

Filtered Total Phosphorus as P											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.01	0.3	0.005	0.005	0.005	0.07	0.05	0.03	0.005	0.02
Round 2	4/06/2019	0.005	0.33	0.005	0.005	0.005	0.08	0.06	0.02	0.005	0.005
Round 3	26/06/2019	0.01	0.16	0.005	0.005	0.005	0.05	0.04	0.02	0.005	0.005
Round 4	17/07/2019	0.01	0.09	0.005	0.005	0.005	0.13	0.05	0.01	0.02	0.04
Round 5	8/08/2019	0.02	0.33	0.005	0.005	0.01	0.13	0.07	0.03	0.005	0.01
Round 6	28/08/2019	0.02	0.32	0.005	0.01	0.01	0.11	0.07	0.03	0.005	0.02
Round 7	18/09/2019	0.02	0.3	0.005	0.005	0.005	0.09	0.05	0.02	0.005	0.02
Round 8	8/10/2019	0.02	0.37	0.005	0.005	0.005	0.08	0.05	0.02	0.005	0.01
Min		0.005	0.09	0.005	0.005	0.005	0.05	0.04	0.01	0.005	0.005
Max		0.02	0.37	0.005	0.01	0.01	0.13	0.07	0.03	0.02	0.04
10th percentile		0.0085	0.139	0.005	0.005	0.005	0.064	0.047	0.017	0.005	0.005
20th percentile		0.01	0.216	0.005	0.005	0.005	0.074	0.05	0.02	0.005	0.007
80th percentile		0.02	0.33	0.005	0.005	0.008	0.122	0.066	0.03	0.005	0.02
90th percentile		0.02	0.342	0.005	0.0065	0.01	0.13	0.07	0.03	0.0095	0.026
median		0.015	0.31	0.005	0.005	0.005	0.085	0.05	0.02	0.005	0.015

Calcium											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	1	3	2	2	5	5	2	1	0.5	3
Round 2	4/06/2019	1	0.5	2	2	5	5	2	2	0.5	2
Round 3	26/06/2019	2	0.5	4	2	5	5	2	2	0.5	2
Round 4	17/07/2019	2	1	3	2	5	6	2	2	0.5	3
Round 5	8/08/2019	1	0.5	3	2	5	6	2	1	0.5	3
Round 6	28/08/2019	1	0.5	2	2	5	5	2	1	0.5	2
Round 7	18/09/2019	2	1	2	2	5	6	2	1	0.5	2
Round 8	8/10/2019	2	1	3	3	6	6	3	1	0.5	2
Min		1	0.5	2	2	5	5	2	1	0.5	2
Max		2	3	4	3	6	6	3	2	0.5	3
10th percentile		1	0.5	2	2	5	5	2	1	0.5	2
20th percentile		1	0.5	2	2	5	5	2	1	0.5	2
80th percentile		2	1	3	2	5	6	2	2	0.5	3
90th percentile		2	1.6	3.3	2.3	5.3	6	2.3	2	0.5	3
median		1.5	0.75	2.5	2	5	5.5	2	1	0.5	2

Magnesium											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	1	6	2	1	0.5	1	1	3	1	2
Round 2	4/06/2019	1	2	2	2	0.5	1	1	3	1	1
Round 3	26/06/2019	1	2	1	2	0.5	1	1	2	1	2
Round 4	17/07/2019	1	2	2	2	0.5	2	2	2	1	2
Round 5	8/08/2019	0.5	2	2	1	0.5	2	2	3	1	2
Round 6	28/08/2019	0.5	2	2	1	0.5	2	2	2	1	1
Round 7	18/09/2019	1	2	2	1	0.5	2	1	2	2	1
Round 8	8/10/2019	1	2	2	2	0.5	2	2	2	2	2
Min		0.5	2	1	1	0.5	1	1	2	1	1
Max		1	6	2	2	0.5	2	2	3	2	2
10th percentile		0.5	2	1.7	1	0.5	1	1	2	1	1
20th percentile		0.7	2	2	1	0.5	1	1	2	1	1
80th percentile		1	2	2	2	0.5	2	2	3	1.6	2
90th percentile		1	3.2	2	2	0.5	2	2	3	2	2
median		1	2	2	1.5	0.5	2	1.5	2	1	2

Sodium											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	12	109	12	8	8	8	8	15	12	10
Round 2	4/06/2019	12	50	12	9	8	8	8	17	12	10
Round 3	26/06/2019	14	51	14	8	8	8	7	14	13	11
Round 4	17/07/2019	14	59	14	8	9	8	7	14	12	11
Round 5	8/08/2019	13	56	16	8	10	9	8	16	13	11
Round 6	28/08/2019	11	49	15	7	9	8	7	14	14	10
Round 7	18/09/2019	13	65	15	8	9	9	8	14	15	9
Round 8	8/10/2019	13	51	15	10	10	9	9	13	16	9
Min		11	49	12	7	8	8	7	13	12	9
Max		14	109	16	10	10	9	9	17	16	11
10th percentile		11.7	49.7	12	7.7	8	8	7	13.7	12	9
20th percentile		12	50.4	12.8	8	8	8	7	14	12	9.4
80th percentile		13.6	62.6	15	8.6	9.6	9	8	15.6	14.6	11
90th percentile		14	78.2	15.3	9.3	10	9	8.3	16.3	15.3	11
median		13	53.5	14.5	8	9	8	8	14	13	10

Potassium											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.5	4	0.5	0.5	0.5	2	2	2	0.5	1
Round 2	4/06/2019	0.5	2	0.5	0.5	0.5	4	2	2	0.5	0.5
Round 3	26/06/2019	0.5	2	0.5	0.5	0.5	3	2	2	0.5	1
Round 4	17/07/2019	0.5	3	0.5	0.5	0.5	3	2	3	0.5	1
Round 5	8/08/2019	0.5	2	0.5	0.5	0.5	3	2	2	0.5	1
Round 6	28/08/2019	0.5	2	0.5	0.5	0.5	3	2	1	0.5	0.5
Round 7	18/09/2019	0.5	2	0.5	0.5	0.5	3	2	1	0.5	1
Round 8	8/10/2019	0.5	2	0.5	0.5	0.5	2	2	1	0.5	1
Min		0.5	2	0.5	0.5	0.5	2	2	1	0.5	0.5
Max		0.5	4	0.5	0.5	0.5	4	2	3	0.5	1
10th percentile		0.5	2	0.5	0.5	0.5	2	2	1	0.5	0.5
20th percentile		0.5	2	0.5	0.5	0.5	2.4	2	1	0.5	0.7
80th percentile		0.5	2.6	0.5	0.5	0.5	3	2	2	0.5	1
90th percentile		0.5	3.3	0.5	0.5	0.5	3.3	2	2.3	0.5	1
median		0.5	2	0.5	0.5	0.5	3	2	2	0.5	1

Bicarbonate Alkalinity as CaCO3											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.5	0.5	0.5	0.5	0.5	7	1	0.5	0.5	0.5
Round 2	4/06/2019	0.5	0.5	0.5	0.5	0.5	7	1	0.5	0.5	0.5
Round 3	26/06/2019	0.5	0.5	0.5	0.5	0.5	6	0.5	0.5	0.5	0.5
Round 4	17/07/2019	0.5	0.5	0.5	0.5	0.5	12	0.5	0.5	0.5	0.5
Round 5	8/08/2019	0.5	0.5	0.5	0.5	0.5	22	0.5	0.5	0.5	0.5
Round 6	28/08/2019	0.5	0.5	0.5	0.5	0.5	10	0.5	0.5	0.5	0.5
Round 7	18/09/2019	0.5	0.5	0.5	0.5	0.5	14	2	0.5	0.5	0.5
Round 8	8/10/2019	0.5	0.5	0.5	0.5	0.5	3	2	0.5	0.5	0.5
Min		0.5	0.5	0.5	0.5	0.5	3	0.5	0.5	0.5	0.5
Max		0.5	0.5	0.5	0.5	0.5	22	2	0.5	0.5	0.5
10th percentile		0.5	0.5	0.5	0.5	0.5	5.1	0.5	0.5	0.5	0.5
20th percentile		0.5	0.5	0.5	0.5	0.5	6.4	0.5	0.5	0.5	0.5
80th percentile		0.5	0.5	0.5	0.5	0.5	13.2	1.6	0.5	0.5	0.5
90th percentile		0.5	0.5	0.5	0.5	0.5	16.4	2	0.5	0.5	0.5
median		0.5	0.5	0.5	0.5	0.5	8.5	0.75	0.5	0.5	0.5

Total Alkalinity as CaCO3											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.5	0.5	0.5	0.5	0.5	7	1	0.5	0.5	0.5
Round 2	4/06/2019	0.5	0.5	0.5	0.5	0.5	7	1	0.5	0.5	0.5
Round 3	26/06/2019	0.5	0.5	0.5	0.5	0.5	6	0.5	0.5	0.5	0.5
Round 4	17/07/2019	0.5	0.5	0.5	0.5	0.5	12	0.5	0.5	0.5	0.5
Round 5	8/08/2019	0.5	0.5	0.5	0.5	0.5	22	0.5	0.5	0.5	0.5
Round 6	28/08/2019	0.5	0.5	0.5	0.5	0.5	10	0.5	0.5	0.5	0.5
Round 7	18/09/2019	0.5	0.5	0.5	0.5	0.5	14	2	0.5	0.5	0.5
Round 8	8/10/2019	0.5	0.5	0.5	0.5	0.5	3	2	0.5	0.5	0.5
Min		0.5	0.5	0.5	0.5	0.5	3	0.5	0.5	0.5	0.5
Max		0.5	0.5	0.5	0.5	0.5	22	2	0.5	0.5	0.5
10th percentile		0.5	0.5	0.5	0.5	0.5	5.1	0.5	0.5	0.5	0.5
20th percentile		0.5	0.5	0.5	0.5	0.5	6.4	0.5	0.5	0.5	0.5
80th percentile		0.5	0.5	0.5	0.5	0.5	13.2	1.6	0.5	0.5	0.5
90th percentile		0.5	0.5	0.5	0.5	0.5	16.4	2	0.5	0.5	0.5
median		0.5	0.5	0.5	0.5	0.5	8.5	0.75	0.5	0.5	0.5

Total Iron											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.11	2.52	0.6	0.18	0.17	0.025	0.14	1.48	0.15	0.23
Round 2	4/06/2019	0.11	0.84	0.47	0.16	0.16	0.025	0.12	1.4	0.18	0.18
Round 3	26/06/2019	0.13	1.12	0.36	0.18	0.17	0.025	0.14	1.46	0.25	0.33
Round 4	17/07/2019	0.13	1.12	0.4	0.14	0.15	0.025	0.12	1.35	0.14	0.26
Round 5	8/08/2019	0.15	0.98	0.5	0.17	0.16	0.025	0.16	1.53	0.19	0.32
Round 6	28/08/2019	0.13	0.85	0.43	0.14	0.16	0.025	0.12	1.41	0.15	0.22
Round 7	18/09/2019	0.14	1.02	0.52	0.16	0.19	0.025	0.11	1.58	0.23	0.21
Round 8	8/10/2019	0.12	0.8	0.57	0.19	0.2	0.025	0.12	1.31	0.26	0.22
Min		0.11	0.8	0.36	0.14	0.15	0.025	0.11	1.31	0.14	0.18
Max		0.15	2.52	0.6	0.19	0.2	0.025	0.16	1.58	0.26	0.33
10th percentile		0.11	0.828	0.388	0.14	0.157	0.025	0.117	1.338	0.147	0.201
20th percentile		0.114	0.844	0.412	0.148	0.16	0.025	0.12	1.37	0.15	0.214
80th percentile		0.136	1.12	0.55	0.18	0.182	0.025	0.14	1.51	0.242	0.296
90th percentile		0.143	1.54	0.579	0.183	0.193	0.025	0.146	1.545	0.253	0.323
median		0.13	1	0.485	0.165	0.165	0.025	0.12	1.435	0.185	0.225

<b>Dissolved Iron</b>											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.28	2.18	0.59	0.18	0.18	0.025	0.11	1.41	0.13	0.21
Round 2	4/06/2019	0.09	0.8	0.51	0.16	0.17	0.025	0.1	1.51	0.17	0.19
Round 3	26/06/2019	0.09	0.95	0.33	0.14	0.16	0.025	0.11	1.45	0.17	0.29
Round 4	17/07/2019	0.11	0.94	0.43	0.14	0.15	0.025	0.11	1.2	0.13	0.27
Round 5	8/08/2019	0.11	0.85	0.41	0.11	0.12	0.025	0.12	1.41	0.12	0.24
Round 6	28/08/2019	0.11	0.68	0.39	0.09	0.12	0.025	0.09	1.14	0.12	0.17
Round 7	18/09/2019	0.15	0.94	0.38	0.09	0.11	0.025	0.06	1.2	0.15	0.14
Round 8	8/10/2019	0.13	0.64	0.49	0.12	0.17	0.025	0.09	1.13	0.17	0.18
Min		0.09	0.64	0.33	0.09	0.11	0.025	0.06	1.13	0.12	0.14
Max		0.28	2.18	0.59	0.18	0.18	0.025	0.12	1.51	0.17	0.29
10th percentile		0.09	0.668	0.365	0.09	0.117	0.025	0.081	1.137	0.12	0.161
20th percentile		0.098	0.728	0.384	0.098	0.12	0.025	0.09	1.164	0.124	0.174
80th percentile		0.142	0.946	0.502	0.152	0.17	0.025	0.11	1.434	0.17	0.258
90th percentile		0.189	1.319	0.534	0.166	0.173	0.025	0.113	1.468	0.17	0.276
median		0.11	0.895	0.42	0.13	0.155	0.025	0.105	1.305	0.14	0.2

