B: Results of Laboratory Testing – External (2017)

APPENDIX A:

Results of Laboratory Testing – Qualtest (2017)

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Material Test Report

Report No: MAT:NEW17W-0307--S01
Issue No: 1

Client: VGT Pty Ltd
Unit 4/30 Glenwood Drive
Thornton NSW 2322

Principal:
Project No.: NEW15P-0045
Project Name: Material Testing

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

Approved Signatory: Adam Dwyer
(Senior Geotechnician)
NATA Accredited Laboratory Number: 18686
Date of Issue: 8/03/2017

Sample Details

Sample ID:	NEW17W-0307--S01
Client Sample ID:	-
Sampling Method:	Sampled by Client
Date Sampled:	23/01/2017
Source:	On-Site
Material:	Rock Core
Specification:	No Specification
Project Location:	Thornton, NSW
Sample Location:	DDH2

Other Test Results

Description	Method	Result	Limits
Finer 75µm (%)	AS 1141.12	2	
Drying Method		Oven	
Misshapen Particles (%)	AS 1141.14	7	
Flat Particles (%)		5.8	
Elongated Particles (%)		1.6	
Flat & Elongated Particles (%)		0.0	
Calliper Ratio		2:1	
Unrounded PSD values used for fraction selection			
Misshapen Particles (%)	AS 1141.14	3	
Flat Particles (%)		1.9	
Elongated Particles (%)		1.2	
Flat & Elongated Particles (%)		0.0	
Calliper Ratio		3:1	
Unrounded PSD values used for fraction selection			
Nominal Sample Size (mm)	AS 1141.22	20	
Nature of Sample		Crushed Rock	
Agg Size and Crush Details		Constant Rate	
Fraction Size		-19.0 + 9.5 mm	
Wet Strength (kN)		215	
Dry Strength (kN)		246	
Wet/Dry Strength Variation (%)		13	
Breakdown Occurred		No	
Cylinder Size (diameter in mm)		150	
Los Angeles Value	AS 1141.23	17	
Test Grading		B	
Loss 19.0 to 13.2 mm (%)	AS 1141.24	0.1	
Loss 13.2 to 9.5 mm (%)		0.3	
Loss 9.5 to 4.75 mm (%)		0.1	
Loss 4.75 to 2.36 mm (%)		0.3	
Loss 2.36 to 1.18 mm (%)		0.4	

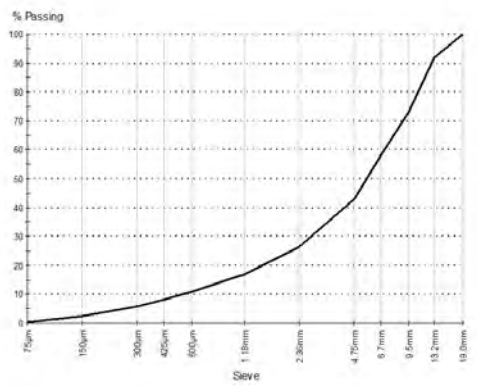
Particle Size Distribution

Method: AS 1141.11.1
Drying by: Oven

Note: Sample Not Washed

Sieve Size	% Passing	Limits
19.0mm	100	
13.2mm	92	
9.5mm	73	
6.7mm	58	
4.75mm	43	
2.36mm	26	
1.18mm	17	
600µm	11	
425µm	8	
300µm	6	
150µm	2	
75µm	0	

Chart



Comments

NP = Non Plastic

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Material Test Report

Report No: MAT:NEW17W-0307--S01
Issue No: 1

Client: VGT Pty Ltd
Unit 4/30 Glenwood Drive
Thornton NSW 2322

Principal:
Project No.: NEW15P-0045
Project Name: Material Testing

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

Approved Signatory: Adam Dwyer
(Senior Geotechnician)
NATA Accredited Laboratory Number: 18686
Date of Issue: 8/03/2017

Sample Details

Sample ID:	NEW17W-0307--S01
Client Sample ID:	-
Sampling Method:	Sampled by Client
Date Sampled:	23/01/2017
Source:	On-Site
Material:	Rock Core
Specification:	No Specification
Project Location:	Thornton, NSW
Sample Location:	DDH2

Other Test Results

Description	Method	Result	Limits
Loss 1.18 to 0.600 mm (%)		0.5	
Total Weighted Loss (%)		0.3	
Uncompacted Bulk Density (t/m³)	AS 1141.4	1.33	
Compacted Bulk Density (t/m³)		1.50	
Aggregate Moisture Condition		As Received	
Nominal Size Of Sample (mm)		20	
Apparent Particle Density (t/m³)	AS 1141.5	2.60	
Particle Density Dry (t/m³)		2.47	
Particle Density SSD (t/m³)		2.52	
Water Absorption (%)		2.1	
Apparent Particle Density - Weighted (t/m³)	AS 1141.6.1	2.59	
Particle Density Dry (t/m³)		2.48	
Particle Density SSD (t/m³)		2.52	
Water Absorption (%)		1.7	
Apparent Particle Density - Coarse (t/m³)	AS 1141.6.1	2.58	
Particle Density Dry (t/m³)		2.49	
Particle Density SSD (t/m³)		2.53	
Water Absorption (%)		1.3	
Sample History	AS 1289.1.1	Air-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	0.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.1	N/A	
Method		Four Point	
Plastic Limit (%)	AS 1289.3.2.1	NP	
Plasticity Index (%)	AS 1289.3.3.1	NP	

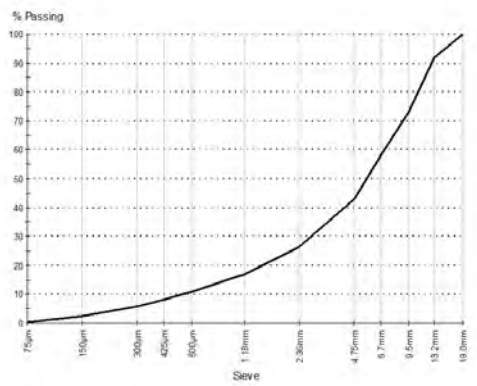
Particle Size Distribution

Method: AS 1141.11.1
Drying by: Oven

Note: Sample Not Washed

Sieve Size	% Passing	Limits
19.0mm	100	
13.2mm	92	
9.5mm	73	
6.7mm	58	
4.75mm	43	
2.36mm	26	
1.18mm	17	
600µm	11	
425µm	8	
300µm	6	
150µm	2	
75µm	0	

Chart



Comments

NP = Non Plastic

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Point Load Strength Report - Diametral and Axial Testing of Rock Core

Issue Number: 1
This report replaces all previous issues

Accredited for compliance with ISO/IEC 17025.

NATA WORLD RECOGNISED ACCREDITATION

Client:	VGT Pty Ltd	Report No.:	PL:NEW17W-0073
Project:	Material Testing	Project No.:	NEW15P-0045
Location:	Thornton, NSW	Work Order No:	NEW17W-0073
		Sample No.:	S01

Date Sampled:	8/12 - 13/12/2016
Date Tested:	10/01/2017

Approved Signatory: Adam Dwyer
Title: Senior Geotechnician
Date of Issue: 13/01/2017
NATA Accredited Laboratory Number: 18686

Test Method: AS 4133.4.1 - 2007

Borehole	Test Depth (m)	Rock Type	Moisture Condition	Diametral Test							Axial Test							
				Length L (mm)	Diameter D (mm)	Load P (kN)	I_s (Mpa)	Size Correction	$I_{s(50)}$ (Mpa)	Strength Classification	Width W (diameter) (mm)	Platen Separation D (mm)	Load P (kN)	I_s (Mpa)	Size Correction	$I_{s(50)}$ (Mpa)	Strength Classification	Anisotropy Index $I_{a(50)}$
DDH2	0.10 - 0.25	Light Brown	N	99.5	60.9	2.52	0.68	1.09	0.74	M	60.9	40	2.25	0.73	1.050	0.76	M	0.98
DDH2	1.95 - 2.05	Blue / Pink	N	99.3	60.9	34.31	9.25	1.09	10.11	EH	60.9	41.22	17.01	5.32	1.057	5.62	VH	1.80
DDH2	4.20 - 4.35	Blue / Pink	N	111.3	60.9	30.37	8.19	1.09	8.95	VH	60.9	36.78	22.14	7.76	1.030	8.00	VH	1.12
DDH2	5.90 - 6.10	Blue / Pink	N	133.7	60.9	24.03	6.48	1.09	7.08	VH	60.9	36.84	21.04	7.37	1.030	7.59	VH	0.93
DDH2	7.80 - 8.00	Blue / Pink	N	127.6	60.9	29.42	7.93	1.09	8.67	VH	60.9	36.81	15.93	5.58	1.030	5.75	VH	1.51
DDH2	10.00 - 10.20	Blue / Pink	N	108.6	57.0	29.20	8.99	1.06	9.54	VH	60.9	45.52	17.26	4.89	1.081	5.28	VH	1.80
DDH2	11.40 - 11.60	Light Grey / Pink	N	141.7	60.9	15.32	4.13	1.09	4.51	VH	60.9	44.13	9.10	2.66	1.073	2.85	H	1.58
DDH2	13.90 - 14.10	Blue / Pink	N	88.5	60.9	32.75	8.83	1.09	9.65	VH	60.9	40.29	26.04	8.34	1.051	8.76	VH	1.10
DDH2	15.00 - 15.30	Light Grey	N	146.7	60.9	12.01	3.24	1.09	3.54	VH	60.9	41.37	9.37	2.92	1.058	3.09	VH	1.15
DDH2	16.75 - 17.00	Blue	N	92.4	60.7	22.92	6.22	1.09	6.79	VH	60.7	49.42	19.25	5.04	1.100	5.54	VH	1.22
DDH2	18.40 - 18.60	Blue	N	115.6	60.9	35.25	9.50	1.09	10.39	EH	60.9	38.28	20.72	6.98	1.039	7.26	VH	1.43
DDH2	20.50 - 20.60	Light Brown	N	68.7	60.3	0.97	0.27	1.09	0.29	L	60.3	41.4	0.51	0.16	1.056	0.17	L	1.71
DDH2	22.30 - 22.50	Blue	N	117.6	60.8	* 40.00	10.83	1.09	11.82	EH	60.7	61.32	39.83	8.40	1.155	9.71	VH	1.22
DDH2	24.70 - 24.90	Blue	N	104.8	60.7	31.87	8.65	1.09	9.44	VH	60.7	50.7	34.43	8.79	1.106	9.72	VH	0.97
DDH2	27.00 - 27.20	Blue / Brown	N	118.9	60.7	20.42	5.54	1.09	6.05	VH	60.7	58.31	16.37	3.63	1.142	4.15	VH	1.46
DDH2	28.50 - 28.70	Blue	N	130.8	60.7	* 40.00	10.86	1.09	11.85	EH	60.7	35.54	19.69	7.17	1.021	7.32	VH	1.62
DDH2	30.50 - 30.70	Dark Blue	N	163.0	60.6	23.79	6.48	1.09	7.06	VH	60.6	43.2	19.90	5.97	1.067	6.37	VH	1.11
DDH2	32.30 - 32.60	Dark Blue	N	89.0	60.7	11.24	3.05	1.09	3.33	VH	60.6	38.9	5.58	1.86	1.042	1.94	H	1.72

Moisture Condition:
D = Dry
N = Natural
S = Saturated

Strength Classification:

$I_{s(50)}$ Mpa	Term	Abbreviation
> 10	Extremely High Strength	EH
3 to 10	Very High Strength	VH
1 to 3	High Strength	H
0.3 to 1	Medium Strength	M
0.1 to 0.3	Low Strength	L
< 0.1	Very Low Strength	VL

Comments: * Specimens approached the loading apparatus' maximum capabilities, so testing was halted short of failure. The true result is > 40 kN. The true corresponding Mpa results will also be greater than reported.

