M54 to M6 Link Road

TR010054

Volume 6

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Appendix 13.5 Water Quality Monitoring

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

January 2020

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

M54 to M6 Link Road

Development Consent Order 202[ ]

6.3 Environmental Statement Appendices

Appendix 13.5 Water Quality Monitoring

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010054
Application Document Reference	6.3
Author	M54 to M6 Link Road Project Team and Highways England

Version	Date	Status of Version
1	January 2020	DCO Application

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1 Water Quality Monitoring Results Tables

1.1.1 The results of water quality monitoring are shown below in Tables 1 to 8.

1.1.2 Water quality monitoring data was collected on the following dates:

- 4 March 2019
- 4 June 2019
- 5 September 2019
- 20 November 2019

1.1.3 A seasonal water quality monitoring programme has been undertaken between spring 2019 and winter 2019; assessing general physico-chemical parameters that provide an indicator of water quality. In total, five watercourses and three ponds have been sampled. Sampling has captured each watercourse due to be crossed by the Scheme in addition to some ponds that would be physically impacted by the works.

1.1.4 Sampling was undertaken on the 4th March on a dry day after a spell of intermittent sun and showers, 4th June on a wet and warm day after a period of scattered showers, September 5th on a warm dry day after a period of five days of showery weather and November 20th on a cold dry day after five days of mostly dry weather with 3 mm of rain recorded across that period. Watercourses 2, 3, 5 and 6 have been sampled four times whilst Watercourse 4 and Pond 1 have been sampled three times. Pond 2 and Pond 3 have been sampled twice due to issues with access. Pond 1 is to the east of Tower House Farm (SJ 94514 04704), Pond 2 is also known as Lower Pool (SJ 94768 05332), and Pond 3 is located south-east of Brookfield Farm (SJ 95120 06335).

1.1.5 All monitored watercourses were generally neutral to slightly alkaline, with pH values falling in the range of 7.35 and 8.14. The three monitored ponds were also neutral, with pH values falling between 7.21 and 7.62.

1.1.6 Total water hardness (as calcium carbonate ($CaCO_3$) ranged from 158 mg/l at Watercourse 3 and Watercourse 4 in November 2019 to 329 mg/l in Watercourse 2 in September 2019. These results suggest the water within these watercourses sampled is medium to hard. The range of total water hardness (as $CaCO_3$) values for the three ponds was smaller in comparison, with values ranging between 168 mg/l and 202 mg/l.

1.1.7 Data for Watercourse 2, Watercourse 4, Watercourse 5, Watercourse 6 and Pond 1 show these waterbodies to be well oxygenated with average dissolved oxygen values ranging from 77% to 88%. Watercourse 3, which is downstream of Lower Pool, is not well oxygenated with the data showing average saturation values of 63%. In addition, sampling data shows that Lower Pool Pond was poorly oxygenated with an average dissolved oxygen value of 26%. This data was supported by observations of a water pump that was in place to oxygenate the water and observations of dead fish around the pond in June 2019.

1.1.8 Common indicators of sanitary pollutants include ammonia, nitrate, biochemical oxygen demand (BOD) and chemical oxygen demand (COD). Ammonia was

generally low for each pond and watercourse, falling below the value used to indicate good Water Framework Directive (WFD) class or better (<0.6 mg/l). Watercourse 2, Watercourse 4 and Watercourse 5 had particularly low levels of ammonia on average, with values of 0.06 mg/l, 0.07 mg/l and 0.05 mg/l respectively. Watercourse 3 and Watercourse 6 had on average, higher ammonia values of 0.29 mg/l and 0.23 mg/l in comparison although these values were still below the value used to indicate good WFD class or better.

1.1.9 Pond 1 had ammonia concentrations ranging from <0.03 mg/l (June 2019) and 0.12 mg/l (November 2019), and Pond 3 had an ammonia concentration of 0.03 mg/l (4 June 2019) with no access possible for the September monitoring.

1.1.10 Nitrate values varied across each watercourse with Watercourse 2 consistently recording the highest values, with values ranging from 20.9 mg/l to 45.1 mg/l. With the exception of Watercourse 3, nitrate values were lower in November in comparison with the rest of the year, possibly reflecting agricultural practices in the area. Nitrate values within the three ponds sampled were all at the limit of detection suggesting a disconnection between ponds and the surrounding farmland.

1.1.11 All monitored watercourses have instances of total cyanide surpassing the WFD environmental quality standards (EQS), and this is usually related to industrial activities such as metal treatment. It can also be derived from de-icing agents, although the occurrence of cyanide was not limited to the winter months in these watercourses.

1.1.12 Total Zinc levels recorded in Watercourse 3, Watercourse 4, Watercourse 5 and Watercourse 6 regularly surpassed the maximum allowable EQS values for Zinc. Of the 15 samples taken on these watercourses, 13 samples showed values that surpassed the EQS values. Values ranged from 665.3 ug/l to 4.4 ug/l across these four watercourses. Total zinc levels in Watercourse 2 in contrast did not surpass the EQS values on any occasion to date.

1.1.13 The levels of numerous metals at Watercourse 3 were regularly reported as exceeding the maximum allowable EQS vales. Dissolved iron, dissolved manganese, dissolved zinc, total chromium, total copper, total iron, total lead, total manganese, total mercury, total nickel and total zinc all surpassed the EQS values at least once. Notably, total manganese and total iron levels surpassed the EQS vales in each sample taken to date.

1.1.14 Numerous metals were reported at levels greater than the annual average or maximum allowable EQS at Watercourse 6. Dissolved Manganese, dissolved nickel, total chromium, total manganese and total zinc all surpassed EQS values once. Total copper and total iron surpassed the EQS values twice whilst total zinc has surpassed the EQS values in each of the three samples taken. June samples recorded considerably higher metal content than any other of the two samples taken.

Table 1: Watercourse 2

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1				77	84
Dissolved Oxygen	mg/l	<2				7.5	10
Temperature	°C					16.8	7.5
BOD	mg/l	<1		<1	<1	<1	1
COD	mg/l	<7		<7	<7	<7	15
Dissolved Organic Carbon	mg/l	<2		<2	<2	3	5
Electrical Conductivity @25°C	uS/cm	<2		813	756	719	479
Free/residual Chlorine	mg/l	<0.02		<0.02	<0.02	<0.02	0.02
pH	pH Units	<0.01		8.14	7.88	7.98	7.67
Silica	mg/l	<0.01		8.3	7.9	8.1	2.2
Total Organic Carbon (TOC)	mg/l	<2		<2	<2	3	7
Total Suspended Solids	mg/l	<10		<10	<10	<10	10
Total Hardness Dissolved (as $CaCO_3$)	mg/l	<1		309	323	329	250
Total Alkalinity as $CaCO_3$ #	mg/l	<1		194	196	208	166
Sulphate as SO_4	mg/l	<0.5	250	56.6	56.4	53.1	33.1
Nitrate as NO_3	mg/l	<0.2		40.1	49.7	45.1	20.9
Nitrite as NO_2	mg/l	<0.02	0.5	0.03	0.02	0.03	0.04
Ortho Phosphate as P	mg/l	<0.03	50	<0.03	0.04	<0.03	<0.03
Total Inorganic Nitrogen	mg/l	<0.05		9.1	11.23	10.22	4.81
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	<0.03	<0.03	0.03	0.08
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	<0.002	<0.002	<0.002
Total Dissolved	mg/l	<0.002		0.002	0.002	<0.002	0.002

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Chromium III							
Total Cyanide	mg/l	<0.01	0.001	<0.01	<0.01	<0.01	<0.01
Dissolved Aluminium	ug/l	<1.5	200	<1.5	<1.5	<1.5	9.8
Dissolved Arsenic	ug/l	<0.9	10	<0.9	<0.9	<0.9	<0.9
Dissolved Barium	ug/l	<1.8		148.3	178.8	166.3	92.5
Dissolved Boron	ug/l	<12		50	49	47	57
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Dissolved Calcium	mg/l	<0.2		107.1	112.4	114.2	84.4
Total Dissolved Chromium	ug/l	<0.2	3.4	<0.2	0.9	0.5	0.3
Dissolved Copper	ug/l	<3	1	<3	<3	<3	<3
Total Dissolved Iron	ug/l	<4.7	1000	<4.7	<4.7	<4.7	54
Dissolved Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4	<0.4
Dissolved Magnesium	mg/l	<0.1		9.9	10.1	10.3	9.2
Dissolved Manganese	ug/l	<1.5	123	14.1	3.5	1.9	62.4
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Dissolved Nickel	ug/l	<0.2	4	<0.2	1.8	<0.2	<0.2
Dissolved Potassium	mg/l	<0.1		7.2	6.1	6.3	8.4
Dissolved Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Dissolved Sodium	mg/l	<0.1		34.3	21.1	21.3	21
Dissolved Vanadium	ug/l	<0.6		<0.6	<0.6	<0.6	0.6
Dissolved Zinc	ug/l	<1.5	10.9	1.7	<1.5	<1.5	3.9
Total Aluminium	ug/l	<1.5		39.6	24	24.4	193.1
Total Barium	ug/l	<1.8		140.7	176	170.2	93.2
Total Boron	ug/l	<12		47	52	47	56
Total Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Total Chromium	ug/l	<0.2	3.4	<0.2	0.2	<0.2	0.8

