

Licence Information



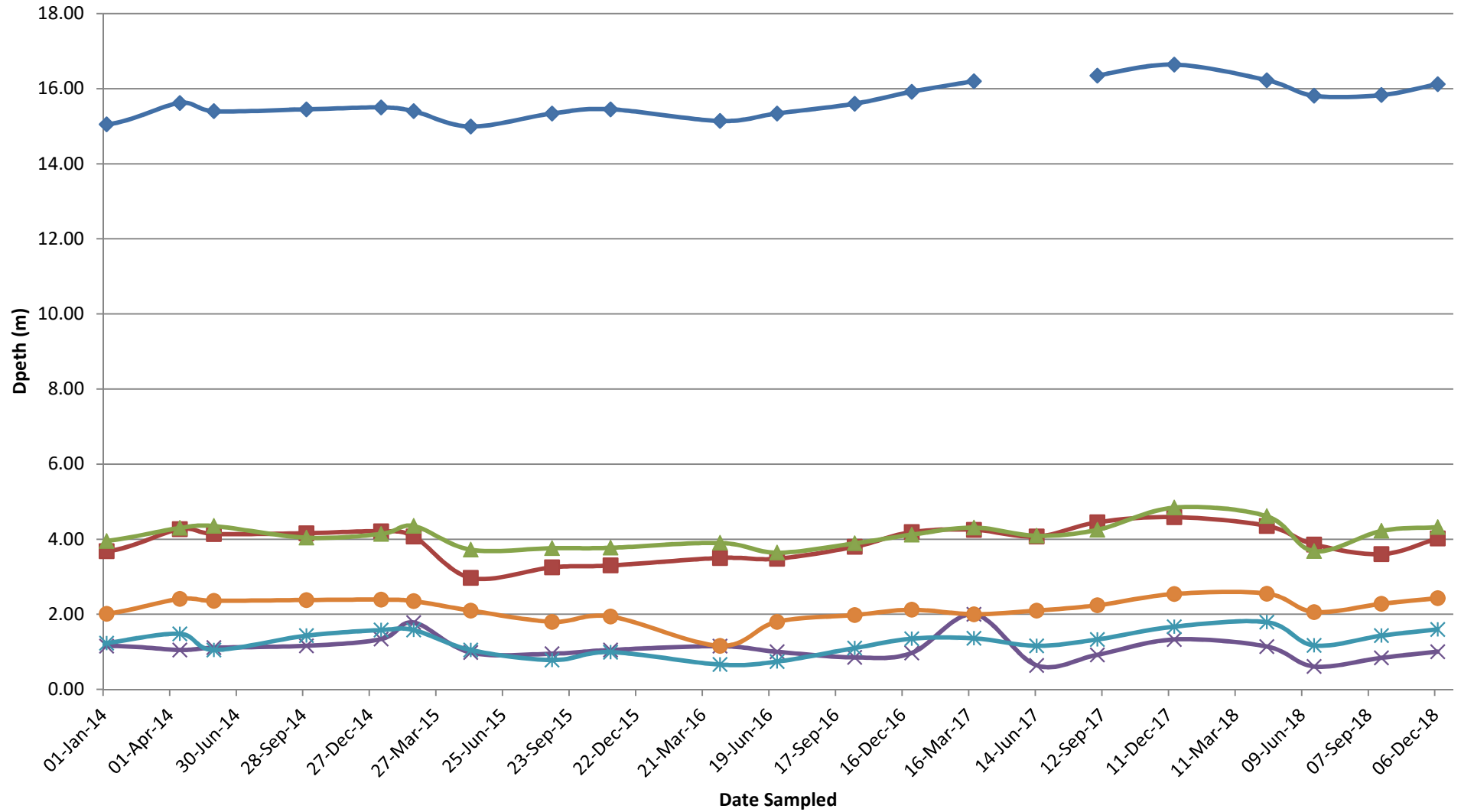
Environment Protection Licence (EPL) Number	13218
License Holder	MACKA'S SAND PTY LTD
Licensee Address	<p>Licensee: Macka's Sand Pty Ltd 2684 Nelson Bay Rd Salt Ash NSW 2318</p> <p>Premises: Macka's Sand Extraction and Processing Facility Off Nelson Bay Road Salt Ash NSW 2318</p>
Link to the full licence on the EPA website	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=13218&id=13218&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued
Anniversary Date:	30-Jun
Information Obtained:	21-Dec-18
Date of Publication:	21-Dec-18

Quarterly Groundwater Monitoring

Sample Date	Depth - EPL (m)						Water Level (PA 08_0142 Only)						Comment
	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	SP1	SP2	SP3	SP4	SP5	BL158	
Water Level Trigger (m)	non-specified	non-specified	non-specified	non-specified	non-specified	non-specified	> 3.6	> 2.8	> 2.6	> 1.25	> 3.6	> 3.7	
06-Jan-14	15.05	3.68	3.95	1.15	1.23	2.01	2.45	2.72	2.26	0.60	2.92	2.15	
15-Apr-14	15.62	4.27	4.30	1.05	1.48	2.41	1.88	2.13	1.91	0.70	2.67	1.75	
31-May-14	15.40	4.14	4.35	1.11	1.05	2.36	2.10	2.26	1.86	0.64	3.10	1.80	
03-Oct-14	15.45	4.16	4.04	1.16	1.43	2.38	2.05	2.24	2.17	0.59	2.72	1.78	
12-Jan-15	15.50	4.21	4.14	1.34	1.58	2.39	2.00	2.19	2.07	0.41	2.57	1.77	
25-Feb-15	15.40	4.07	4.35	1.78	1.58	2.35	2.10	2.33	1.86	-0.03	2.57	1.81	
13-May-15	14.99	2.97	3.72	0.98	1.05	2.10	2.51	3.43	2.49	0.77	3.10	2.06	
31-Aug-15	15.34	3.25	3.76	0.95	0.78	1.80	2.16	3.15	2.45	0.80	3.37	2.36	
18-Nov-15	15.45	3.30	3.77	1.05	0.99	1.94	2.05	3.10	2.44	0.70	3.16	2.22	
14-Apr-16	15.14	3.50	3.90	1.15	0.66	1.16	2.36	2.90	2.31	0.60	3.49	3.00	
30-Jun-16	15.34	3.48	3.64	1.00	0.74	1.80	2.16	2.92	2.57	0.75	3.41	2.36	
13-Oct-16	15.60	3.80	3.89	0.85	1.10	1.98	1.90	2.60	2.32	0.90	3.05	2.18	
29-Dec-16	15.92	4.19	4.12	0.97	1.35	2.12	1.58	2.21	2.09	0.78	2.80	2.04	
23-Mar-17	16.20	4.25	4.31	2.00	1.36	2.00	1.30	2.15	1.90	-0.25	2.79	2.16	
16-Jun-17		4.07	4.09	0.64	1.16	2.10		2.33	2.12	1.11	2.99	2.06	Sampling error at SP1/EPA Point 1
06-Sep-17	16.35	4.45	4.25	0.92	1.33	2.24	1.15	1.95	1.96	0.83	2.82	1.92	
19-Dec-17	16.64	4.59	4.84	1.33	1.67	2.54	0.86	1.81	1.37	0.42	2.48	1.62	
23-Apr-18	16.23	4.36	4.61	1.14	1.79	2.55	1.28	2.05	1.60	0.61	2.36	1.61	
26-Jun-18	15.81	3.86	3.68	0.61	1.17	2.06	1.69	2.54	2.53	1.14	2.98	2.10	
25-Sep-18	15.83	3.60	4.22	0.84	1.43	2.28	1.67	2.80	1.99	0.88	2.72	1.88	Standpipe replaced in August 2018. Value to be updated retrospectively following survey
10-Dec-18	16.12	4.02	4.32	1.00	1.60	2.43	1.38	2.38	1.89	0.72	2.55	1.73	

