



Appendix A – Groundwater Quality & Level Data

Appendix A - Groundwater Quality and Level Data

MB07	LOR	Units	6/06/2019	14/07/2019	11/08/2019	23/09/2019	24/10/2019	2/12/2019		4/06/2020	6/08/2020	4/10/2020	3/12/2020	26/02/2021	10/05/2021	12/07/2021	12/09/2021	16/12/2021	22/03/2022	18/06/2022	
pH	0.01	pH units	8.31	7.73	7.48	7.43	7.57	7.48	No sample	7.48	7.79	7.32	7.98	7.75	7.95	7.9	8.11	7.62	7.63	8.16	
EC	1	µS/cm	5430	5430	5630	5620	5890	5820		5420	5260	5420	5530	5320	5150	5430	5440	5200	5590	5290	
SO ₄	1	mg/L	819	778	665	754	733	722		722	592	682	666	684	671	675	691	653	687	657	
Aluminium (dissolved)	0.01	mg/L	0.02	0.005	0.005	0.005	0.02	0.005		0.005	0.005	0.005	0.005	0.02	0.005	0.005	0.005	0.005	0.005	0.01	0.0025
Arsenic (dissolved)	0.001	mg/L	0.001	0.002	0.0005	0.0005	0.0005	0.0005		0.003	0.001	0.003	0.002	0.003	0.003	0.003	0.002	0.003	0.002	0.0029	0.0015
Lead (dissolved)	0.001	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Iron (dissolved)	0.05	mg/L	0.025	0.025	0.025	0.025	0.07	0.025		0.98	0.33	0.34	0.37	0.25	0.53	0.38	0.37	0.4	0.283	0.13	
Mercury (dissolved)	0.0001	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Molybdenum (dissolved)	0.001	mg/L	0.007	0.006	0.0005	0.0005	0.001	0.001		0.0005	0.001	0.001	0.0005	0.001	0.004	0.0005	0.0005	0.002	0.0016	0.001	
Selenium (dissolved)	0.0002	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
TRH (C6-C9)	20	µg/L	10	10	10	10	10	10		10	10	10	10	40	10	10	10	10	10	10	
TRH (C10-C36)	50	µg/L	25	25	25	25	25	25		25	25	25	25	25	25	25	25	60	200	25	
Standing Water Level	-	mAHD	-	207	207.06	207.08	206.93	207.23		206.41	207.21	207.16	207.2	207.28	207.2	207.25	207.32	207.31	207.3	207.3	

MB09	LOR	Units	6/06/2019	14/07/2019	12/08/2019	24/09/2019	26/10/2019	3/12/2019	22/03/2020	4/06/2020	6/08/2020	4/10/2020	3/12/2020	26/02/2021	10/05/2021	12/07/2021	12/09/2021	16/12/2021	23/03/2022	18/06/2022
pH	0.01	pH units	7.59	7.65	7.64	7.47	7.53	7.58	7.99	7.51	7.81	7.28	7.93	7.53	7.76	7.56	7.97	8.09	8.13	7.95
EC	1	µS/cm	16200	12500	14900	13500	13300	11500	11400	12000	12100	12100	12000	11600	11500	12100	12200	12000	11600	11200
SO ₄	1	mg/L	2580	1020	1800	1400	1210	934	708	808	700	748	716	745	746	729	751	718	744	703
Aluminium (dissolved)	0.01	mg/L	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Arsenic (dissolved)	0.001	mg/L	0.001	0.0005	0.001	0.0005	0.002	0.001	0.001	0.001	0.0005	0.001	0.0005	0.001	0.001	0.0005	0.001	0.0005	0.0008	0.0005
Lead (dissolved)	0.001	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Iron (dissolved)	0.05	mg/L	0.025	0.025	0.025	0.025	0.89	0.63	0.66	0.65	0.29	0.29	0.08	0.09	0.42	0.24	0.3	0.13	0.137	0.083
Mercury (dissolved)	0.0001	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Molybdenum (dissolved)	0.001	mg/L	0.003	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005
Selenium (dissolved)	0.0002	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
TRH (C6-C10)	20	µg/L	10	10	10	10	10	10	10	10	10	10	10	20	10	10	10	10	10	
TRH (C10-C40)	50	µg/L	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	70	25	25
Standing Water Level	-	mAHD	-	215.64	215.66	215.69	215.46	215.81	215.73	215.53	215.54	215.28	215.59	215.65	215.63	215.62	215.73	215.76	215.76	215.68

MB10	LOR	Units		14/07/2019	12/08/2019	24/09/2019	24/10/2019	2/12/2019	22/03/2020	4/06/2020	8/08/2020	4/10/2020	3/12/2020	1/03/2021	11/05/2021	12/07/2021	13/09/2021	16/12/2021	22/03/2022	18/06/2022	
pH	0.01	pH units	No sample	7.62	7.54	7.67	7.64	7.51	7.42	7.57	7.97	7.37	8.08	7.59	8.02	8.01	8.2	7.55	7.94	8.14	
EC	1	µS/cm		5060	4780	4140	4280	4000	4000	4080	4110	3960	3970	3790	3720	3800	3830	3810	3760	3660	
SO ₄	1	mg/L		628	491	458	445	420	414	435	396	395	381	386	378	367	375	372	383	388	
Aluminium (dissolved)	0.01	mg/L		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.007	0.005
Arsenic (dissolved)	0.001	mg/L		0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.001	0.001	0.001	0.0005	0.0005	0.001	0.0005	0.0005	0.0005	0.001	0.0007
Lead (dissolved)	0.001	mg/L		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Iron (dissolved)	0.05	mg/L		0.025	0.07	0.025	0.025	0.025	0.29	0.18	0.12	0.11	0.08	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.03
Mercury (dissolved)	0.0001	mg/L		0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Molybdenum (dissolved)	0.001	mg/L		0.003	0.002	0.002	0.003	0.003	0.002	0.002	0.003	0.003	0.003	0.002	0.004	0.003	0.002	0.002	0.007	0.003	0.0024
Selenium (dissolved)	0.0002	mg/L		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TRH (C6-C10)	20	µg/L		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
TRH (C10-C40)	50	µg/L		25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
Standing Water Level	-	mAHD			210.83	210.88	210.97	211.02	211.06	210.98	216.08	211.17	211.18	211.23	211.28	211.24	211.29	211.33	211.35	211.34	211.32

Appendix A - Groundwater Quality and Level Data

MB12	LOR	Units	6/06/2019	14/07/2019	11/08/2019	23/09/2019	26/10/2019	2/12/2019	22/03/2020	4/06/2020	6/08/2020	3/10/2020	3/12/2020	26/02/2021	10/05/2021	12/07/2021	13/09/2021	16/12/2021	22/03/2022	18/06/2022
pH	0.01	pH units	7.81	7.61	7.36	7.33	7.19	7.28	7.18	7.08	7.65	7.07	7.64	7.5	7.75	7.77	7.89	7.36	7.52	7.9
EC	1	µS/cm	21600	17300	17400	16900	20900	17000	14800	22200	23100	21900	23500	21900	22000	22500	22400	21800	21800	20000
SO ₄	1	mg/L	908	804	852	1090	808	785	682	911	781	842	830	861	847	842	822	817	861	824
Aluminium (dissolved)	0.01	mg/L	0.04	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Arsenic (dissolved)	0.001	mg/L	0.002	0.002	0.004	0.009	0.0005	0.0005	0.0005	0.001	0.001	0.002	0.0005	0.001	0.002	0.001	0.002	0.001	0.0018	0.0005
Lead (dissolved)	0.001	mg/L	0.001	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Iron (dissolved)	0.05	mg/L	0.025	0.47	0.77	1.2	0.43	1.04	2.41	4.85	4.5	3.53	2.7	2.41	3.2	3.58	3.08	3.03	3.84	1.37
Mercury (dissolved)	0.0001	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Molybdenum (dissolved)	0.001	mg/L	0.003	0.004	0.004	0.002	0.002	0.004	0.001	0.0005	0.0005	0.001	0.0005	0.004	0.002	0.001	0.001	0.001	0.0011	0.0003
Selenium (dissolved)	0.0002	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TRH (C6-C10)	20	µg/L	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
TRH (C10-C40)	50	µg/L	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	180	220	25
Standing Water Level	-	mAHD	-	218.07	218.26	218.51	219.19	218.15	218.03	216.9	218.4	218.41	218.38	217.7	217.45	217.46	216.7	217.29	217.68	216.86