** Specimens fractured through weak vein.

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Point Load Strength Report - Diametral and Axial Testing of Rock Core

Issue Number: 1
This report replaces all previous issues

Client:	VGT Pty Ltd	Report No.:	PL:NEW17W-0073
Project:	Material Testing	Project No.:	NEW15P-0045
Location:	Thornton, NSW	Work Order No:	NEW17W-0073
		Sample No.:	S01

Date Sampled:	8/12 - 13/12/2016
Date Tested:	10/01/2017

NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

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Approved Signatory: Adam Dwyer
Title: Senior Geotechnician
Date of Issue: 13/01/2017
NATA Accredited Laboratory Number: 18686

Test Method: AS 4133.4.1 - 2007

Borehole	Test Depth (m)	Rock Type	Moisture Condition	Diametral Test							Axial Test							
				Length L (mm)	Diameter D (mm)	Load P (kN)	I_s (Mpa)	Size Correction	$I_{s(50)}$ (Mpa)	Strength Classification	Width W (diameter) (mm)	Platen Separation D (mm)	Load P (kN)	I_s (Mpa)	Size Correction	$I_{s(50)}$ (Mpa)	Strength Classification	Anisotropy Index $I_{a(50)}$
DDH2	35.00 - 30.70	Blue / Pink	N	165.1	60.8	* 40.00	10.82	1.09	11.82	EH	60.8	54.31	15.49	3.68	1.124	4.14	VH	2.85
DDH2	37.20 - 37.50	Blue / Pink	N	190.4	60.8	31.35	8.48	1.09	9.26	VH	60.8	66.01	34.15	6.68	1.175	7.85	VH	1.18
DDH2	39.30 - 39.40	Blue / Pink	N	120.6	60.9	* 40.00	10.79	1.09	11.79	EH	60.9	42.11	21.37	6.54	1.062	6.95	VH	1.70
DDH2	41.70 - 41.80	Blue / Pink	N	111.0	60.9	* 40.00	10.79	1.09	11.79	EH	60.9	57.33	35.68	8.03	1.138	9.14	VH	1.29
DDH2	43.00 - 43.20	Grey / Light Brown	N	87.5	60.6	3.58	0.97	1.09	1.06	H	60.6	46.89	4.72	1.30	1.087	1.42	H	0.75
DDH2	44.90 - 45.10	Blue / Light Grey	N	163.5	60.7	17.29	4.69	1.09	5.12	VH	60.7	37.20	13.84	4.81	1.032	4.97	VH	1.03
DDH2	46.70 - 47.10	Blue / Pink	N	85.5	60.9	11.19	3.02	1.09	3.30	VH	60.9	41.32	6.11	1.91	1.057	2.02	H	1.64
DDH2	48.70 - 49.30	Blue / Pink	N	78.2	60.8	29.95	8.10	1.09	8.85	VH	60.8	36.80	15.92	5.59	1.030	5.75	VH	1.54
DDH2	51.20 - 51.40	Light Grey / Pink	N	83.3	60.9	26.02	7.02	1.09	7.67	VH	60.9	37.31	14.81	5.12	1.033	5.29	VH	1.45
DDH2	53.00 - 53.20	Light Grey / Pink	N	115.5	60.9	* 40.00	10.79	1.09	11.79	EH	60.9	44.63	33.56	9.70	1.076	10.43	EH	1.13
DDH2	55.10 - 55.30	Light Grey / Pink	N	110.4	60.8	18.85	5.10	1.09	5.57	VH	60.8	56.65	22.47	5.12	1.135	5.81	VH	0.96
DDH2	57.00 - 57.20	Blue / Pink	N	113.7	60.9	33.76	9.10	1.09	9.95	VH	60.9	51.16	31.33	7.90	1.109	8.76	VH	1.14
DDH2	58.90 - 59.20	Light Grey / Pink	N	142.5	60.8	23.36	6.32	1.09	6.90	VH	60.8	37.26	11.13	3.86	1.033	3.98	VH	1.73
DDH2	61.00 - 61.30	Light Grey / Pink	N	100.0	61.3	4.37	1.16	1.10	1.27	H	61.3	52.52	5.33	1.30	1.118	1.45	H	0.88
DDH2	62.90 - 63.20	Light Grey / Pink	N	124.6	60.9	* 40.00	10.79	1.09	11.79	EH	60.9	48.78	28.73	7.60	1.098	8.34	VH	1.41
DDH2	64.90 - 65.20	Blue / Pink	N	159.5	60.8	17.23	4.66	1.09	5.09	VH	60.8	36.73	12.29	4.32	1.029	4.45	VH	1.14
DDH2	67.10 - 67.30	Blue / Pink	N	95.1	60.8	30.80	8.33	1.09	9.10	VH	60.8	47.77	31.31	8.47	1.092	9.25	VH	0.98
DDH2	68.60 - 69.10	Light Grey / Pink	N	140.2	60.9	35.82	9.66	1.09	10.55	EH	60.9	56.83	15.85	3.60	1.136	4.09	VH	2.58

Moisture Condition:
D = Dry
N = Natural
S = Saturated

Strength Classification:

$I_{s(50)}$ Mpa	Term	Abbreviation
> 10	Extremely High Strength	EH
3 to 10	Very High Strength	VH
1 to 3	High Strength	H
0.3 to 1	Medium Strength	M
0.1 to 0.3	Low Strength	L
< 0.1	Very Low Strength	VL

Comments: * Specimens approached the loading apparatus' maximum capabilities, so testing was halted short of failure. The true result is > 40 kN. The true corresponding Mpa results will also be greater than reported.

** Specimens fractured through weak vein.

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ABN: 98 153 268 896

Point Load Strength Report - Diametral and Axial Testing of Rock Core

Issue Number: 1
This report replaces all previous issues

Accredited for compliance with ISO/IEC 17025.

NATA WORLD RECOGNISED ACCREDITATION

Client:	VGT Pty Ltd	Report No.:	PL:NEW17W-0073
Project:	Material Testing	Project No.:	NEW15P-0045
Location:	Thornton, NSW	Work Order No:	NEW17W-0073
		Sample No.:	S01

Date Sampled:	8/12 - 13/12/2016
Date Tested:	10/01/2017

Approved Signatory: Adam Dwyer
Title: Senior Geotechnician
Date of Issue: 13/01/2017
NATA Accredited Laboratory Number: 18686

Test Method: AS 4133.4.1 - 2007

Borehole	Test Depth (m)	Rock Type	Moisture Condition	Diametral Test							Axial Test							
				Length L (mm)	Diameter D (mm)	Load P (kN)	I_s (Mpa)	Size Correction	$I_{s(50)}$ (Mpa)	Strength Classification	Width W (diameter) (mm)	Platen Separation D (mm)	Load P (kN)	I_s (Mpa)	Size Correction	$I_{s(50)}$ (Mpa)	Strength Classification	Anisotropy Index $I_{a(50)}$
DDH2	70.70 - 71.00	Light Grey / Pink	N	105.2	60.9	18.37	4.95	1.09	5.41	VH	60.9	36.77	** 4.61	1.62	1.030	1.67	H	3.25
DDH2	72.60 - 72.80	Blue / Pink	N	116.9	60.9	32.87	8.86	1.09	9.69	VH	60.9	55.53	** 4.08	0.95	1.130	1.07	H	9.04
DDH2	75.10 - 75.30	Blue / Pink	N	121.1	60.8	28.78	7.79	1.09	8.50	VH	60.8	52.56	14.53	3.57	1.116	3.98	VH	2.13
DDH2	77.00 - 77.20	Blue	N	91.6	60.9	33.55	9.05	1.09	9.89	VH	60.9	47.61	17.74	4.81	1.092	5.25	VH	1.88
DDH2	78.80 - 79.30	Blue / White	N	92.4	61.0	32.77	8.81	1.09	9.63	VH	61.00	45.52	12.09	3.42	1.081	3.70	VH	2.61
DDH2	80.60 - 81.20	Blue / Pink	N	94.2	60.8	* 40.00	10.82	1.09	11.82	EH	60.80	50.03	** 5.12	1.32	1.104	1.46	H	8.10
DDH2	82.50 - 82.60	Blue / Pink	N	127.4	60.9	25.49	6.87	1.09	7.51	VH	60.9	52.31	** 9.17	2.26	1.115	2.52	H	2.98
DDH2	84.40 - 84.70	Blue / Pink	N	112.9	60.9	25.42	6.85	1.09	7.49	VH	60.9	43.91	18.88	5.55	1.072	5.94	VH	1.26
DDH2	86.70 - 87.00	Blue / Pink	N	134.6	60.9	31.23	8.42	1.09	9.20	VH	60.9	57.01	15.16	3.43	1.137	3.90	VH	2.36
DDH2	89.00 - 89.30	Blue / Pink	N	102.5	60.9	34.91	9.41	1.09	10.29	EH	60.9	38.19	23.17	7.82	1.039	8.13	VH	1.27
DDH2	90.40 - 91.20	Blue / Pink	N	152.1	60.9	33.19	8.95	1.09	9.78	VH	60.9	38.10	26.07	8.82	1.038	9.16	VH	1.07
DDH2	92.80 - 93.10	Light Grey / Pink	N	115.7	61.0	6.18	1.66	1.09	1.82	H	61.0	56.91	** 1.40	0.32	1.137	0.36	M	5.04
DDH2	94.80 - 95.00	Blue / Pink	N	134.8	60.8	33.69	9.11	1.09	9.95	VH	60.8	37.79	14.94	5.11	1.036	5.29	VH	1.88
DDH2	97.50 - 97.80	Blue	N	130.9	60.7	36.09	9.80	1.09	10.69	EH	60.7	50.63	37.69	9.63	1.106	10.65	EH	1.00
DDH2	99.80 - 100.00	Blue	N	138.1	60.7	* 40.00	10.86	1.09	11.85	EH	60.7	52.96	26.37	6.44	1.117	7.20	VH	1.65

Moisture Condition:
D = Dry
N = Natural
S = Saturated

Strength Classification:

$I_{s(50)}$ Mpa	Term	Abbreviation
> 10	Extremely High Strength	EH
3 to 10	Very High Strength	VH
1 to 3	High Strength	H
0.3 to 1	Medium Strength	M
0.1 to 0.3	Low Strength	L
< 0.1	Very Low Strength	VL

Comments: * Specimens approached the loading apparatus' maximum capabilities, so testing was halted short of failure. The true result is > 40 kN. The true corresponding Mpa results will also be greater than reported.

** Specimens fractured through weak vein.

APPENDIX B:

Results of Laboratory Testing – External (2017)

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UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