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Total Copper	ug/l	<3	1 (bioavailable)	<3	<3	<3	<3
Total Iron	ug/l	<4.7	1000	69.3	55.6	49.9	395.8
Total Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4	<0.4
Total Manganese	ug/l	<1.5	123 (bioavailable)	15.4	6.5	9.1	101.4
Total Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Total Nickel	ug/l	<0.2	4	<0.2	1.5	<0.2	<0.8
Total Phosphorus	ug/l	<0.7		83.5	92.6	79.9	115.4
Total Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Total Vanadium	ug/l	<0.6		<0.6	<0.6	<0.6	<0.6
Total Zinc	ug/l	<1.5	10.9	1.8	<1.5	2.7	<7.1
Naphthalene	ug/l	<0.1	2	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	0.1	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	0.0063	0.03	<0.01	0.01	<0.01
Pyrene	ug/l	<0.01	4	0.03	<0.01	0.01	<0.01
Benzo(a)anthracene	ug/l	<0.01		0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01		0.02	<0.01	0.01	<0.01
Benzo(bk)fluoranthene	ug/l	<0.01		0.03	<0.01	0.02	<0.01
Benzo(a)pyrene	ug/l	<0.01		0.01	<0.01	<0.01	<0.01
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
PAH 16 Total	ug/l	<0.1		0.1	<0.1	<0.1	<0.1

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Benzo(b)fluoranthene	ug/l	<0.01		0.02	<0.01	0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
>C5-C6	ug/l	<10		<10	<10	<10	<10
>C6-C8	ug/l	<10		<10	<10	<10	<10
>C8-C10	ug/l	<10		<10	<10	<10	<10
>C10-C12	ug/l	<5		<5	<5	<5	<5
>C12-C16	ug/l	<10		<10	<10	<10	<10
>C16-C21	ug/l	<10		<10	<10	<10	<10
>C21-C35	ug/l	<10		<10	<10	<10	<10
Total aliphatics C5-35	ug/l	<10		<10	<10	<10	<10
>C5-EC7	ug/l	<10		<10	<10	<10	<10
>EC7-EC8	ug/l	<10		<10	<10	<10	<10
>EC8-EC10	ug/l	<10		<10	<10	<10	<10
>EC10-EC12	ug/l	<5		<5	<5	<5	<5
>EC12-EC16	ug/l	<10		<10	<10	<10	<10
>EC16-EC21	ug/l	<10		<10	<10	<10	<10
>EC21-EC35	ug/l	<10		<10	<10	<10	<10
Total aromatics C5-35	ug/l	<10		<10	<10	<10	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		<10	<10	<10	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	<5	<5	<5
Benzene	ug/l	<5		<5	<5	<5	<5
Toluene	ug/l	<5		<5	<5	<5	<5
Ethylbenzene	ug/l	<5		<5	<5	<5	<5
m/p-Xylene	ug/l	<5		<5	<5	<5	<5
o-Xylene	ug/l	<5		<5	<5	<5	<5
Resorcinol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Catechol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Phenol #	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
m/p-cresol	mg/l	<0.02		<0.02	<0.02	<0.02	<0.02
o-cresol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total cresols #	mg/l	<0.03		<0.03	<0.03	<0.03	<0.03
Xylenols #	mg/l	<0.06		<0.06	<0.06	<0.06	<0.06
1-naphthol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2-isopropylphenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	<0.1	<0.1	<0.1

Table 2: Watercourse 3

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1				47	79
Dissolved Oxygen	mg/L	<2				5.1	9.7
Temperature	°C					14.2	6
BOD	mg/l	<1		<1	<1	3	1
COD	mg/l	<7		<7	44	42	15
Dissolved Organic Carbon	mg/l	<2		<2	6	15	5
Electrical Conductivity @25C	uS/cm	<2		813	661	525	479
Free/residual Chlorine	mg/l	<0.02		<0.02	0.07	0.25	<0.02
pH	pH Units	<0.01		8.14	7.35	7.68	7.67
Silica	mg/l	<0.01		8.3	7.6	5.7	2.2
Total Organic Carbon (TOC)	mg/l	<2		<2	10	16	7
Total Suspended Solids	mg/l	<10		<10	1099	28	10
Total Hardness Dissolved (as CaCO3)	mg/l	<1		309	280	249	158
Total Alkalinity as CaCO3 #	mg/l	<1		194	268	240	124
Sulphate as SO4	mg/l	<0.5	250	56.6	20.7	9.7	20.4
Nitrate as NO3	mg/l	<0.2		40.1	4.7	1.5	3.5
Nitrite as NO2	mg/l	<0.02	0.5	0.03	0.14	0.24	0.04
Ortho Phosphate as P	mg/l	<0.03	50	<0.03	<0.03	<0.03	<0.03
Total Inorganic Nitrogen	mg/l	<0.05		9.1	1.48	1.08	0.89
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	<0.03	0.37	0.67	0.08
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	<0.002	<0.002	<0.002
Total Dissolved Chromium III	mg/l	<0.002		0.002	<0.002	<0.002	<0.002

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Total Cyanide	mg/l	<0.01	0.001	<0.01	<0.01	<0.01	<0.01
Dissolved Aluminium	ug/l	<1.5	200	<1.5	137.9	3.4	19.2
Dissolved Arsenic	ug/l	<0.9	10	<0.9	<0.9	3.3	2.5
Dissolved Barium	ug/l	<1.8		148.3	196.9	196.4	72.3
Dissolved Boron	ug/l	<12		50	54	53	40
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Dissolved Calcium	mg/l	<0.2		107.1	88.9	78.3	55.4
Total Dissolved Chromium	ug/l	<0.2	3.4	<0.2	0.9	<0.2	0.6
Dissolved Copper	ug/l	<3	1	<3	4	<3	<3
Total Dissolved Iron	ug/l	<4.7	1000	<4.7	1476	392.2	126.9
Dissolved Lead	ug/l	<0.4	1.2	<0.4	<0.4	0.4	<0.4
Dissolved Magnesium	mg/l	<0.1		9.9	13.7	12.7	7.1
Dissolved Manganese	ug/l	<1.5	123	14.1	952.9	1589	73.1
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Dissolved Nickel	ug/l	<0.2	4	<0.2	3.2	<0.2	0.8
Dissolved Potassium	mg/l	<0.1		7.2	6.2	8.5	5.7
Dissolved Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Dissolved Sodium	mg/l	<0.1		34.3	26.8	17.7	17.5
Dissolved Vanadium	ug/l	<0.6		<0.6	2.9	1	<0.6
Dissolved Zinc	ug/l	<1.5	10.9	1.7	15.2	2.8	9.9
Total Aluminium	ug/l	<1.5		39.6	18690	271.4	164.8
Total Barium	ug/l	<1.8		140.7	1000	221.4	72.8
Total Boron	ug/l	<12		47	75	54	39
Total Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Total Chromium	ug/l	<0.2	3.4	<0.2	41.8	<0.5	1.4
Total Copper	ug/l	<3	1 (bioavailable)	<3	126	8	<3
Total Iron	ug/l	<4.7	1000	69.3	59840	1536	362.1
Total Lead	ug/l	<0.4	1.2	<0.4	159.9	0.4	<0.4
Total Manganese	ug/l	<1.5	123	15.4	10450	1359	92.4