Appendix B – Groundwater Quality Statistics Summary

Appendix B - Groundwater Quality Statistics Summary

MB07	Unit	LOR	n	Min	5 th percentile	20 th percentile	50 th percentile	Mean	80 th percentile	95 th percentile	Max	Std Dev	
pH - Field		0.01	17	6.53	6.682	6.754	6.91	7.00	7.072	7.598	8.31	0.40	
EC - Field	µS/cm	1		4040	4235.2	5186.4	5383	5365.76	5803	6099.2	6132	545.04	
Ca	mg/L	1		84	86.4	95.6	102	105.12	114.2	129	129	13.56	
Mg	mg/L	1		161	165.8	173.2	182	181.71	190	202.8	210	12.43	
Na	mg/L	1		759	781.4	800	845	844.24	866.4	914.6	997	53.06	
K	mg/L	1		6	6	6	7	7.82	7	11.4	25	4.48	
HCO3	mg/L	1		752.74	609.695	638.792	671	671.09	699.792	731.329	752.74	41.80	
SO4	mg/L	1		592	640.8	665.2	684	697.12	730.8	786.2	819	53.31	
Cl	mg/L	1		1080	1096	1132	1190	1198.82	1272	1320	1320	77.37	
Al (dissolved)	mg/L	0.01		0.0025	0.0045	0.005	0.005	0.008	0.009	0.02	0.02	0.01	
As (dissolved)	mg/L	0.001		0.0005	0.0005	0.0006	0.002	0.002	0.003	0.003	0.003	0.00	
Fe (dissolved)	mg/L	0.05		0.025	0.025	0.025	0.283	0.255	0.378	0.62	0.98	0.26	
Pb (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00
Hg (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00
Mo (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.001	0.002	0.00192	0.0062	0.007	0.00	
Se (dissolved)	mg/L	0.0002		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
TRH (C6-C10)	µg/L	20		10	10	10	10	13.75	10	29.5	40	10.61	
TRH (C10-C40)	µg/L	50	25	25	25	25	51.25	46	151	200	61.34		

Appendix B - Groundwater Quality Statistics Summary

MB09	Unit	LOR	n	Min	5 th percentile	20 th percentile	50 th percentile	Mean	80 th percentile	95 th percentile	Max	Std Dev
pH - Field		0.01	18	6.64	6.6995	6.816	6.92	7.01	7.158	7.576	7.95	0.32
EC - Field	µS/cm	1		6332	10642.35	11643.2	11961	12267.17	13543.6	15290.5	16200	1995.11
Ca	mg/L	1		184	194.2	206.4	220	232.50	251.2	305.25	369	43.18
Mg	mg/L	1		312	324.75	350.4	364.5	398.50	422.6	570.75	694	90.71
Na	mg/L	1		1600	1736	1864	1930	1977.78	2050	2318.5	2820	250.10
K	mg/L	1		44	44.85	47.4	49.5	50.72	52	58.55	73	6.29
HCO3	mg/L	1		771.04	861.564	1017.724	1065.06	1039.28	1106.052	1131.184	1151.68	95.84
SO4	mg/L	1		700	702.55	716.8	747	986.67	1134	1917	2580	496.85
Cl	mg/L	1		3250	3301	3470	3610	3706.11	3814	4530.5	4590	379.23
Al (dissolved)	mg/L	0.01		0.0025	0.0025	0.005	0.005	0.005	0.005	0.00575	0.01	0.00
As (dissolved)	mg/L	0.001		0.0001	0.00044	0.0005	0.001	0.001	0.001	0.00115	0.002	0.00
Fe (dissolved)	mg/L	0.05		0.025	0.025	0.047	0.1885	0.277	0.546	0.6945	0.89	0.27
Pb (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00
Hg (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00
Mo (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.000	0.00032	0.00215	0.003	0.00
Se (dissolved)	mg/L	0.0002		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TRH (C6-C10)	µg/L	20		10	10	10	10	11.25	10	16.5	20	3.54
TRH (C10-C40)	µg/L	50		25	25	25	25	30.625	25	54.25	70	15.91

Appendix B - Groundwater Quality Statistics Summary

MB12	Unit	LOR	n	Min	5 th percentile	20 th percentile	50 th percentile	Mean	80 th percentile	95 th percentile	Max	Std Dev	
pH - Field		0.01	18	6.22	6.3475	6.57	6.69	6.76	6.99	7.1895	7.81	0.36	
EC - Field	µS/cm	1		14000	14340	16927.4	21625	19907.89	22337.6	22841.65	22851	3078.20	
Ca	mg/L	1		230	290.35	350.6	483	436.06	502.4	523.55	538	88.89	
Mg	mg/L	1		555	573.7	633.6	857.5	808.00	925.6	947.5	956	139.71	
Na	mg/L	1		2330	2372.5	2694	3195	3038.89	3276	3464.5	3490	362.83	
K	mg/L	1		13	13	14	18	16.89	19	20	20	2.49	
HCO3	mg/L	1		570.96	668.316	742.248	762.5	777.95	841.068	904.02	946.72	84.92	
SO4	mg/L	1		682	766.15	805.6	836	842.61	861	937.85	1090	79.75	
Cl	mg/L	1		4940	5203.5	5920	7665	7099.44	7936	8098	8200	1101.17	
Al (dissolved)	mg/L	0.01		0.0025	0.0025	0.005	0.005	0.011	0.005	0.046	0.08	0.02	
As (dissolved)	mg/L	0.001		0.0005	0.0005	0.001	0.0019	0.002	0.0032	0.0056	0.009	0.00	
Fe (dissolved)	mg/L	0.05		0.025	0.36925	0.878	2.555	2.358	3.56	4.5525	4.85	1.47	
Pb (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.0001	0.00005	0.0001925	0.001	0.00	
Hg (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00
Mo (dissolved)	mg/L	0.0001		0.00005	0.00005	0.00058	0.00105	0.002	0.0036	0.004	0.004	0.00	
Se (dissolved)	mg/L	0.0002		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
TRH (C6-C10)	µg/L	20		10	10	10	10	10	10	10	10	10	0.00
TRH (C10-C40)	µg/L	50		25	25	25	25	68.75	118	206	220	81.71	



Appendix C – Groundwater Quality Trends

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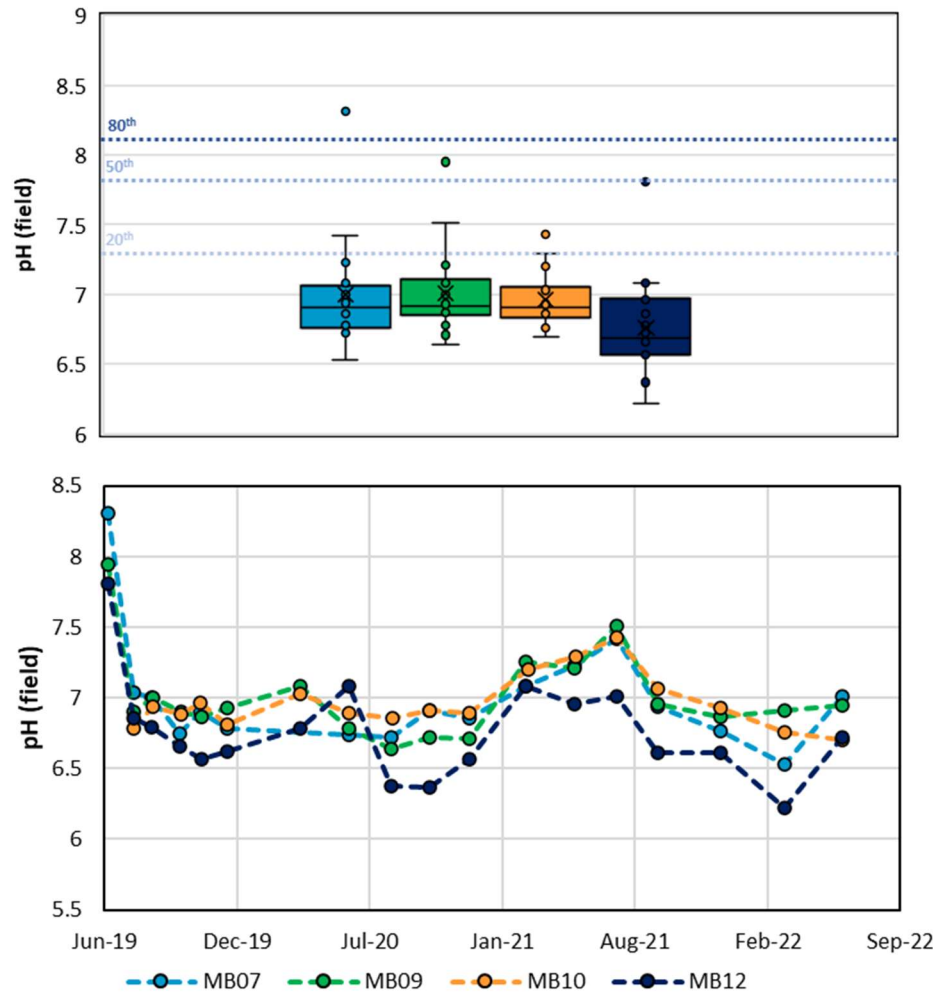