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	SP1	SP2	SP3	SP4	SP5	BL158	Comment
Count	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	
Min	15.83	3.60	4.22	0.84	1.43	2.28	1.67	2.54	1.99	0.91	2.72	1.88	
Average	15.83	3.60	4.22	0.84	1.43	2.28	1.68	2.67	2.26	1.03	2.85	1.99	
Max	15.83	3.60	4.22	0.84	1.43	2.28	1.69	2.80	2.53	1.14	2.98	2.10	

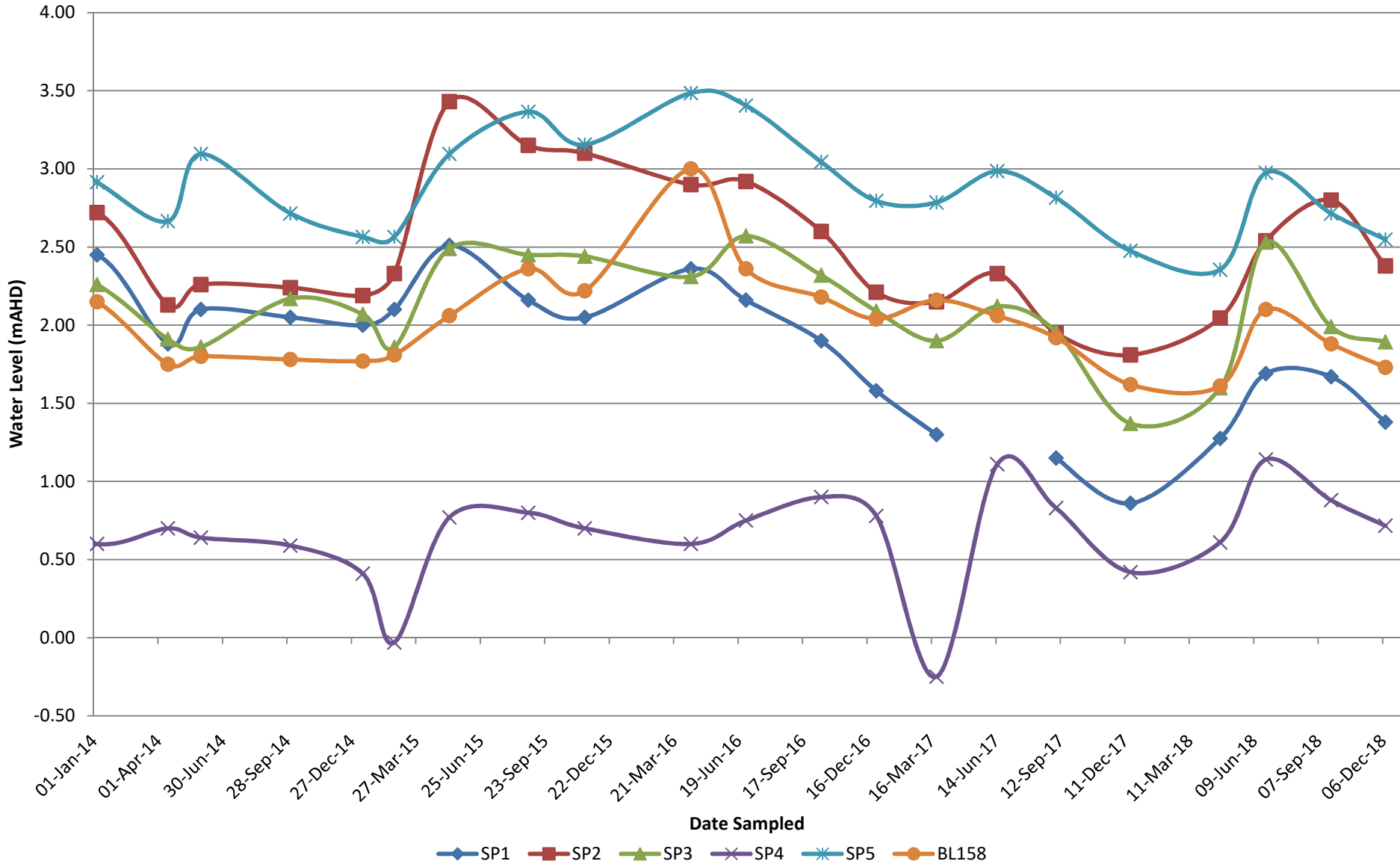
Groundwater Depths (m)



Note: No EPL Limit Specified

- EPA Point 1
- EPA Point 2
- EPA Point 3
- EPA Point 4
- EPA Point 5
- EPA Point 6

Groundwater Levels (mAHD)