<b>Total Aluminium</b>											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.36	2.18	0.56	0.36	0.18	0.12	0.21	0.68	0.35	0.23
Round 2	4/06/2019	0.36	1.49	0.42	0.27	0.19	0.1	0.2	0.68	0.34	0.18
Round 3	26/06/2019	0.4	1.96	0.54	0.27	0.2	0.11	0.19	0.69	0.42	0.34
Round 4	17/07/2019	0.5	1.85	0.52	0.28	0.22	0.1	0.21	0.75	0.34	0.22
Round 5	8/08/2019	0.46	1.89	0.53	0.3	0.22	0.1	0.21	0.82	0.31	0.2
Round 6	28/08/2019	0.45	1.7	0.52	0.28	0.2	0.1	0.21	0.77	0.25	0.16
Round 7	18/09/2019	0.43	1.9	0.58	0.3	0.21	0.11	0.2	0.93	0.26	0.13
Round 8	8/10/2019	0.46	1.68	0.52	0.34	0.18	0.06	0.18	0.7	0.54	0.1
Min		0.36	1.49	0.42	0.27	0.18	0.06	0.18	0.68	0.25	0.1
Max		0.5	2.18	0.58	0.36	0.22	0.12	0.21	0.93	0.54	0.34
10th percentile		0.36	1.623	0.49	0.27	0.18	0.088	0.187	0.68	0.257	0.121
20th percentile		0.376	1.688	0.52	0.274	0.184	0.1	0.194	0.684	0.28	0.142
80th percentile		0.46	1.936	0.552	0.324	0.216	0.11	0.21	0.8	0.392	0.226
90th percentile		0.472	2.026	0.566	0.346	0.22	0.113	0.21	0.853	0.456	0.263
median		0.44	1.87	0.525	0.29	0.2	0.1	0.205	0.725	0.34	0.19

<b>Dissolved Aluminium</b>											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.35	1.4	0.54	0.3	0.2	0.12	0.18	0.57	0.26	0.19
Round 2	4/06/2019	0.31	1.01	0.39	0.21	0.16	0.09	0.17	0.6	0.24	0.14
Round 3	26/06/2019	0.36	1.12	0.53	0.24	0.19	0.09	0.16	0.6	0.29	0.3
Round 4	17/07/2019	0.4	1.15	0.47	0.24	0.19	0.07	0.2	0.62	0.25	0.2
Round 5	8/08/2019	0.38	1.29	0.48	0.23	0.17	0.08	0.17	0.68	0.22	0.16
Round 6	28/08/2019	0.38	1.2	0.48	0.24	0.18	0.07	0.17	0.63	0.18	0.14
Round 7	18/09/2019	0.43	1.37	0.5	0.24	0.18	0.08	0.16	0.78	0.18	0.11
Round 8	8/10/2019	0.4	1.12	0.5	0.28	0.18	0.08	0.19	0.6	0.2	0.11
Min		0.31	1.01	0.39	0.21	0.16	0.07	0.16	0.57	0.18	0.11
Max		0.43	1.4	0.54	0.3	0.2	0.12	0.2	0.78	0.29	0.3
10th percentile		0.338	1.087	0.446	0.224	0.167	0.07	0.16	0.591	0.18	0.11
20th percentile		0.354	1.12	0.474	0.234	0.174	0.074	0.164	0.6	0.188	0.122
80th percentile		0.4	1.338	0.518	0.264	0.19	0.09	0.186	0.66	0.256	0.196
90th percentile		0.409	1.379	0.533	0.286	0.193	0.099	0.193	0.71	0.269	0.23
median		0.38	1.175	0.49	0.24	0.18	0.08	0.17	0.61	0.23	0.15

<b>Dissolved Manganese</b>											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Unit	Date	mg/L	mg/L	mg/L							
Round 1	15/05/2019	0.009	0.034	0.003	0.0005	0.0005	0.0005	0.008	0.029	0.0005	0.002
Round 2	4/06/2019	0.007	0.011	0.002	0.0005	0.0005	0.0005	0.006	0.03	0.0005	0.002
Round 3	26/06/2019	0.01	0.013	0.003	0.0005	0.0005	0.0005	0.006	0.027	0.001	0.019
Round 4	17/07/2019	0.014	0.015	0.002	0.0005	0.0005	0.0005	0.005	0.025	0.0005	0.002
Round 5	8/08/2019	0.012	0.013	0.001	0.0005	0.0005	0.0005	0.004	0.028	0.0005	0.002
Round 6	28/08/2019	0.012	0.011	0.0005	0.0005	0.0005	0.0005	0.004	0.026	0.0005	0.002
Round 7	18/09/2019	0.012	0.013	0.0005	0.0005	0.0005	0.0005	0.003	0.026	0.0005	0.002
Round 8	8/10/2019	0.013	0.011	0.0005	0.0005	0.0005	0.0005	0.004	0.025	0.0005	0.002
Min		0.007	0.011	0.0005	0.0005	0.0005	0.0005	0.003	0.025	0.0005	0.002
Max		0.014	0.034	0.003	0.0005	0.0005	0.0005	0.008	0.03	0.001	0.019
10th percentile		0.0084	0.011	0.0005	0.0005	0.0005	0.0005	0.0037	0.025	0.0005	0.002
20th percentile		0.0094	0.011	0.0005	0.0005	0.0005	0.0005	0.004	0.0254	0.0005	0.002
80th percentile		0.0126	0.0142	0.0026	0.0005	0.0005	0.0005	0.006	0.0286	0.0005	0.002
90th percentile		0.0133	0.0207	0.003	0.0005	0.0005	0.0005	0.0066	0.0293	0.00065	0.0071
median		0.012	0.013	0.0015	0.0005	0.0005	0.0005	0.0045	0.0265	0.0005	0.002



Total Lead											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Round 2	4/06/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Round 3	26/06/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Round 4	17/07/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Round 5	8/08/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Round 6	28/08/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Round 7	18/09/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Round 8	8/10/2019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Min		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Max		0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
10th percentile		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
20th percentile		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
80th percentile		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
90th percentile		0.0005	0.00095	0.0005	0.0005	0.0005	0.0005	0.0005	0.00095	0.0005	0.0005
median		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005

Total Nickel											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.0005	0.003	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.0005	0.002
Round 2	4/06/2019	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.0005	0.0005
Round 3	26/06/2019	0.0005	0.003	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Round 4	17/07/2019	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Round 5	8/08/2019	0.0005	0.003	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Round 6	28/08/2019	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Round 7	18/09/2019	0.0005	0.0025	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Round 8	8/10/2019	0.0005	0.002	0.001	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Min		0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.0005	0.0005
Max		0.0005	0.003	0.001	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.002
10th percentile		0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.0005	0.0005
20th percentile		0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0014	0.0005	0.0005
80th percentile		0.0005	0.003	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
90th percentile		0.0005	0.003	0.00065	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.00095
median		0.0005	0.00225	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005

Total Zinc											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Unit	Date	mg/L	mg/L	mg/L							
Round 1	15/05/2019	0.106	0.062	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.005	0.007
Round 2	4/06/2019	0.106	0.061	0.02	0.012	0.008	0.005	0.032	0.008	0.011	0.027
Round 3	26/06/2019	0.138	0.028	0.0025	0.0025	0.0025	0.009	0.0025	0.0025	0.0025	0.0025
Round 4	17/07/2019	0.1	0.024	0.0025	0.0025	0.0025	0.0025	0.0025	0.016	0.0025	0.0025
Round 5	8/08/2019	0.098	0.02	0.0025	0.013	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Round 6	28/08/2019	0.098	0.013	0.0025	0.0025	0.0025	0.0025	0.0025	0.006	0.0025	0.0025
Round 7	18/09/2019	0.118	0.013	0.0025	0.0025	0.04	0.0025	0.0025	0.0025	0.0025	0.007
Round 8	8/10/2019	0.136	0.019	0.072	0.043	0.048	0.045	0.031	0.013	0.042	0.051
Min		0.098	0.013	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Max		0.138	0.062	0.072	0.043	0.048	0.045	0.032	0.016	0.042	0.051
10th percentile		0.098	0.013	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
20th percentile		0.0988	0.0154	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
80th percentile		0.1288	0.0478	0.013	0.0126	0.0272	0.0074	0.0196	0.011	0.0086	0.019
90th percentile		0.1366	0.0613	0.0356	0.022	0.0424	0.0198	0.0313	0.0139	0.0203	0.0342
median		0.106	0.022	0.0025	0.0025	0.0025	0.0025	0.0025	0.00425	0.0025	0.00475

Chloride											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	21	154	24	14	16	15	14	30	24	22
Round 2	4/06/2019	22	78	26	16	16	16	13	32	20	17
Round 3	26/06/2019	22	80	27	16	15	16	13	28	20	23
Round 4	17/07/2019	24	96	27	15	17	16	16	29	21	23
Round 5	8/08/2019	20	76	29	14	17	14	14	28	22	22
Round 6	28/08/2019	22	77	27	16	19	16	16	26	24	21
Round 7	18/09/2019	22	97	26	14	16	18	14	25	25	15
Round 8	8/10/2019	25	74	28	15	21	21	17	23	30	21
Min		20	74	24	14	15	14	13	23	20	15
Max		25	154	29	16	21	21	17	32	30	23
10th percentile		20.7	75.4	25.4	14	15.7	14.7	13	24.4	20	16.4
20th percentile		21.4	76.4	26	14	16	15.4	13.4	25.4	20.4	18.6
80th percentile		23.2	96.6	27.6	16	18.2	17.2	16	29.6	24.6	22.6
90th percentile		24.3	114.1	28.3	16	19.6	18.9	16.3	30.6	26.5	23
median		22	79	27	15	16.5	16	14	28	23	21.5

Sulfate as SO4											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.5	34	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 2	4/06/2019	0.5	25	0.5	0.5	0.5	0.5	0.5	7	7	5
Round 3	26/06/2019	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 4	17/07/2019	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 5	8/08/2019	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 6	28/08/2019	0.5	5	3	3	0.5	0.5	0.5	5	2	2.5
Round 7	18/09/2019	0.5	5	5	5	5	5	5	5	5	5
Round 8	8/10/2019	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Min		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Max		0.5	34	5	5	5	5	5	7	7	5
10th percentile		0.5	3.65	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
20th percentile		0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
80th percentile		0.5	17	2	2	0.5	0.5	0.5	5	3.8	4
90th percentile		0.5	27.7	3.6	3.6	1.85	1.85	1.85	5.6	5.6	5
median		0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Ammonium as N											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	0.03	0.49	0.03	0.07	0.04	0.05	0.08	0.93	0.05	0.17
Round 2	4/06/2019	0.005	0.37	0.005	0.005	0.005	0.005	0.005	1.06	0.005	0.12
Round 3	26/06/2019	0.005	0.4	0.005	0.05	0.005	0.005	0.06	0.93	0.02	0.07
Round 4	17/07/2019	0.005	0.27	0.005	0.03	0.05	0.08	0.05	0.8	0.05	0.14
Round 5	8/08/2019	0.005	0.15	0.05	0.005	0.08	0.005	0.005	0.005	0.04	0.04
Round 6	28/08/2019	0.03	0.33	0.005	0.04	0.005	0.005	0.03	0.98	0.005	0.12
Round 7	18/09/2019	0.02	0.39	0.005	0.12	0.19	0.23	0.19	1.1	0.1	0.25
Round 8	8/10/2019	0.04	0.35	0.03	0.07	0.05	0.02	0.08	0.69	0.005	0.14
Min		0.005	0.15	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.04
Max		0.04	0.49	0.05	0.12	0.19	0.23	0.19	1.1	0.1	0.25
10th percentile		0.005	0.234	0.005	0.005	0.005	0.005	0.005	0.4845	0.005	0.061
20th percentile		0.005	0.294	0.005	0.015	0.005	0.005	0.015	0.734	0.005	0.09
80th percentile		0.03	0.396	0.03	0.07	0.068	0.068	0.08	1.028	0.05	0.158
90th percentile		0.033	0.427	0.036	0.085	0.113	0.125	0.113	1.072	0.065	0.194
median		0.0125	0.36	0.005	0.045	0.045	0.0125	0.055	0.93	0.03	0.13

Colour (True)											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	PCU	PCU	PCU	PCU	PCU	PCU	PCU	PCU	PCU	PCU
Round 1	15/05/2019	200	1750	450	450	250	170	230	600	500	800
Round 2	4/06/2019	180	1500	250	200	170	150	190	300	450	500
Round 3	26/06/2019	150	1800	200	170	180	120	180	500	450	400
Round 4	17/07/2019	250	2000	450	500	400	230	400	900	650	500
Round 5	8/08/2019	250	1900	250	350	200	150	200	600	550	500
Round 6	28/08/2019	300	1900	350	250	200	130	250	650	170	600
Round 7	18/09/2019	150	1900	600	450	200	130	150	900	130	250
Round 8	8/10/2019	350	1900	450	400	150	130	150	500	150	250
Min		150	1500	200	170	150	120	150	300	130	250
Max		350	2000	600	500	400	230	400	900	650	800
10th percentile		150	1675	235	191	164	127	150	440	144	250
20th percentile		162	1770	250	220	174	130	162	500	158	310
80th percentile		280	1900	450	450	230	162	242	800	530	560
90th percentile		315	1930	495	465	295	188	295	900	580	660
median		225	1900	400	375	200	140	195	600	450	500