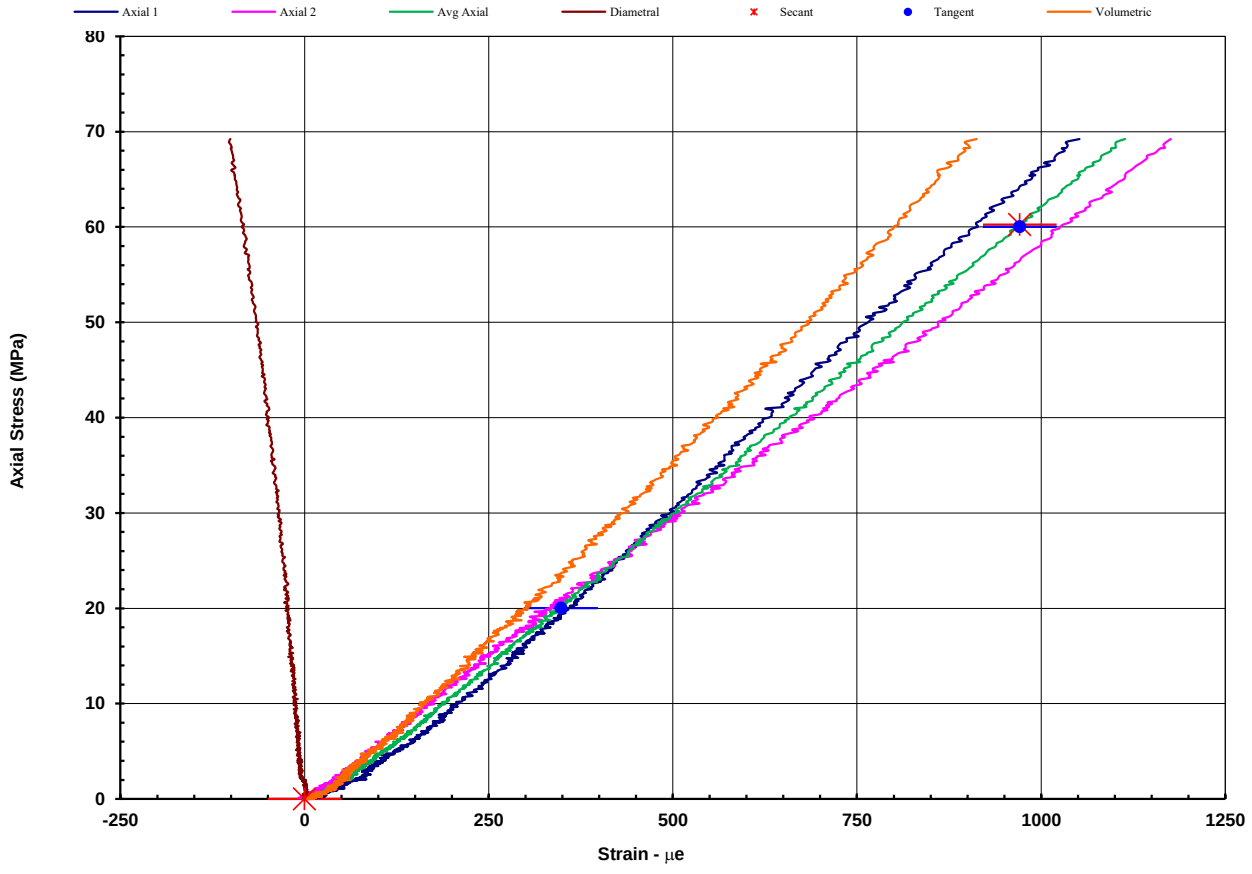
Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010483-MOD
Address	8 Ironbark Close, Warabrook NSW 2304	**Test Date**	23/01/2017
		Report Date	24/01/2017
Project	NEW15P-0045 - Material Testing, Thornton NSW		
Client ID	NEW17W-0173-S01 - DDH2	**Depth (m)**	4.20-4.35
Description	-		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 215 MPa

	Young's Modulus	Poisson Ratio	
Tangent	64.2 GPa	0.085	from 9 % to 28 % of Max UCS
Secant	62.1 GPa	0.088	from 0 % to 28 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client Graph not to scale Tested as received. **Page 1 of 2** REP03603

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory
C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE
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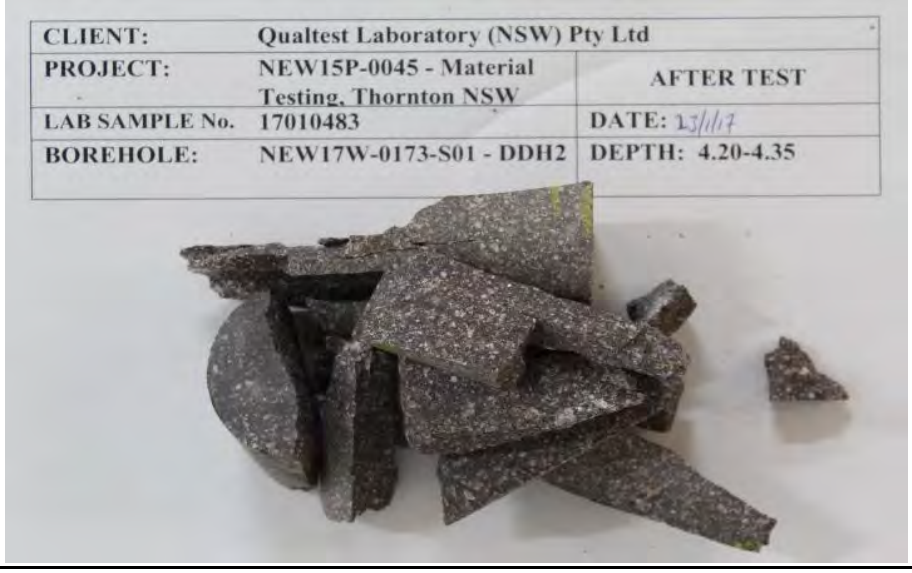
UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010483-MOD

Average Sample Diameter (mm)	60.8	Moisture Content (%)	0.5
Sample Height (mm)	158.7	Wet Density (t/m^3)	2.61
Duration of Test (min)	12.95	Dry Density (t/m^3)	2.59
Rate of Loading (MPa/min)	16.63	Bedding (°)	Nil
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell



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UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

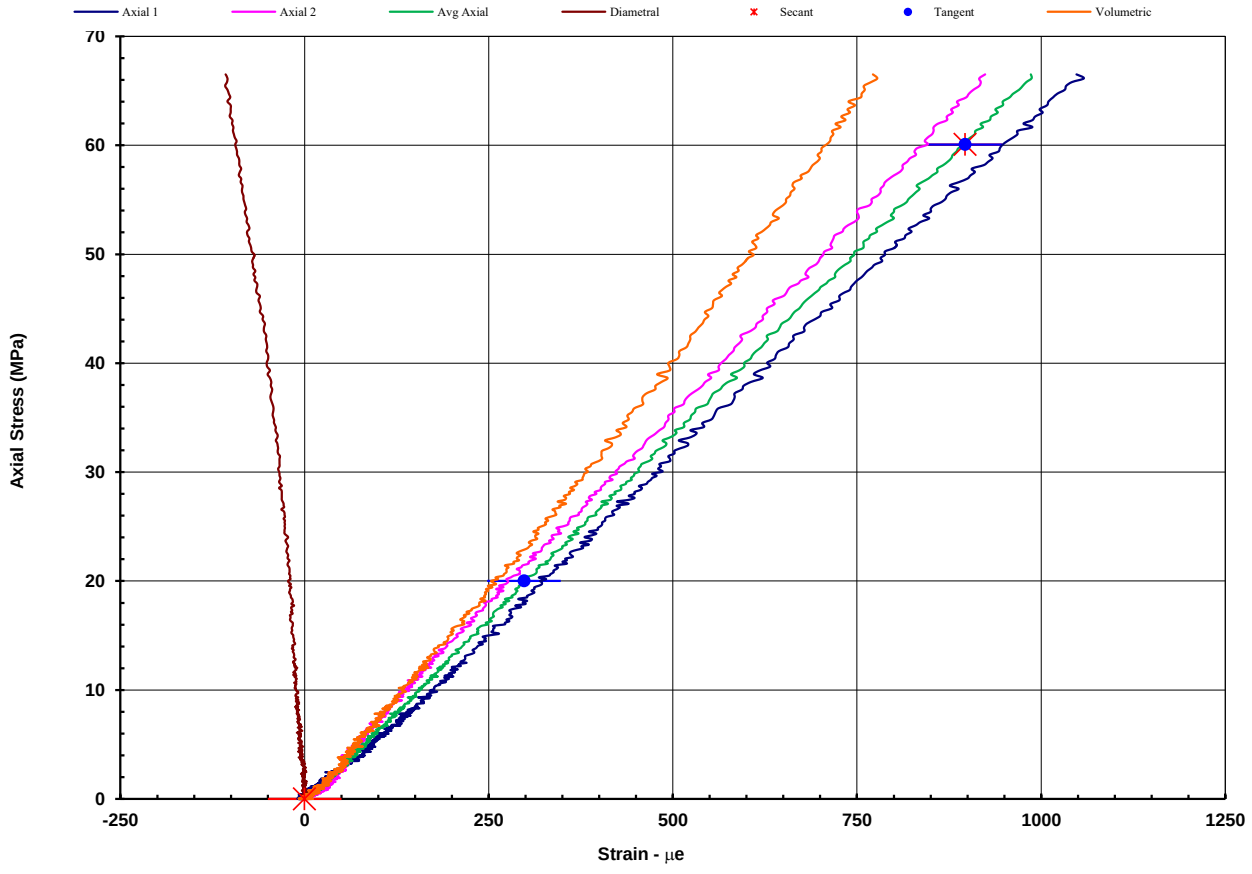
Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010484-MOD
Address	8 Ironbark Close, Warabrook NSW 2304	**Test Date**	23/01/2017
		Report Date	25/01/2017
Project	NEW15P-0045 - Material Testing, Thornton NSW		
Client ID	NEW17W-0173-S02 - DDH2	**Depth (m)**	24.70-24.90
Description	-		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 209 MPa

	Young's Modulus	Poisson Ratio	
Tangent	66.9 GPa	0.105	from 10 % to 29 % of Max UCS
Secant	67.0 GPa	0.105	from 0 % to 29 % of Max UCS

Axial Stress vs Strain Plots



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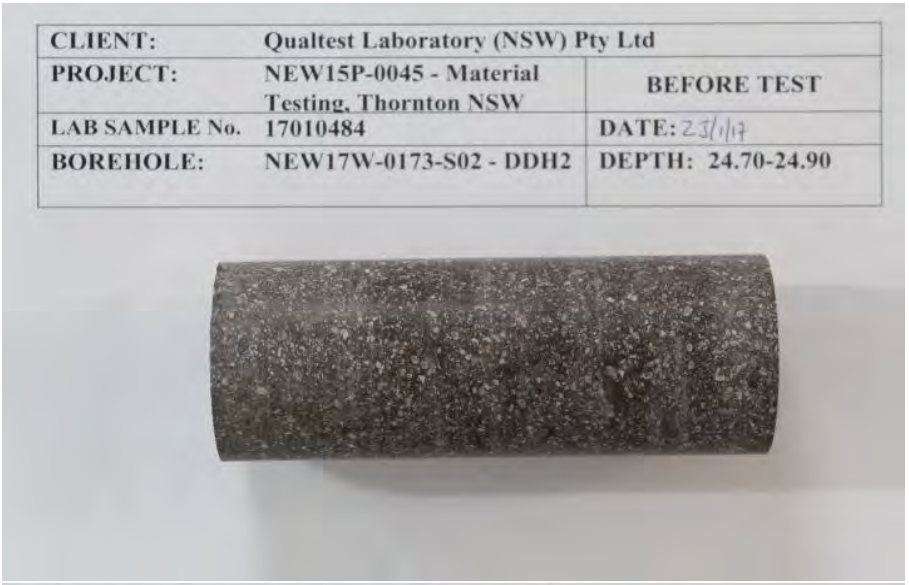
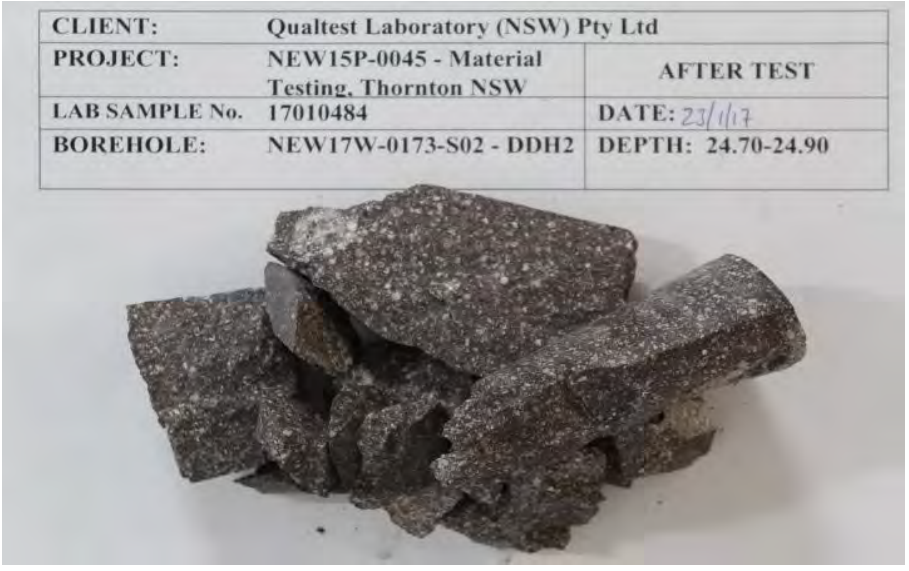
UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010484-MOD