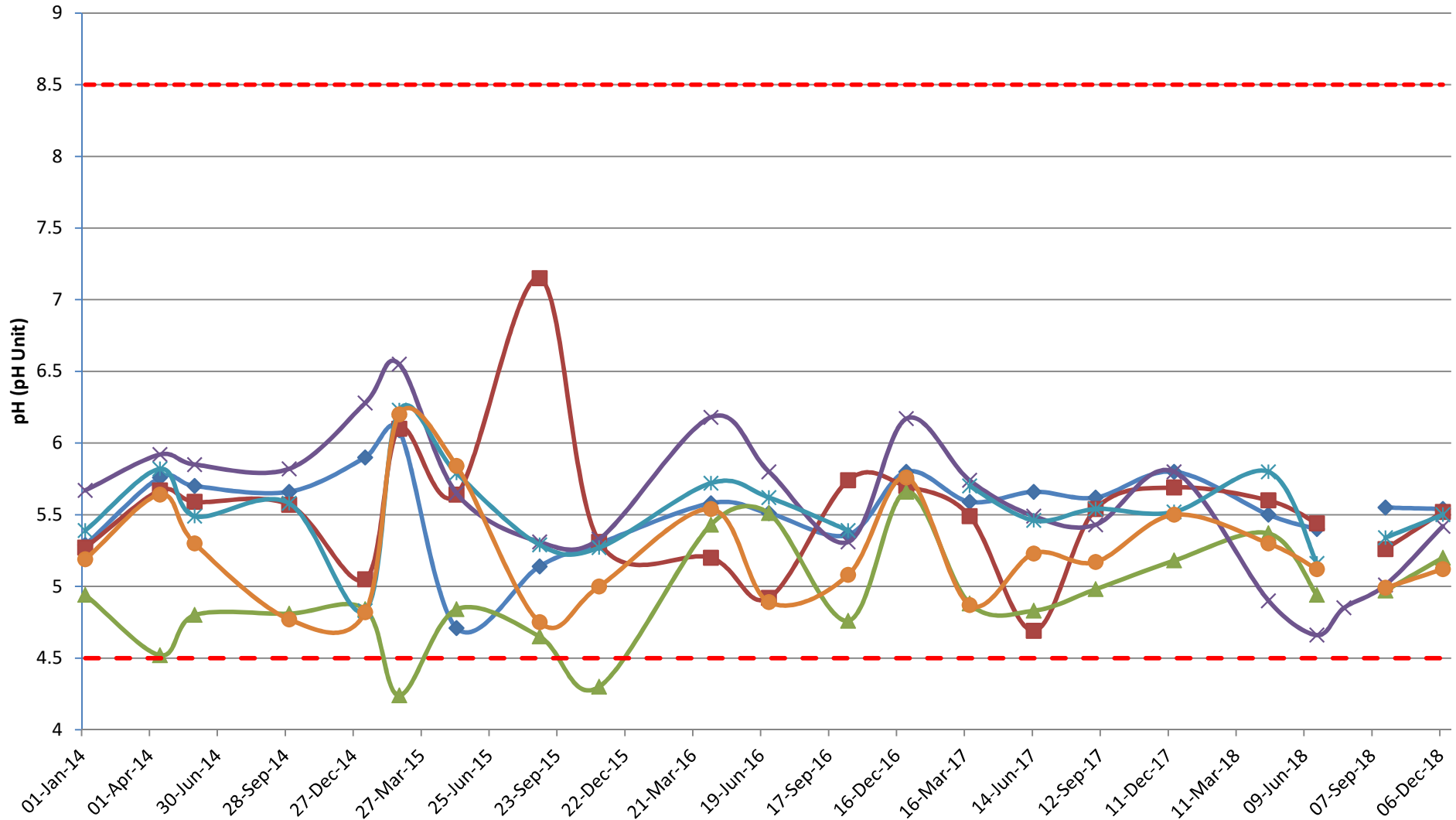


Quarterly Groundwater Monitoring

Sample Date	Lower SWMP Trigger	Upper SWMP Trigger	EPL Limit	pH						Comment
				EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
				SP1	SP2	SP3	SP4	SP5	BL158	
06-Jan-14	4.5	8.5	non-specified	5.29	5.27	4.94	5.67	5.39	5.19	
15-Apr-14	4.5	8.5	non-specified	5.76	5.67	4.52	5.92	5.82	5.64	
31-May-14	4.5	8.5	non-specified	5.7	5.59	4.8	5.85	5.49	5.3	
03-Oct-14	4.5	8.5	non-specified	5.66	5.57	4.81	5.82	5.58	4.77	
12-Jan-15	4.5	8.5	non-specified	5.9	5.05	4.84	6.28	4.83	4.82	
26-Feb-15	4.5	8.5	non-specified	6.09	6.1	4.24	6.55	6.23	6.2	
13-May-15	4.5	8.5	non-specified	4.71	5.64	4.84	5.65	5.79	5.84	
31-Aug-15	4.5	8.5	non-specified	5.14	7.15	4.65	5.31	5.29	4.75	
18-Nov-15	4.5	8.5	non-specified	5.3	5.31	4.3	5.33	5.27	5	
14-Apr-16	4.5	8.5	non-specified	5.58	5.2	5.43	6.18	5.72	5.54	
30-Jun-16	4.5	8.5	non-specified	5.51	4.92	5.51	5.8	5.62	4.89	
13-Oct-16	4.5	8.5	non-specified	5.36	5.74	4.76	5.31	5.39	5.08	
29-Dec-16	4.5	8.5	non-specified	5.8	5.7	5.66	6.17		5.76	Sampling error at SP5
23-Mar-17	4.5	8.5	non-specified	5.59	5.49	4.88	5.74	5.7	4.87	
16-Jun-17	4.5	8.5	non-specified	5.66	4.69	4.83	5.49	5.46	5.23	
06-Sep-17	4.5	8.5	non-specified	5.62	5.54	4.98	5.43	5.54	5.17	
19-Dec-17	4.5	8.5	non-specified	5.80	5.69	5.18	5.80	5.52	5.50	
23-Apr-18	4.5	8.5	non-specified	5.50	5.60	5.37	4.90	5.80	5.30	
26-Jun-18	4.5	8.5	non-specified	5.40	5.44	4.94	4.66	5.16	5.12	
01-Aug-18	4.5	8.5	non-specified				4.85			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	4.5	8.5	non-specified	5.55	5.26	4.97	5.01	5.34	4.99	
10-Dec-18	4.5	8.5	non-specified	5.54	5.52	5.20	5.42	5.50	5.12	

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	2.0	2.0	2.0	3.0	2.0	2.0
Min	5.54	5.26	4.97	4.85	5.34	4.99
Average	5.55	5.39	5.09	5.09	5.42	5.06
Max	5.55	5.52	5.20	5.42	5.50	5.12