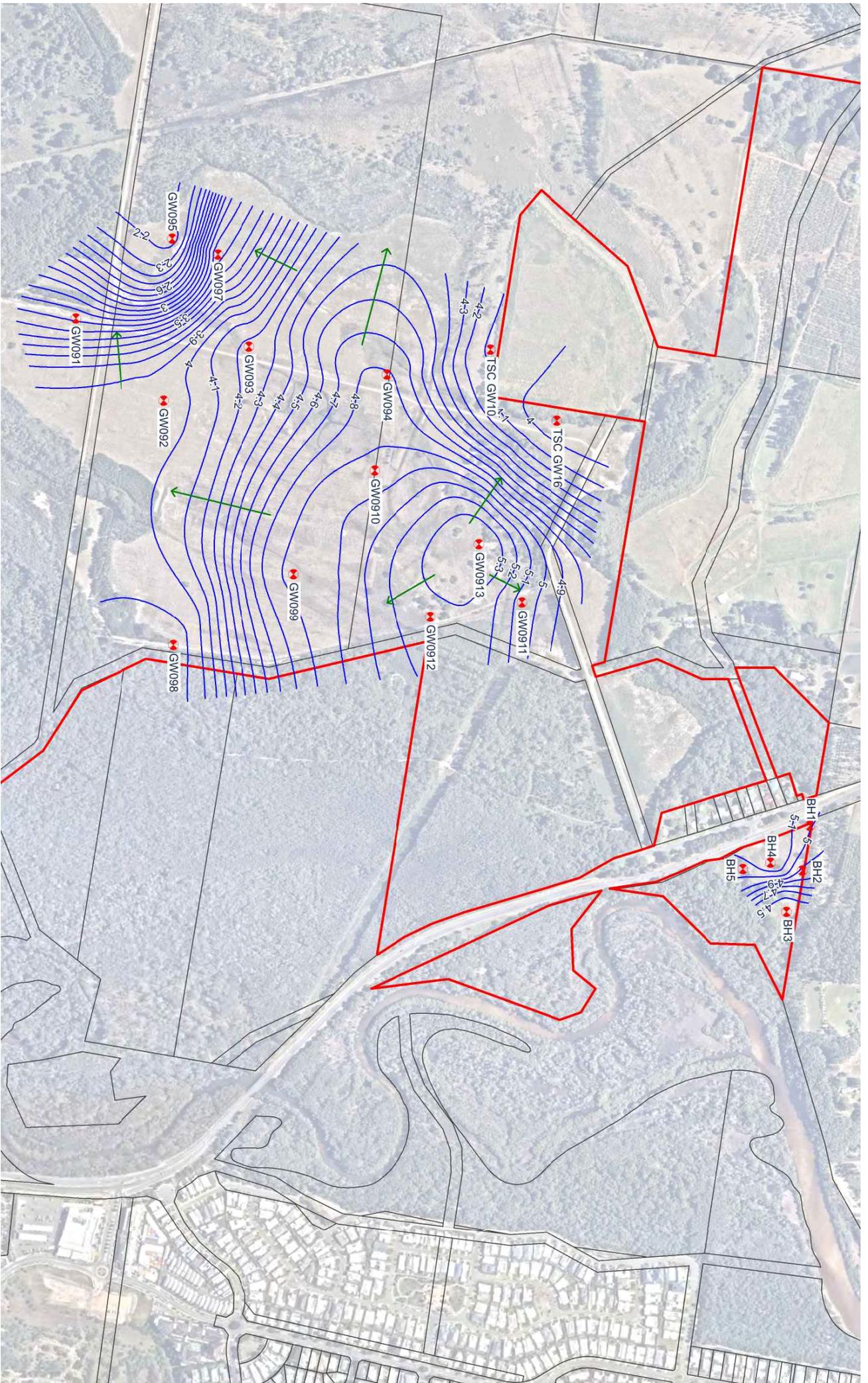
Acidity as CaCO3											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Round 1	15/05/2019	20	99	43	24	23	13	20	38	37	35
Round 2	4/06/2019	10	43	20	18	8	3	8	24	21	17
Round 3	26/06/2019	21	81	51	43	36	4	31	77	52	57
Round 4	17/07/2019	17	47	22	23	12	4	10	21	23	25
Round 5	8/08/2019	16	41	34	21	22	12	6	32	18	22
Round 6	28/08/2019	40	41	28	11	12	6	10	28	18	24
Round 7	18/09/2019	27	112	74	37	32	4	11	37	19	17
Round 8	8/10/2019	20	46	67	29	51	13	24	34	39	59
Min		10	41	20	11	8	3	6	21	18	17
Max		40	112	74	43	51	13	31	77	52	59
10th percentile		14.2	41	21.4	15.9	10.8	3.7	7.4	23.1	18	17
20th percentile		16.4	41.8	24.4	19.2	12	4	8.8	25.6	18.4	19
80th percentile		24.6	91.8	60.6	33.8	34.4	12.6	22.4	37.6	38.2	48.2
90th percentile		30.9	102.9	69.1	38.8	40.5	13	26.1	49.7	42.9	57.6
median		20	46.5	38.5	23.5	22.5	5	10.5	33	22	24.5

Faecal Coliforms											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	CFU/100mL									
Round 1	15/05/2019	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 2	4/06/2019	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 3	26/06/2019	0.5	5	24	0.5	0.5	13	5	0.5	1	2
Round 4	17/07/2019	0.5	5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5
Round 5	8/08/2019	1	1	0.5	1	1	0.5	0.5	0.5	0.5	0.5
Round 6	28/08/2019	1	1	0.5	0.5	0.5	0.5	0.5	1	0.5	1
Round 7	18/09/2019	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Round 8	8/10/2019	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5
Min		0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Max		1	5	24	1	1	13	5	1	5	2
10th percentile		0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
20th percentile		0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
80th percentile		1	3.4	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8
90th percentile		1	5	7.55	0.65	0.65	4.25	1.85	1	2.2	1.3
median		0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Total Anions											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	meq/L 0.01									
Round 1	15/05/2019	0.59	5.05	0.68	0.39	0.45	0.56	0.41	0.85	0.68	0.62
Round 2	4/06/2019	0.62	2.2	0.73	0.45	0.45	0.59	0.39	1.05	0.71	0.58
Round 3	26/06/2019	0.62	2.26	0.76	0.45	0.42	0.57	0.37	0.79	0.56	0.65
Round 4	17/07/2019	0.68	2.71	0.76	0.42	0.48	0.69	0.45	0.82	0.59	0.65
Round 5	8/08/2019	0.56	2.14	0.82	0.39	0.48	0.83	0.46	0.84	0.62	0.62
Round 6	28/08/2019	0.62	2.17	0.82	0.51	0.54	0.65	0.45	0.84	0.72	0.59
Round 7	18/09/2019	0.62	2.74	0.73	0.39	0.45	0.79	0.43	0.7	0.7	0.42
Round 8	8/10/2019	0.7	2.09	0.79	0.42	0.59	0.65	0.52	0.65	0.85	0.59
Min		0.56	2.09	0.68	0.39	0.42	0.56	0.37	0.65	0.56	0.42
Max		0.7	5.05	0.82	0.51	0.59	0.83	0.52	1.05	0.85	0.65
10th percentile		0.581	2.125	0.715	0.39	0.441	0.567	0.384	0.685	0.581	0.532
20th percentile		0.602	2.152	0.73	0.39	0.45	0.578	0.398	0.736	0.602	0.584
80th percentile		0.656	2.728	0.808	0.45	0.516	0.75	0.456	0.846	0.716	0.638
90th percentile		0.686	3.433	0.82	0.468	0.555	0.802	0.478	0.91	0.759	0.65
median		0.62	2.23	0.76	0.42	0.465	0.65	0.44	0.83	0.69	0.605

Total Cations											
Client sample ID (1st):		BH3	BH4	GW0910	GW098	GW092	GW091	GW097	TSCGW16	GW0912	GW094
Limit of reporting		1	1	1	1	1	1	1	1	1	1
Unit	Date	meq/L 0.01									
Round 1	15/05/2019	0.65	5.49	0.79	0.53	0.6	0.73	0.58	1	0.6	0.77
Round 2	4/06/2019	0.65	2.39	0.79	0.65	0.6	0.78	0.58	1.14	0.6	0.62
Round 3	26/06/2019	0.79	2.43	0.89	0.61	0.6	0.76	0.54	0.92	0.65	0.77
Round 4	17/07/2019	0.79	2.86	0.92	0.61	0.64	0.89	0.62	0.95	0.6	0.82
Round 5	8/08/2019	0.62	2.65	1.01	0.53	0.68	0.93	0.66	1.04	0.65	0.82
Round 6	28/08/2019	0.53	2.35	0.92	0.49	0.64	0.84	0.62	0.85	0.69	0.62
Round 7	18/09/2019	0.75	3.09	0.92	0.53	0.64	0.93	0.58	0.85	0.82	0.6
Round 8	8/10/2019	0.75	2.48	0.97	0.75	0.73	0.91	0.76	0.8	0.86	0.68
Min		0.53	2.35	0.79	0.49	0.6	0.73	0.54	0.8	0.6	0.6
Max		0.79	5.49	1.01	0.75	0.73	0.93	0.76	1.14	0.86	0.82
10th percentile		0.593	2.378	0.79	0.518	0.6	0.751	0.568	0.835	0.6	0.614
20th percentile		0.632	2.406	0.83	0.53	0.6	0.768	0.58	0.85	0.6	0.62
80th percentile		0.774	2.998	0.95	0.634	0.664	0.922	0.644	1.024	0.768	0.8
90th percentile		0.79	3.81	0.982	0.68	0.695	0.93	0.69	1.07	0.832	0.82
median		0.7	2.565	0.92	0.57	0.64	0.865	0.6	0.935	0.65	0.725

## 11 Appendix 4 – Groundwater elevation



**ORIENTATION**

**SCALE**  
 50 100 150 200 250  
 metres

**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@gacross.qs  
 www.gacross.qs

**LEGEND**

- Site boundary
- Cadastral boundaries
- Groundwater Monitoring Borehole
- Groundwater Control (0.1m interval)
- Groundwater Flow Direction

**SOURCES**  
 Image: Nearmap image dated 19/07/2019

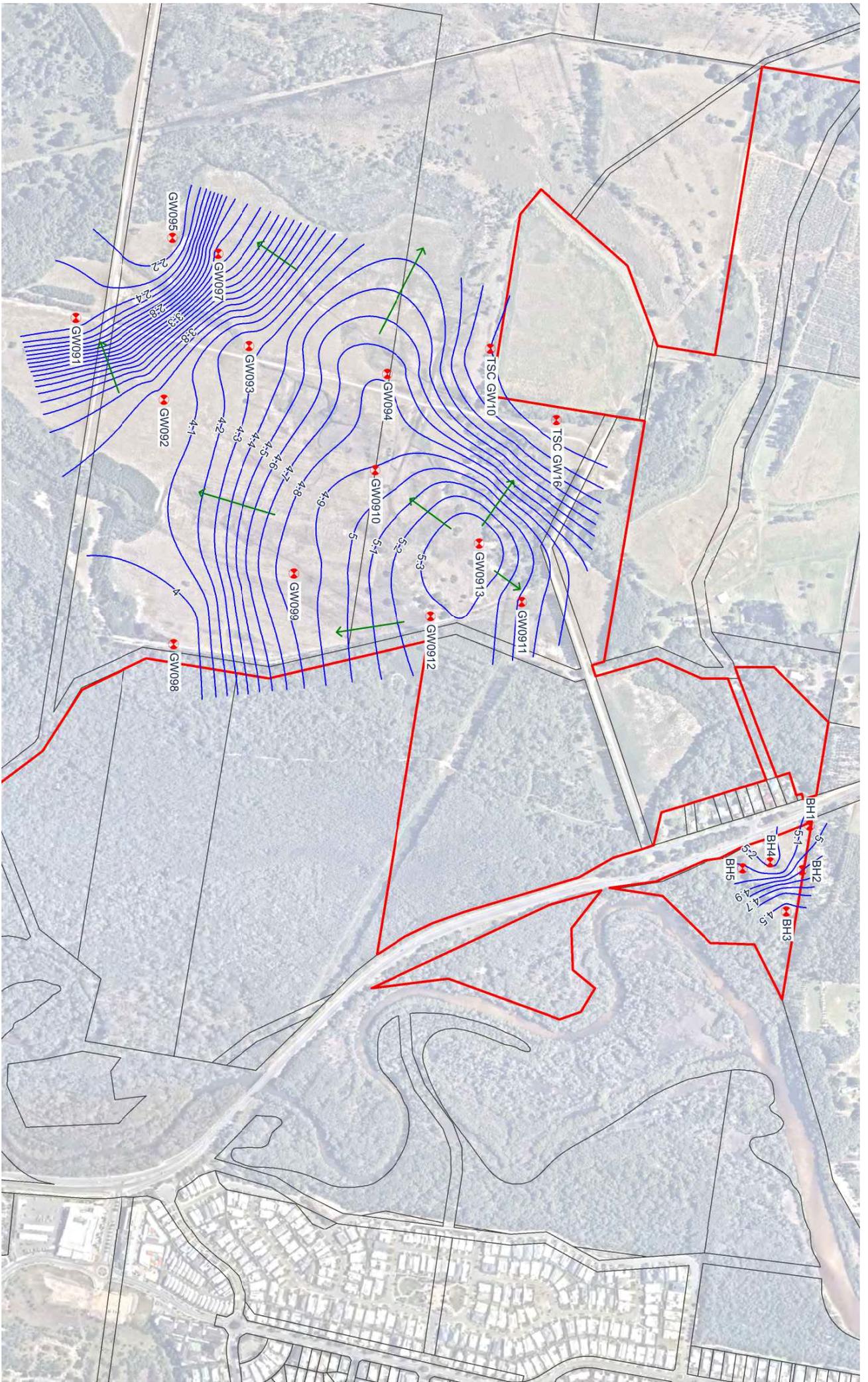
**PROJECT**  
 KINGS FOREST

**CLIENT**  
 PROJECT 28  
 PTY LTD

**DRAWING**  
 GROUNDWATER  
 ELEVATIONS  
 15 & 16 MAY 2019

**SCALE** 1:300@A3  
**DATE** 29/11/2019  
**DRAWN** SM  
**CHECKED** EHL  
**PROJECT** 1207  
**DRAWING** 002  
**REVISION**





**ORIENTATION**



**SCALE**  
 0 100 150 200 250 metres  
**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@sgccs.qs  
 07 557 8 9944  
 www.sgccs.qs

**LEGEND**

- Site boundary
- Cadastral boundaries
- Groundwater Monitoring Borehole
- Groundwater Contour (0.1m interval)
- Groundwater Flow Direction