Average Sample Diameter (mm)	60.7	Moisture Content (%)	0.4
Sample Height (mm)	158.1	Wet Density (t/m^3)	2.61
Duration of Test (min)	8.73	Dry Density (t/m^3)	2.60
Rate of Loading (MPa/min)	23.94	Bedding (°)	Nil
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell





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UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

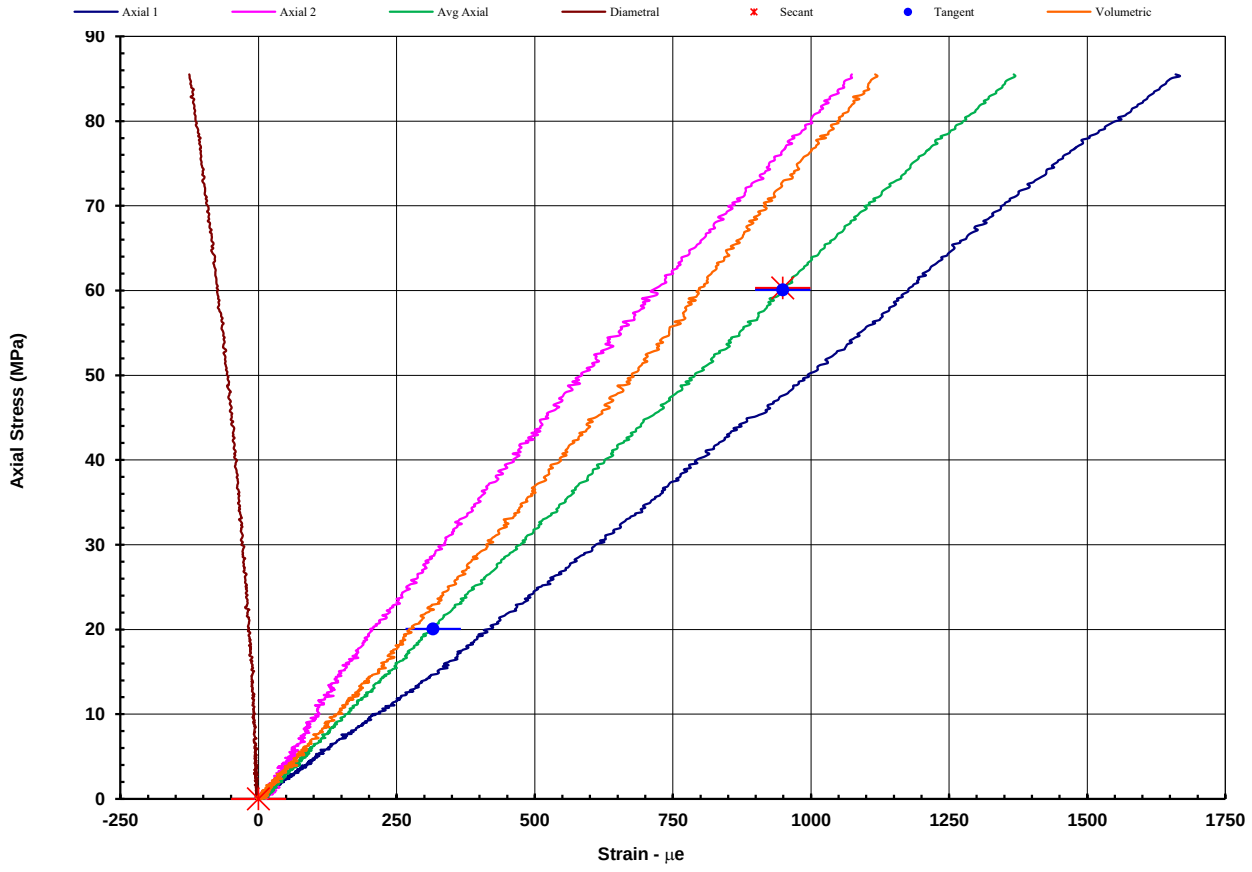
Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010485-MOD
Address	8 Ironbark Close, Warabrook NSW 2304	**Test Date**	23/01/2017
		Report Date	24/01/2017
Project	NEW15P-0045 - Material Testing, Thornton NSW		
Client ID	NEW17W-0173-S03 - DDH2	**Depth (m)**	44.90-45.10
Description	-		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 201 MPa

	Young's Modulus	Poisson Ratio	
Tangent	63.2 GPa	0.077	from 10 % to 30 % of Max UCS
Secant	63.5 GPa	0.080	from 0 % to 30 % of Max UCS

Axial Stress vs Strain Plots



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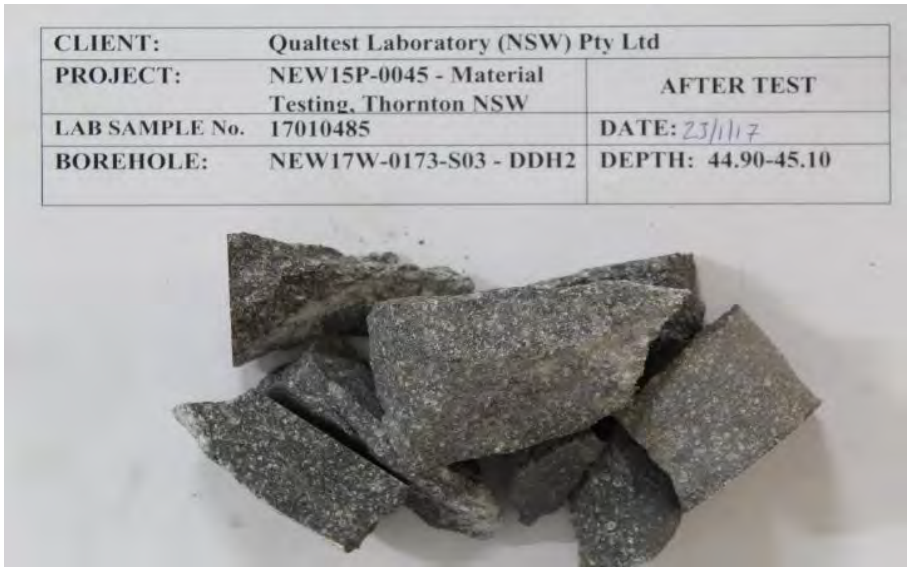
UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010485-MOD

Average Sample Diameter (mm)	60.6	Moisture Content (%)	0.6
Sample Height (mm)	160.2	Wet Density (t/m^3)	2.60
Duration of Test (min)	10.20	Dry Density (t/m^3)	2.59
Rate of Loading (MPa/min)	19.71	Bedding (°)	Nil
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell



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UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

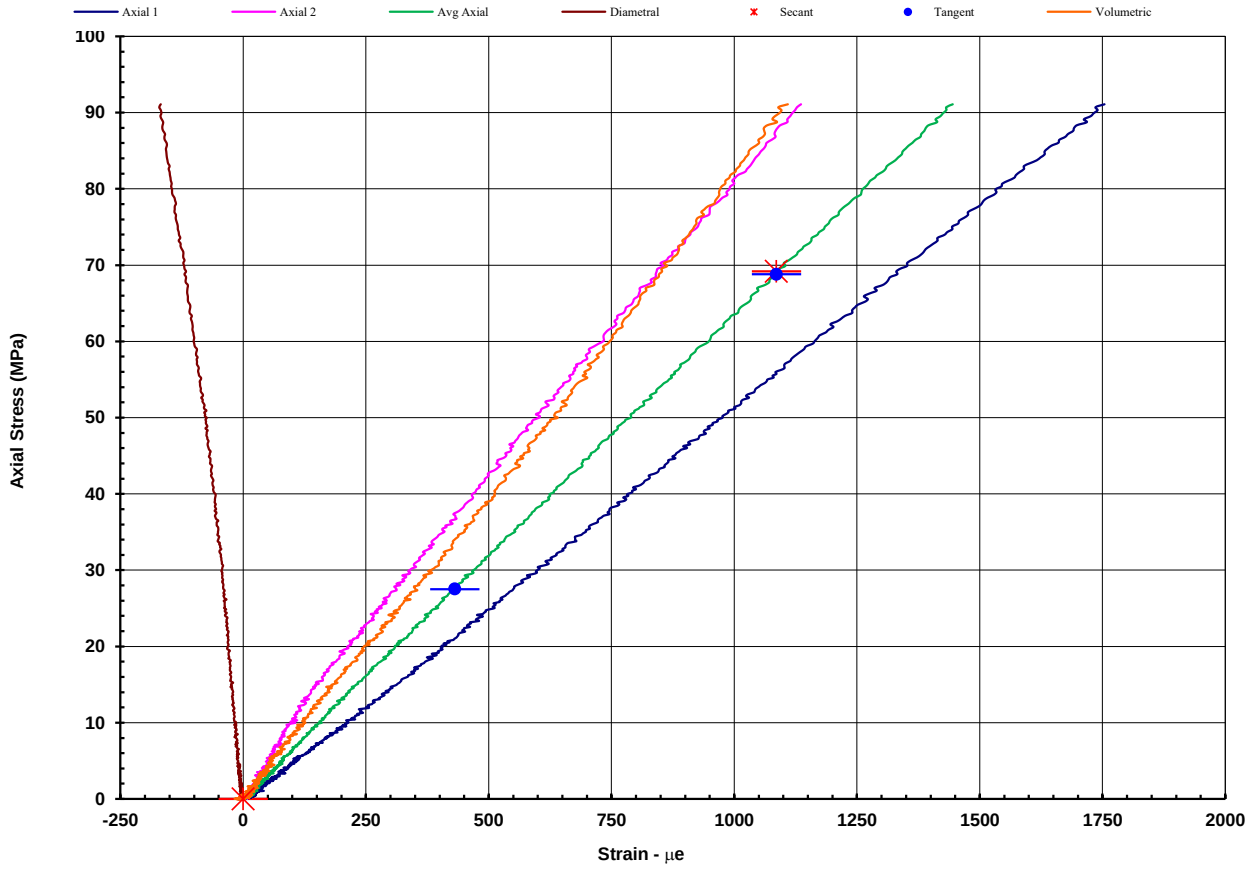
Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010486-MOD
Address	8 Ironbark Close, Warabrook NSW 2304	**Test Date**	23/01/2017
		Report Date	25/01/2017
Project	NEW15P-0045 - Material Testing, Thornton NSW		
Client ID	NEW17W-0173-S04 - DDH2	**Depth (m)**	48.70-49.30
Description	-		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 137 MPa

	Young's Modulus	Poisson Ratio	
Tangent	63.0 GPa	0.107	from 20 % to 50 % of Max UCS
Secant	63.7 GPa	0.110	from 0 % to 50 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