Groundwater - pH



Note: No EPL Limit Specified

Date Sampled

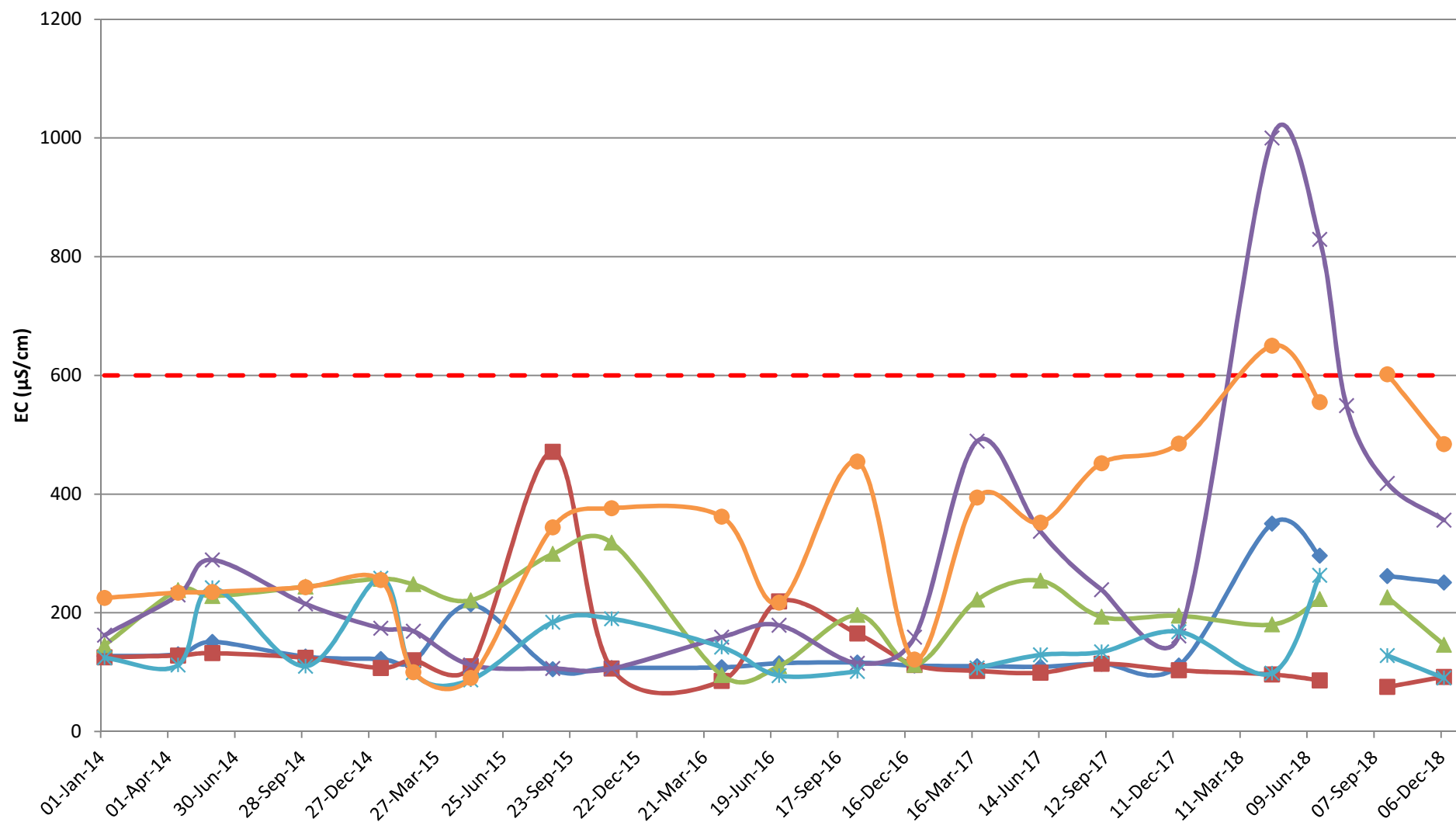
—◆— EPA Point 1 —■— EPA Point 2 —▲— EPA Point 3 —×— EPA Point 4 —*— EPA Point 5 —●— EPA Point 6 - - - Lower Trigger - - - Upper Trigger

Quarterly Groundwater Monitoring

Electrical Conductivity (µS/cm)									
Sample Date	SWMP Trigger	EPL Limit	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	Comment
			SP1	SP2	SP3	SP4	SP5	BL158	
06-Jan-14	600	non-specified	127	125	145	162	124	225	
15-Apr-14	600	non-specified	130	128	238	230	112	234	
31-May-14	600	non-specified	151	132	228	289	242	235	
03-Oct-14	600	non-specified	126	124	244	215	110	243	
12-Jan-15	600	non-specified	122	107	257	174	258	255	
25-Feb-15	600	non-specified	118	120	248	169	99	100	
13-May-15	600	non-specified	214	110	221	112	87	90	
31-Aug-15	600	non-specified	105	471	299	106	184	344	
18-Nov-15	600	non-specified	107	106	318	106	190	376	
14-Apr-16	600	non-specified	108	85	95	159	142	362	
30-Jun-16	600	non-specified	115	219	110	179	94	217	
13-Oct-16	600	non-specified	116	165	196	115	101	455	
29-Dec-16	600	non-specified	111	112	112	159		121	Sampling Error at SP5
23-Mar-17	600	non-specified	110	102	222	489	107	394	
16-Jun-17	600	non-specified	109	99	254	337	129	352	
06-Sep-17	600	non-specified	114	114	193	239	134	452	
19-Dec-17	600	non-specified	111	103	195	161	168	485	
23-Apr-18	600	non-specified	350	96	180	1000	98	650	
26-Jun-18	600	non-specified	296	86	223	829	263	555	
01-Aug-18	600	non-specified				549			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	600	non-specified	262	75	226	418	128	602	
10-Dec-18	600	non-specified	251	92	146	356	90	484	

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	2.0	2.0	2.0	3.0	2.0	2.0
Min	251.0	75.0	146.0	356.0	90.0	484.0
Average	217.8	99.8	197.8	557.3	165.8	535.5
Max	262.0	92.0	226.0	549.0	128.0	602.0

Groundwater - Electrical Conductivity (EC)