**SOURCES**  
 Image: Nearmap image dated 19/07/2019.

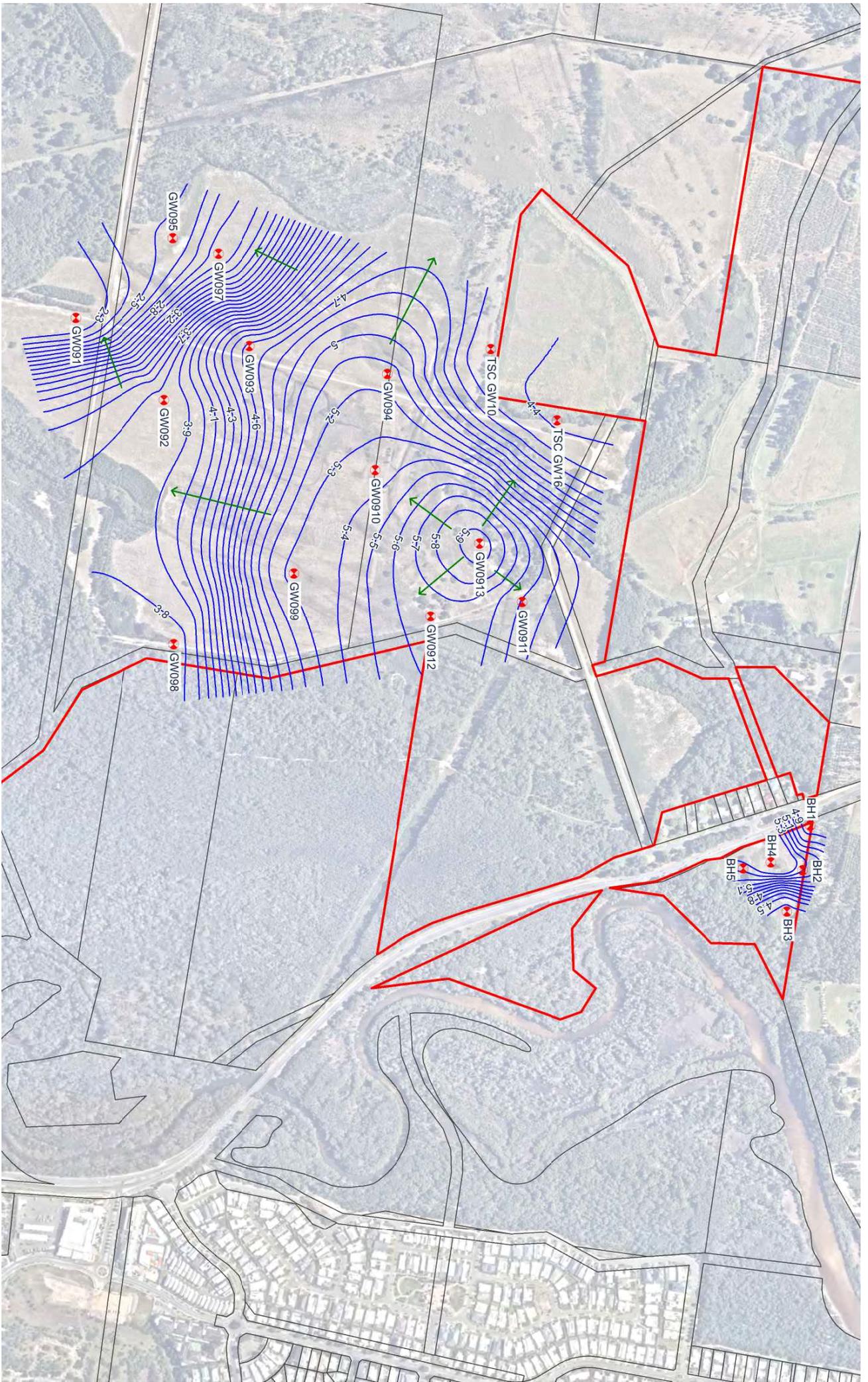
**PROJECT**  
 KINGS FOREST

**CLIENT**  
 PROJECT 28  
 PTY LTD

**DRAWING**  
 GROUNDWATER  
 ELEVATIONS  
 4 & 5 JUNE 2019

**SCALE** 1:300@A3  
**DATE** 29/11/2019  
**DRAWN** SWP  
**CHECKED** ELH  
**PROJECT** 1207  
**DRAWING** 003  
**REVISION**





**ORIENTATION**

**SCALE**  
 50 100 150 200 250  
 metres

**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@sgccs.qs  
 www.sgccs.qs

**LEGEND**

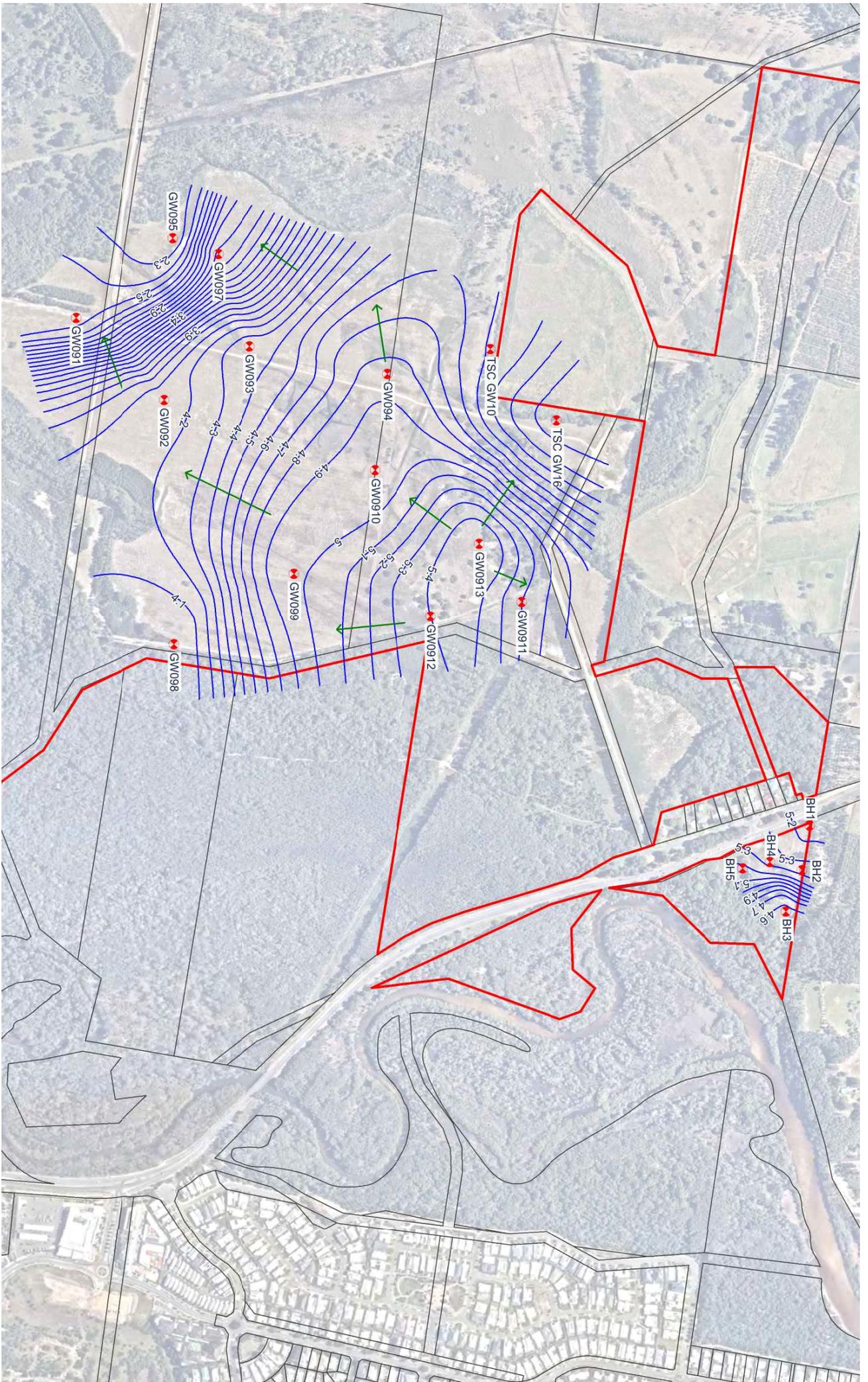
- Site boundary
- Cadastral boundaries
- ↔ Groundwater Monitoring Borehole
- ↔ Groundwater Contour (0.1m interval)
- ↔ Groundwater Flow Direction

**SOURCES**

Image: Nearmap image dated 19/07/2019.

<b>PROJECT</b> KINGS FOREST	<b>CLIENT</b> PROJECT 28 PTY LTD	<b>DRAWING</b> GROUNDWATER ELEVATIONS 26 & 27 JUNE 2019
<b>SCALE</b> 1:300@A3	<b>DATE</b> 25/11/2019	<b>CHECKED</b> ELH
	<b>DRAWN</b> SM	<b>PROJECT</b> 1207
		<b>DRAWING</b> 004
		<b>REVISION</b>





**ORIENTATION**

**SCALE**  
 50 100 150 200 250  
 metres

**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@gccs.qs  
 www.gccs.qs

**LEGEND**

- Site boundary
- Cadastral boundaries
- ◆ Groundwater Monitoring Borehole
- Groundwater Contour (0.1m interval)
- Groundwater Flow Direction

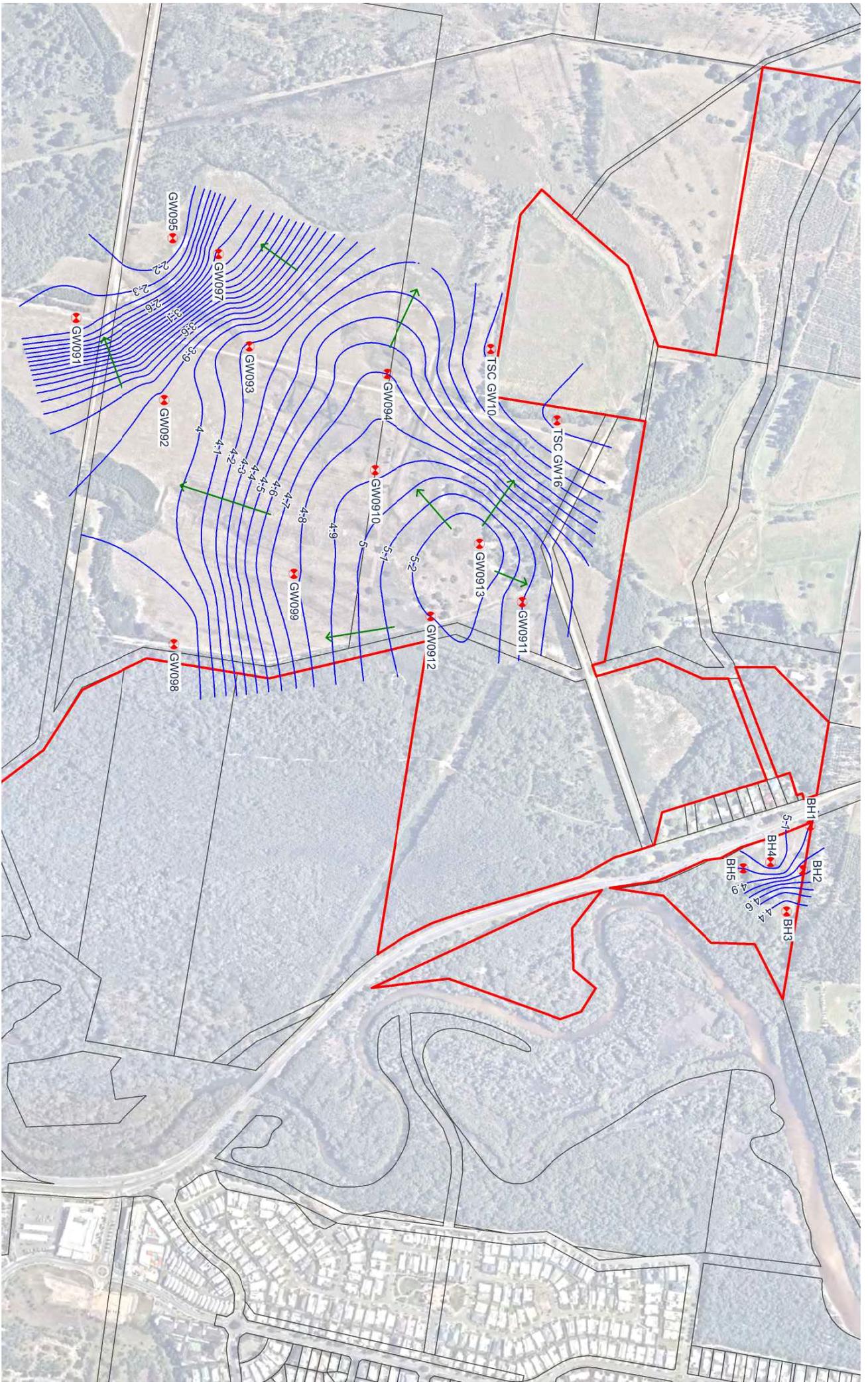
**SOURCES**

Image: Nearmap image dated 19/07/2019

<b>PROJECT</b> KINGS FOREST	<b>CLIENT</b> PROJECT 28 PTY LTD
<b>SCALE</b> 1:500@A3	<b>DRAWING</b> 009
<b>DATE</b> 29/11/2019	<b>CHECKED</b> ELH
<b>DRAWN</b> SNP	<b>PROJECT</b> 1207
<b>DRAWING</b> 009	<b>REVISION</b>



**DRAWING**  
GROUNDWATER  
ELEVATIONS  
17 & 18 JULY 2019



**ORIENTATION**

**SCALE**  
 50 100 150 200 250  
 metres

**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@accross.qs  
 www.accross.qs

**LEGEND**

- Site boundary
- Cadastral boundaries
- ◆ Groundwater Monitoring Borehole
- Groundwater Contour (0.1m interval)
- Groundwater Flow Direction

**SOURCES**  
 Image: Nearmap image dated 19/07/2019

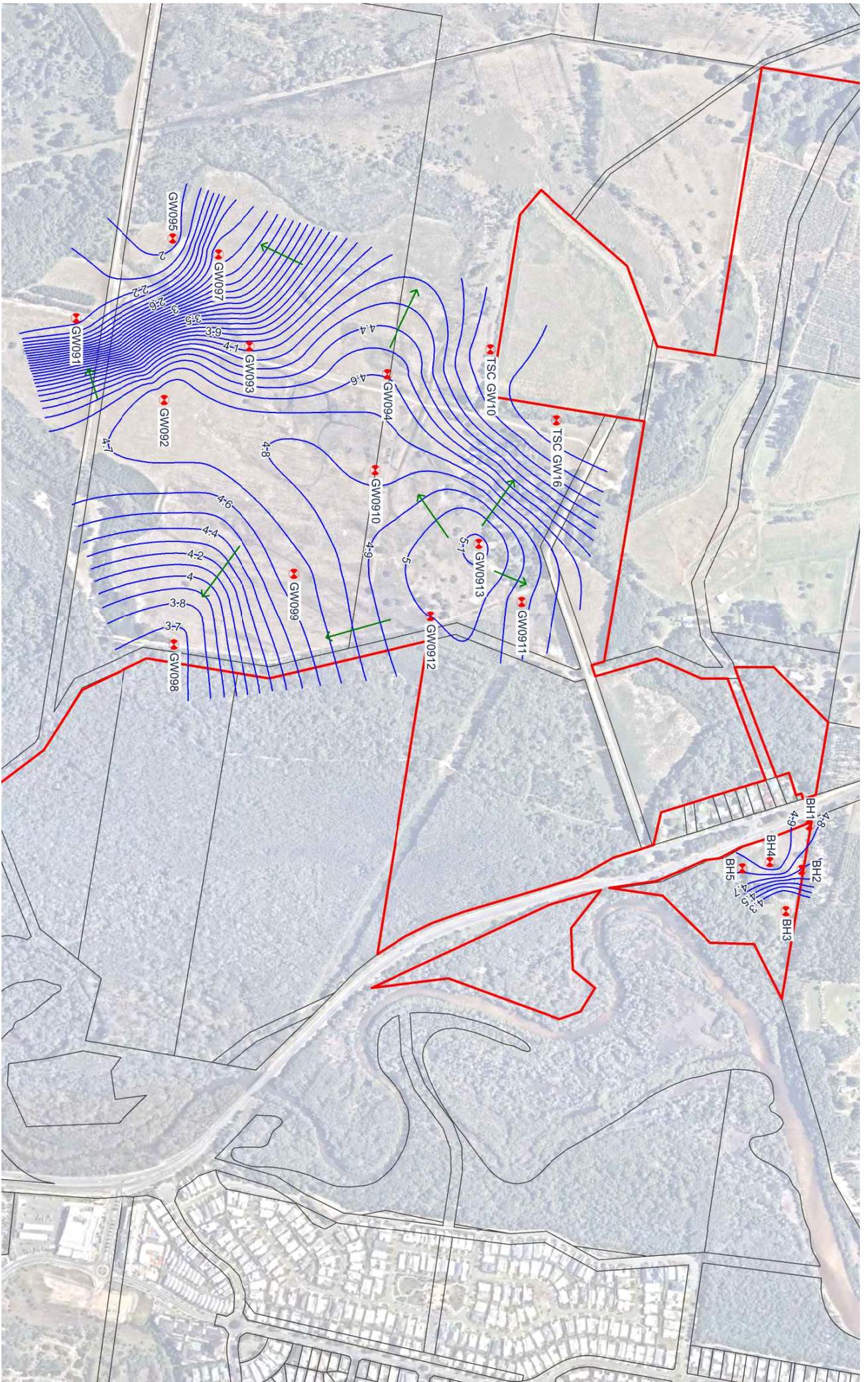
**PROJECT**  
 KINGS FOREST

**CLIENT**  
 PROJECT 28  
 PTY LTD

**DRAWING**  
 GROUNDWATER  
 ELEVATIONS  
 6 & 8 AUGUST 2019

**SCALE** 1:300@A3  
**DATE** 29/11/2019  
**DRAWN** SM  
**CHECKED** ELH  
**PROJECT** 1207  
**DRAWING** 006  
**REVISION**





**ORIENTATION**

**SCALE**  
 50 100 150 200 250  
 metres

**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@gccsccs.qs  
 07 557 8 9944  
 www.gccsccs.qs

**LEGEND**

- Site boundary
- Cadastral boundaries
- Groundwater Monitoring Borehole
- Groundwater Contour (0.1m interval)
- Groundwater Flow Direction

**SOURCES**

Image: Nearmap image dated 19/07/2019.