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
			(bioavailable)				
Total Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Total Nickel	ug/l	<0.2	4	<0.2	36.4	<0.5	0.6
Total Phosphorus	ug/l	<0.7		83.5	2650	234.5	124.8
Total Selenium	ug/l	<1.2		<1.2	<1.2	1.2	<1.2
Total Vanadium	ug/l	<0.6		<0.6	58.5	0.6	<0.6
Total Zinc	ug/l	<1.5	10.9	1.8	579.8	12.4	12.9
Naphthalene	ug/l	<0.1	2	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	0.1	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	0.0063	0.03	<0.01	0.01	<0.01
Pyrene	ug/l	<0.01	4	0.03	<0.01	0.01	<0.01
Benzo(a)anthracene	ug/l	<0.01		0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01		0.02	<0.01	0.01	<0.01
Benzo(bk)fluoranthene	ug/l	<0.01		0.03	<0.01	0.02	<0.01
Benzo(a)pyrene	ug/l	<0.01		0.01	<0.01	<0.01	<0.01
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
PAH 16 Total	ug/l	<0.1		0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	ug/l	<0.01		0.02	<0.01	0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
>C5-C6	ug/l	<10		<10	<10	<10	<10
>C6-C8	ug/l	<10		<10	<10	<10	<10
>C8-C10	ug/l	<10		<10	<10	<10	<10

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
>C10-C12	ug/l	<5		<5	<5	<5	<5
>C12-C16	ug/l	<10		<10	<10	<10	<10
>C16-C21	ug/l	<10		<10	<10	<10	<10
>C21-C35	ug/l	<10		<10	<10	<10	<10
Total aliphatics C5-35	ug/l	<10		<10	<10	<10	<10
>C5-EC7	ug/l	<10		<10	<10	<10	<10
>EC7-EC8	ug/l	<10		<10	<10	<10	<10
>EC8-EC10	ug/l	<10		<10	<10	<10	<10
>EC10-EC12	ug/l	<5		<5	<5	<5	<5
>EC12-EC16	ug/l	<10		<10	<10	<10	<10
>EC16-EC21	ug/l	<10		<10	<10	<10	<10
>EC21-EC35	ug/l	<10		<10	<10	<10	<10
Total aromatics C5-35	ug/l	<10		<10	<10	<10	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		<10	<10	<10	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	<5	<5	<5
Benzene	ug/l	<5		<5	<5	<5	<5
Toluene	ug/l	<5		<5	<5	<5	<5
Ethylbenzene	ug/l	<5		<5	<5	<5	<5
m/p-Xylene	ug/l	<5		<5	<5	<5	<5
o-Xylene	ug/l	<5		<5	<5	<5	<5
Resorcinol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Catechol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Phenol #	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
m/p-cresol	mg/l	<0.02		<0.02	<0.02	<0.02	<0.02
o-cresol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total cresols #	mg/l	<0.03		<0.03	<0.03	<0.03	<0.03
Xylenols #	mg/l	<0.06		<0.06	<0.06	<0.06	<0.06
1-naphthol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
2-isopropylphenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	<0.1	<0.1	<0.1

Table 3: Watercourse 4

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1				NO ACCESS	84
Dissolved Oxygen	mg/L	<2				NO ACCESS	10.5
Temperature	°C					NO ACCESS	5.7
BOD	mg/l	<1		<1	<1	NO ACCESS	1
COD	mg/l	<7		15	10	NO ACCESS	21
Dissolved Organic Carbon	mg/l	<2		3	<2	NO ACCESS	12
Electrical Conductivity @25C	uS/cm	<2		1240	767	NO ACCESS	347
Free/residual Chlorine	mg/l	<0.02		<0.02	<0.02	NO ACCESS	<0.02
pH	pH Units	<0.01		8.04	7.82	NO ACCESS	7.7
Silica	mg/l	<0.01		9.6	7.4	NO ACCESS	4.6
Total Organic Carbon (TOC)	mg/l	<2		4	<2	NO ACCESS	17
Total Suspended Solids	mg/l	<10		12	29	NO ACCESS	<10
Total Hardness Dissolved (as CaCO3)	mg/l	<1		259	178	NO ACCESS	158
Total Alkalinity as	mg/l	<1		190	198	NO	124

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
CaCO3 #						ACCESS	
Sulphate as SO4	mg/l	<0.5	250	57.6	39.1	NO ACCESS	16.3
Nitrate as NO3	mg/l	<0.2		13.9	28.3	NO ACCESS	7.3
Nitrite as NO2	mg/l	<0.02	0.5	<0.02	<0.02	NO ACCESS	0.04
Ortho Phosphate as P	mg/l	<0.03	50	0.03	0.05	NO ACCESS	0.07
Total Inorganic Nitrogen	mg/l	<0.05		3.17	6.44	NO ACCESS	1.79
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	0.04	0.04	NO ACCESS	0.14
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	<0.002	NO ACCESS	<0.002
Total Dissolved Chromium III	mg/l	<0.002		<0.002	<0.002	NO ACCESS	<0.002
Total Cyanide	mg/l	<0.01	0.001	<0.01	<0.01	NO ACCESS	<0.01
Dissolved Aluminium	ug/l	<1.5	200	2.1	5	NO ACCESS	30.4
Dissolved Arsenic	ug/l	<0.9	10	<0.9	<0.9	NO ACCESS	2.1
Dissolved Barium	ug/l	<1.8		122.3	135.7	NO ACCESS	46.8
Dissolved Boron	ug/l	<12		67	178	NO ACCESS	39
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	NO ACCESS	<0.03
Dissolved Calcium	mg/l	<0.2		81.3	50.7	NO ACCESS	49.9
Total Dissolved Chromium	ug/l	<0.2	3.4	0.7	0.6	NO ACCESS	0.7
Dissolved Copper	ug/l	<3	1	<3	<3	NO ACCESS	6
Total Dissolved Iron	ug/l	<4.7	1000	18.9	12	NO ACCESS	158.2
Dissolved Lead	ug/l	<0.4	1.2	<0.4	<0.4	NO ACCESS	<0.4

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Magnesium	mg/l	<0.1		13.3	12.3	NO ACCESS	7.9
Dissolved Manganese	ug/l	<1.5	123	37.7	21.2	NO ACCESS	36.9
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	<0.5	NO ACCESS	<0.5
Dissolved Nickel	ug/l	<0.2	4	<0.2	<0.2	NO ACCESS	1.6
Dissolved Potassium	mg/l	<0.1		5.8	8.3	NO ACCESS	6
Dissolved Selenium	ug/l	<1.2		<1.2	<1.2	NO ACCESS	<1.2
Dissolved Sodium	mg/l	<0.1		128.6	83.3	NO ACCESS	11.4
Dissolved Vanadium	ug/l	<0.6		0.9	3.8	NO ACCESS	<0.6
Dissolved Zinc	ug/l	<1.5	10.9	9.6	2.5	NO ACCESS	7.2
Total Aluminium	ug/l	<1.5		593.8	964.4	NO ACCESS	572.4
Total Barium	ug/l	<1.8		121	146.6	NO ACCESS	51.4
Total Boron	ug/l	<12		64	180	NO ACCESS	35
Total Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	NO ACCESS	<0.03
Total Chromium	ug/l	<0.2	3.4	1.1	1.5	NO ACCESS	1.2
Total Copper	ug/l	<3	1 (bioavailable)	3	4	NO ACCESS	7
Total Iron	ug/l	<4.7	1000	543.5	1108	NO ACCESS	902.9
Total Lead	ug/l	<0.4	1.2	<0.4	<0.4	NO ACCESS	<0.4
Total Manganese	ug/l	<1.5	123 (bioavailable)	46.1	100.2	NO ACCESS	48.9
Total Mercury	ug/l	<0.5	0.07	<0.5	<0.5	NO ACCESS	<0.5
Total Nickel	ug/l	<0.2	4	0.6	2.5	NO	1.5