Plate 1 – Field pH

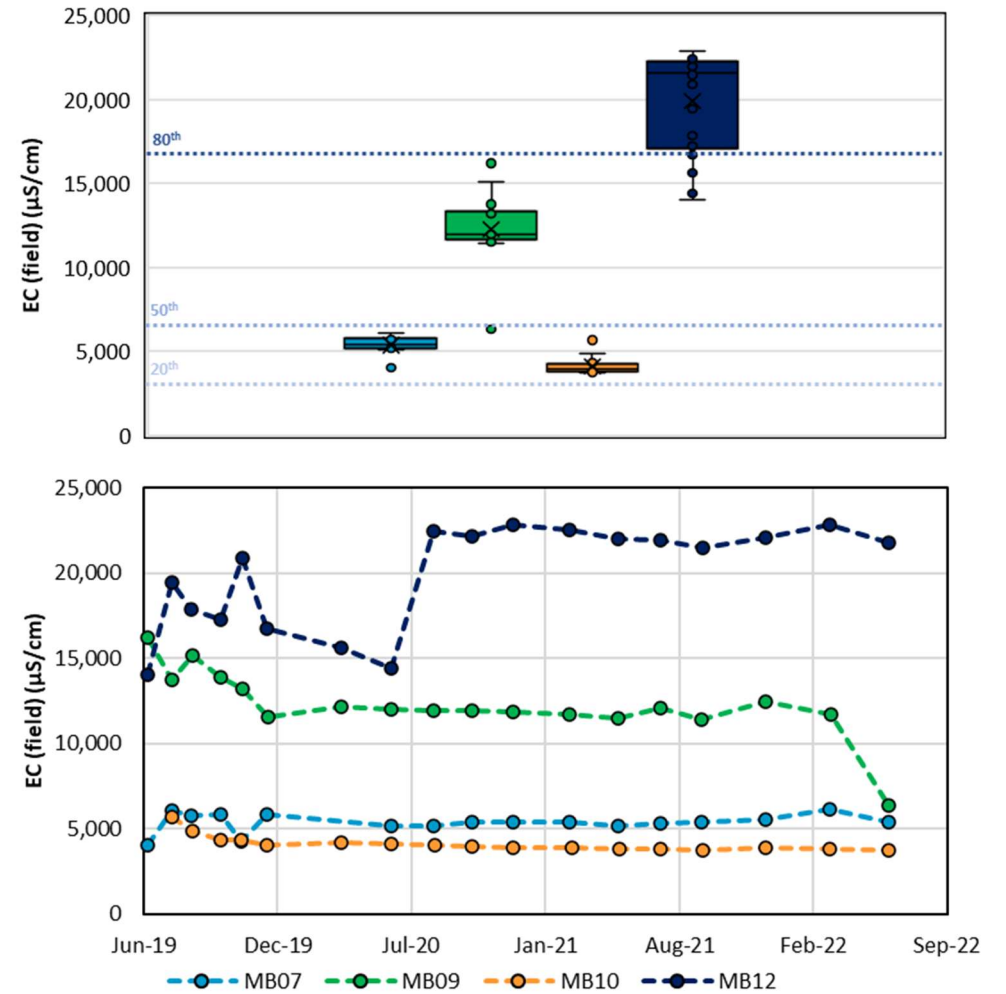


Plate 2 – Field Electrical Conductivity

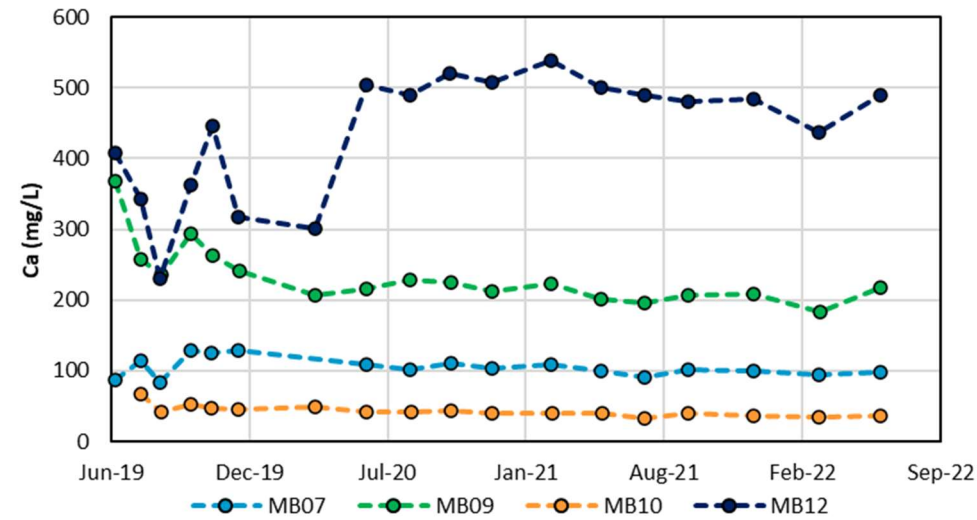
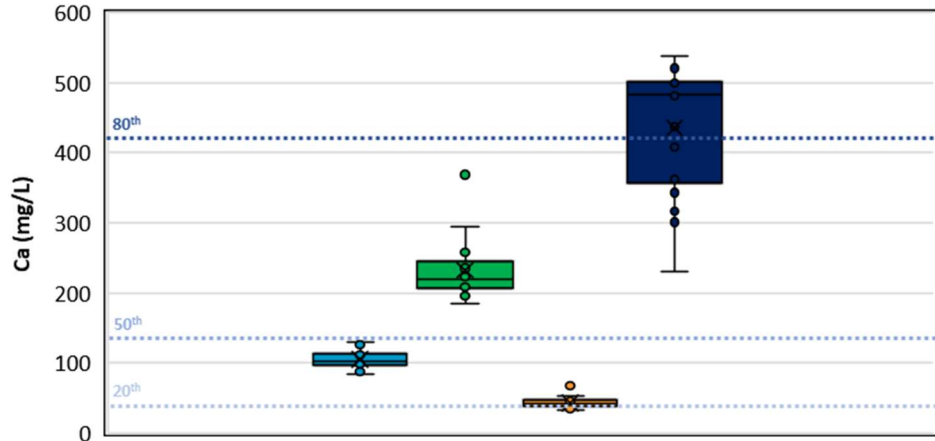


Plate 3 – Calcium (Ca²⁺)