**PROJECT**

KINGS FOREST

**CLIENT**

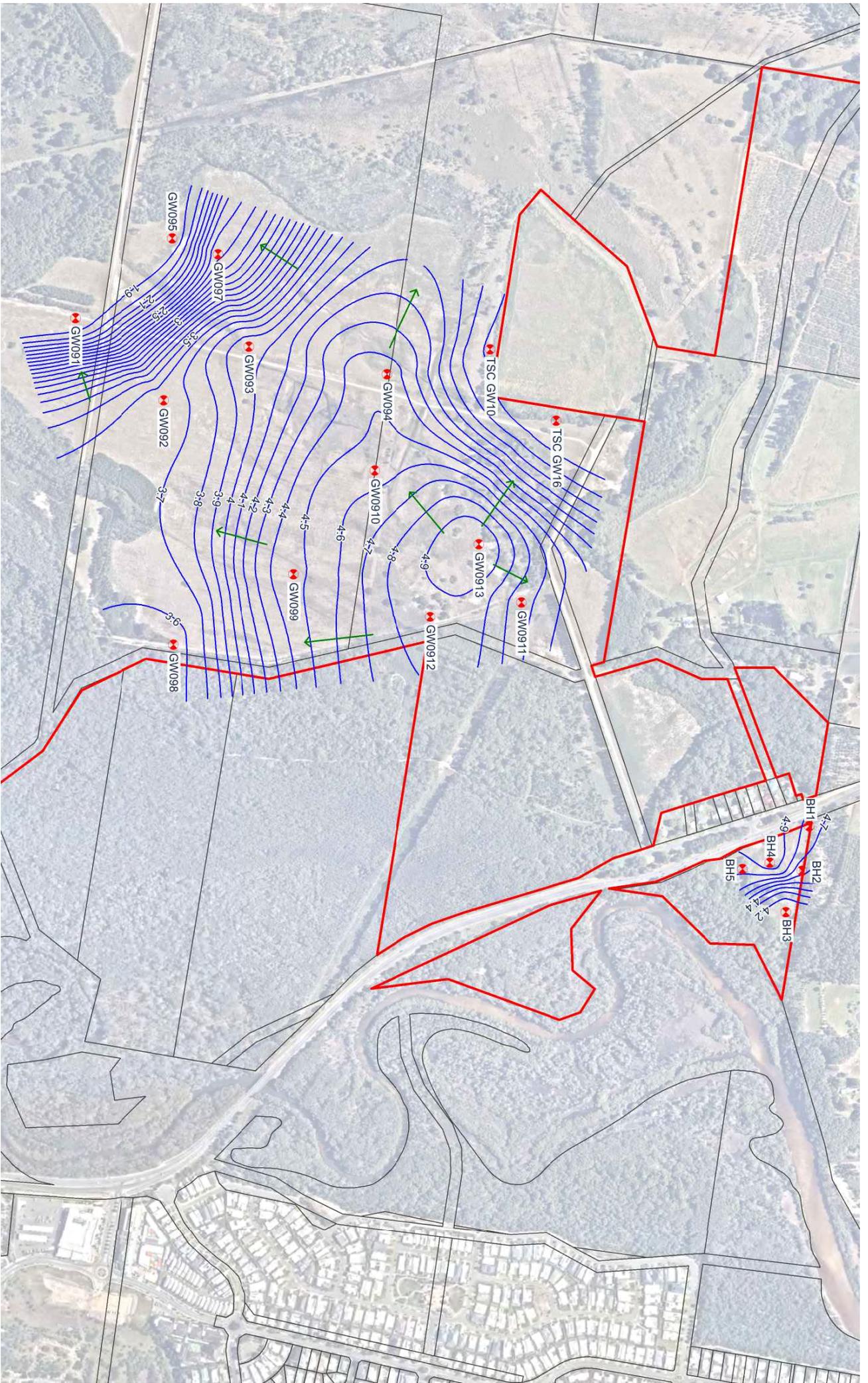
PROJECT 28  
 PTY LTD

**DRAWING**

GROUNDWATER  
 ELEVATIONS  
 27 & 28 AUGUST 2019

**SCALE** 1:500 @ A3  
**DATE** 29/11/2019  
**DRAWN** SWP  
**CHECKED** ELH  
**PROJECT** 12017  
**DRAWING** 007  
**REVISION**





**ORIENTATION**



**ROBINA**  
PO Box 4115 Robina QLD 4230  
Email: robina@gccs.qs  
www.gccs.qs

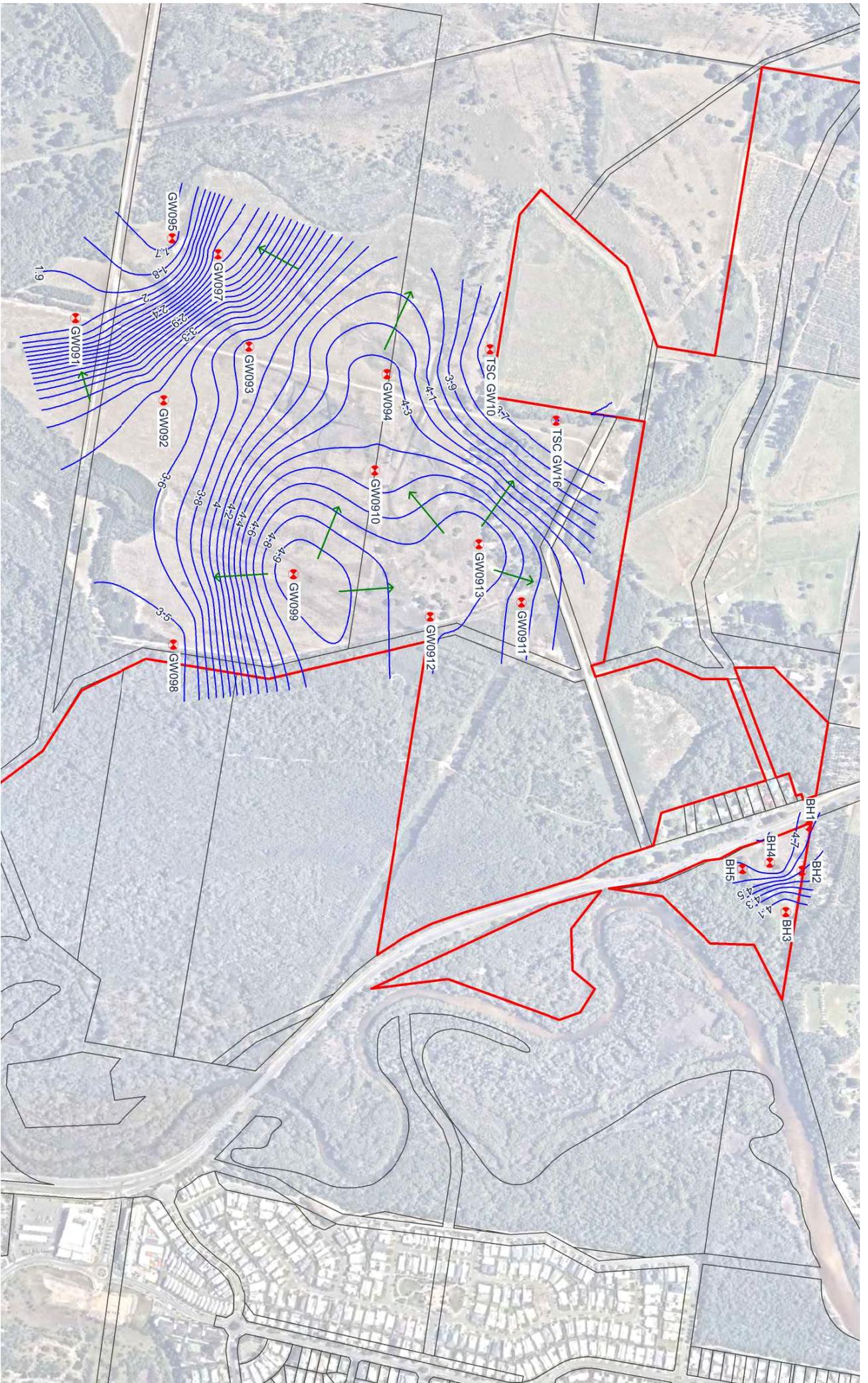
**LEGEND**

- Site boundary
- Cadastral boundaries
- Groundwater Monitoring Borehole
- Groundwater Contour (0.1m interval)
- Groundwater Flow Direction

**SOURCES**  
Image: Nearmap image dated 19/07/2019.

<b>PROJECT</b>	<b>CLIENT</b>	<b>DRAWING</b>
KINGS FOREST	PROJECT 28 PTY LTD	GROUNDWATER ELEVATIONS 17 & 18 SEPTEMBER 2019
<b>SCALE</b>	<b>DATE</b>	<b>CHECKED</b>
1:500@A3	29/11/2019	ELH
<b>DRAWN</b>	<b>PROJECT</b>	<b>DRAWING</b>
SNP	12017	008
<b>REVISION</b>		





**ORIENTATION**

SCALE 50 100 150 200 250 metres

**ROBINA**  
 PO Box 4115 Robina QLD 4230  
 Email: robina@gccsccs.qs  
 www.gccsccs.qs

**LEGEND**

- Site boundary
- Cadastral boundaries
- Groundwater Monitoring Borehole
- Groundwater Contour (0.1m interval)
- Groundwater Flow Direction

**SOURCES**

Image: Nearmap image dated 19/07/2019.

**PROJECT**

KINGS FOREST

**CLIENT**

PROJECT 28  
 PTY LTD

**DRAWING**

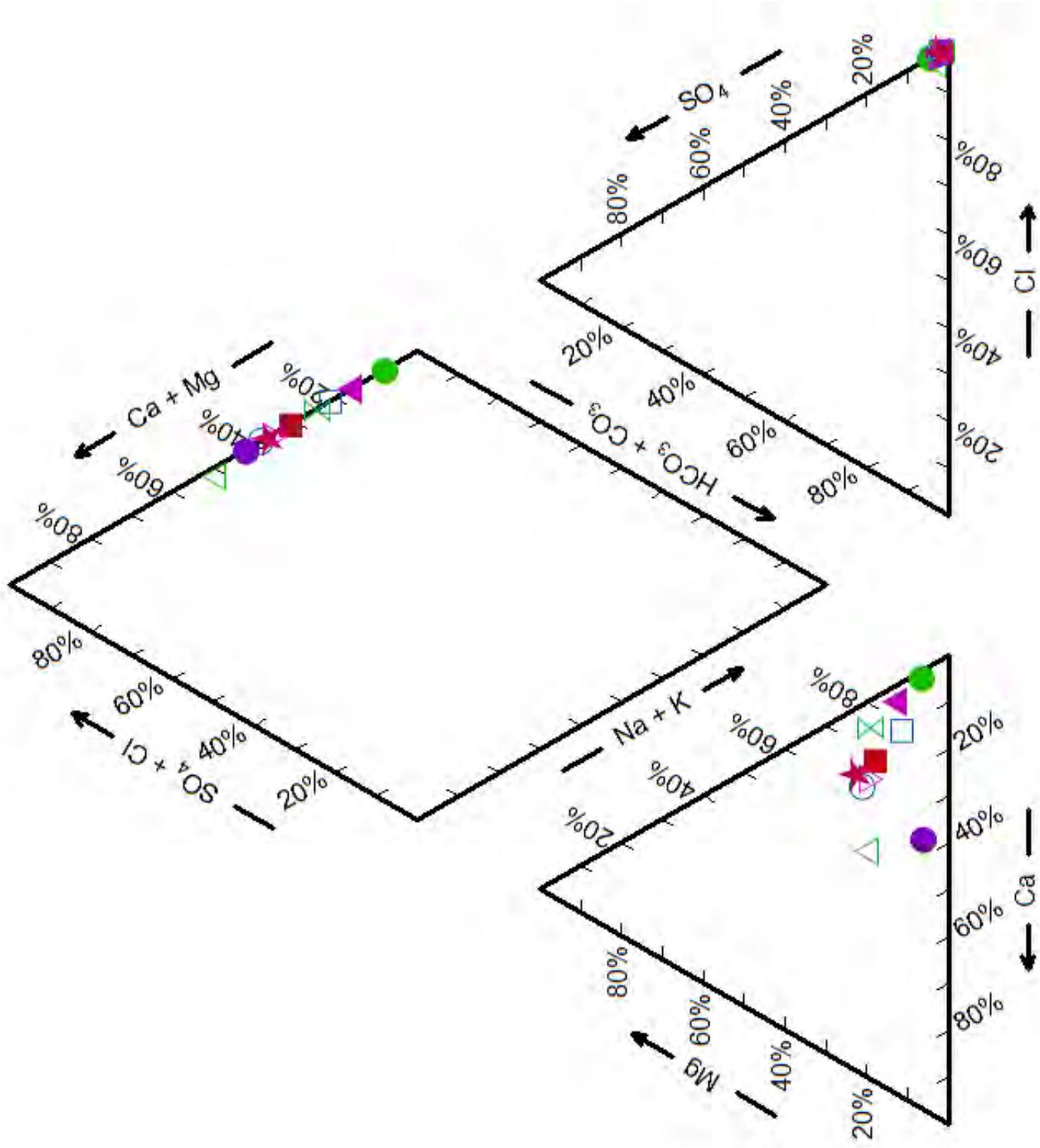
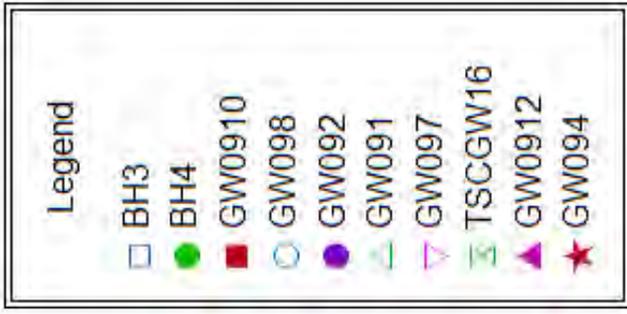
GROUNDWATER  
 ELEVATIONS  
 8 & 10 OCTOBER 2019