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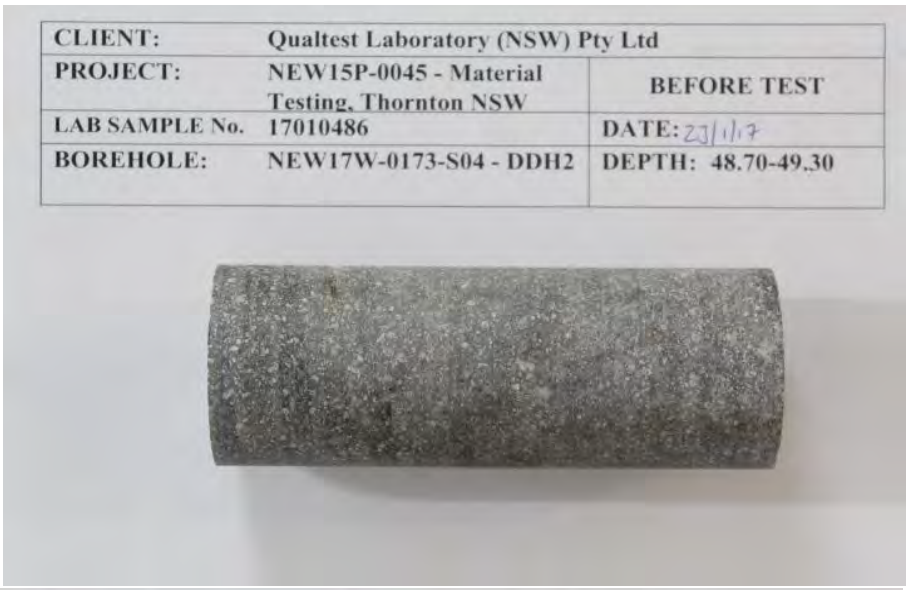
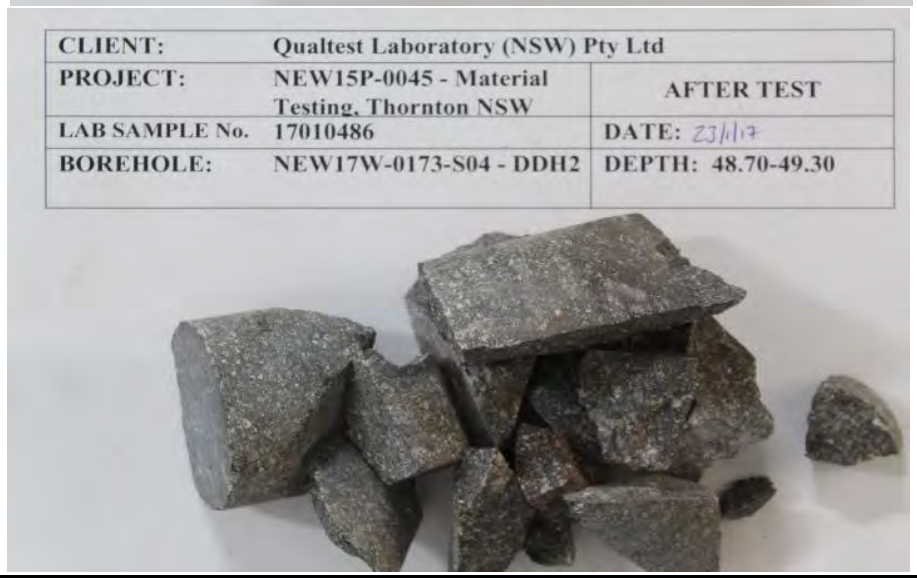
UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010486-MOD

Average Sample Diameter (mm)	60.7	Moisture Content (%)	0.5
Sample Height (mm)	161.2	Wet Density (t/m^3)	2.60
Duration of Test (min)	9.35	Dry Density (t/m^3)	2.59
Rate of Loading (MPa/min)	14.68	Bedding (°)	Nil
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell





Notes/Remarks:

Sample/s supplied by client Graph not to scale Tested as received.

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The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National Standards.

Tested at Trilab Brisbane Laboratory.

Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

Trilab
Soil Rock Calibration

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

Perth
2 Kimmer Place,
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WA 6107
Ph: +61 8 9258 8323

UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

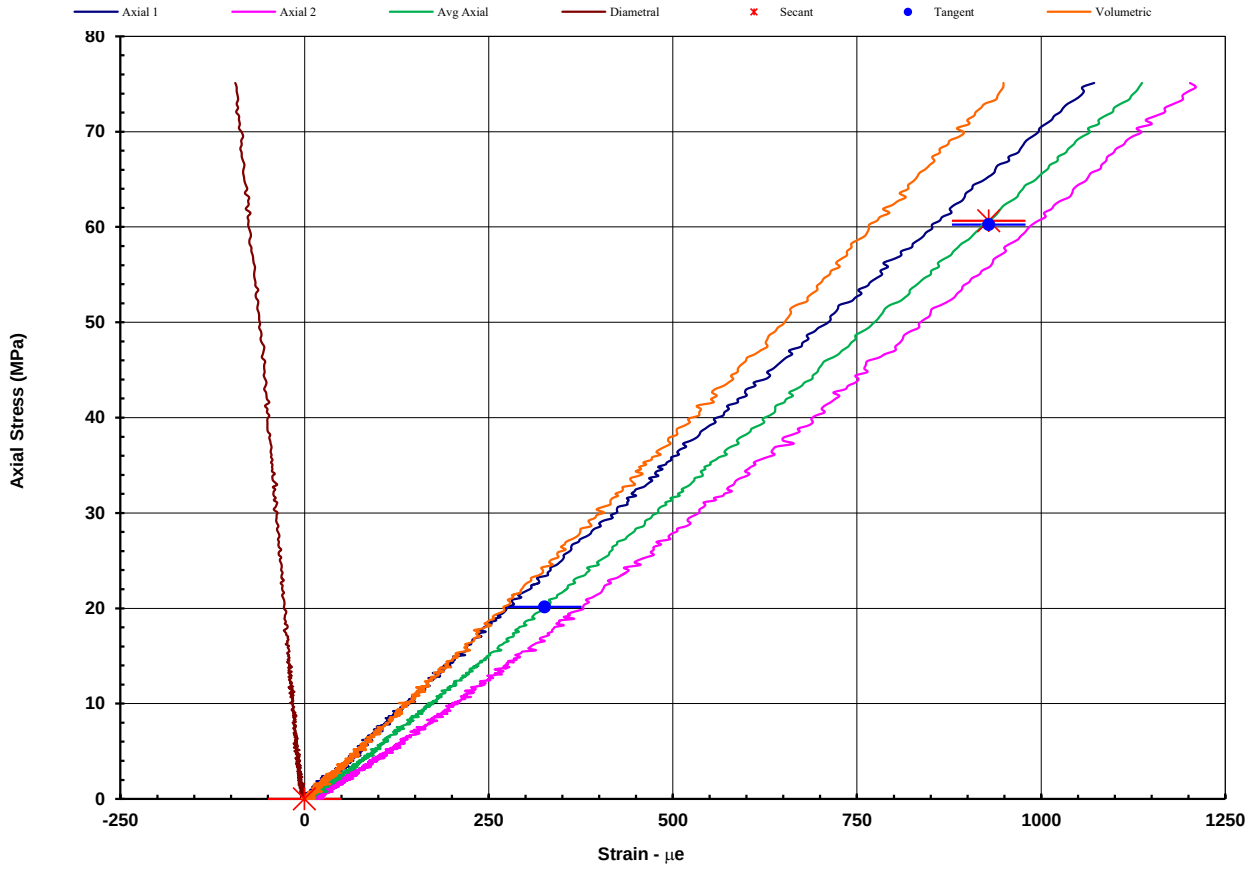
Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010487-MOD
Address	8 Ironbark Close, Warabrook NSW 2304	**Test Date**	23/01/2017
		Report Date	25/01/2017
Project	NEW15P-0045 - Material Testing, Thornton NSW		
Client ID	NEW17W-0173-S05 - DDH2	**Depth (m)**	99.80-100.00
Description	-		
Sample Type	Single Individual Rock Core Specimen		

Uniaxial Compressive Strength 228 MPa

	Young's Modulus	Poisson Ratio	
Tangent	66.5 GPa	0.082	from 9 % to 26 % of Max UCS
Secant	65.3 GPa	0.083	from 0 % to 26 % of Max UCS

Axial Stress vs Strain Plots



Notes/Remarks:

Sample/s supplied by client Graph not to scale Tested as received. **Page 1 of 2** REP03603

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Tested at Trilab Brisbane Laboratory.

Authorised Signatory
C. Channon

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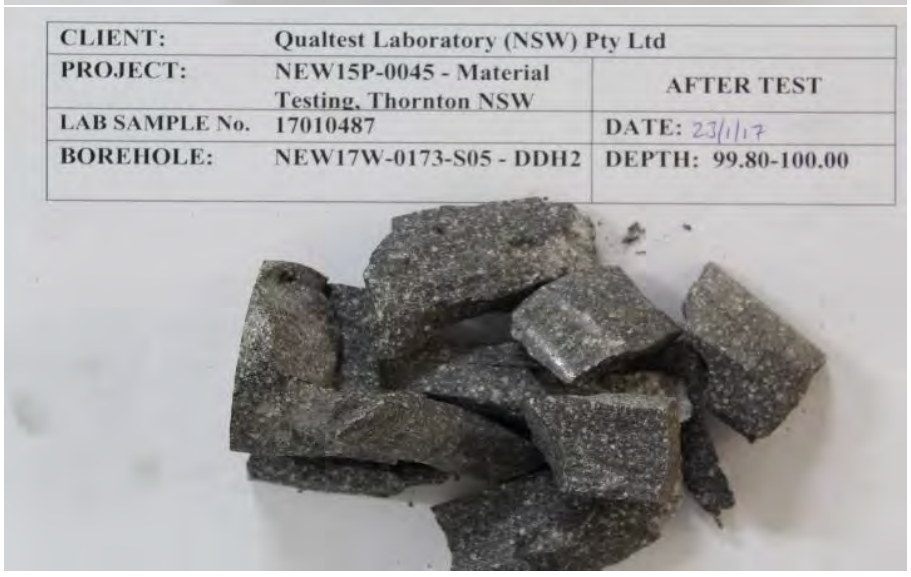
UNIAXIAL COMPRESSIVE STRENGTH & DEFORMATION TEST REPORT

Test Method: AS 4133.4.3.1

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17010487-MOD

Average Sample Diameter (mm)	60.4	Moisture Content (%)	0.4
Sample Height (mm)	160.0	Wet Density (t/m^3)	2.64
Duration of Test (min)	10.73	Dry Density (t/m^3)	2.63
Rate of Loading (MPa/min)	21.22	Bedding (°)	Nil
Mode of Failure	Disintegration	Test Apparatus	Kelba 1000kN Load Cell



Notes/Remarks:

Sample/s supplied by client Graph not to scale Tested as received.

Accredited for compliance with ISO/IEC 17025.
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Tested at Trilab Brisbane Laboratory.

Authorised Signatory

C. Channon

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CERCHAR ABRASIVITY INDEX TEST REPORT

ASTM D7625 - 10 - Standard Test Method for Laboratory Determination of Abrasiveness of Rock Using the Cerchar Method

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17020012-CERC
Address	8 Ironbark Close, Warabrook NSW 2304	**Test Date**	1/02/2017
		Report Date	2/02/2017
Project	NEW15P-0045 - Material Testing - Various, NSW	**Depth (m)**	Not Supplied
Client ID	NEW17W-0307-S01 - DDH2	**Sample Type**	Single Individual Rock Core Specimen
Description	-		

SAMPLE DETAILS

Sample Diameter (mm):	60.6	**Moisture Content (%):**	0.2
Sample Height (mm):	69.9	**Dry Density (t/m^3)**	2.64
Surface Type :	Smooth (Saw Cut) Surface	**Wet Density (t/m^3)**	2.65

RESULTS OF TESTING

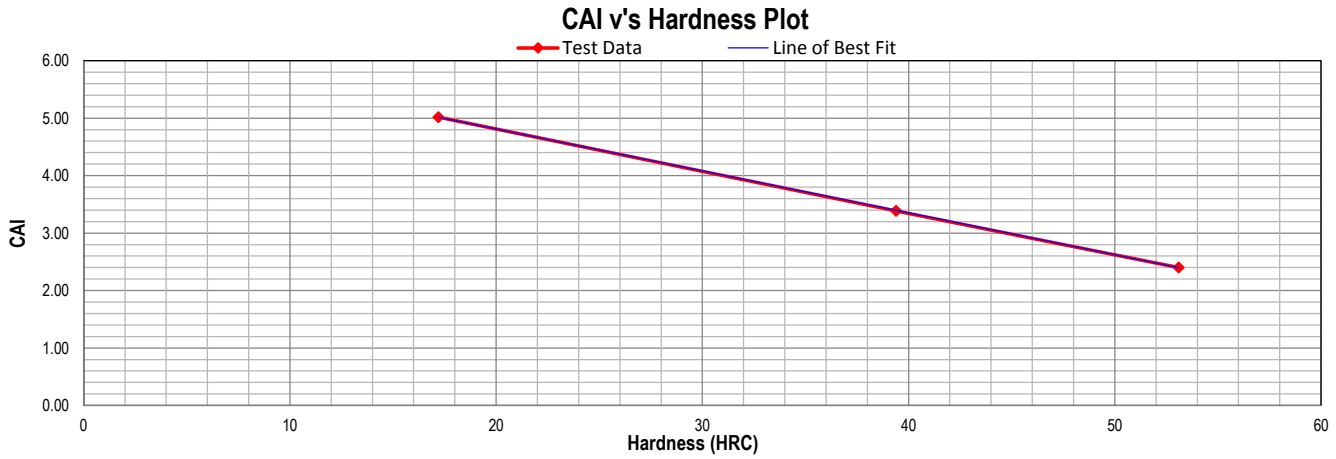
Hardness of Tip Used	17 HRC	Hardness of Tip Used	39 HRC	Hardness of Tip Used	53 HRC
Average Diameter (mm)	*CAI	Average Diameter (mm)	*CAI	Average Diameter (mm)	*CAI
0.50	5.02	0.34	3.39	0.24	2.40

Linear Relationship between Tip Hardness and CAI

CAI = (-0.073 x HRC) + 6.2698

Average CAI$_s$ (HRC55) = 2.71 Corrected for Smooth Saw Cut Surface

Classification : High abrasiveness



Remarks:

Sample/s supplied by client

* CAI values corrected for smooth surface.