Note: No EPL Limit Specified

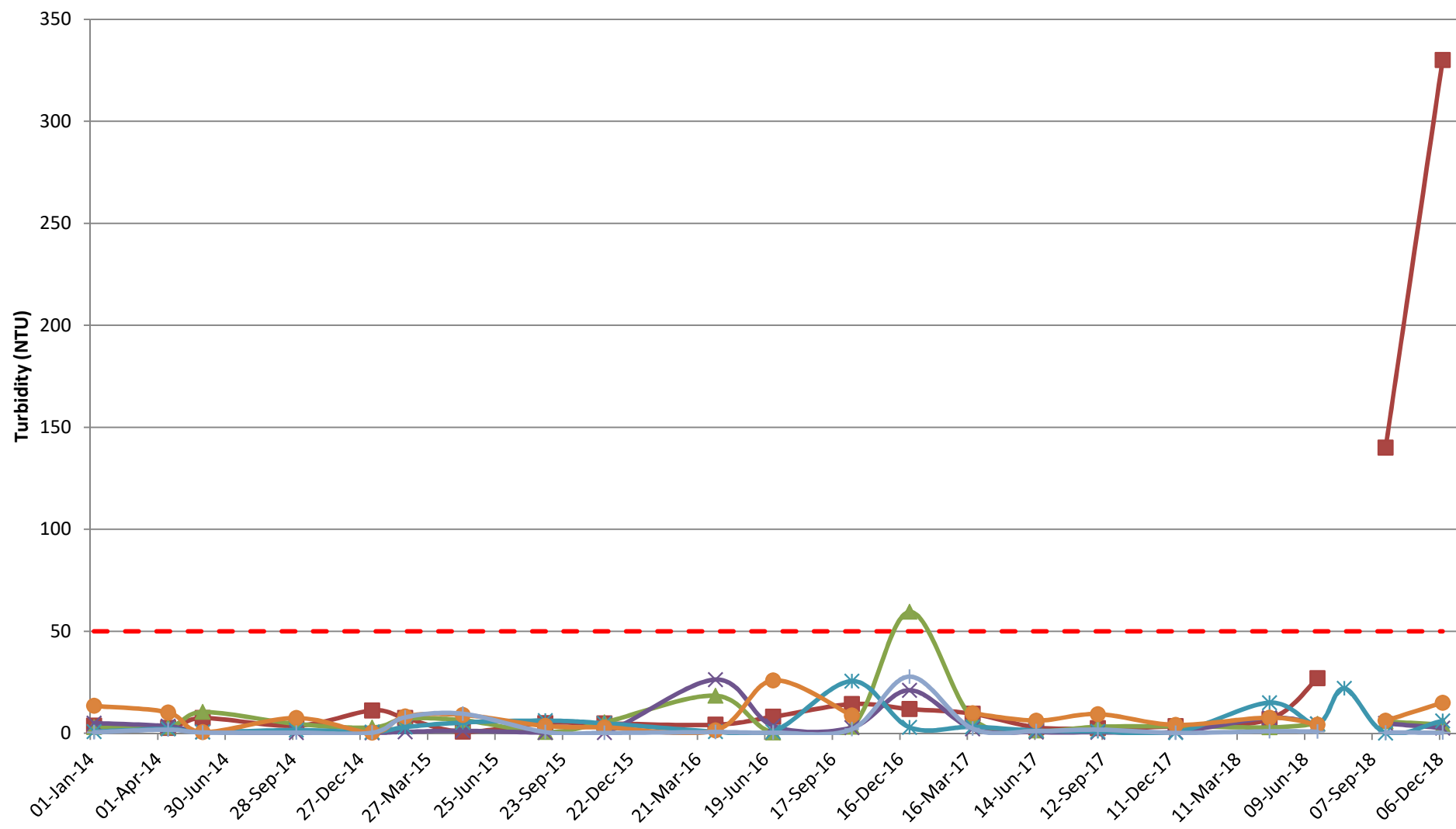
- - - SWMP Trigger
- ◆ EPA Point 1
- EPA Point 2
- ▲ EPA Point 3
- × EPA Point 4
- ✱ EPA Point 5
- EPA Point 6

Quarterly Groundwater Monitoring

Sample Date	SWMP Trigger	EPL Limit	Turbidity (NTU)						Comment
			EPA Point 1 SP1	EPA Point 2 SP2	EPA Point 3 SP3	EPA Point 4 SP4	EPA Point 5 SP5	EPA Point 6 BL158	
06-Jan-14	50	non-specified	3.8	3.0	5.0	0.8	13.5	0.5	
15-Apr-14	50	non-specified	2.7	3.2	3.5	2.2	10.2	1.8	
31-May-14	50	non-specified	7.5	10.4	0.7	0.6	0.6	0.4	
03-Oct-14	50	non-specified	3.7	4.6	0.3	1.6	7.5	0.3	
12-Jan-15	50	non-specified	11.2	2.8	0.2	0.6	0.3	0.3	
25-Feb-15	50	non-specified	7.5	7.1	0.7	3.0	8.3	7.8	
13-May-15	50	non-specified	0.8	6.4	1.2	5.3	9.0	9.6	
31-Aug-15	50	non-specified	5.0	0.6	0.3	6.2	3.6	0.6	
18-Nov-15	50	non-specified	4.8	5.4	0.3	4.9	2.9	0.2	
14-Apr-16	50	non-specified	4.2	18.4	26.3	0.8	1.5	0.6	
30-Jun-16	50	non-specified	8.1	0.3	3.6	0.7	25.9	0.3	
13-Oct-16	50	non-specified	14.3	3.1	2.8	25.6	8.7	2.0	
29-Dec-16	50	non-specified	11.9	59.5	21.1	2.9		27.8	Sampling Error at SP5
23-Mar-17	50	non-specified	9.6	7.4	2.2	3.2	9.8	2.3	
16-Jun-17	50	non-specified	2.9	1.3	0.6	1.3	6.2	1.1	
06-Sep-17	50	non-specified	2.5	3.2	0.5	1.0	9.4	1.8	
19-Dec-17	50	non-specified	3.5	3.4	0.7	0.4	4.1	0.2	
23-Apr-18	50	non-specified	6.9	2.9	7.6	15.0	7.7	1.0	
26-Jun-18	50	non-specified	27.0	4.6	4.6	4.6	4.2	0.8	
01-Aug-18	50	non-specified				22.0			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	50	non-specified	140.0	5.8	4.8	0.1	6.2	0.4	
10-Dec-18	50	non-specified	330.0	4.2	2.6	6.1	15.0	0.3	

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	2.0	2.0	2.0	3.0	2.0	2.0
Min	140.0	4.2	2.6	0.1	6.2	0.3
Average	235.0	5.0	3.7	9.4	10.6	0.4
Max	330.0	5.8	4.8	22.0	15.0	0.4

Groundwater - Turbidity (NTU)



Note: No EPL Limit Specified

- SWMP Trigger
- EPA Point 1
- EPA Point 2
- EPA Point 3
- EPA Point 4
- EPA Point 5
- EPA Point 6