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
						ACCESS	
Total Phosphorus	ug/l	<0.7		97.4	150.8	NO ACCESS	191.1
Total Selenium	ug/l	<1.2		<1.2	<1.2	NO ACCESS	<1.2
Total Vanadium	ug/l	<0.6		1	3.3	NO ACCESS	<0.6
Total Zinc	ug/l	<1.5	10.9	15.9	19.2	NO ACCESS	13.1
Naphthalene	ug/l	<0.1	2	<0.1	<0.1	NO ACCESS	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
Acenaphthene	ug/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
Fluorene	ug/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
Phenanthrene	ug/l	<0.01		0.01	0.06	NO ACCESS	0.02
Anthracene	ug/l	<0.01	0.1	<0.01	0.02	NO ACCESS	<0.01
Fluoranthene	ug/l	<0.01	0.0063	0.04	0.18	NO ACCESS	0.02
Pyrene	ug/l	<0.01	4	0.04	0.19	NO ACCESS	0.02
Benzo(a)anthracene	ug/l	<0.01		0.02	0.11	NO ACCESS	0.01
Chrysene	ug/l	<0.01		0.02	0.13	NO ACCESS	0.01
Benzo(bk)fluoranthene	ug/l	<0.01		0.04	0.3	NO ACCESS	0.02
Benzo(a)pyrene	ug/l	<0.01		0.02	0.16	NO ACCESS	<0.01
Indeno(123cd)pyrene	ug/l	<0.01		0.01	0.12	NO ACCESS	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	0.02	NO ACCESS	<0.01
Benzo(ghi)perylene	ug/l	<0.01		0.01	0.11	NO ACCESS	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
PAH 16 Total	ug/l	<0.1		0.2	1.4	NO ACCESS	0.1
Benzo(b)fluoranthene	ug/l	<0.01		0.03	0.22	NO ACCESS	0.01
Benzo(k)fluoranthene	ug/l	<0.01		0.01	0.08	NO ACCESS	<0.01
>C5-C6	ug/l	<10		<10	<10	NO ACCESS	<10
>C6-C8	ug/l	<10		<10	<10	NO ACCESS	<10
>C8-C10	ug/l	<10		<10	<10	NO ACCESS	<10
>C10-C12	ug/l	<5		<5	<5	NO ACCESS	<5
>C12-C16	ug/l	<10		<10	<10	NO ACCESS	<10
>C16-C21	ug/l	<10		<10	<10	NO ACCESS	<10
>C21-C35	ug/l	<10		<10	<10	NO ACCESS	<10
Total aliphatics C5-35	ug/l	<10		<10	<10	NO ACCESS	<10
>C5-EC7	ug/l	<10		<10	<10	NO ACCESS	<10
>EC7-EC8	ug/l	<10		<10	<10	NO ACCESS	<10
>EC8-EC10	ug/l	<10		<10	<10	NO ACCESS	<10
>EC10-EC12	ug/l	<5		<5	<5	NO ACCESS	<5
>EC12-EC16	ug/l	<10		<10	<10	NO ACCESS	<10
>EC16-EC21	ug/l	<10		<10	<10	NO ACCESS	<10
>EC21-EC35	ug/l	<10		<10	<10	NO ACCESS	<10
Total aromatics C5-35	ug/l	<10		<10	<10	NO ACCESS	<10
Total aliphatics	ug/l	<10		<10	<10	NO	<10

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
and aromatics(C5-35)						ACCESS	
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	<5	NO ACCESS	<5
Benzene	ug/l	<5		<5	<5	NO ACCESS	<5
Toluene	ug/l	<5		<5	<5	NO ACCESS	<5
Ethylbenzene	ug/l	<5		<5	<5	NO ACCESS	<5
m/p-Xylene	ug/l	<5		<5	<5	NO ACCESS	<5
o-Xylene	ug/l	<5		<5	<5	NO ACCESS	<5
Resorcinol	mg/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
Catechol	mg/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
Phenol #	mg/l	<0.01		<0.02	<0.02	NO ACCESS	<0.01
m/p-cresol	mg/l	<0.02		<0.01	<0.01	NO ACCESS	<0.02
o-cresol	mg/l	<0.01		<0.03	<0.03	NO ACCESS	<0.01
Total cresols #	mg/l	<0.03		<0.06	<0.06	NO ACCESS	<0.03
Xylenols #	mg/l	<0.06		<0.01	<0.01	NO ACCESS	<0.06
1-naphthol	mg/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	<0.01	NO ACCESS	<0.01
2-isopropylphenol	mg/l	<0.01		<0.1	<0.1	NO ACCESS	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	<0.1	NO ACCESS	<0.1

Table 4: Watercourse 5

Analyte	Units	Limit of	Screening	Sample Dates

		Detection	Values	04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1				77	89
Dissolved Oxygen	mg/L	<2				7.5	10.8
Temperature	°C					16.8	5.4
BOD	mg/l	<1		<1	<1	<1	<1
COD	mg/l	<7		<7	<7	<7	<7
Dissolved Organic Carbon	mg/l	<2		<2	<2	3	8
Electrical Conductivity @25C	uS/cm	<2		813	756	719	480
Free/residual Chlorine	mg/l	<0.02		<0.02	<0.02	<0.02	<0.02
pH	pH Units	<0.01		8.14	7.88	7.98	7.87
Silica	mg/l	<0.01		8.3	7.9	8.1	12.9
Total Organic Carbon (TOC)	mg/l	<2		<2	<2	3	10
Total Suspended Solids	mg/l	<10		<10	<10	<10	<10
Total Hardness Dissolved (as CaCO3)	mg/l	<1		309	323	329	224
Total Alkalinity as CaCO3 #	mg/l	<1		194	196	208	162
Sulphate as SO4	mg/l	<0.5	250	56.6	56.4	53.1	47
Nitrate as NO3	mg/l	<0.2		40.1	49.7	45.1	10.5
Nitrite as NO2	mg/l	<0.02	0.5	0.03	0.02	0.03	<0.02
Ortho Phosphate as P	mg/l	<0.03	50	<0.03	0.04	<0.03	<0.03
Total Inorganic Nitrogen	mg/l	<0.05		9.1	11.23	10.22	2.39
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	<0.03	<0.03	0.03	0.03
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	<0.002	<0.002	<0.002
Total Dissolved Chromium III	mg/l	<0.002		0.002	0.002	<0.002	<0.002
Total Cyanide	mg/l	<0.01	0.001	<0.01	<0.01	<0.01	<0.01
Dissolved Aluminium	ug/l	<1.5	200	<1.5	<1.5	<1.5	15.3
Dissolved Arsenic	ug/l	<0.9	10	<0.9	<0.9	<0.9	1.1
Dissolved Barium	ug/l	<1.8		148.3	178.8	166.3	78.5
Dissolved Boron	ug/l	<12		50	49	47	65
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Calcium	mg/l	<0.2		107.1	112.4	114.2	71.9
Total Dissolved Chromium	ug/l	<0.2	3.4	<0.2	0.9	0.5	0.9
Dissolved Copper	ug/l	<3	1	<3	<3	<3	5
Total Dissolved Iron	ug/l	<4.7	1000	<4.7	<4.7	<4.7	54.2
Dissolved Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4	<0.4
Dissolved Magnesium	mg/l	<0.1		9.9	10.1	10.3	10.6
Dissolved Manganese	ug/l	<1.5	123	14.1	3.5	1.9	22.2
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Dissolved Nickel	ug/l	<0.2	4	<0.2	1.8	<0.2	1.6
Dissolved Potassium	mg/l	<0.1		7.2	6.1	6.3	5.3
Dissolved Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Dissolved Sodium	mg/l	<0.1		34.3	21.1	21.3	42.7
Dissolved Vanadium	ug/l	<0.6		<0.6	<0.6	<0.6	<0.6
Dissolved Zinc	ug/l	<1.5	10.9	1.7	<1.5	<1.5	10.2
Total Aluminium	ug/l	<1.5		39.6	24	24.4	248.3
Total Barium	ug/l	<1.8		140.7	176	170.2	79.4
Total Boron	ug/l	<12		47	52	47	63
Total Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Total Chromium	ug/l	<0.2	3.4	<0.2	0.2	<0.2	1
Total Copper	ug/l	<3	1 (bioavailable)	<3	<3	<3	5
Total Iron	ug/l	<4.7	1000	69.3	55.6	49.9	420.4
Total Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4	<0.4
Total Manganese	ug/l	<1.5	123 (bioavailable)	15.4	6.5	9.1	29.6
Total Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Total Nickel	ug/l	<0.2	4	<0.2	1.5	<0.2	1.7
Total Phosphorus	ug/l	<0.7		83.5	92.6	79.9	85.5
Total Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Total Vanadium	ug/l	<0.6		<0.6	<0.6	<0.6	<0.6
Total Zinc	ug/l	<1.5	10.9	1.8	<1.5	2.7	14.6