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

Tested at Trilab Brisbane Laboratory.

Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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CERCHAR ABRASIVITY INDEX TEST REPORT

ASTM D7625 - 10 - Standard Test Method for Laboratory Determination of Abrasiveness of Rock Using the Cerchar Method

Client	Qualtest Laboratory (NSW) Pty Ltd	**Report No.**	17020012-CERC

BEFORE & AFTER PHOTOS

CLIENT:	Qualtest Laboratory (NSW) Pty Ltd	
PROJECT:	NEW15P-0045 - Material Testing - Various, NSW	BEFORE TEST
LAB SAMPLE No.	17020012	DATE: 1/02/17
BOREHOLE:	NEW17W-0307-S01 - DDH2	DEPTH: Not Supplied

CLIENT:	Qualtest Laboratory (NSW) Pty Ltd	
PROJECT:	NEW15P-0045 - Material Testing - Various, NSW	AFTER TEST
LAB SAMPLE No.	17020012	DATE: 1/02/17
BOREHOLE:	NEW17W-0307-S01 - DDH2	DEPTH: Not Supplied

Remarks:

Sample/s supplied by client

* CAI values corrected for smooth surface.

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Tested at Trilab Brisbane Laboratory.

Authorised Signatory

C. Channon

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Laboratory No. 9926

ORGANIC MATTER REPORT

Client:	Qualtest Laboratory Pty Ltd	**Source:**	NEW 17W-0307-S01
Address:	8 Ironbark Close, Warabrook NSW 2304	**Sample Description:**	Sandy GRAVEL
Project:	Material Analysis	**Report No:**	B35669-OC
Job No:	B17041	**Lab No:**	B35669

Test Procedure: ☑ AS1289 4.1.1 Soil Chemical Tests - Determination of the organic matter content of a soil - Normal method

Sampling:	Sampled by Client	**Date Sampled:**	23/01/2017
Preparation:	Prepared in accordance with the test method		

Organic Matter (%)	0.1

NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Brad Morris

7/02/2017

Date:

Macquarie Geotechnical
3 Watt Drive
Bathurst NSW 2795

Accredited for compliance with ISO/IEC 17025 Accreditation Number 5598

SAMI Bitumen Technologies

12 Grand Ave, Camellia
NSW 2142 Or PO Box 164
Winston Hills, NSW 2153

Laboratory @samibitumen.com.au

Ph: 02 9638 0150
Fax: 02 8209 4873

PRODUCT TEST REPORT

Test Report No.: 36389
Product: NEW Aggregates
Client Sample No.: NEW17W-0307-S01
SAMI Sample No.: ME70306
Date on P. Order: 01-03-2017
Sample Details: QTPO17-0071
Binder Type: SAMI Bitumen Class 170
Test completed on: 17-03-2017
Specification: RMS 3258

Method	Property	Result	Specification
RMS T238	Initial Adhesion using SAMI C170 binder with 7% kerosene*, on NEW17W0307-S01 aggregates, precoated with SAMI standard precoat plus 1% Redicote 422/60, soaked curing condition and unsoaked curing condition	<5% <5%	Maximum 10% stripping
RMS T230	Resistance to stripping using SAMI C170 binder on same precoated aggregates, plus 1% Redicote 422/60. Oven temperature for conditioning = 68.5C and tendency for aggregates to crumble when pulled is <2%	<2%	Maximum 10% stripping

Certificate Issued Date: 17-03-2017
Sampling Method: Test as received
Testing Operator Name: M. T.
Softening point of SAMI C170 (ME70258) = 48.5C; *Viscosity of cutback binder at test temperature =15000 stokes

Authorised Officer of the Company
B. Chik, Quality Manager

Accredited for compliance with ISO/IEC 17025 Accreditation Number 5598

SAMI Bitumen Technologies

12 Grand Ave, Camellia
NSW 2142 Or PO Box 164
Winston Hills, NSW 2153

Laboratory @samibitumen.com.au

Ph: 02 9638 0150
Fax: 02 8209 4873

PRODUCT TEST REPORT

Test Report No.: 36390
Product: NEW Aggregates
Client Sample No.: NEW17W-0307-S01
SAMI Sample No.: ME70306
Date on P. Order: 01-03-2017
Sample Details: QTPO17-0071
Binder Type: Polyseal S35E
Test completed on: 17-03-2017
Specification: RMS 3268

Method	Property	Result	Specification
RMS T238	Initial Adhesion using Polyseal S35E binder with 8% kerosene, on NEW17W-0307-S01 aggregates, precoated with SAMI standard precoat plus 1% Redicote 422/60, soaked curing condition and unsoaked curing conditions	 <5 <5	Maximum 10% stripping
RMS T230	Resistance to stripping using Polyseal S35E binder on same precoated aggregates plus 1% Redicote 422/60. Oven temperature for conditioning = 74.0C and tendency for aggregates to crumble when pulled is <2%	<2	Maximum 10% stripping

Certificate Issued Date: 28-10-2016
Sampling Method: Test as received
Testing Operator Name: G. Y.
Softening point of Polyseal S35E (C17176) = 54.0C
For RMS T238, viscosity of cutback binder at test temperature = 15000 stokes

Authorised Officer of the Company
B. Chik, Quality Manager

SYDNEY
ANALYTICAL
LABORATORIES

Office:
PO BOX 48
ERMINGTON NSW 2115

Laboratory:
1/4 ABBOTT ROAD
SEVEN HILLS NSW 2147
Telephone: (02) 9838 8903
Fax: (02) 9838 8919
A.C.N. 003 614 695
A.B.N. 81 829 182 852
NATA No: 1884

ANALYTICAL REPORT for:

QUALTEST LABORATORY PTY LTD

8 IRONBARK CLOSE
WARABROOK, NSW 2304

ATTN: ADAM DWYER

JOB NO:	SAL26195H
CLIENT ORDER:	17W-0307
DATE RECEIVED:	02/02/17
DATE COMPLETED:	10/02/17
TYPE OF SAMPLES:	AGGREGATE
NO OF SAMPLES:	1

NATA Accredited for compliance with ISO/IEC 17025

.....
Issued on 10/02/17
Lance Smith
(Chief Chemist)

SYDNEY ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB NO: SAL26195H
CLIENT ORDER: 17W-0307

	SAMPLES	Cl %	SO4 % as SO3
1	NEW17W-0307-S01	0.004	0.001
	MDL	0.001	0.001
	Method Code	C32	C33
	Preparation	P5	P5

RESULTS ON DRY BASIS
SAMPLE DESCRIPTION: DDH2

SYDNEY ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB NO: SAL26195H
CLIENT ORDER: 17W-0307

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5	Sample dried, split and crushed to -150um
C32	Acid Soluble Chloride - AS1012.20
C33	Acid Soluble Sulphate - AS1012.20

SYDNEY
ANALYTICAL
LABORATORIES

Office:
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ERMINGTON NSW 2115

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SEVEN HILLS NSW 2147
Telephone: (02) 9838 8903
Fax: (02) 9838 8919
A.C.N. 003 614 695
A.B.N. 81 829 182 852
NATA No: 1884

ANALYTICAL REPORT for:

QUALTEST LABORATORY PTY LTD

8 IRONBARK CLOSE
WARABROOK, NSW 2304

ATTN: DANE CULLEN

JOB NO:	SAL26262C
CLIENT ORDER:	17W-0307
DATE RECEIVED:	29/03/17
DATE COMPLETED:	31/03/17
TYPE OF SAMPLES:	AGGREGATE
NO OF SAMPLES:	1

NATA Accredited for compliance with ISO/IEC 17025

.....
Issued on 31/03/17
Lance Smith
(Chief Chemist)

ANALYTICAL REPORT

JOB NO: SAL26262C
CLIENT ORDER: 17W-0307

	SAMPLES	SO4 % as SO3
1	NEW17W-0307-S01	0.010
	MDL	0.001
	Method Code	C34
	Preparation	P5

RESULTS ON DRY BASIS
SAMPLE DESCRIPTION: DDH2

ANALYTICAL REPORT

JOB NO: SAL26262C
CLIENT ORDER: 17W-0307

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5	Sample dried, split and crushed to -150um
C34	Acid Soluble Sulphate - RMS T219

Network Geotechnics Pty Ltd
Geotechnical Engineering, Consulting & Testing Services

ACN 069 211 561
Unit 1/140 Industrial Road
Oak Flats NSW 2529 AUSTRALIA
Telephone 61 2 4257 4458
Facsimile 61 2 4257 4463
Email southcoast@netgeo.com.au

TEST REPORT

Client:	Qualtest	Job No:	W07/3100	Sheet:	1 of 1
Principal:	-				
Project:	Material Testing	Tested By:	TM	Date:	3.02.17
Location:	Various Locations, NSW	Checked By:	HU	Date:	6.02.17

Sample Description:	**Rock Core (DDH2)**	Sample Procedure:	**Sampled by Client**
Sample Number:	**38**	Laboratory Number:	**W59855**
Date Sampled:	**23/01/2017**	Client Job Number:	**NEW17W-0307**
Client Number:	**NEW17W-0307-S01**		

DETECTION OF SUGAR - AS1141.35

	TEST PROCEDURE	TEST RESULTS
Sugar	Not Detected/Detected	Not Detected

REMARKS:

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Wollongong Laboratory 1318

APPROVED SIGNATORY: Harry Ubungen

DATE: 6/02/2017

Network Geotechnics Pty Ltd
Geotechnical Engineering, Consulting & Testing Services

ACN 069 211 561
Unit 1/140 Industrial Road
Oak Flats NSW 2529
Telephone 61 2 4257 4458
Facsimilie 61 2 4257 4463
Email southcoast@netgeo.com.au

TEST REPORT

Client:	Qualtest	**Job Number:**	W07/3100
Project:	Material Testing	**Report Number:**	-
Location:	Various Locations, NSW	**Report Date:**	6/02/2017
GTR Number :	NEW17W-0307	**Tested By:**	Tim Mathie

Sample Identification

Sample Description :	Rock Core (DDH2)	Sampling Procedure:	Sampled By Client
Sample Number:	38		
Laboratory Number:	W59855	Date Sampled:	23/01/2017
Client Number:	NEW17W-0307-S01		

DETERMINATION OF LIGHT PARTICLES - AS 1141.31

TEST PROCEDURE		TEST RESULTS
Light Particles	%	0

REMARKS:

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Wollongong Laboratory 1318

APPROVED SIGNATORY: Harry Ubungen

DATE: 6/02/2017

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Telephone 61 2 4257 4458
Facsimile 61 2 4257 4463
Email southcoast@netgeo.com.au

TEST REPORT

Client:	Qualtest Laboratory	Job No:	W07/3100	Sheet:	1 of 1
Principal:	-				
Project:	Material Testing	Tested By:	TM	Date:	3.02.17
Location:	Various Locations, NSW	Checked By:	HU	Date:	6.02.17

Sample Description:	**Rock Core (DDH2)**	Sample Procedure:	**Sampled By Client**
Sample Number:	**38**		
Date Sampled:	**23/01/2017**	Client Number:	**NEW17W-0307-S01**
Laboratory Number:	**W59855**		

Determination of Methylene Blue Adsorption Value of Road Construction Materials

TEST PROCEDURE AS 1141.66		TEST RESULT
Methylene Blue Value (MBV)	mg/g	2.5

REMARKS:

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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Wollongong Laboratory 1318

APPROVED SIGNATORY: Harry Ubungen

DATE: 6/02/2017

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TEST REPORT

Accelerated mortar bar test for the assessment of alkali-reactivity of aggregate

Client: Qualtest
Project: Material Testing
Location: Warabrook NSW

Job No: W07/3100
Report Number: 1
Test Date 10/03/2017

Page: 1 of 1
Ed. No: 1

This report replaces all previous issues of the above report number.