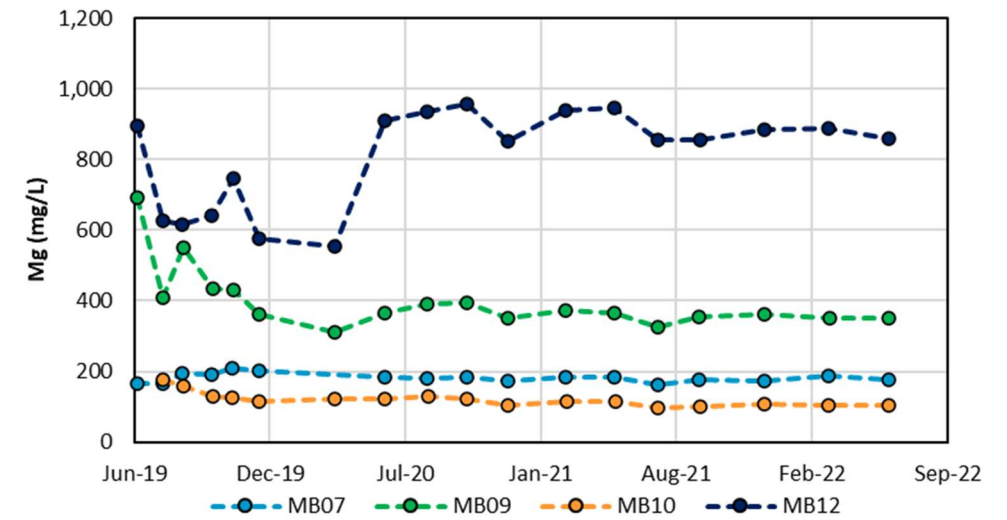
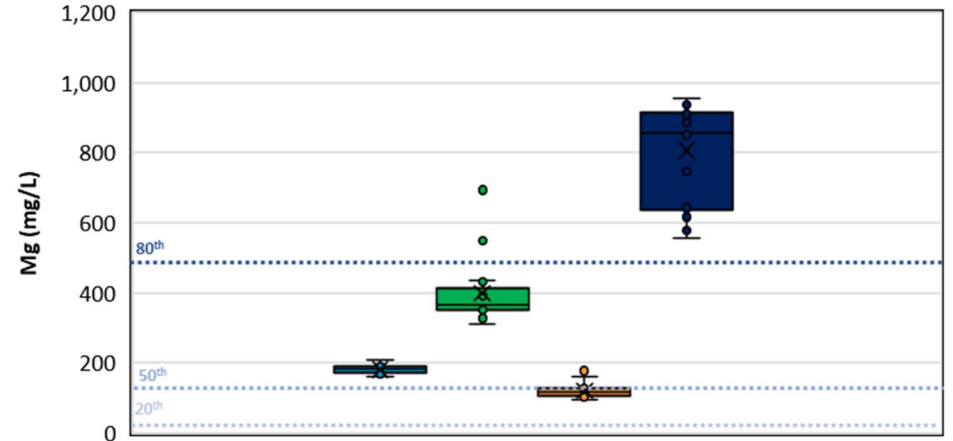


Plate 4 – Magnesium (Mg²⁺)

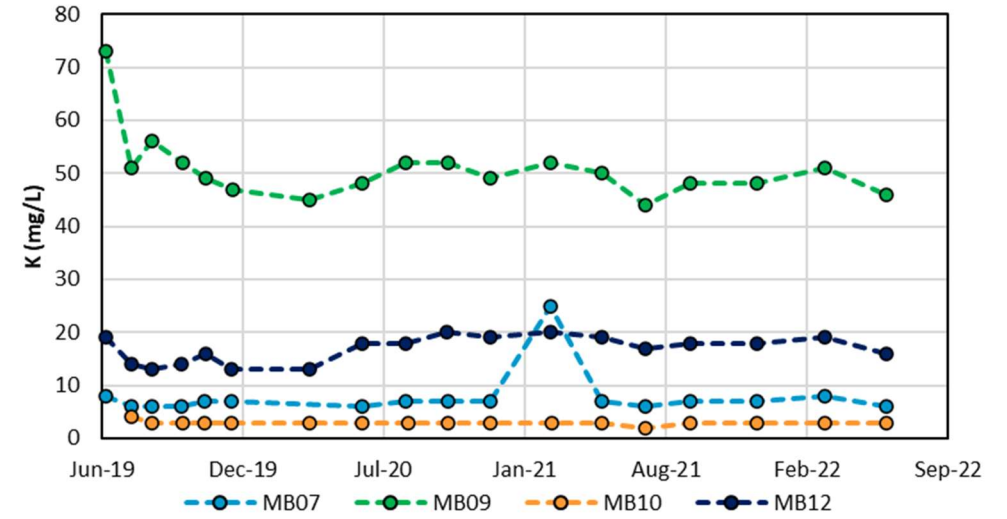
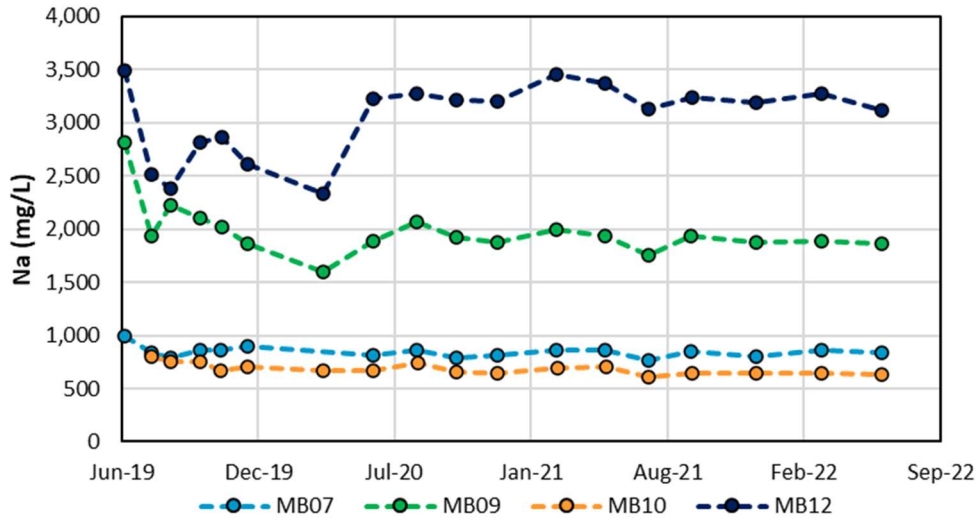
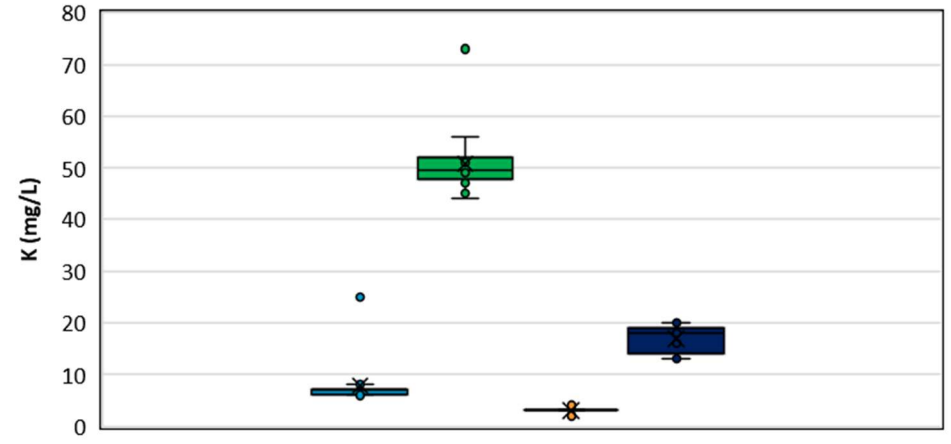
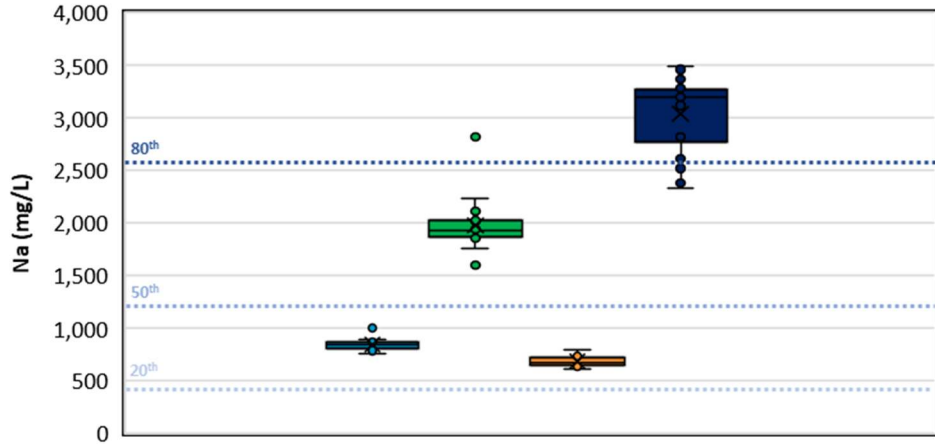


Plate 5 – Sodium (Na⁺)

Plate 6 – Potassium (K⁺)