SCALE 1:500 @ A3  
 DATE 29/11/2019  
 DRAWN SWP  
 CHECKED ELH  
 PROJECT 12017  
 DRAWING 009  
 REVISION

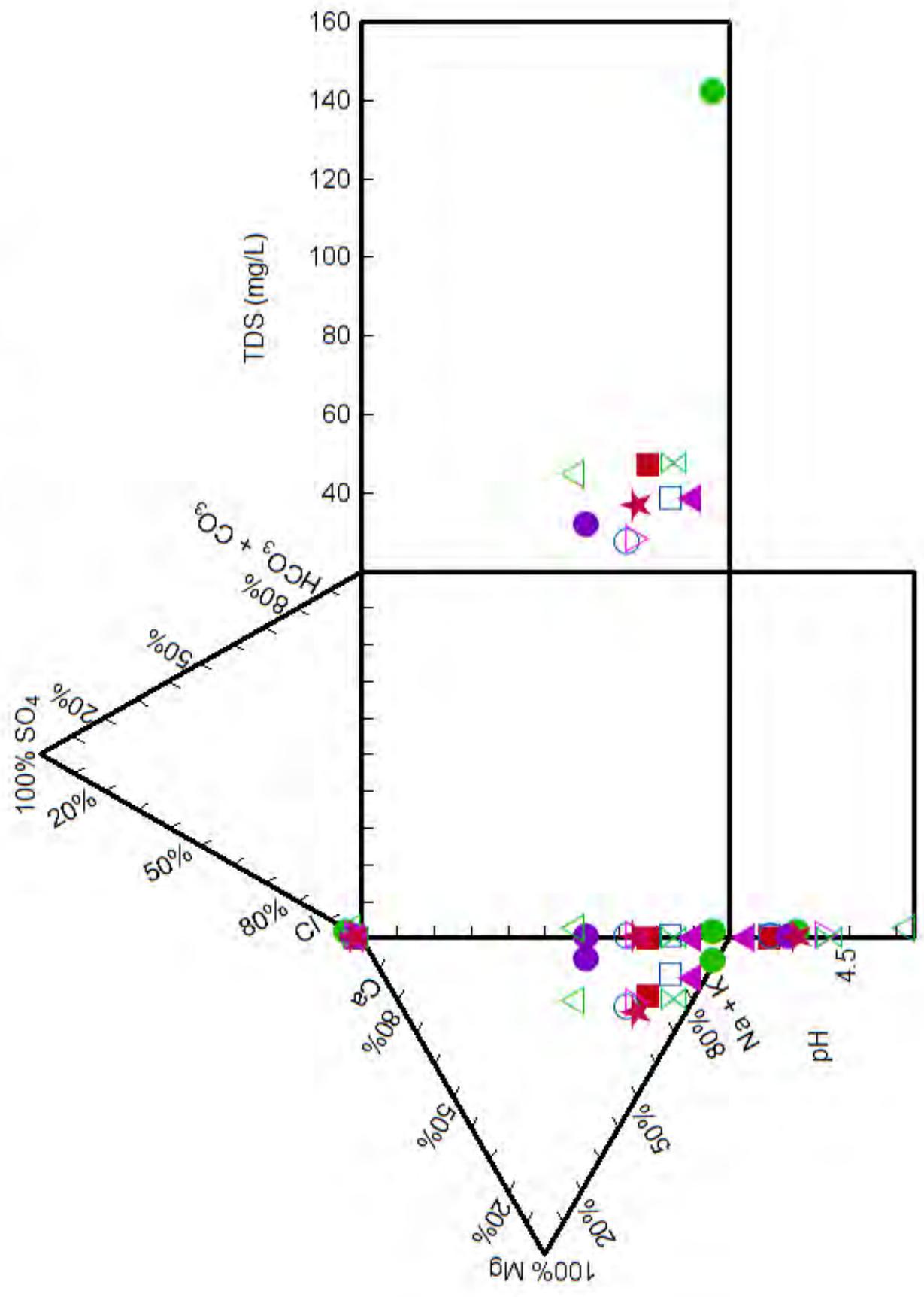
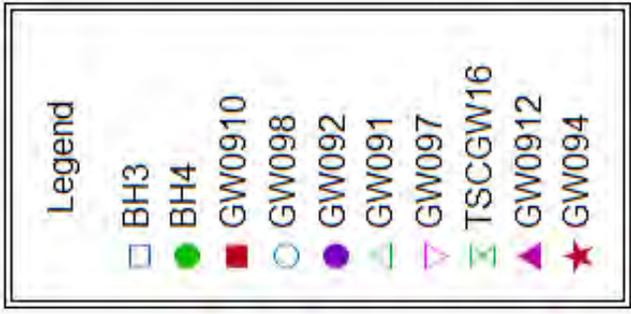


## 12 Appendix 5 – Piper and Durov diagrams

# Kings Forest Piper Diagram



# Kings Forest Durov Diagram



## 13 Appendix 6 – Rainfall analysis







Figure 4. Surface water - Electrical Conductivity

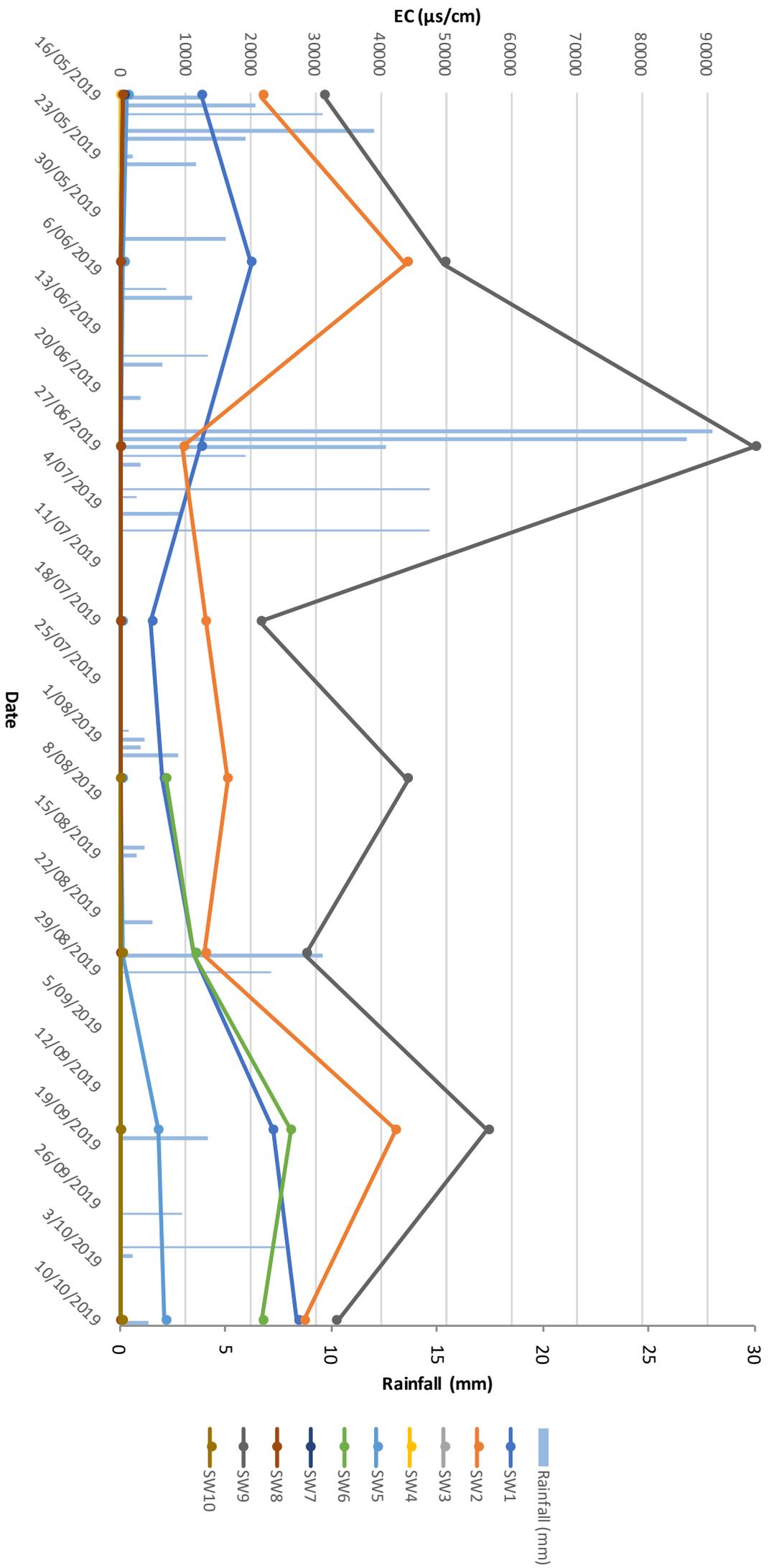
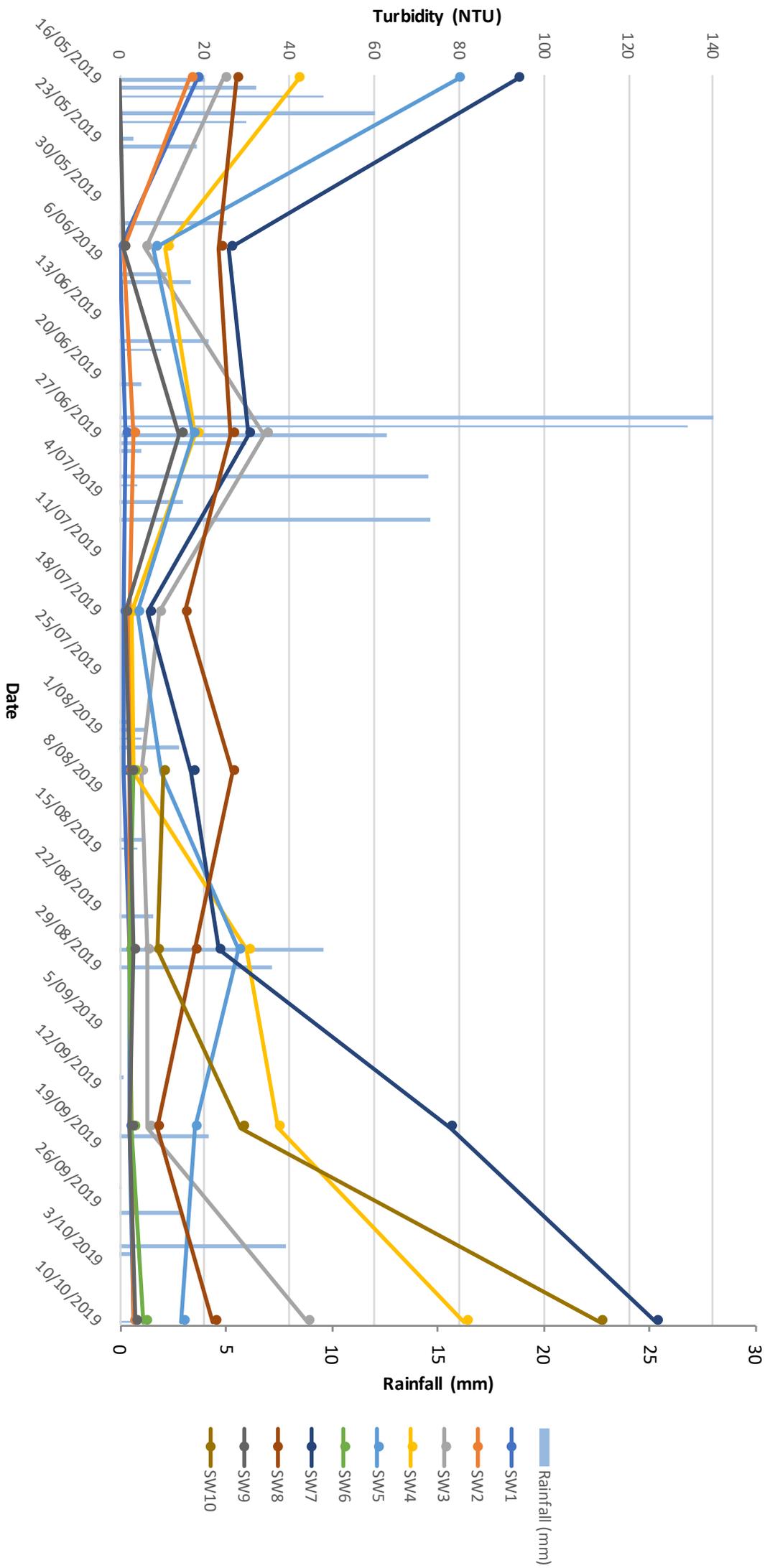