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Naphthalene	ug/l	<0.1	2	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01		<0.01	<0.01	<0.01	0.01
Anthracene	ug/l	<0.01	0.1	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	0.0063	0.03	<0.01	0.01	0.03
Pyrene	ug/l	<0.01	4	0.03	<0.01	0.01	0.03
Benzo(a)anthracene	ug/l	<0.01		0.01	<0.01	<0.01	0.02
Chrysene	ug/l	<0.01		0.02	<0.01	0.01	0.02
Benzo(bk)fluoranthene	ug/l	<0.01		0.03	<0.01	0.02	0.04
Benzo(a)pyrene	ug/l	<0.01		0.01	<0.01	<0.01	0.02
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	<0.01	<0.01	<0.01
PAH 16 Total	ug/l	<0.1		0.1	<0.1	<0.1	0.2
Benzo(b)fluoranthene	ug/l	<0.01		0.02	<0.01	0.01	0.03
Benzo(k)fluoranthene	ug/l	<0.01		<0.01	<0.01	<0.01	0.01
>C5-C6	ug/l	<10		<10	<10	<10	<10
>C6-C8	ug/l	<10		<10	<10	<10	<10
>C8-C10	ug/l	<10		<10	<10	<10	<10
>C10-C12	ug/l	<5		<5	<5	<5	<5
>C12-C16	ug/l	<10		<10	<10	<10	<10
>C16-C21	ug/l	<10		<10	<10	<10	<10
>C21-C35	ug/l	<10		<10	<10	<10	<10
Total aliphatics C5-35	ug/l	<10		<10	<10	<10	<10
>C5-EC7	ug/l	<10		<10	<10	<10	<10
>EC7-EC8	ug/l	<10		<10	<10	<10	<10
>EC8-EC10	ug/l	<10		<10	<10	<10	<10
>EC10-EC12	ug/l	<5		<5	<5	<5	<5
>EC12-EC16	ug/l	<10		<10	<10	<10	<10
>EC16-EC21	ug/l	<10		<10	<10	<10	<10

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
>EC21-EC35	ug/l	<10		<10	<10	<10	<10
Total aromatics C5-35	ug/l	<10		<10	<10	<10	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		<10	<10	<10	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	<5	<5	<5
Benzene	ug/l	<5		<5	<5	<5	<5
Toluene	ug/l	<5		<5	<5	<5	<5
Ethylbenzene	ug/l	<5		<5	<5	<5	<5
m/p-Xylene	ug/l	<5		<5	<5	<5	<5
o-Xylene	ug/l	<5		<5	<5	<5	<5
Resorcinol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Catechol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Phenol #	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
m/p-cresol	mg/l	<0.02		<0.02	<0.02	<0.02	<0.02
o-cresol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total cresols #	mg/l	<0.03		<0.03	<0.03	<0.03	<0.03
Xylenols #	mg/l	<0.06		<0.06	<0.06	<0.06	<0.06
1-naphthol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2-isopropylphenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	<0.1	<0.1	<0.1

Table 5: Watercourse 6

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1				88	84
Dissolved Oxygen	mg/L	<2				9.3	10
Temperature	°C					14.2	6.7
BOD	mg/l	<1		2	1	5	2
COD	mg/l	<7		48	49	54	11
Dissolved Organic Carbon	mg/l	<2		10	10	12	10
Electrical Conductivity @25C	uS/cm	<0.01		2381	2338	1593	632
Free/residual Chlorine	mg/l	<0.01		0.1	0.02	<0.02	<0.02
pH	pH Units	<2		7.83	7.42	7.71	7.71
Silica	mg/l	<2		9.8	6.9	7.9	1.3
Total Organic Carbon	mg/l	<0.02		11	11	21	14
Total Suspended Solids	mg/l	<10		15	1215	19	10
Total Hardness Dissolved (as CaCO3)	mg/l	<1		356	378	270	247
Total Alkalinity as CaCO3	mg/l	<1		180	202	222	162
Sulphate as SO4	mg/l	<0.5	250	68.6	68.3	46.5	52
Nitrate as NO3	mg/l	<0.2		31.7	36.5	17	14.3
Nitrite as NO2	mg/l	<0.02	0.5	0.63	0.09	<0.02	0.22
Ortho Phosphate as P	mg/l	<0.03	50	<0.03	<0.03	<0.09	<0.03
Total Inorganic Nitrogen	mg/l	<0.05		7.66	8.43	3.91	3.66
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	0.32	0.15	0.08	0.36
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	<0.002	<0.002	<0.002
Total Dissolved Chromium III	mg/l	<0.002		<0.002	<0.002	<0.002	<0.002
Total Cyanide	mg/l	<0.01	0.001	<0.01	<0.01	<0.01	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Dissolved Aluminium	ug/l	<1.5	200	3.1	13.9	4.3	11.8
Dissolved Arsenic	ug/l	<0.9	10	<0.9	1.6	1.7	<0.9
Dissolved Barium	ug/l	<1.8		243.2	265.1	226.1	111.9
Dissolved Boron	ug/l	<12		403	779	466	150
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Dissolved Calcium	mg/l	<0.2		98.4	95.4	81.2	72.6
Total Dissolved Chromium	ug/l	<0.2	3.4	1.1	0.3	<0.2	0.5
Dissolved Copper	ug/l	<3	1	4	4	<3	4
Total Dissolved Iron	ug/l	<4.7	1000	31.9	44.1	58	176.3
Dissolved Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4	<0.4
Dissolved Magnesium	mg/l	<0.1		26.1	33.1	26.6	15.5
Dissolved Manganese	ug/l	<1.5	123	177	185.6	65.9	192.5
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Dissolved Nickel	ug/l	<0.2	4	1.8	5.1	1.6	1.7
Dissolved Potassium	mg/l	<0.1		41.8	65.6	42	20.6
Dissolved Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Dissolved Sodium	mg/l	<0.1		466.4	284.8	165.6	64.5
Dissolved Vanadium	ug/l	<0.6		<0.6	3.4	1.5	<0.6
Dissolved Zinc	ug/l	<1.5	10.9	15	8.5	4.4	9.6
Total Aluminium	ug/l	<1.5		307.1	15220	266	296.3
Total Barium	ug/l	<1.8		238.3	662.3	234.3	116.7
Total Boron	ug/l	<12		358	780	446	146
Total Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03	<0.03
Total Chromium	ug/l	<0.2	3.4	3	41.2	0.4	1.9
Total Copper	ug/l	<3	1 (bioavailable)	5	131	7	5
Total Iron	ug/l	<4.7	1000	584.4	29790	668.1	852.4

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Total Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4	<0.4
Total Manganese	ug/l	<1.5	123 (bioavailable)	168.9	3130	121.2	211.5
Total Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5	<0.5
Total Nickel	ug/l	<0.2	4	1.1	34.6	2.4	2.1
Total Phosphorus	ug/l	<0.7		110	1506	162.6	142.3
Total Selenium	ug/l	<1.2		<1.2	<1.2	<1.2	<1.2
Total Vanadium	ug/l	<0.6		1.6	42.2	<0.6	<0.6
Total Zinc	ug/l	<1.5	10.9	23.1	665.3	15.3	17.7
Naphthalene	ug/l	<0.1	2	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	0.03	<0.01	<0.01
Acenaphthene	ug/l	<0.01		<0.01	0.02	<0.01	<0.01
Fluorene	ug/l	<0.01		<0.01	0.02	<0.01	<0.01
Phenanthrene	ug/l	<0.01		0.01	0.23	<0.01	<0.01
Anthracene	ug/l	<0.01	0.1	<0.01	0.08	<0.01	<0.01
Fluoranthene	ug/l	<0.01	0.0063	0.04	0.9	0.01	0.02
Pyrene	ug/l	<0.01	4	0.04	0.93	0.02	0.02
Benzo(a)anthracene	ug/l	<0.01		0.02	0.43	<0.01	0.01
Chrysene	ug/l	<0.01		0.02	0.45	0.01	0.01
Benzo(bk)fluoranthene	ug/l	<0.01		0.04	1.05	0.02	0.02
Benzo(a)pyrene	ug/l	<0.01		0.02	0.53	<0.01	<0.01
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	0.37	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	0.07	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	0.36	<0.01	<0.01
PAH 16 Total	ug/l	<0.1		0.2	5.5	<0.1	<0.1
Benzo(b)fluoranthene	ug/l	<0.01		0.03	0.76	0.01	0.01
Benzo(k)fluoranthene	ug/l	<0.01		0.01	0.29	<0.01	<0.01
>C5-C6	ug/l	<10		<10	<10	<10	<10
>C6-C8	ug/l	<10		<10	<10	<10	<10
>C8-C10	ug/l	<10		<10	<10	<10	<10