Date Sampled: 8/12/2016
Sample Location: Not Known
Sampled by: Client
Sampling Procedure: Sampled by Client
Sample Number: W60067 (#39)
Client sample number: NEW17W-0307-S01

Type of aggregate: Crushed Cores (DDH2)
Source of aggregate: Not Known
Type of cement used: Port Kembla GP
Source of cement : Cement Australia Port Kembla
Test Method: RMST363

Flow (%)	7
Water to cement ratio	0.42

Age (days)	Change in length (%)
1	0.004
3	0.032
7	0.069
10	0.098
14	0.138
21	0.206

Table T363/A
Aggregate Reactivity Classification

Mortar Bar Expansion (%) in 1M NaOH (80°C)		Classification
10 days	21 days	
< 0.10*	< 0.10*	Non-reactive
< 0.10*	≥ 0.10*	Slowly reactive
≥ 0.10*	>> 0.10*	Reactive

* 0.15% for naturally occurring fine aggregates

REMARKS:

NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025

Wollongong Laboratory: 1318

APPROVED SIGNATORY: Tim Mathie
DATE: 3/04/2017

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Email: southcoast@netgeo.com.au

TEST REPORT

DETERMINATION OF POLISHED AGGREGATE FRICTION VALUE

Client: Qualtest
Project: Material Testing
Location: Warrabrook NSW

Job No: W07/3100
Report Number: 1
Test Date 15/03/2017

Page: 1 of 1
Ed. No: 1

This report replaces all previous issues of the above report number.

Date Sampled: 8/12/2016
Sample Location: Not known
Sampled by: Client
Sampling Procedure: Sampled by Client
Sample Number: W60067
Sample Description: Crushed Core (DDH2)
Client Sample Number: NEW17W-0307-S01

Size of aggregate tested: -9.5+6.7
Reference material: Panmure Basalt
Ambient air temperature: 25°C
Size of slider: 75mm
Polishing Test Method: AS1141.41
Friction Testing Method: AS1141.42

	Test sample	Reference sample Panmure Basalt
The unpolished test sample mean friction value corrected to a temperature of 23°C	77	75
The polished test sample mean friction value corrected to a temperature of 23°C	48	49
The polished aggregate friction value (PAFV)	50	51

REMARKS:

NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025

Wollongong Laboratory: 1318

APPROVED SIGNATORY: Tim Mathie
DATE: 16/03/2017

Geochempet Services

ABN 980 6945 3445
PETROLOGICAL and GEOCHEMICAL CONSULTANTS
Principals: K.E. Spring BSc (Hons), MAppSc and H.M. Spring B.Sc

5/14 Redcliffe Gardens Drive
Clontarf Q 4019

Telephone: (07) 3284 0020

Email: *info@geochempet.com*
www.geochempet.com

PETROGRAPHIC REPORT
ON A DRILL CORE SAMPLE (NEW17W-0117-S01)

prepared for

QUALTEST LABORATORY (NSW) PTY LTD
WARABROOK, NSW

Order Number: QTPO17-0015

Invoice Number: 00007463

Client Ref: Adam Dwyer

Issued by

K. E. Spring B.Sc (Hons), MAppSc
7 February 2017

Sample Number: NEW17W-0117-S01 **Date Sampled**: 13/12/16

Borehole Descript.: DDH2-P1 **Date Received**: 13/01/17

Project Name: Material Testing

Work Order No.: NEW17W-0117 **Project No.**: NEW15P-0045

Location: Warrabrook, NSW

Work Requested Petrographic analysis in relation to suitability for use as a source of road base, concrete sand/aggregate, asphaltic/sealing aggregate, rail ballast, rip rap, marine armour rock and dimension stone

Methods Account taken of ASTM C295 Standard Guide for *Petrographic Assessment of Aggregates for Concrete,* the AS2758.1 – 2014 *Aggregates and rock for engineering purposes part 1; Concrete aggregates (Appendix B),* and of the content of the 2015 joint publication of the Cement and Concrete Association of Australia and Standards Australia, entitled *Alkali Aggregate Reaction - Guidelines on Minimising the Risk of Damage to Concrete Structures in Australia* and in accordance with *ASTM C 294 Standard Guide for Petrographic Assessment of Railway Ballast* and to the content of the 1996 publication of Standards Australia (AS 2758.7 – Appendix B), entitled Aggregates and Rock for Engineering Purposes- Part 7: Railway Ballast, and in accordance with ASTM C1721-09 *Standard Guide for Petrographic Assessment of Dimension Stone*, and in accordance with ASTM D4992-07 *Standard Guide for Evaluation of Rock to be used for Erosion Control*

Identification Hematized rhyolitic tuff

Description

The supplied sample of drill core consists of moderate red, apparently unweathered, quite robust acid tuff, displaying numerous phenoclasts of transparent quartz, pinkish feldspar, and sparse biotite and opaque oxide grains set in a very finely crystalline, obviously vitroclastic matrix. The ends of the core are a parallel set of limonite and manganese-coated joint surfaces. The rock can only be very lightly scratched by a steel tool.

Plate 1. Photograph of the supplied drill core sample.

A thin section was prepared to permit detailed microscopic examination in transmitted polarised light of the drill core. An approximate mineralogical composition of the rock expressed in volume percent and based on a count of 100 widely spaced points falling within the thin section, is:

Durable Minerals

52%	finely microcrystalline feldspars and quartz (17-18%) as devitrification products after former vitric shards
41%	coarser feldspars and quartz (12%) as devitrification products and phenoclasts
<1%	opaque oxide phenoclasts
<1%	hornblende phenoclasts
5%	hematite
<1%	leucoxene
<1%	epidote

Weak &/or Deleterious Minerals

2%	sericite/illite
trace	fine clay

In thin section, the rock is seen to represent acid tuffaceous rock in which numerous subhedral, corroded and broken phenoclasts (mainly about 0.2 to 5 mm) are dispersed through a finely devitrified matrix with obvious ghosts of former welded vitric shards (about 0.2 to 0.5 mm long) and minor compressed pumice.

The phenoclasts comprise finely clouded by clays and are very slightly sericitized with rare chloritization of plagioclase, finely clay-clouded but otherwise unaltered K-feldspar and beta-form quartz along with minor biotite (now converted to hematite, epidote, leucoxene and sericite), almost completely but similarly-altered hornblende and opaque oxide. The formerly vitroclastic matrix is now devitrified to a finely microcrystalline mosaic (mainly finer than 0.01 mm) with micro-spherulites and related fibrous sheafs of mainly feldspars and quartz. Minor,

small patches or clasts in the matrix show coarser devitrification (up to about 0.2 mm grainsize). Fine sericite (possibly illitic) and chlorite is present in minor amounts in the devitrified matrix, which is pervasively, pigmented between former vitric shards by very fine hematite along with small patches of hematitized former mafic minerals.

Comments and Interpretations

The supplied drill core sample (labelled NEW17W-0117-S01) is interpreted to be devitrified tuff which is of broadly rhyolitic composition (using the classification criteria of the International Union of Geological Sciences) or of more specific rhyo-dacitic composition (using narrower, older established British/Australian criteria). The rock is thought to have originated as acid ashflow tuff (or "ignimbrite") composed of phenoclasts of quartz and feldspars dispersed through a welded matrix of vitric shards and minor compressed pumice. At some stage after initial solidification, the tuff was finely devitrified, hematitized and slightly sericitized.

For engineering purposes the rock represented in the supplied drill core sample may be summarised as:

- former vitric crystal **acid tuff** with a composition equivalent broadly to **rhyolite** or more specifically to rhyo-dacite (i.e. equivalent to acid volcanic rock)
- now devitrified, but otherwise only slightly altered
- now finely crystalline
- unweathered
- non-porous
- carrying about 2% of weak mineral (sericite/illite and a trace of fine clays)
- **quite hard**
- **strong**

The rock is predicted to be **durable**.

Because the rock carries an estimated 17-18% of finely micro-crystalline quartz (as a devitrification product), it is predicted to have **substantial potential for deleterious alkali-silica reactivity in concrete**.

Thus, devitrified tuff of the type represented in the supplied sample is predicted to be **suitable for use as a source of manufactured concrete sand and concrete aggregate**: provided that appropriate precautions are taken in mix and engineering design to take account of its perceived potential for substantial deleterious alkali-silica reactivity.

Guidance on how to deal with the perceived potential for deleterious alkali-silica reactivity may be found in the 1996 joint publication of the *Cement and Concrete Association of Australia* and *Standards Australia,* entitled *Alkali Aggregate Reaction - Guidelines on Minimising the Risk of Damage to Concrete Structures in Australia.*

The rock is considered to have **more than adequate strength and durability for use in asphaltic/sealing aggregate**. Some rhyolitic rock types can present problems in relation to bonding to bitumen and polishing in service.

Thus, devitrified tuff of the type represented in the supplied sample is predicted to be **suitable for use as a source of road base, rail ballast** (subject to compliance with the Durability Criteria of CT147 / AS2758.7) **and rip rap**.

Non-porous, unweathered rock equivalent to the supplied sample may be suitable for use as a source of durable marine armour rock. However, supplementary observations at the quarry or using product rock of large size would be required to check whether rock fragments of suitable size, free of weak or permeable joints, veins or other physical defects can be obtained: the more weathered and fractured rock should be avoided. It is common for acid volcanic and sub-volcanic rock to be fairly closely jointed, a characteristic which facilitates quarrying and crushing, but which may limit the availability of armour rock of suitably large and stable size.

It seems from petrographic examination that the rhyolitic tuff may have potential for use as a source of 'granite' dimension stone ('granite' being a very broad, ill-defined term used by stonemasons for almost any crystalline rock which is not 'marble'), subject to appropriate consideration of the impact of jointing or veining from visual inspection at the quarry and the presence of illitic clay.

Free Silica Content

The free silica content is about 29-30%, with 12% as common quartz and 17-18% as finely micro-crystalline quartz, all locked within crystalline rock.