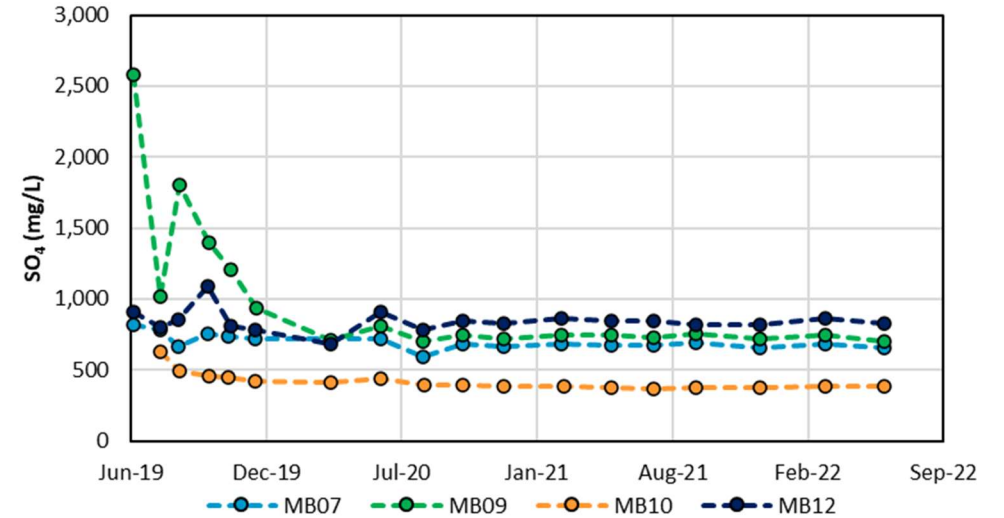
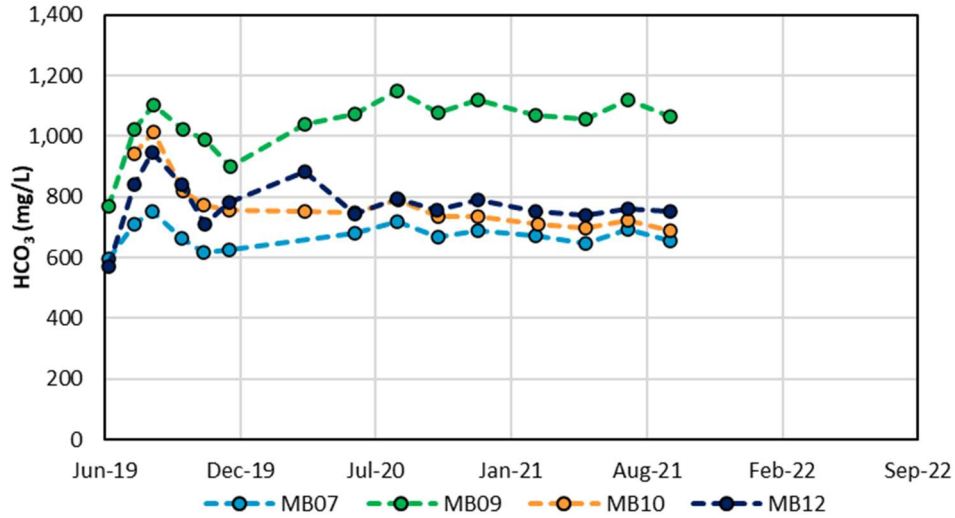
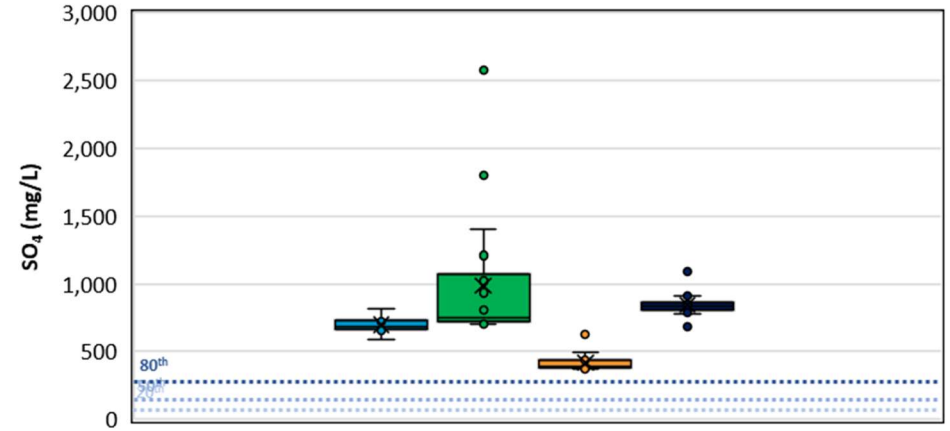
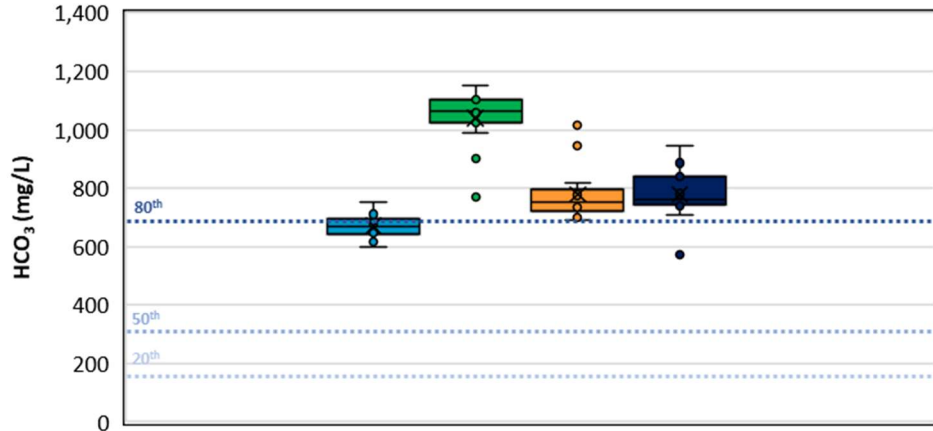


Plate 7 – Bicarbonate (HCO_3^-)

Plate 8 – Sulphate (SO_4^{2-})

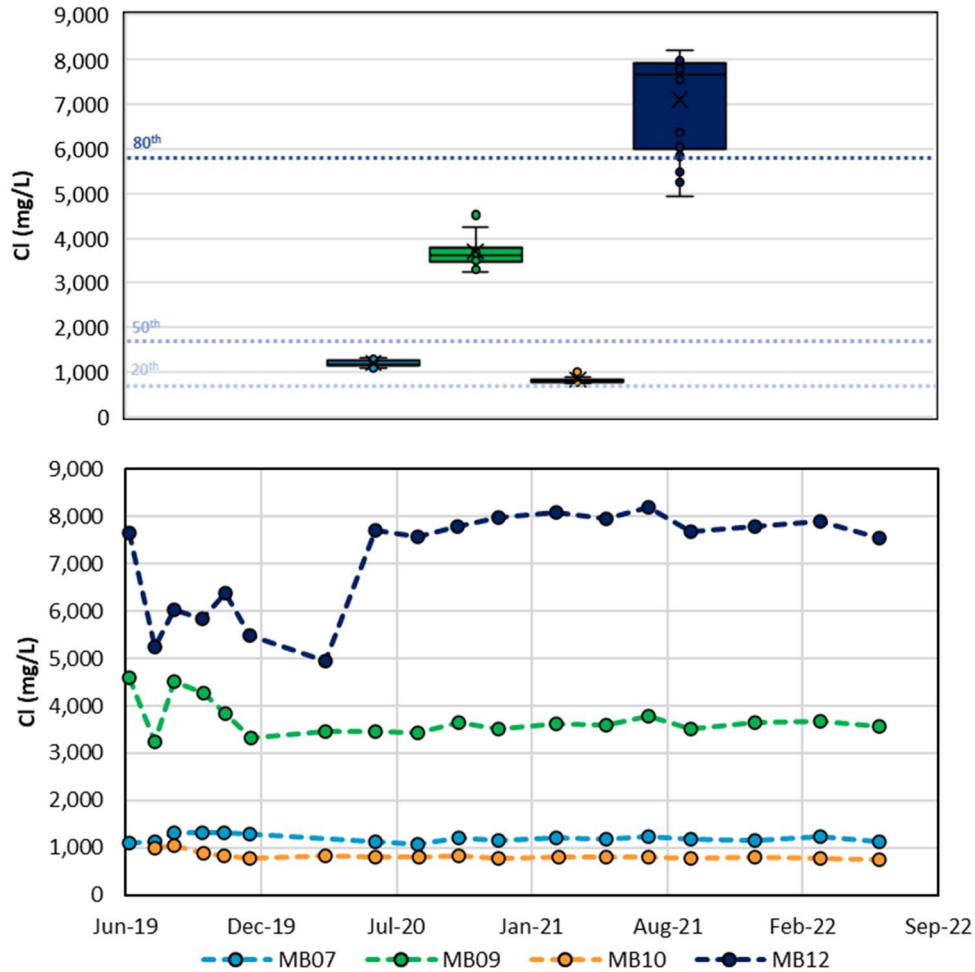


Plate 9 – Chloride (Cl)