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
>C10-C12	ug/l	<5		<5	<5	<5	<5
>C12-C16	ug/l	<10		<10	<10	<10	<10
>C16-C21	ug/l	<10		<10	<10	<10	<10
>C21-C35	ug/l	<10		470	470	470	<10
Total aliphatics C5-35	ug/l	<10		470	470	470	<10
>C5-EC7	ug/l	<10		<10	<10	<10	<10
>EC7-EC8	ug/l	<10		<10	<10	<10	<10
>EC8-EC10	ug/l	<10		<10	<10	<10	<10
>EC10-EC12	ug/l	<5		<5	<5	<5	<5
>EC12-EC16	ug/l	<10		<10	<10	<10	<10
>EC16-EC21	ug/l	<10		<10	<10	<10	<10
>EC21-EC35	ug/l	<10		<10	<10	<10	<10
Total aromatics C5-35	ug/l	<10		<10	<10	<10	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		470	470	470	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	<5	<5	<5
Benzene	ug/l	<5		<5	<5	<5	<5
Toluene	ug/l	<5		<5	<5	<5	<5
Ethylbenzene	ug/l	<5		<5	<5	<5	<5
m/p-Xylene	ug/l	<5		<5	<5	<5	<5
o-Xylene	ug/l	<5		<5	<5	<5	<5
Resorcinol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Catechol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Phenol #	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
m/p-cresol	mg/l	<0.02		<0.02	<0.02	<0.02	<0.02
o-cresol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
Total cresols #	mg/l	<0.03		<0.03	<0.03	<0.03	<0.03
Xylenols #	mg/l	<0.06		<0.06	<0.06	<0.06	<0.06
1-naphthol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01
2-isopropylphenol	mg/l	<0.01		<0.01	<0.01	<0.01	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates			
				04/03/19	04/06/19	05/09/19	20/11/19
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	<0.1	<0.1	<0.1

Table 6: Pond 1, West of Tower House Farm

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1			89	53
Dissolved Oxygen	mg/L	<2			9.9	6.7
Temperature	°C				10.8	5.3
BOD	mg/l	<1		4	3	2
COD	mg/l	<7		36	35	11
Dissolved Organic Carbon	mg/l	<2		8	11	7
Electrical Conductivity @25C	uS/cm	<0.01		452	370	374
Free/residual Chlorine	mg/l	<0.01		0.14	0.06	0.02
pH	pH Units	<2		7.54	7.62	7.77
Silica	mg/l	<2		0.37	2.9	0.6
Total Organic Carbon	mg/l	<0.02		9	17	11
Total Suspended Solids	mg/l	<10		16	26	<10
Total Hardness Dissolved (as CaCO3)	mg/l	<1		202	183	194
Total Alkalinity as CaCO3 #	mg/l	<1		<180	160	150
Sulphate as SO4	mg/l	<0.5	250	<23.1	21.2	22.4
Nitrate as NO3	mg/l	<0.2		<0.2	<0.2	0.4
Nitrite as NO2	mg/l	<0.02	0.5	<0.02	<0.02	<0.02
Ortho Phosphate as P	mg/l	<0.03	50	<0.03	<0.03	<0.03
Total Inorganic Nitrogen	mg/l	<0.05		<0.05	0.05	0.21
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	<0.03	0.05	0.12

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	<0.002	<0.002
Total Dissolved Chromium III	mg/l	<0.002		<0.007	<0.002	<0.002
Total Cyanide	mg/l	<0.01	0.001	<0.01	<0.01	<0.01
Dissolved Aluminium	ug/l	<1.5	200	15.9	<1.5	<1.5
Dissolved Arsenic	ug/l	<0.9	10	<0.9	1.6	<0.9
Dissolved Barium	ug/l	<1.8		109.3	78.7	85.7
Dissolved Boron	ug/l	<12		145	143	121
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03
Dissolved Calcium	mg/l	<0.2		67.6	60.8	66.2
Total Dissolved Chromium	ug/l	<0.2	3.4	<0.2	<0.2	0.2
Dissolved Copper	ug/l	<3	1	<3	<3	<3
Total Dissolved Iron	ug/l	<4.7	1000	50.5	10.6	12.6
Dissolved Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4
Dissolved Magnesium	mg/l	<0.1		7.8	7.4	6.9
Dissolved Manganese	ug/l	<1.5	123	6.3	<1.5	9.9
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5
Dissolved Nickel	ug/l	<0.2	4	0.8	<0.2	0.3
Dissolved Potassium	mg/l	<0.1		7.3	7	6.6
Dissolved Selenium	ug/l	<1.2		<1.2	<1.2	<1.2
Dissolved Sodium	mg/l	<0.1		10.8	10.4	9.2
Dissolved Vanadium	ug/l	<0.6		<0.6	1.5	<0.6
Dissolved Zinc	ug/l	<1.5	10.9	<1.5	<1.5	1.6
Total Aluminium	ug/l	<1.5		94.4	227.4	87.5
Total Barium	ug/l	<1.8		114.5	98	84.2
Total Boron	ug/l	<12		147	140	117
Total Cadmium	ug/l	<0.03	0.25	<0.03	<0.03	<0.03
Total Chromium	ug/l	<0.2	3.4	0.8	1.3	0.4
Total Copper	ug/l	<3	1 (bioavailable)	<3	<3	<3
Total Iron	ug/l	<4.7	1000	180	370.3	172.1
Total Lead	ug/l	<0.4	1.2	<0.4	<0.4	<0.4

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Total Manganese	ug/l	<1.5	123 (bioavailable)	230	163	50.1
Total Mercury	ug/l	<0.5	0.07	<0.5	<0.5	<0.5
Total Nickel	ug/l	<0.2	4	2.4	0.6	0.2
Total Phosphorus	ug/l	<0.7		137.1	153	67.2
Total Selenium	ug/l	<1.2		<1.2	<1.2	<1.2
Total Vanadium	ug/l	<0.6		<0.6	<0.6	<0.6
Total Zinc	ug/l	<1.5	1.5	<1.5	3.1	3.1
Naphthalene	ug/l	<0.1	2	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01		<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01		<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01		<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	0.1	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	0.0063	<0.01	<0.01	0.02
Pyrene	ug/l	<0.01	4	<0.01	<0.01	0.02
Benzo(a)anthracene	ug/l	<0.01		<0.01	<0.01	0.01
Chrysene	ug/l	<0.01		<0.01	<0.01	0.02
Benzo(bk)fluoranthene	ug/l	<0.01		<0.01	<0.01	0.04
Benzo(a)pyrene	ug/l	<0.01		<0.01	<0.01	0.02
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	<0.01	0.02
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	<0.01	0.02
PAH 16 Total	ug/l	<0.1		<0.1	<0.1	0.2
Benzo(b)fluoranthene	ug/l	<0.01		<0.01	<0.01	0.03
Benzo(k)fluoranthene	ug/l	<0.01		<0.01	<0.01	0.01
>C5-C6	ug/l	<10		<10	<10	<10
>C6-C8	ug/l	<10		<10	<10	<10
>C8-C10	ug/l	<10		<10	<10	<10
>C10-C12	ug/l	<5		<5	<5	<5
>C12-C16	ug/l	<10		<10	<10	<10

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
>C16-C21	ug/l	<10		<10	<10	<10
>C21-C35	ug/l	<10		<10	<10	<10
Total aliphatics C5-35	ug/l	<10		<10	<10	<10
>C5-EC7	ug/l	<10		<10	<10	<10
>EC7-EC8	ug/l	<10		<10	<10	<10
>EC8-EC10	ug/l	<10		<10	<10	<10
>EC10-EC12	ug/l	<5		<5	<5	<5
>EC12-EC16	ug/l	<10		<10	<10	<10
>EC16-EC21	ug/l	<10		<10	<10	<10
>EC21-EC35	ug/l	<10		<10	<10	<10
Total aromatics C5-35	ug/l	<10		<10	<10	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		<10	<10	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	<5	<5
Benzene	ug/l	<5		<5	<5	<5
Toluene	ug/l	<5		<5	<5	<5
Ethylbenzene	ug/l	<5		<5	<5	<5
m/p-Xylene	ug/l	<5		<5	<5	<5
o-Xylene	mg/l	<5		<5	<5	<5
Resorcinol	mg/l	<0.01		<0.01	<0.01	<0.01
Catechol	mg/l	<0.01		<0.01	<0.01	<0.01
Phenol #	mg/l	<0.01		<0.01	<0.01	<0.01
m/p-cresol	mg/l	<0.02		<0.02	<0.02	<0.02
o-cresol	mg/l	<0.01		<0.01	<0.01	<0.01
Total cresols #	mg/l	<0.03		<0.03	<0.03	<0.03
Xylenols #	mg/l	<0.06		<0.06	<0.06	<0.06
1-naphthol	mg/l	<0.01		<0.01	<0.01	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	<0.01	<0.01
2-isopropylphenol	mg/l	<0.01		<0.01	<0.01	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	<0.1	<0.1