Figure 5. Surface water - Turbidity



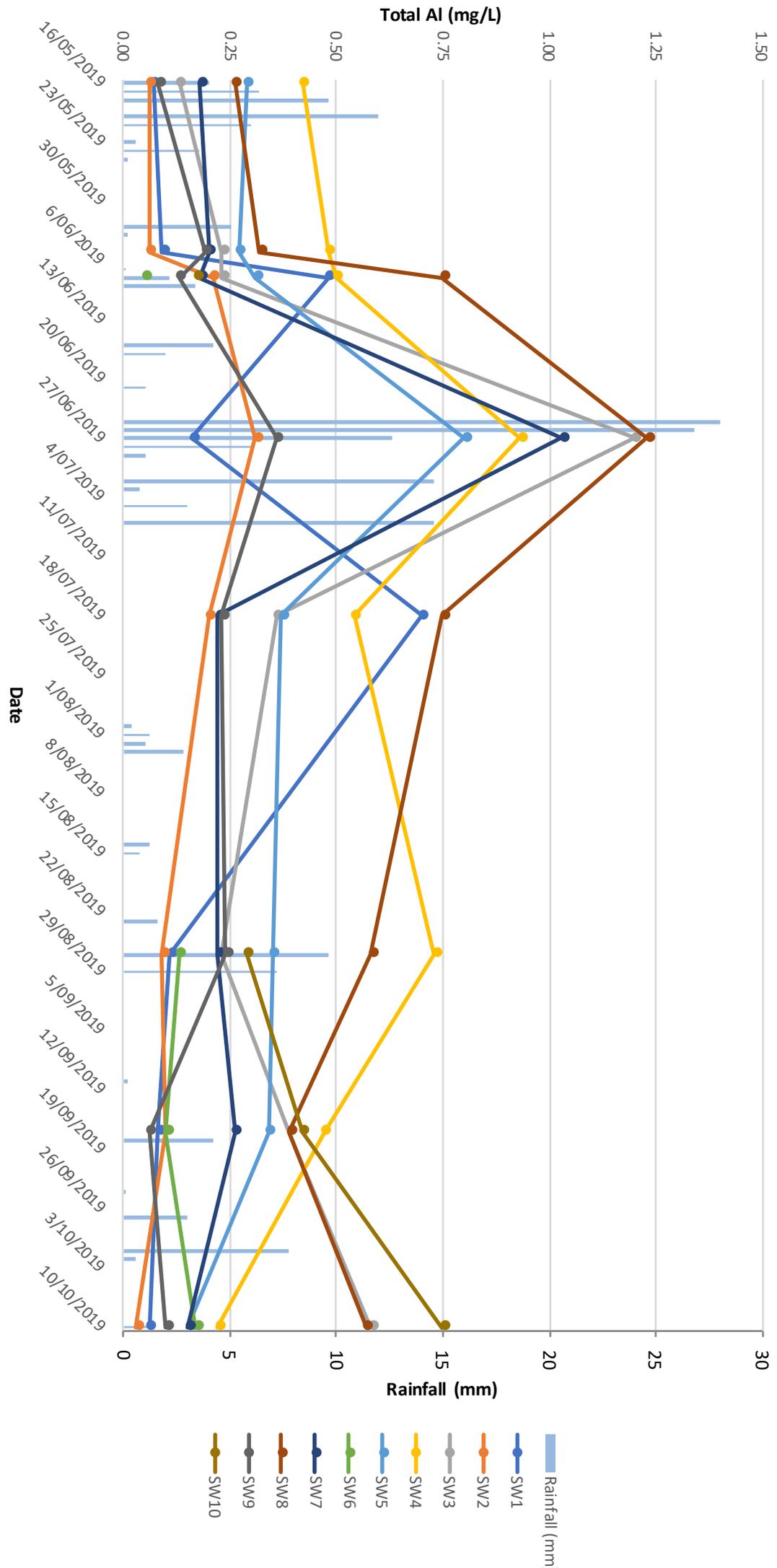


Figure 6. Surface water - Total Aluminium



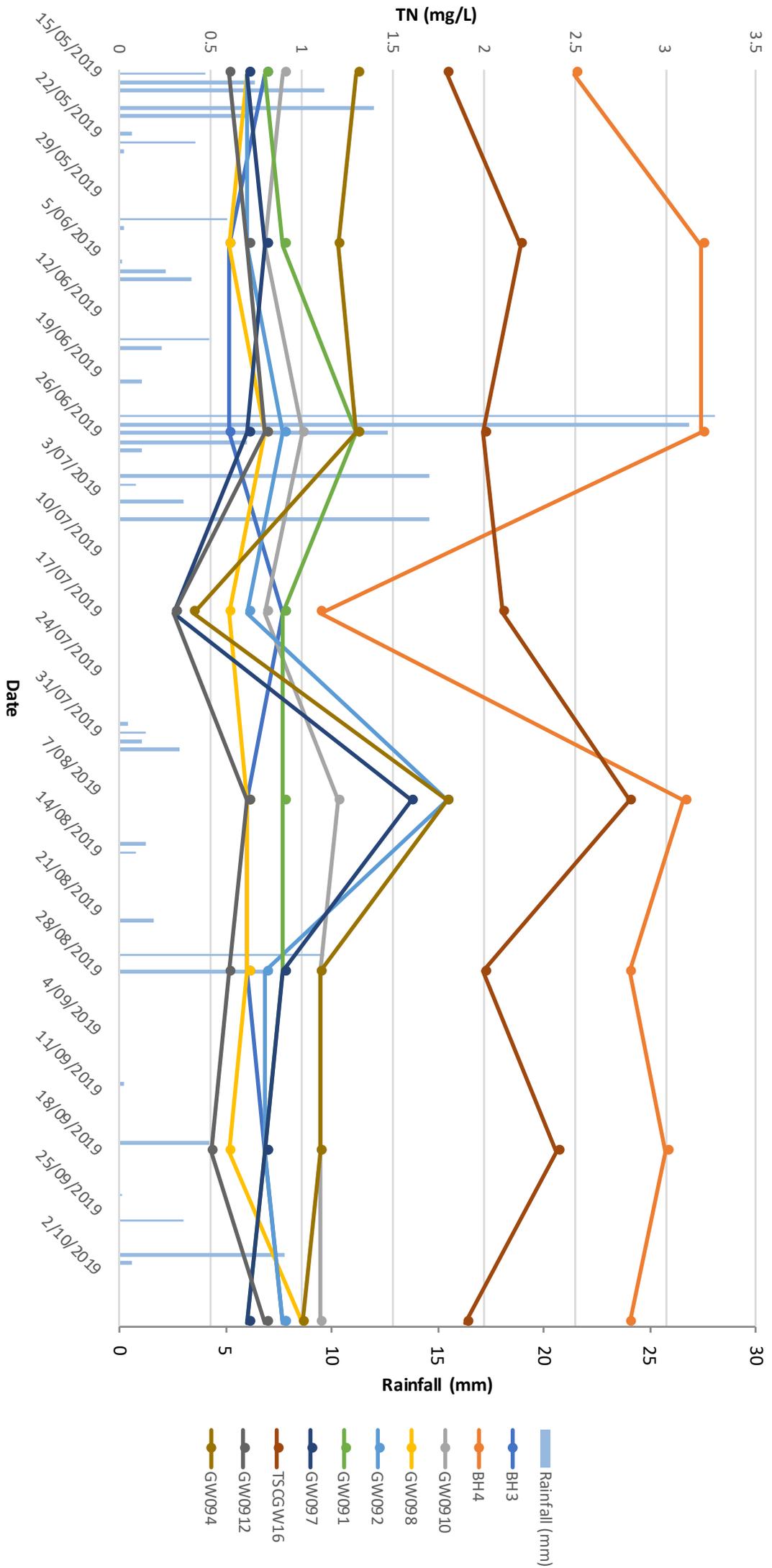








Figure 12. Groundwater - Total Nitrogen









## 14 Appendix 7 – Water Quality Monitoring and Management

The following tables have been sourced from the Overall Water Management Plan, Stage 1 Kings Forest, New South Wales (G&S 2020).

### 14.1 Surface water quality monitoring and management

Applies to:	Bulk earthworks phase
Person responsible:	Contractor’s Site Manager; Environmental Consultant

Issue	Surface water quality monitoring.																																																						
Operational policy	To maintain the water quality conditions of the receiving environment during the bulk earthworks phase of the development.																																																						
Performance criteria	<p>Surface water monitoring will be conducted monthly and following the first monthly rainfall event (defined as &gt;25mm in 24 hours) at the locations shown on Drawing No. 12017_001 for the parameters listed in Section 4.1. Results shall be compared with the surface water quality criteria (indicator parameters only) detailed below;</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #1a3d4d; color: white;"> <th colspan="4" style="text-align: left; padding: 5px;"><i>Surface water quality criteria</i></th> </tr> <tr style="background-color: #1a3d4d; color: white;"> <th style="text-align: left; padding: 5px;">Parameter</th> <th style="text-align: center; padding: 5px;"><i>Saline (SW1, SW2, SW6, and SW9)</i></th> <th style="text-align: center; padding: 5px;"><i>Brackish (SW5)</i></th> <th style="text-align: center; padding: 5px;"><i>Fresh (SW3, SW4, SW7, SW8 and SW10)</i></th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">pH</td> <td style="text-align: center; padding: 5px;">5.66-6.3</td> <td style="text-align: center; padding: 5px;">5.34-6.14</td> <td style="text-align: center; padding: 5px;">5.23-6.66</td> </tr> <tr> <td style="padding: 5px;">Electrical Conductivity</td> <td style="text-align: center; padding: 5px;">&lt;38700 <math>\mu</math>s/cm</td> <td style="text-align: center; padding: 5px;">&lt;4008.6 <math>\mu</math>s/cm</td> <td style="text-align: center; padding: 5px;">&lt;230.4 <math>\mu</math>s/cm</td> </tr> <tr> <td style="padding: 5px;">Dissolved Oxygen</td> <td style="text-align: center; padding: 5px;">&gt;7.10 mg/L</td> <td style="text-align: center; padding: 5px;">&gt;4.87 mg/L</td> <td style="text-align: center; padding: 5px;">&gt;2.91 mg/L</td> </tr> <tr> <td style="padding: 5px;">Turbidity</td> <td style="text-align: center; padding: 5px;">&lt;3.1 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;23.76 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;32.54 mg/L</td> </tr> <tr> <td style="padding: 5px;">Total Nitrogen</td> <td style="text-align: center; padding: 5px;">&lt;0.5 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;1 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;1.46 mg/L</td> </tr> <tr> <td style="padding: 5px;">Total Phosphorus</td> <td style="text-align: center; padding: 5px;">&lt;0.03 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;0.04 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;0.14 mg/L</td> </tr> <tr> <td style="padding: 5px;">Iron (total)</td> <td style="text-align: center; padding: 5px;">&lt;0.41 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;4.40 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;6.57 mg/L</td> </tr> <tr> <td style="padding: 5px;">Aluminium (total)</td> <td style="text-align: center; padding: 5px;">&lt;0.22 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;0.36 mg/L</td> <td style="text-align: center; padding: 5px;">&lt;0.68 mg/L</td> </tr> <tr> <td style="padding: 5px;">Chlorophyll-a</td> <td style="text-align: center; padding: 5px;">&lt;6 <math>\mu</math>g/L</td> <td style="text-align: center; padding: 5px;">&lt;6 <math>\mu</math>g/L</td> <td style="text-align: center; padding: 5px;">&lt;6 <math>\mu</math>g/L</td> </tr> <tr> <td style="padding: 5px;">Litter and gross pollutants</td> <td style="padding: 5px;">No man made material &lt;5mm in any dimension</td> <td style="padding: 5px;">No man made material &lt;5mm in any dimension</td> <td style="padding: 5px;">No man made material &lt;5mm in any dimension</td> </tr> <tr> <td style="padding: 5px;">Oil and/or grease</td> <td style="padding: 5px;">No visible film, no detectable odour</td> <td style="padding: 5px;">No visible film, no detectable odour</td> <td style="padding: 5px;">No visible film, no detectable odour</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">*Note: pH must be consistent with receiving water quality. Consideration must be given to the preferred water quality conditions of WSF communities when interpreting pH results against the site-specific water quality criteria. If receiving waters are estuarine, pH can range from 5.5 -7.5; if receiving waters are fresh, pH can range from 4.2 – 6.7 in accordance with the <i>Threatened Species Management Plans</i> (JWA, 20120a-c) for habitat requirements for Wallum Froglet (<i>Crinia signifera</i>)</p>			<i>Surface water quality criteria</i>				Parameter	<i>Saline (SW1, SW2, SW6, and SW9)</i>	<i>Brackish (SW5)</i>	<i>Fresh (SW3, SW4, SW7, SW8 and SW10)</i>	pH	5.66-6.3	5.34-6.14	5.23-6.66	Electrical Conductivity	<38700 $\mu$ s/cm	<4008.6 $\mu$ s/cm	<230.4 $\mu$ s/cm	Dissolved Oxygen	>7.10 mg/L	>4.87 mg/L	>2.91 mg/L	Turbidity	<3.1 mg/L	<23.76 mg/L	<32.54 mg/L	Total Nitrogen	<0.5 mg/L	<1 mg/L	<1.46 mg/L	Total Phosphorus	<0.03 mg/L	<0.04 mg/L	<0.14 mg/L	Iron (total)	<0.41 mg/L	<4.40 mg/L	<6.57 mg/L	Aluminium (total)	<0.22 mg/L	<0.36 mg/L	<0.68 mg/L	Chlorophyll-a	<6 $\mu$ g/L	<6 $\mu$ g/L	<6 $\mu$ g/L	Litter and gross pollutants	No man made material <5mm in any dimension	No man made material <5mm in any dimension	No man made material <5mm in any dimension	Oil and/or grease	No visible film, no detectable odour	No visible film, no detectable odour	No visible film, no detectable odour
<i>Surface water quality criteria</i>																																																							
Parameter	<i>Saline (SW1, SW2, SW6, and SW9)</i>	<i>Brackish (SW5)</i>	<i>Fresh (SW3, SW4, SW7, SW8 and SW10)</i>																																																				
pH	5.66-6.3	5.34-6.14	5.23-6.66																																																				
Electrical Conductivity	<38700 $\mu$ s/cm	<4008.6 $\mu$ s/cm	<230.4 $\mu$ s/cm																																																				
Dissolved Oxygen	>7.10 mg/L	>4.87 mg/L	>2.91 mg/L																																																				
Turbidity	<3.1 mg/L	<23.76 mg/L	<32.54 mg/L																																																				
Total Nitrogen	<0.5 mg/L	<1 mg/L	<1.46 mg/L																																																				
Total Phosphorus	<0.03 mg/L	<0.04 mg/L	<0.14 mg/L																																																				
Iron (total)	<0.41 mg/L	<4.40 mg/L	<6.57 mg/L																																																				
Aluminium (total)	<0.22 mg/L	<0.36 mg/L	<0.68 mg/L																																																				
Chlorophyll-a	<6 $\mu$ g/L	<6 $\mu$ g/L	<6 $\mu$ g/L																																																				
Litter and gross pollutants	No man made material <5mm in any dimension	No man made material <5mm in any dimension	No man made material <5mm in any dimension																																																				
Oil and/or grease	No visible film, no detectable odour	No visible film, no detectable odour	No visible film, no detectable odour																																																				

and the *Wallum Sedge Frog Management Plan* (JWA 2020g) for habitat requirements for the Wallum sedge Frog (*Litoria olongburensis*).