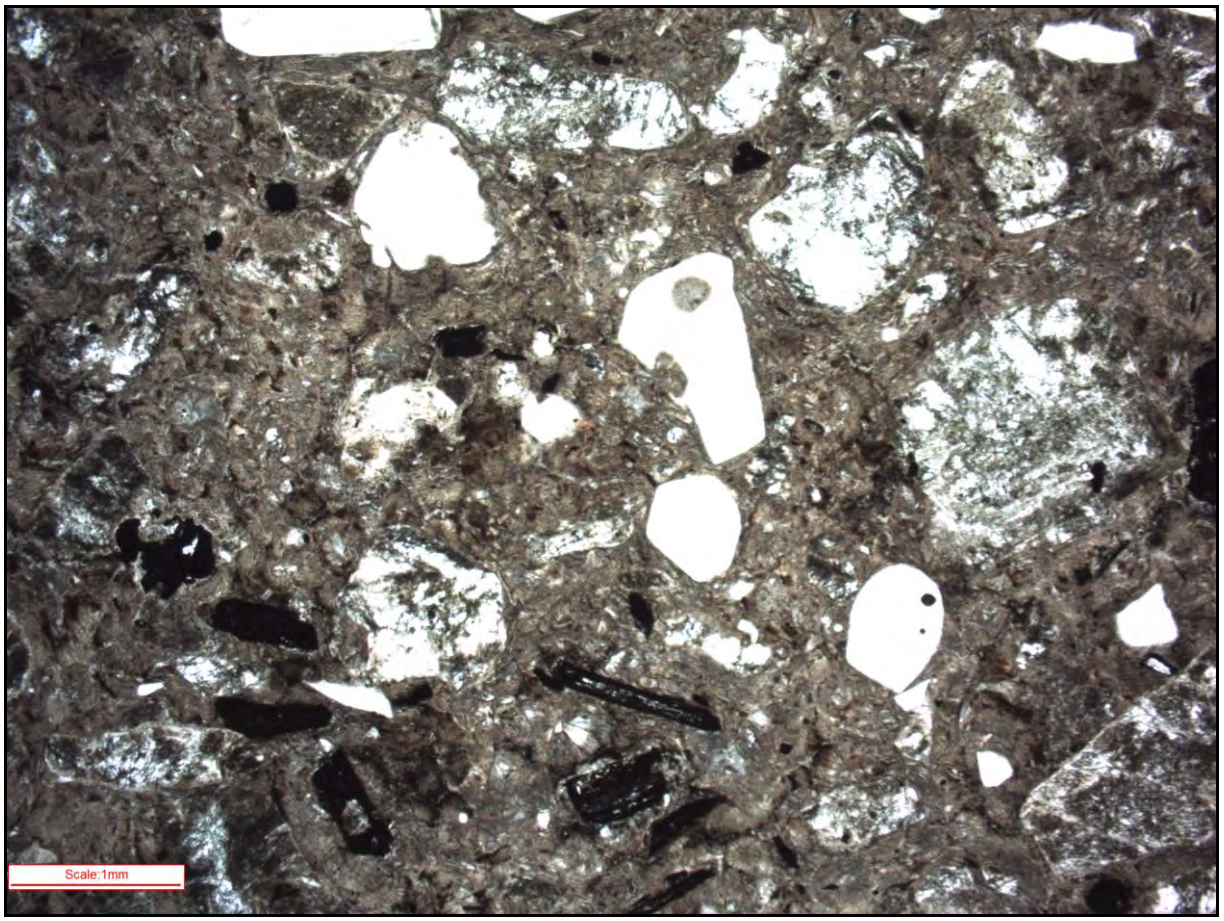

Plate 2. Low magnification, plane transmitted light image of part of hematitized acid tuff showing phenoclasts of quartz, feldspar, opaque oxide and altered biotite flakes in a finely devitrified matrix with obvious ghosts of former welded vitric shards showing fine pigmentation of hematite

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PETROGRAPHIC REPORT
ON A DRILL CORE SAMPLE (NEW17W-0117-S02)

prepared for

QUALTEST LABORATORY (NSW) PTY LTD
WARABROOK, NSW

Order Number: QTPO17-0015

Invoice Number: 00007463

Client Ref: Adam Dwyer

Issued by

K. E. Spring B.Sc (Hons), MAppSc
7 February 2017

Sample Number: NEW17W-0117-S02 **Date Sampled**: 13/12/16

Borehole Descript.: DDH2-P2 **Date Received**: 13/01/17

Project Name: Material Testing

Work Order No.: NEW17W-0117 **Project No.**: NEW15P-0045

Location: Warrabrook, NSW

Work Requested Petrographic analysis in relation to suitability for use as a source of road base, concrete sand/aggregate, asphaltic/sealing aggregate, rail ballast, rip rap, marine armour rock and dimension stone

Methods Account taken of ASTM C295 Standard Guide for *Petrographic Assessment of Aggregates for Concrete,* the AS2758.1 – 2014 *Aggregates and rock for engineering purposes part 1; Concrete aggregates (Appendix B),* and of the content of the 2015 joint publication of the Cement and Concrete Association of Australia and Standards Australia, entitled *Alkali Aggregate Reaction - Guidelines on Minimising the Risk of Damage to Concrete Structures in Australia* and in accordance with *ASTM C 294 Standard Guide for Petrographic Assessment of Railway Ballast* and to the content of the 1996 publication of Standards Australia (AS 2758.7 – Appendix B), entitled Aggregates and Rock for Engineering Purposes- Part 7: Railway Ballast, and in accordance with ASTM C1721-09 *Standard Guide for Petrographic Assessment of Dimension Stone*, and in accordance with ASTM D4992-07 *Standard Guide for Evaluation of Rock to be used for Erosion Control*

Identification Rhyolitic tuff

Description

The supplied sample of drill core consists of light to medium grey, unweathered, quite robust acid tuff, displaying numerous phenoclasts of transparent quartz, white and pink feldspar, and sparse biotite and opaque oxide grains set in a very finely crystalline, obviously vitroclastic, matrix. The rock can only be very lightly scratched by a steel tool.

Plate 1. Photograph of the supplied drill core sample.

A thin section was prepared to permit detailed microscopic examination in transmitted polarised light of the drill core. An approximate mineralogical composition of the rock expressed in volume percent and based on a count of 100 widely spaced points falling within the thin section, is:

Durable Minerals

57%	finely microcrystalline feldspars and quartz (19%) as devitrification products after former vitric shards
34%	coarser feldspars and quartz (10%) as devitrification products and phenoclasts
<1%	opaque oxide phenoclasts
<1%	hornblende phenoclasts
<1%	hematite
3%	leucoxene
<1%	epidote

Weak &/or Deleterious Minerals

6%	sericite/illite
trace	calcite
trace	fine clay

In thin section, the rock is seen to represent acid tuffaceous rock in which numerous subhedral, corroded and broken phenoclasts (mainly about 0.2 to 3 mm) are dispersed through a finely devitrified matrix with obvious ghosts of former welded vitric shards (about 0.2 to 0.5 mm long) and minor compressed pumice.

The phenoclasts comprise finely clouded by clays and are slightly sericitized with rare carbonation of plagioclase, finely clay-clouded but otherwise unaltered K-feldspar and beta-form quartz along with minor biotite (now converted to hematite, epidote, leucoxene and sericite), almost completely but similarly-altered hornblende and opaque oxide. The formerly vitroclastic matrix is now devitrified to a finely microcrystalline mosaic (mainly finer than 0.01 mm) with spherulites and related fibrous sheafs of mainly feldspars and quartz. Minor, small patches or clasts in the matrix show coarser devitrification (up to about 0.2 mm grainsize). Fine sericite (possibly illitic) is present in minor amounts in the devitrified matrix, which is pervasively, faintly pigmented between former vitric shards by very fine hematite.

Comments and Interpretations

The supplied drill core sample (labelled NEW17W-0117-S02) is interpreted to be devitrified tuff which is of broadly rhyolitic composition (using the classification criteria of the International Union of Geological Sciences) or of more specific rhyo-dacitic composition (using narrower, older established British/Australian criteria). The rock is thought to have originated as acid ashflow tuff (or "ignimbrite") composed of phenoclasts of quartz and feldspars dispersed through a welded matrix of vitric shards and minor compressed pumice. At some stage after initial solidification, the tuff was finely devitrified and slightly sericitized, hematized and carbonated.

For engineering purposes the rock represented in the supplied drill core sample may be summarised as:

- former vitric crystal **acid tuff** with a composition equivalent broadly to **rhyolite** or more specifically to rhyo-dacite (i.e. equivalent to acid volcanic rock)
- now devitrified, but otherwise only slightly altered
- now finely crystalline
- unweathered
- non-porous
- carrying about 6% of weak mineral (sericite/illite and a trace of calcite and fine clays)
- **quite hard**
- **strong**

The rock is predicted to be **durable**.

Because the rock carries an estimated 19% of finely micro-crystalline quartz (as a devitrification product), it is predicted to have **substantial potential for deleterious alkali-silica reactivity in concrete**.

Thus, devitrified tuff of the type represented in the supplied sample is predicted to be **suitable for use as a source of manufactured concrete sand and concrete aggregate**: provided that appropriate precautions are taken in mix and engineering design to take account of its perceived potential for substantial deleterious alkali-silica reactivity.

Guidance on how to deal with the perceived potential for deleterious alkali-silica reactivity may be found in the 1996 joint publication of the *Cement and Concrete Association of Australia*

and *Standards Australia,* entitled *Alkali Aggregate Reaction - Guidelines on Minimising the Risk of Damage to Concrete Structures in Australia.*

The rock is considered to have **more than adequate strength and durability for use in asphaltic/sealing aggregate**. Some rhyolitic rock types can present problems in relation to bonding to bitumen and polishing in service.

Thus, devitrified tuff of the type represented in the supplied sample is predicted to be **suitable for use as a source of road base, rail ballast** (subject to compliance with the Durability Criteria of CT147 / AS2758.7) **and rip rap**.

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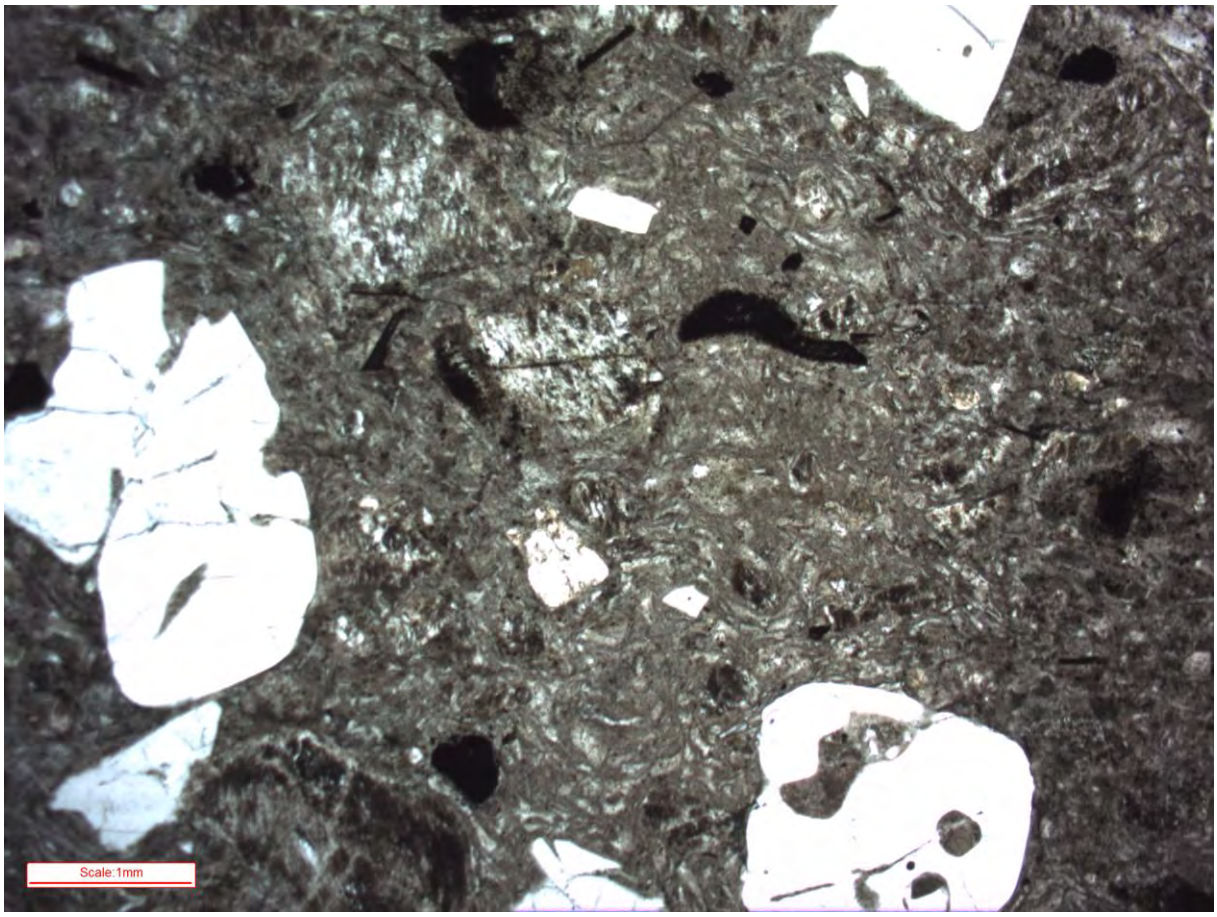

Plate 2. Low magnification, plane polarised, transmitted light image of part of acid tuff showing phenoclasts of white quartz, finely clouded feldspar, hematized and leucoxenized biotite and opaque oxide in a finely devitrified matrix with obvious ghosts of former welded vitric shards

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