1646 - Macka's Sand

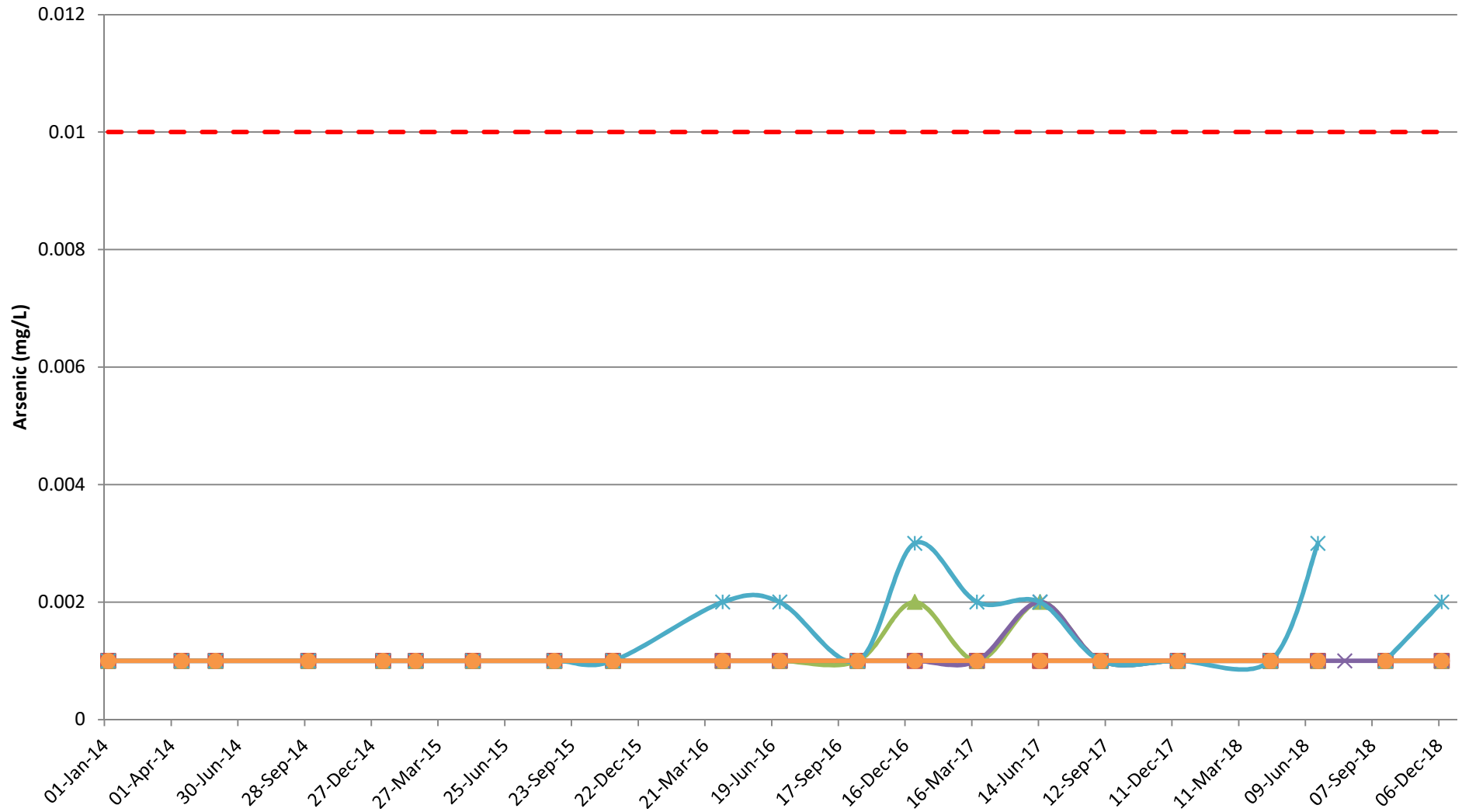
Quarterly Groundwater Monitoring

Sample Date	SWMP Trigger	EPL Limit	Arsenic (mg/L)						Comment
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
			SP1	SP2	SP3	SP4	SP5	BL158	
06-Jan-14	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
15-Apr-14	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
31-May-14	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
03-Oct-14	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
12-Jan-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
25-Feb-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
13-May-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
31-Aug-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
18-Nov-15	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
14-Apr-16	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	
30-Jun-16	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	
13-Oct-16	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
29-Dec-16	0.01	non-specified	0.001	0.001	0.002	0.001	0.003	0.001	
23-Mar-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	
16-Jun-17	0.01	non-specified	0.001	0.001	0.002	0.002	0.002	0.001	
06-Sep-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
19-Dec-17	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
23-Apr-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
26-Jun-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.003	0.001	
01-Aug-18	0.01	non-specified				0.001			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.001	0.001	
10-Dec-18	0.01	non-specified	0.001	0.001	0.001	0.001	0.002	0.001	

Note: Shaded cells indicate values less than 0.001 (i.e. limit of detection). '<' removed to populate graph

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	2.0	2.0	2.0	3.0	2.0	2.0
Min	0.001	0.001	0.001	0.001	0.001	0.001
Average	0.001	0.001	0.001	0.001	0.002	0.001
Max	0.001	0.001	0.001	0.001	0.002	0.001

Groundwater - Arsenic (mg/L)



Note: No EPL Limit Specified

SWMP Trigger EPA Point 1 EPA Point 2 EPA Point 3 EPA Point 4 EPA Point 5 EPA Point 6