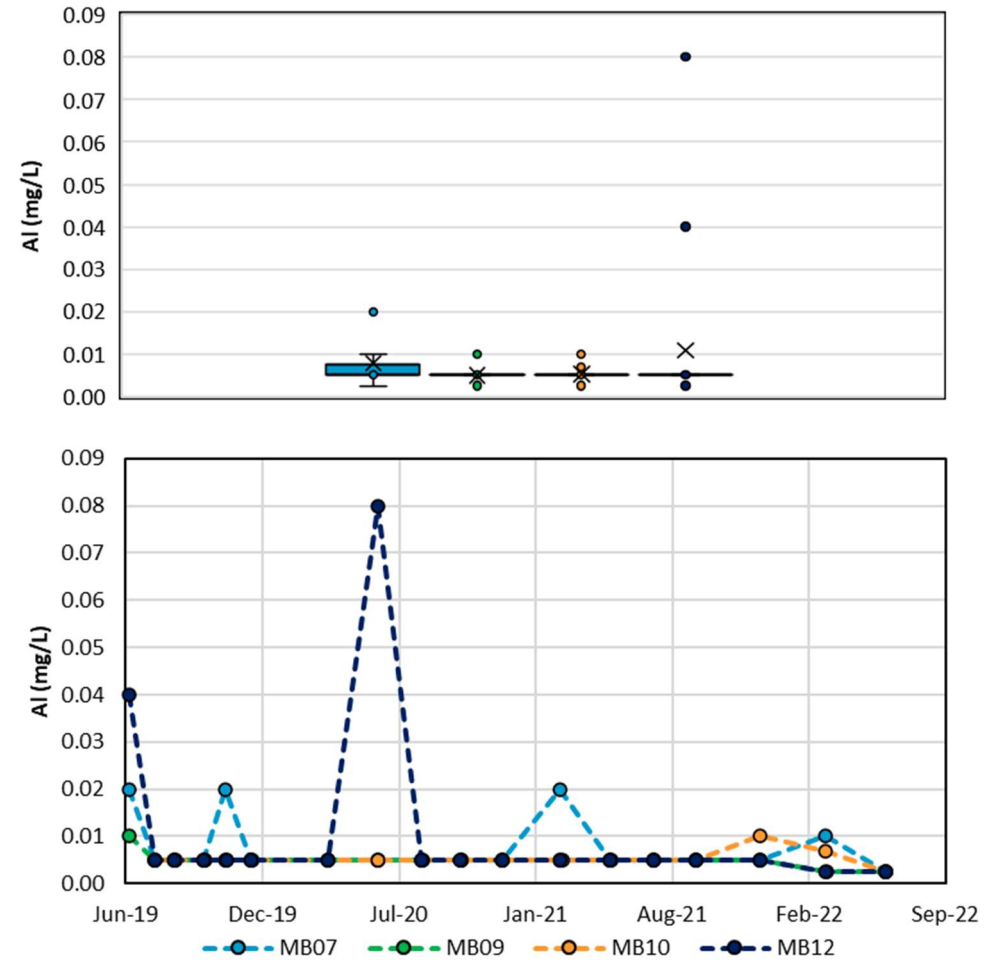


Plate 10 – Dissolved Aluminium (Al)

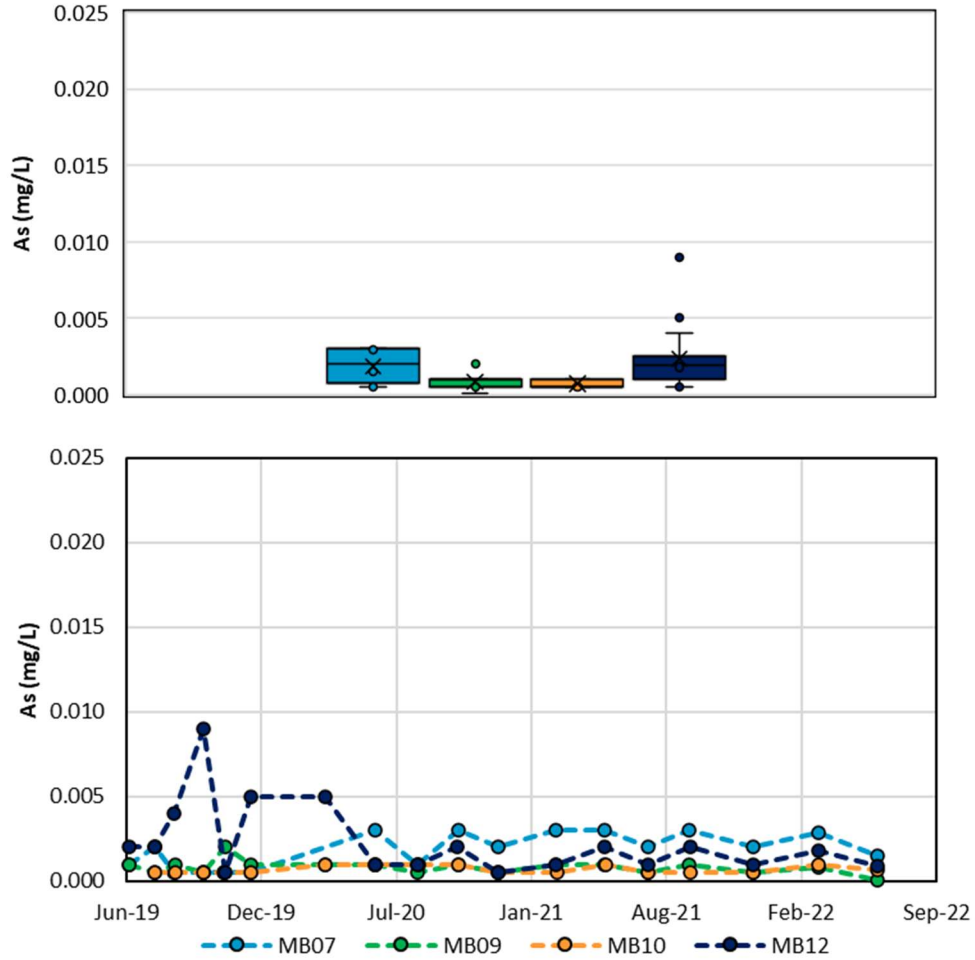


Plate 10 – Dissolved Arsenic (As)

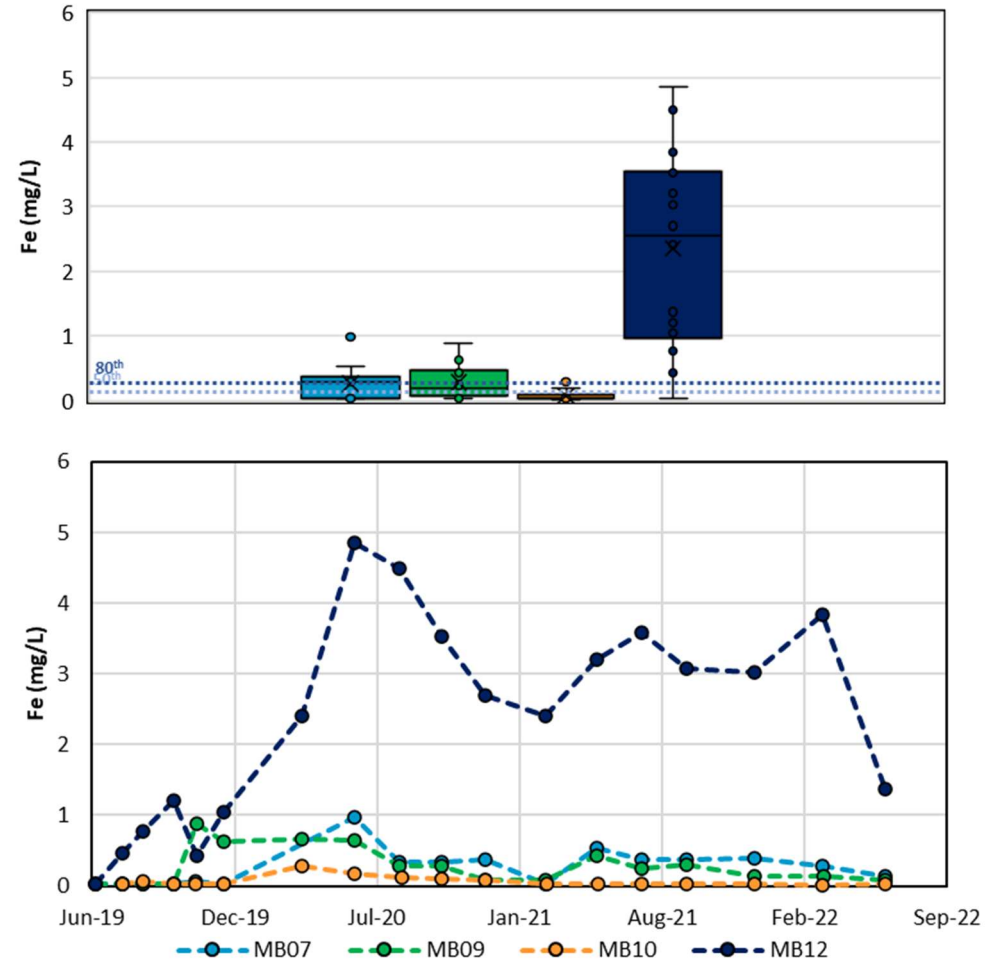


Plate 11 – Dissolved Iron (Fe)