Results of monitoring should also be compared to the Tweed Catchment Water Quality Objectives<sup>12</sup> (in accordance with the Project Approval Condition 21[5]) as below;

Parameter	Unit	Objective
pH	pH units	Freshwater 6.5 - 8.5 Estuary 7 - 8.5
Dissolved oxygen	mg/L	80 - 100% saturation
Turbidity	NTU	0.5 - 10 NTU
Total phosphorous	mg/L	0.03 mg/L
Total nitrogen	mg/L	0.3mg/L
Chlorophyll a	ug/L	<4

Note: These objectives are included for comparison only and do not constitute compliance criteria for the site. In many instances, baseline site water quality does not meet these objectives.

**Implementation strategy**

Construction of temporary sediment detention basins, clean-water diversion channels, swales and vegetated filter strips will be constructed prior to the commencement of earthworks in accordance with the approved Erosion and Sediment Control Plan (ESCP).

Stormwater control will be achieved by directing as much runoff from disturbed areas as practicable to the sediment detention basins.

Clean water diversion channels will be used to divert clean water from construction areas.

Monitoring of the sediment detention basins prior to controlled release shall occur in accordance with the approved ESCP. Monitoring shall be undertaken for pH, turbidity and suspended solids to ensure compliance with background conditions (as relevant to the discharge location).

Water may be discharged from the site that exhibits a suspended solids concentration greater than 50mg L<sup>-1</sup>, providing the concentration in the discharge is 10% less than the concentration exhibited in the receiving water.

Where water quality fails to meet the established criteria, corrective measures will be undertaken (e.g. if sediment problems are identified, settling in the sediment detention ponds shall be aided by dosing with flocculation agents) to achieve compliance with the water quality release criteria. Treated water is to be re-tested prior to release to establish the effectiveness of treatment measures.

Landscaping activities and revegetation will occur progressively as soon as possible after areas reach final grade.

<sup>12</sup> <https://www.environment.nsw.gov.au/ieo/Tweed/report-02.htm>

Monitoring	<p>Only appropriate herbicides and fertilisers are to be used in accordance with TSC specifications.</p>
	<p>Surface water monitoring will be conducted monthly and following the first monthly rainfall event (defined as &gt;25mm in 24 hours) at the locations shown on Drawing No. 12017_001 for the parameters listed in Section 4.1.</p> <p>Surface water and groundwater quality monitoring are to be conducted simultaneously to allow temporal comparisons between the systems.</p> <p>Sample recovery and in situ analysis will be performed by trained staff and, when required, samples will be forwarded to a NATA-accredited laboratory.</p> <p>Sediment and erosion control measures will be inspected regularly in accordance with the approved ESCP.</p>
Auditing	<p>Environmental consultant to audit water quality results to ensure all discharges from sediment basins comply with the performance criteria as relevant at the discharge location.</p> <p>Environmental consultant to audit monthly and rainfall event water quality results against the site specific water quality criteria.</p>
Reporting	<p>Result sheets to be compiled for monitoring results relating to water quality of water bodies. These results to be kept onsite for inspection by local and state government officers.</p> <p>Monthly reports to be submitted to TSC until completion of works. Reports will be submitted to TSC within 30 working days upon receipt of the laboratory results.</p> <p>The water quality reports will be prepared by a suitably qualified and experienced Environmental Consultant. These reports will detail:</p> <ul style="list-style-type: none"> <li>• The results for each of the environmental indicators monitored.</li> <li>• An assessment of the monitoring results against the criteria.</li> <li>• Consideration must be given to the preferred water quality conditions of WSF communities when interpreting pH results against the site-specific water quality criteria.</li> <li>• When interpreting compliance with the adopted water quality criteria, it is essential to acknowledge that the values of water quality indicators vary naturally and that not all of this variation is ecologically important<sup>13</sup>.</li> <li>• An evaluation, if applicable, of the environmental conditions if monitoring results fall outside the limits of the release criteria.</li> <li>• Recommendations that are relevant to ensuring a high level of water quality is maintained.</li> <li>• Each report will include previous water quality results in tabular format for comparative purposes and trend graphs will be provided. Laboratory certificates will be provided.</li> </ul> <p>Within 24 hours of detecting any incidents during construction that cause (or may cause) significant harm to the environment, the Proponent shall notify TSC and other relevant agencies of the incident in accordance with the protocol in Section 5.3.</p>

<sup>13</sup> Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, 2000, Section 3.1, Page 21.

<p>Identification of incident or failure</p>	<p>The values of water quality indicators will vary naturally and not all of this variation is ecologically important<sup>14</sup>.</p> <p>The site-specific criteria are based on the 80th percentile of the baseline data set and thus the probability of a single observation exceeding the 80th percentile is 20%. The probability of a Type 1 error (or the risk of triggering a false alarm) is 20%.</p> <p>The recording of a single result that exceeds the criteria will be used to trigger additional investigations including an increase to fortnightly monitoring of the parameter(s) in question. Results will be used to ascertain whether an adverse trend may be emerging and if so, allow early detection of the cause of the trend. The findings of such site investigations should be used to determine whether a non-compliance has occurred.</p>
<p>Corrective action</p>	<p>All development activities taking place at the time of incident/failure shall be reviewed to verify compliance with the OWMP provisions and, if necessary, construction methods and procedures shall be adjusted. Specific strategies to be implemented in consultation with the Environmental Consultant but may include;</p> <p><b>pH</b></p> <p>In the event that the pH of waters falls outside of the critical limits, such waters will be contained and the pH adjusted to within the target range prior to release.</p> <p><b>Electrical conductivity</b></p> <p>If electrical conductivity exceeds the relevant background criteria, the waters will be contained onsite until adequate EC levels are reached. Further monitoring of upstream waters will be conducted to assess the impact of the development on the absolute change to water quality.</p> <p>Rainfall data will also be assessed at such times to determine the impact that rainfall has had on the water quality of the site and discharging waters.</p> <p><b>Suspended solids and turbidity</b></p> <p>If total suspended solids exceed the relevant background criteria the waters will be contained onsite for a period sufficient to allow suspended solids to settle out prior to release, or treated with a flocculent. After gypsum has been applied, the stored waters will be retested immediately prior to discharge.</p> <p>Erosion control devices will be immediately inspected and cleaned if necessary. Additional devices will be installed if a need is detected to prevent future breaches of the suspended solids criteria. The placement of stockpiles and management of disturbed areas will be reviewed with respect to the approved ESCP.</p> <p><b>Dissolved oxygen</b></p> <p>In the event that dissolved oxygen levels drop below the relevant background criteria, the waters will not be released until visual inspections for algae have been carried out. If algae are present, further laboratory tests will be carried out to determine the type of algae in the waters.</p> <p>A general investigation will be carried out of the flow conditions of the affected waters, to assess the flow rates and volume of water passing through the monitoring locations and suitability for release.</p> <p><b>Litter and gross pollutants</b></p>

<sup>14</sup> Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, 2000, Section 3.1, Page 21.

<p>In the event that litter and gross pollutants with a dimension greater than 5mm are observed, this material will be clean up and appropriately disposed of as soon as practicable. The contractor shall inform staff of the appropriate waste disposal procedures and reiterate the importance and sensitivity of the surrounding ecosystems.</p> <p><b>Oil and grease</b></p> <p>In the event that oil and grease are visible and/or an odour is detected within a waterbody, management strategies will be implemented. Specifically, the waters shall be contained and the oil and grease isolated through the use of booms, containments bunds or other appropriate measures. Remediation works shall be implemented in consultation with the environmental consultant and DPIE.</p> <p>Upon receipt of a complaint follow the Complaints Procedure provided in Section 5.2.</p>
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## 14.2 Groundwater quality monitoring and management

Applies to:	Bulk earthworks phase
Person responsible:	Contractor's Site Manager; Environmental Consultant

Issue	Groundwater monitoring.																								
Operational policy	<p>To establish stable groundwater conditions and verify by monitoring that development management is appropriate.</p> <p>Groundwater monitoring is to be undertaken in accordance with the site's <i>Groundwater Assessment and Management Plan</i> (G&amp;S July 2012) and any subsequent revisions of that plan.</p>																								
Performance criteria	<p>Groundwater quality monitoring will be conducted monthly at the locations shown on Drawing No. 12017_001 for the parameters listed in Section 4.1. Results shall be compared with the water quality criteria (indicator parameters only) detailed below;</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #1a3d4d; color: white;"> <th colspan="3">Groundwater quality criteria</th> </tr> <tr style="background-color: #1a3d4d; color: white;"> <th>Parameter</th> <th>Precinct 1</th> <th>Precinct 5</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>3.5-4.33</td> <td>3.59-4.47</td> </tr> <tr> <td>Electrical Conductivity</td> <td>&lt;339.4 <math>\mu</math>s/cm</td> <td>&lt;131 <math>\mu</math>s/cm</td> </tr> <tr> <td>Total Nitrogen</td> <td>&lt;3 mg/L</td> <td>&lt;1.3 mg/L</td> </tr> <tr> <td>Total Phosphorus</td> <td>&lt;0.34 mg/L</td> <td>&lt;0.05 mg/L</td> </tr> <tr> <td>Iron (total)</td> <td>&lt;1.02 mg/L</td> <td>&lt;0.45 mg/L</td> </tr> <tr> <td>Aluminium (total)</td> <td>&lt;1.89 mg/L</td> <td>&lt;0.52 mg/L</td> </tr> </tbody> </table>	Groundwater quality criteria			Parameter	Precinct 1	Precinct 5	pH	3.5-4.33	3.59-4.47	Electrical Conductivity	<339.4 $\mu$ s/cm	<131 $\mu$ s/cm	Total Nitrogen	<3 mg/L	<1.3 mg/L	Total Phosphorus	<0.34 mg/L	<0.05 mg/L	Iron (total)	<1.02 mg/L	<0.45 mg/L	Aluminium (total)	<1.89 mg/L	<0.52 mg/L
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Implementation strategy	<p>Groundwater levels will be monitored fortnightly throughout bulk earthworks.</p> <p>Groundwater monitoring will be conducted during bulk earthworks at the locations identified on Drawing 12017_01. The progression of earthworks</p>																								

	<p>will necessitate the gradual removal of bores within the footprint of development. Bores will be retained for as long as possible.</p> <p>Monitoring of groundwater levels should be undertaken fortnightly during the bulk earthworks phase to determine any effect excavation and dewatering activities may have on groundwater levels.</p> <p>Groundwater samples are to be collected monthly and analysed for the parameters specified in 'Performance Criteria' above.</p>
Monitoring	<p>Carry out fortnightly groundwater level monitoring and monthly groundwater quality monitoring at locations to be specified.</p> <p>Sample recovery and in situ analysis will be performed by onsite staff and, when required, samples will be forwarded to a NATA-accredited laboratory.</p>
Auditing	<p>The environmental consultant is to audit water quality to ensure that no deleterious effects are resulting from any excavation, filling and dewatering operations at the site.</p> <p>The data from the water level measurement shall be collated quarterly and evaluated against the background monitoring data. It will also be used to verify the predictive model for groundwater behaviour when required.</p>
Reporting	<p>Quarterly reports are to be submitted to TSC.</p> <p>The water quality reports will be prepared by a suitably qualified and experienced Environmental Consultant. These reports will detail:</p> <ul style="list-style-type: none"> <li>• The results for each of the environmental indicators monitored.</li> <li>• An assessment of the monitoring results against the criteria.</li> <li>• Consideration must be given to the preferred water quality conditions of WSF communities when interpreting pH results against the site-specific water quality criteria.</li> <li>• When interpreting compliance with the adopted water quality criteria, it is essential to acknowledge that the values of water quality indicators vary naturally and that not all of this variation is ecologically important<sup>15</sup>.</li> <li>• An evaluation, if applicable, of the environmental conditions if monitoring results fall outside the limits of the release criteria.</li> <li>• Recommendations that are relevant to ensuring a high level of water quality is maintained.</li> <li>• Each report will include previous water quality results in tabular format for comparative purposes and trend graphs will be provided. Laboratory certificates will be provided.</li> </ul> <p>Within 24 hours of detecting any incidents during construction that cause (or may cause) significant harm to the environment, the Proponent shall notify TSC and other relevant agencies of the incident in accordance with the protocol in Section 5.3.</p>
Identification of incident or failure	<p>The values of water quality indicators and groundwater levels will vary naturally and not all of this variation is ecologically important.<sup>16</sup></p>

<sup>15</sup> Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, 2000, Section 3.1, Page 21.

<sup>16</sup> Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, 2000, Section 3.1, Page 21.

Corrective action

The site-specific criteria are based on the 80<sup>th</sup> percentile of the baseline data set and thus the probability of a single observation exceeding the 80<sup>th</sup> percentile is 20%. The probability of a Type 1 error (or the risk of triggering a false alarm) is 20%.

The recording of a single result that exceeds the criteria will be used to trigger additional investigations including an increase to fortnightly monitoring of the parameter(s) in question. Results will be used to ascertain whether an adverse trend may be emerging and if so, allow early detection of the cause of the trend. The findings of such site investigations should be used to determine whether a non-compliance has occurred.

If a trend of declining groundwater quality is detected, the likely source(s) of contamination will be identified.

Should the investigation indicate that site activities are triggering the incident/failure, the following will be implemented:

- Locate the source of the contamination/level variation and take appropriate actions to contain and control the contaminant/level variation. Investigate the cause of the contamination/level variation and take action to prevent a recurrence.
- All development activities taking place at the time of incident/failure shall be reviewed to verify compliance with the OWMP provisions and, if necessary, construction methods and procedures shall be adjusted.

The quality of the dewatered groundwater being discharged to recharge trenches shall be reviewed to confirm compliance with the performance criteria detailed below.

Water Quality Parameter	Release Criteria	
	Precinct 1	Precinct 5
pH	3.5-4.33	3.59-4.47
Oil and grease	No visible film, no detectable odour	No visible film, no detectable odour

Upon receipt of a complaint follow the Complaints Procedure provided in Section 5.2.