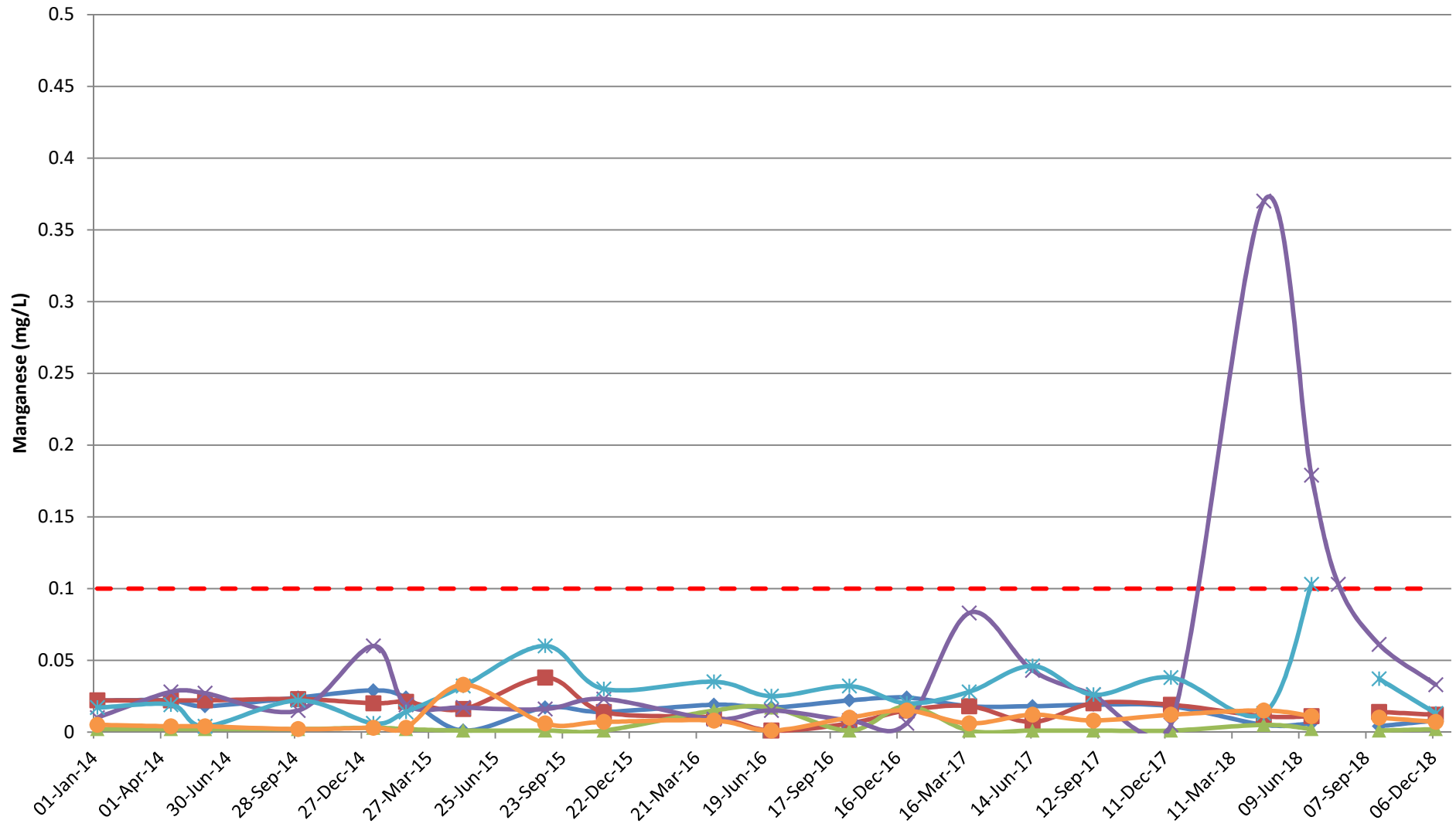
Quarterly Groundwater Monitoring

Sample Date	SWMP Trigger	EPL Limit	Manganese (mg/L)						Comment
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
			SP1	SP2	SP3	SP4	SP5	BL158	
06-Jan-14	0.1	non-specified	0.022	0.022	0.002	0.010	0.017	0.005	
15-Apr-14	0.1	non-specified	0.022	0.022	0.002	0.028	0.019	0.004	
31-May-14	0.1	non-specified	0.018	0.022	0.002	0.027	0.004	0.004	
03-Oct-14	0.1	non-specified	0.024	0.023	0.002	0.015	0.022	0.002	
12-Jan-15	0.1	non-specified	0.029	0.020	0.003	0.060	0.006	0.003	
25-Feb-15	0.1	non-specified	0.024	0.021	0.002	0.019	0.014	0.003	
13-May-15	0.1	non-specified	0.001	0.016	0.001	0.017	0.032	0.033	
31-Aug-15	0.1	non-specified	0.017	0.038	0.001	0.016	0.060	0.006	
18-Nov-15	0.1	non-specified	0.014	0.014	0.001	0.023	0.030	0.007	
14-Apr-16	0.1	non-specified	0.019	0.010	0.015	0.009	0.035	0.008	
30-Jun-16	0.1	non-specified	0.017	0.001	0.017	0.015	0.025	0.001	
13-Oct-16	0.1	non-specified	0.022	0.006	0.001	0.008	0.032	0.010	
29-Dec-16	0.1	non-specified	0.024	0.015	0.018	0.006	0.020	0.015	
23-Mar-17	0.1	non-specified	0.018	0.018	0.001	0.083	0.028	0.006	
16-Jun-17	0.1	non-specified	0.018	0.007	0.001	0.043	0.046	0.012	
06-Sep-17	0.1	non-specified	0.019	0.020	0.001	0.026	0.026	0.008	
19-Dec-17	0.1	non-specified	0.018	0.019	0.001	0.005	0.038	0.012	
23-Apr-18	0.1	non-specified	0.005	0.011	0.005	0.37	0.013	0.015	
26-Jun-18	0.1	non-specified	0.006	0.011	0.002	0.179	0.103	0.011	
01-Aug-18	0.1	non-specified				0.103			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	0.1	non-specified	0.004	0.014	0.001	0.061	0.037	0.010	
10-Dec-18	0.1	non-specified	0.008	0.012	0.002	0.033	0.013	0.007	

Note: Shaded cells indicate values less than 0.001 (i.e. limit of detection). '<' removed to populate graph

FY 18/19 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	2	2	2	3	2	2
Min	0.004	0.012	0.001	0.033	0.013	0.007
Average	0.006	0.013	0.001	0.066	0.025	0.009
Max	0.008	0.014	0.001	0.103	0.037	0.010

Groundwater - Manganese (mg/L)