Table 7: Pond 2, Lower Pool

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1			NO ACCESS	3.3
Dissolved Oxygen	mg/L	<2			NO ACCESS	26
Temperature	°C				NO ACCESS	6
BOD	mg/l	<1		2	NO ACCESS	2
COD	mg/l	<7		17	NO ACCESS	10
Dissolved Organic Carbon	mg/l	<2		35	NO ACCESS	10
pH	uS/cm	<0.01		9	NO ACCESS	298
Silica	mg/l	<0.01		407	NO ACCESS	<0.02
Total Organic Carbon (TOC)	pH Units	<2		<0.02	NO ACCESS	7.37
Electrical Conductivity @25C	mg/l	<2		7.21	NO ACCESS	4.9
Free/residual Chlorine	mg/l	<0.02		3.7	NO ACCESS	14
Total Suspended Solids	mg/l	<10		8	NO ACCESS	<10
Total Hardness Dissolved (as CaCO3)	mg/l	<1		<10	NO ACCESS	143
Total Alkalinity as CaCO3 #	mg/l	<1		174	NO ACCESS	126
Sulphate as SO4	mg/l	<0.5	250	4.7	NO ACCESS	11.4
Nitrate as NO3	mg/l	<0.2		<0.2	NO ACCESS	0.9
Nitrite as NO2	mg/l	<0.02	0.5	<0.02	NO ACCESS	0.03
Ortho Phosphate as P	mg/l	<0.03	50	0.19	NO ACCESS	<0.03
Total Inorganic Nitrogen	mg/l	<0.05		0.93	NO ACCESS	0.53
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	0.93	NO ACCESS	0.31

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	NO ACCESS	<0.002
Total Dissolved Chromium III	mg/l	<0.002		<0.002	NO ACCESS	<0.002
Total Cyanide	mg/l	<0.01	0.001	<0.01	NO ACCESS	<0.01
Dissolved Aluminium	ug/l	<1.5	200	4.3	NO ACCESS	6.7
Dissolved Arsenic	ug/l	<0.9	10	<0.9	NO ACCESS	<0.9
Dissolved Barium	ug/l	<1.8		109.2	NO ACCESS	54.1
Dissolved Boron	ug/l	<12		42	NO ACCESS	26
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	NO ACCESS	<0.03
Dissolved Calcium	mg/l	<0.2		60.6	NO ACCESS	49.7
Total Dissolved Chromium	ug/l	<0.2	3.4	<0.2	NO ACCESS	0.4
Dissolved Copper	ug/l	<3	1	<3	NO ACCESS	<3
Total Dissolved Iron	ug/l	<4.7	1000	561.5	NO ACCESS	203
Dissolved Lead	ug/l	<0.4	1.2	<0.4	NO ACCESS	<0.4
Dissolved Magnesium	mg/l	<0.1		5.7	NO ACCESS	4.5
Dissolved Manganese	ug/l	<1.5	123	988.7	NO ACCESS	99.6
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	NO ACCESS	<0.5
Dissolved Nickel	ug/l	<0.2	4	0.4	NO ACCESS	0.3
Dissolved Potassium	mg/l	<0.1		4.5	NO ACCESS	4
Dissolved Selenium	ug/l	<1.2		<1.2	NO ACCESS	<1.2
Dissolved Sodium	mg/l	<0.1		12.6	NO ACCESS	10.5
Dissolved Vanadium	ug/l	<0.6		<0.6	NO ACCESS	<0.6

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Dissolved Zinc	ug/l	<1.5	10.9	<1.5	NO ACCESS	2
Total Aluminium	ug/l	<1.5		16.5	NO ACCESS	215.3
Total Barium	ug/l	<1.8		109	NO ACCESS	53.9
Total Boron	ug/l	<12		45	NO ACCESS	23
Total Cadmium	ug/l	<0.03	0.25	<0.03	NO ACCESS	<0.03
Total Chromium	ug/l	<0.2	3.4	<0.2	NO ACCESS	0.4
Total Copper	ug/l	<3	1 (bioavailable)	<3	NO ACCESS	<3
Total Iron	ug/l	<4.7	1000	754	NO ACCESS	499
Total Lead	ug/l	<0.4	1.2	<0.4	NO ACCESS	<0.4
Total Manganese	ug/l	<1.5	123 (bioavailable)	953.8	NO ACCESS	115.4
Total Mercury	ug/l	<0.5	0.07	<0.5	NO ACCESS	<0.5
Total Nickel	ug/l	<0.2	4	0.6	NO ACCESS	18.8
Total Phosphorus	ug/l	<0.7		390.8	NO ACCESS	117.5
Total Selenium	ug/l	<1.2		<1.2	NO ACCESS	<1.2
Total Vanadium	ug/l	<0.6		<0.6	NO ACCESS	<0.6
Total Zinc	ug/l	<1.5	1.5	<1.5	NO ACCESS	3.1
Naphthalene	ug/l	<0.1	2	<0.1	NO ACCESS	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Acenaphthene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Fluorene	ug/l	<0.01		<0.01	NO ACCESS	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Phenanthrene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Anthracene	ug/l	<0.01	0.1	<0.01	NO ACCESS	<0.01
Fluoranthene	ug/l	<0.01	0.0063	<0.01	NO ACCESS	<0.01
Pyrene	ug/l	<0.01	4	<0.01	NO ACCESS	<0.01
Benzo(a)anthracene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Chrysene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Benzo(bk)fluoranthene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Benzo(a)pyrene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
PAH 16 Total	ug/l	<0.1		<0.1	NO ACCESS	<0.1
Benzo(b)fluoranthene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Benzo(k)fluoranthene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
>C5-C6	ug/l	<10		<10	NO ACCESS	<10
>C6-C8	ug/l	<10		<10	NO ACCESS	<10
>C8-C10	ug/l	<10		<10	NO ACCESS	<10
>C10-C12	ug/l	<5		13	NO ACCESS	<5
>C12-C16	ug/l	<10		<10	NO ACCESS	<10
>C16-C21	ug/l	<10		<10	NO ACCESS	<10
>C21-C35	ug/l	<10		<10	NO ACCESS	<10

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Total aliphatics C5-35	ug/l	<10		13	NO ACCESS	<10
>C5-EC7	ug/l	<10		<10	NO ACCESS	<10
>EC7-EC8	ug/l	<10		<10	NO ACCESS	<10
>EC8-EC10	ug/l	<10		<10	NO ACCESS	<10
>EC10-EC12	ug/l	<5		<5	NO ACCESS	<5
>EC12-EC16	ug/l	<10		<10	NO ACCESS	<10
>EC16-EC21	ug/l	<10		<10	NO ACCESS	<10
>EC21-EC35	ug/l	<10		<10	NO ACCESS	<10
Total aromatics C5-35	ug/l	<10		<10	NO ACCESS	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		13	NO ACCESS	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	NO ACCESS	<5
Benzene	ug/l	<5		<5	NO ACCESS	<5
Toluene	ug/l	<5		<5	NO ACCESS	<5
Ethylbenzene	ug/l	<5		<5	NO ACCESS	<5
m/p-Xylene	ug/l	<5		<5	NO ACCESS	<5
o-Xylene	mg/l	<5		<5	NO ACCESS	<5
Resorcinol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Catechol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Phenol #	mg/l	<0.01		<0.01	NO ACCESS	<0.01
m/p-cresol	mg/l	<0.02		<0.02	NO ACCESS	<0.02
o-cresol	mg/l	<0.01		<0.01	NO ACCESS	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Total cresols #	mg/l	<0.03		<0.03	NO ACCESS	<0.03
Xylenols #	mg/l	<0.06		<0.06	NO ACCESS	<0.06
1-naphthol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
2-isopropylphenol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	NO ACCESS	<0.1