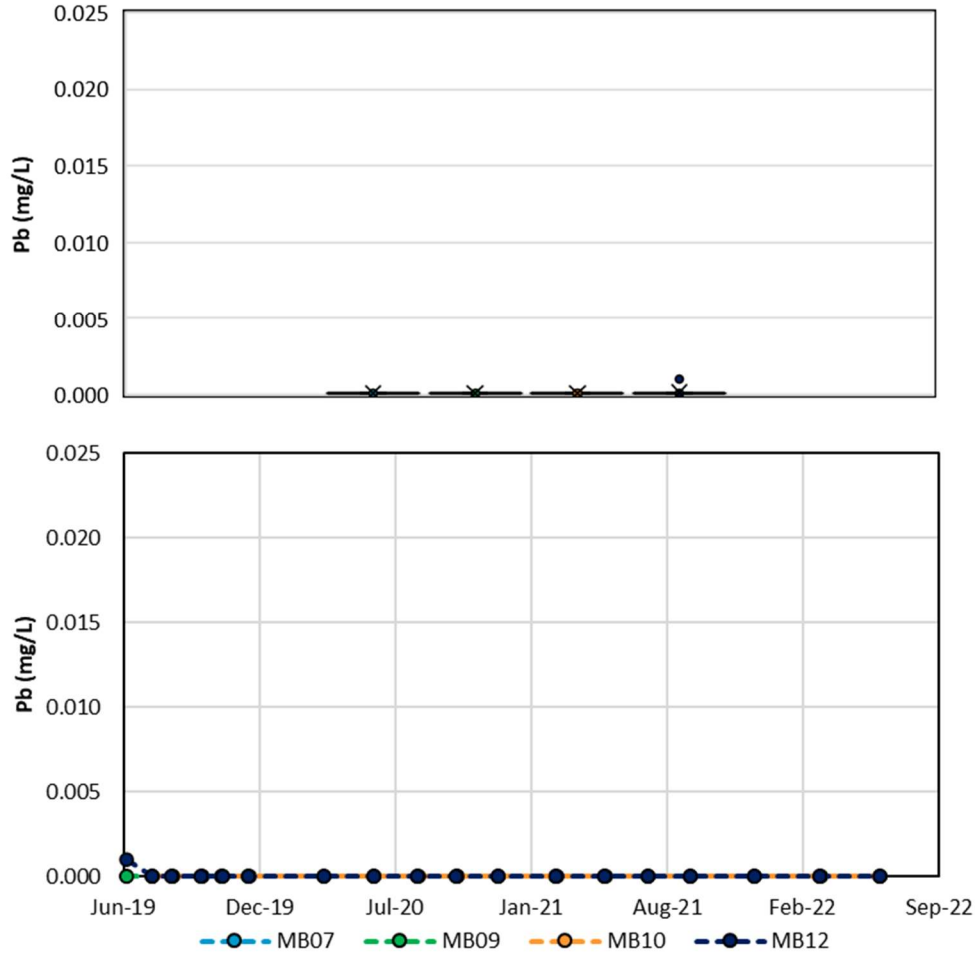


Plate 12 – Dissolved Lead (Pb)

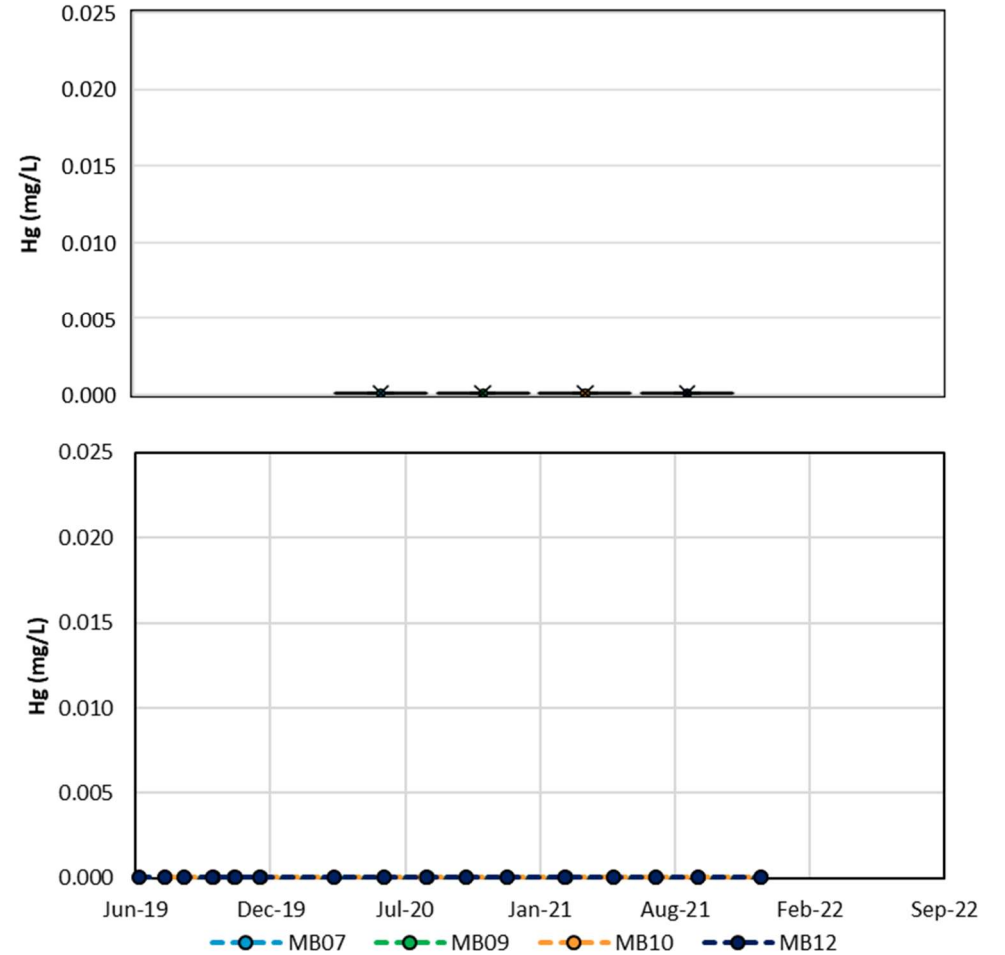


Plate 13 – Dissolved Mercury (Hg)