Note: No EPL Limit Specified

Date Sampled

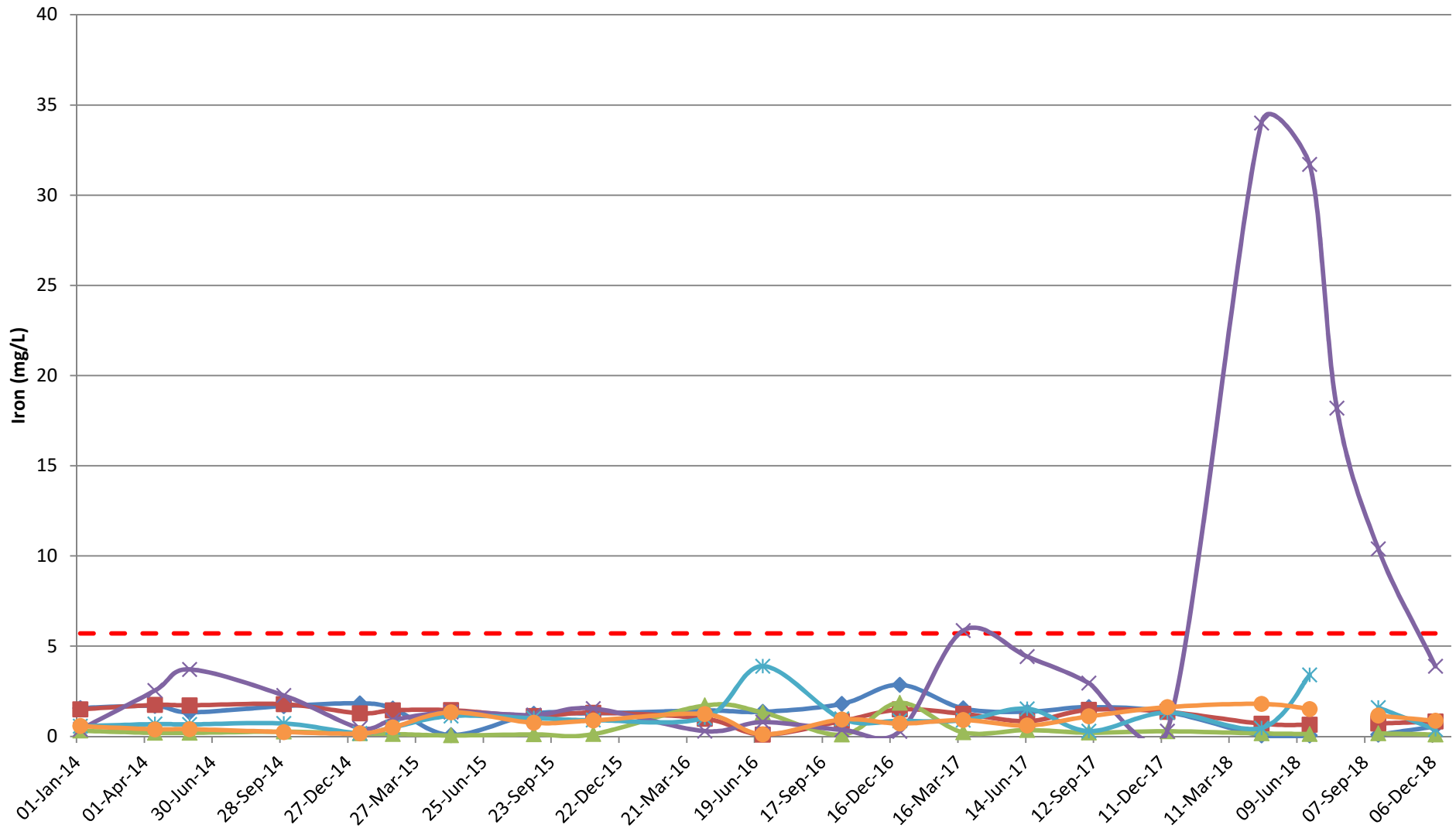
SWMP Trigger EPA Point 1 EPA Point 2 EPA Point 3 EPA Point 4 EPA Point 5 EPA Point 6

Quarterly Groundwater Monitoring

Sample Date	SWMP Trigger	EPL Limit	Iron (mg/L)						Comment
			EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6	
			SP1	SP2	SP3	SP4	SP5	BL158	
06-Jan-14	5.7	non-specified	1.57	1.50	0.31	0.38	0.56	0.57	
15-Apr-14	5.7	non-specified	1.69	1.74	0.19	2.54	0.68	0.39	
31-May-14	5.7	non-specified	1.33	1.72	0.19	3.71	0.66	0.40	
03-Oct-14	5.7	non-specified	1.68	1.78	0.26	2.27	0.71	0.24	
12-Jan-15	5.7	non-specified	1.83	1.28	0.16	0.46	0.17	0.16	
25-Feb-15	5.7	non-specified	1.54	1.44	0.13	0.91	0.50	0.50	
13-May-15	5.7	non-specified	0.07	1.45	0.05	1.34	1.13	1.33	
31-Aug-15	5.7	non-specified	1.25	1.12	0.11	1.18	1.01	0.75	
18-Nov-15	5.7	non-specified	1.27	1.31	0.12	1.54	0.90	0.88	
14-Apr-16	5.7	non-specified	1.43	0.98	1.71	0.29	1.03	1.23	
30-Jun-16	5.7	non-specified	1.36	0.10	1.32	0.79	3.89	0.11	
13-Oct-16	5.7	non-specified	1.80	0.85	0.09	0.36	0.97	0.93	
29-Dec-16	5.7	non-specified	2.86	1.49	1.86	0.28	0.86	0.71	
23-Mar-17	5.7	non-specified	1.55	1.25	0.22	5.86	0.89	0.90	
16-Jun-17	5.7	non-specified	1.36	0.84	0.35	4.42	1.53	0.60	
06-Sep-17	5.7	non-specified	1.62	1.47	0.20	2.95	0.29	1.11	
19-Dec-17	5.7	non-specified	1.35	1.36	0.28	0.29	1.32	1.62	
23-Apr-18	5.7	non-specified	0.05	0.70	0.16	34	0.46	1.80	
26-Jun-18	5.7	non-specified	0.05	0.64	0.13	31.7	3.40	1.51	
01-Aug-18	5.7	non-specified				18.2			Additional SP4 monitoring event due to standpipe replacement
25-Sep-18	5.7	non-specified	0.09	0.71	0.16	10.4	1.59	1.15	
10-Dec-18	5.7	non-specified	0.55	0.82	0.10	3.88	0.38	0.86	

FY 17/18 Statistics	EPA Point 1	EPA Point 2	EPA Point 3	EPA Point 4	EPA Point 5	EPA Point 6
Count	2.0	2.0	2.0	3.0	2.0	2.0
Min	0.09	0.71	0.10	3.88	0.38	0.86
Average	0.32	0.77	0.13	10.83	0.99	1.01
Max	0.55	0.82	0.16	18.20	1.59	1.15

Groundwater - Iron (mg/L)



Note: No EPL Limit Specified

Date Sampled

- SWMP Trigger
- EPA Point 1
- EPA Point 2
- EPA Point 3
- EPA Point 4
- EPA Point 5
- EPA Point 6