Table 8: Pond 3, Brookfield Farm

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Dissolved Oxygen	%	<1			NO ACCESS	77
Dissolved Oxygen	mg/L	<2			NO ACCESS	9.8
Temperature	°C				NO ACCESS	5.7
BOD	mg/l	<1		8	NO ACCESS	1
COD	mg/l	<7		56	NO ACCESS	23
Dissolved Organic Carbon	mg/l	<2		10	NO ACCESS	13
pH	uS/cm	<0.01		418	NO ACCESS	254
Silica	mg/l	<0.01		0.06	NO ACCESS	<0.02
Total Organic Carbon (TOC)	pH Units	<2		7.31	NO ACCESS	7.51
Electrical Conductivity @25C	mg/l	<2		3.1	NO ACCESS	8
Free/residual Chlorine	mg/l	<0.02		14	NO ACCESS	19
Total Suspended Solids	mg/l	<10		51	NO ACCESS	40
Total Hardness Dissolved (as	mg/l	<1		181	NO ACCESS	150

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
CaCO3)						
Total Alkalinity as CaCO3 #	mg/l	<1		168	NO ACCESS	124
Sulphate as SO4	mg/l	<0.5	250	19.5	NO ACCESS	14.5
Nitrate as NO3	mg/l	<0.2		<0.2	NO ACCESS	6
Nitrite as NO2	mg/l	<0.02	0.5	<0.02	NO ACCESS	0.02
Ortho Phosphate as P	mg/l	<0.03	50	<0.03	NO ACCESS	0.07
Total Inorganic Nitrogen	mg/l	<0.05		<0.05	NO ACCESS	1.48
Ammoniacal Nitrogen as N	mg/l	<0.03	0.6	0.03	NO ACCESS	0.12
Hexavalent Chromium	mg/l	<0.002	3.4	<0.002	NO ACCESS	<0.002
Total Dissolved Chromium III	mg/l	<0.002		<0.002	NO ACCESS	<0.002
Total Cyanide	mg/l	<0.01	0.001	<0.01	NO ACCESS	<0.01
Dissolved Aluminium	ug/l	<1.5	200	7	NO ACCESS	33.5
Dissolved Arsenic	ug/l	<0.9	10	<0.9	NO ACCESS	<0.9
Dissolved Barium	ug/l	<1.8		70	NO ACCESS	45.7
Dissolved Boron	ug/l	<12		52	NO ACCESS	34
Dissolved Cadmium	ug/l	<0.03	0.25	<0.03	NO ACCESS	<0.03
Dissolved Calcium	mg/l	<0.2		55.5	NO ACCESS	47.2
Total Dissolved Chromium	ug/l	<0.2	3.4	0.3	NO ACCESS	0.3
Dissolved Copper	ug/l	<3	1	<3	NO ACCESS	6
Total Dissolved Iron	ug/l	<4.7	1000	113.9	NO ACCESS	176.2
Dissolved Lead	ug/l	<0.4	1.2	<0.4	NO ACCESS	<0.4
Dissolved	mg/l	<0.1		10.1	NO	7.7

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
Magnesium					ACCESS	
Dissolved Manganese	ug/l	<1.5	123	51.2	NO ACCESS	40
Dissolved Mercury	ug/l	<0.5	0.07	<0.5	NO ACCESS	<0.5
Dissolved Nickel	ug/l	<0.2	4	1.7	NO ACCESS	1.6
Dissolved Potassium	mg/l	<0.1		4.7	NO ACCESS	5.9
Dissolved Selenium	ug/l	<1.2		<1.2	NO ACCESS	<1.2
Dissolved Sodium	mg/l	<0.1		14.7	NO ACCESS	9
Dissolved Vanadium	ug/l	<0.6		2.4	NO ACCESS	<0.6
Dissolved Zinc	ug/l	<1.5	10.9	<1.5	NO ACCESS	5.6
Total Aluminium	ug/l	<1.5		794.9	NO ACCESS	1281
Total Barium	ug/l	<1.8		82.3	NO ACCESS	58.3
Total Boron	ug/l	<12		53	NO ACCESS	32
Total Cadmium	ug/l	<0.03	0.25	<0.03	NO ACCESS	<0.03
Total Chromium	ug/l	<0.2	3.4	1.1	NO ACCESS	2.8
Total Copper	ug/l	<3	1 (bioavailable)	<3	NO ACCESS	8
Total Iron	ug/l	<4.7	1000	1361	NO ACCESS	1876
Total Lead	ug/l	<0.4	1.2	<0.4	NO ACCESS	<0.4
Total Manganese	ug/l	<1.5	123 (bioavailable)	210	NO ACCESS	86.7
Total Mercury	ug/l	<0.5	0.07	<0.5	NO ACCESS	<0.5
Total Nickel	ug/l	<0.2	4	4.3	NO ACCESS	2.4
Total Phosphorus	ug/l	<0.7		274.6	NO	250.7

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
					ACCESS	
Total Selenium	ug/l	<1.2		<1.2	NO ACCESS	<1.2
Total Vanadium	ug/l	<0.6		2.7	NO ACCESS	<0.6
Total Zinc	ug/l	<1.5	1.5	5.5	NO ACCESS	18.2
Naphthalene	ug/l	<0.1	2	<0.1	NO ACCESS	<0.1
Acenaphthylene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Acenaphthene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Fluorene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Phenanthrene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Anthracene	ug/l	<0.01	0.1	<0.01	NO ACCESS	<0.01
Fluoranthene	ug/l	<0.01	0.0063	0.02	NO ACCESS	0.01
Pyrene	ug/l	<0.01	4	0.02	NO ACCESS	0.01
Benzo(a)anthracene	ug/l	<0.01		0.01	NO ACCESS	<0.01
Chrysene	ug/l	<0.01		0.01	NO ACCESS	<0.01
Benzo(bk)fluoranthene	ug/l	<0.01		0.03	NO ACCESS	<0.01
Benzo(a)pyrene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Indeno(123cd)pyrene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
Benzo(ghi)perylene	ug/l	<0.01		<0.01	NO ACCESS	<0.01
PAH 16 Total	ug/l	<0.1		<0.1	NO ACCESS	<0.1
Benzo(b)fluoranthene	ug/l	<0.01		0.02	NO ACCESS	<0.01
Benzo(k)fluoranthen	ug/l	<0.01		<0.01	NO	<0.01

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
e					ACCESS	
>C5-C6	ug/l	<10		<10	NO ACCESS	<10
>C6-C8	ug/l	<10		<10	NO ACCESS	<10
>C8-C10	ug/l	<10		<10	NO ACCESS	<10
>C10-C12	ug/l	<5		16	NO ACCESS	<5
>C12-C16	ug/l	<10		<10	NO ACCESS	<10
>C16-C21	ug/l	<10		<10	NO ACCESS	<10
>C21-C35	ug/l	<10		<10	NO ACCESS	<10
Total aliphatics C5-35	ug/l	<10		16	NO ACCESS	<10
>C5-EC7	ug/l	<10		<10	NO ACCESS	<10
>EC7-EC8	ug/l	<10		<10	NO ACCESS	<10
>EC8-EC10	ug/l	<10		<10	NO ACCESS	<10
>EC10-EC12	ug/l	<5		<5	NO ACCESS	<5
>EC12-EC16	ug/l	<10		<10	NO ACCESS	<10
>EC16-EC21	ug/l	<10		<10	NO ACCESS	<10
>EC21-EC35	ug/l	<10		<10	NO ACCESS	<10
Total aromatics C5-35	ug/l	<10		<10	NO ACCESS	<10
Total aliphatics and aromatics(C5-35)	ug/l	<10		16	NO ACCESS	<10
MTBE (Methyle tert-butyl ether)	ug/l	<5	5100	<5	NO ACCESS	<5
Benzene	ug/l	<5		<5	NO ACCESS	<5
Toluene	ug/l	<5		<5	NO ACCESS	<5
Ethylbenzene	ug/l	<5		<5	NO	<5

Analyte	Units	Limit of Detection	Screening Values	Sample Dates		
				04/06/19	05/09/19	20/11/19
					ACCESS	
m/p-Xylene	ug/l	<5		<5	NO ACCESS	<5
o-Xylene	mg/l	<5		<5	NO ACCESS	<5
Resorcinol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Catechol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Phenol #	mg/l	<0.01		<0.01	NO ACCESS	<0.01
m/p-cresol	mg/l	<0.02		<0.02	NO ACCESS	<0.02
o-cresol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Total cresols #	mg/l	<0.03		<0.03	NO ACCESS	<0.03
Xylenols #	mg/l	<0.06		<0.06	NO ACCESS	<0.06
1-naphthol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
2,3,5-trimethyl phenol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
2-isopropylphenol	mg/l	<0.01		<0.01	NO ACCESS	<0.01
Total Speciated Phenols HPLC	mg/l	<0.1		<0.1	NO ACCESS	<0.1