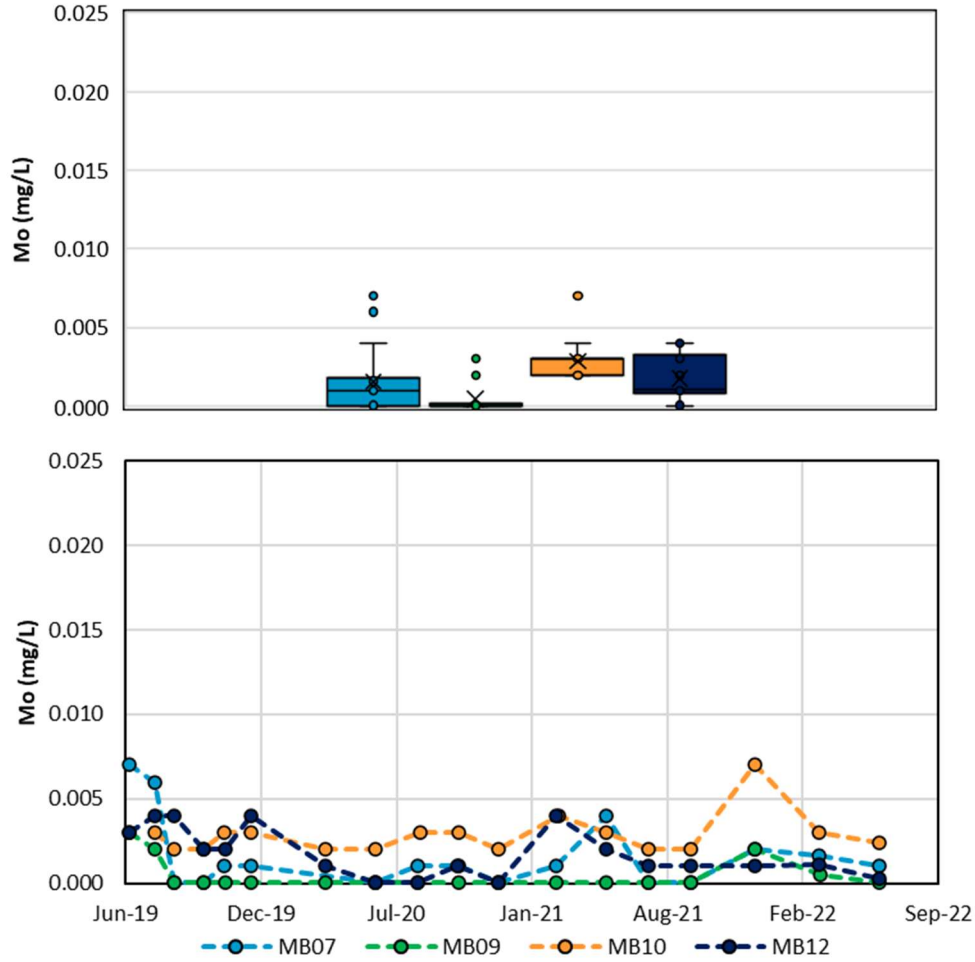


Plate 14 – Dissolved Molybdenum (Mo)

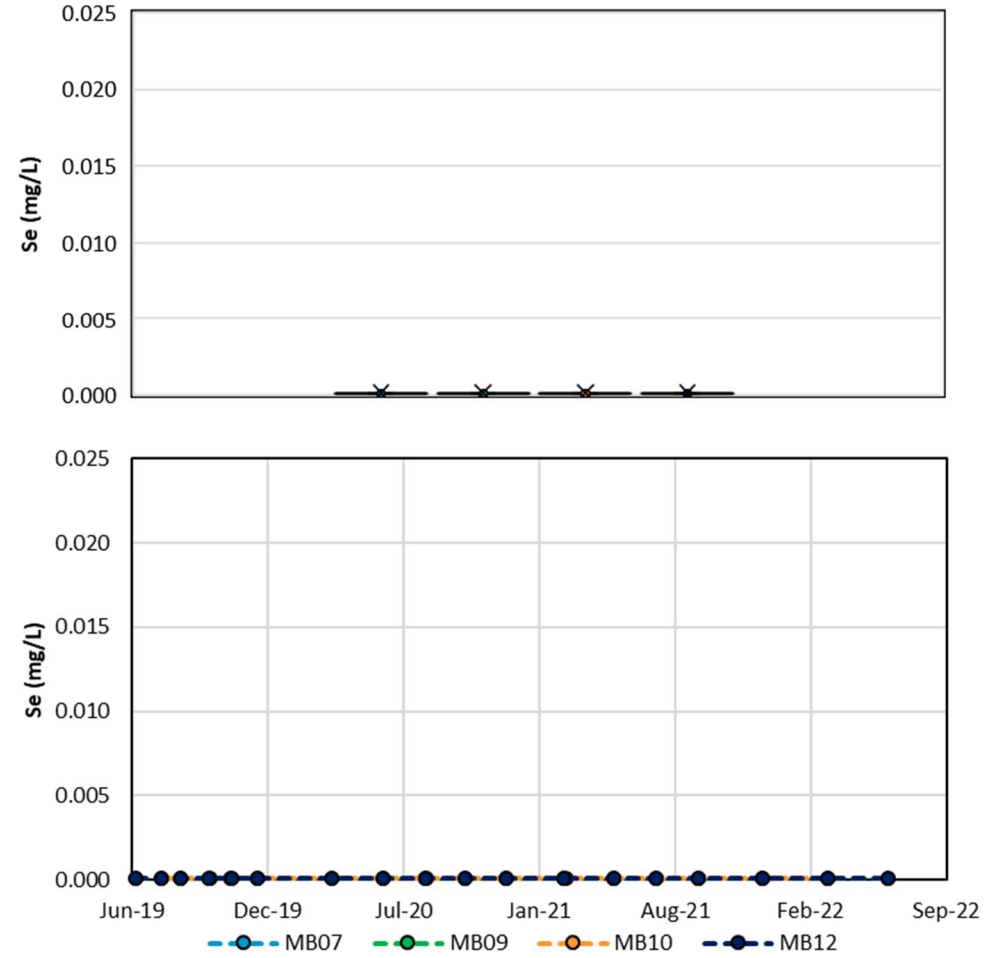


Plate 15 – Dissolved Selenium (Se)

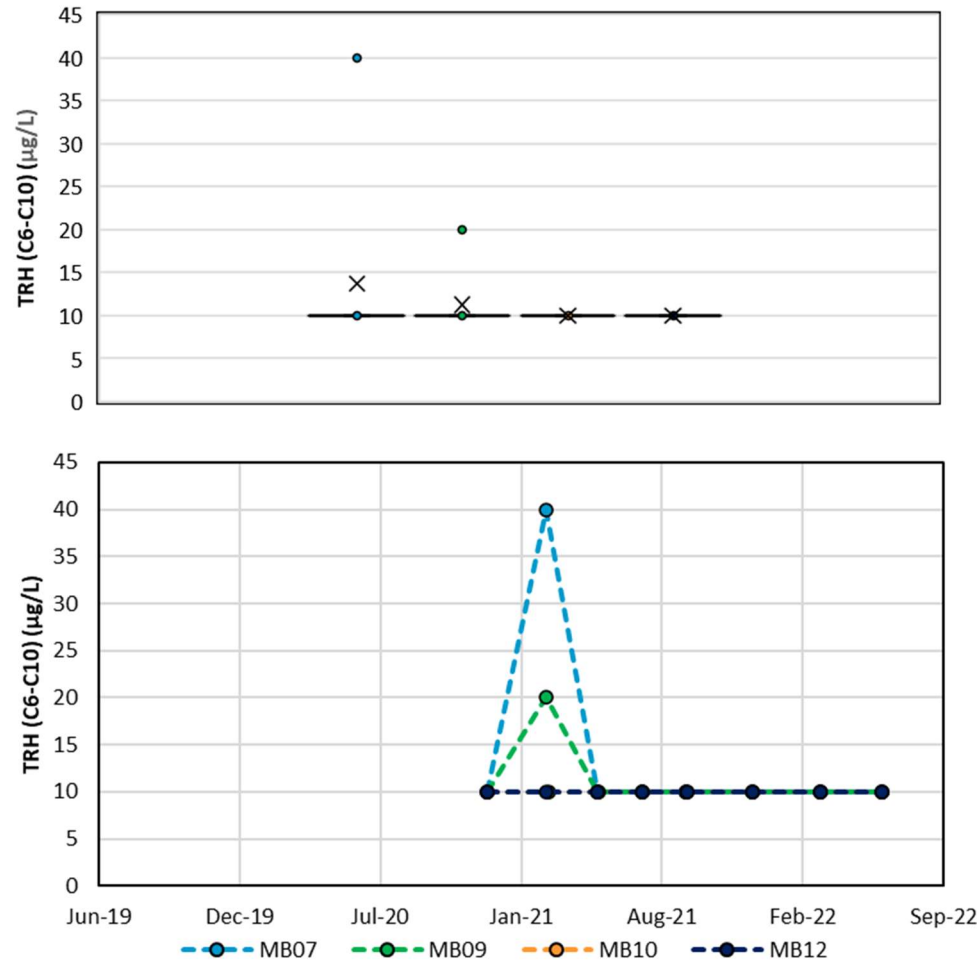


Plate 16 – Total Recoverable Hydrocarbons (TRH) C6 – C10 fraction

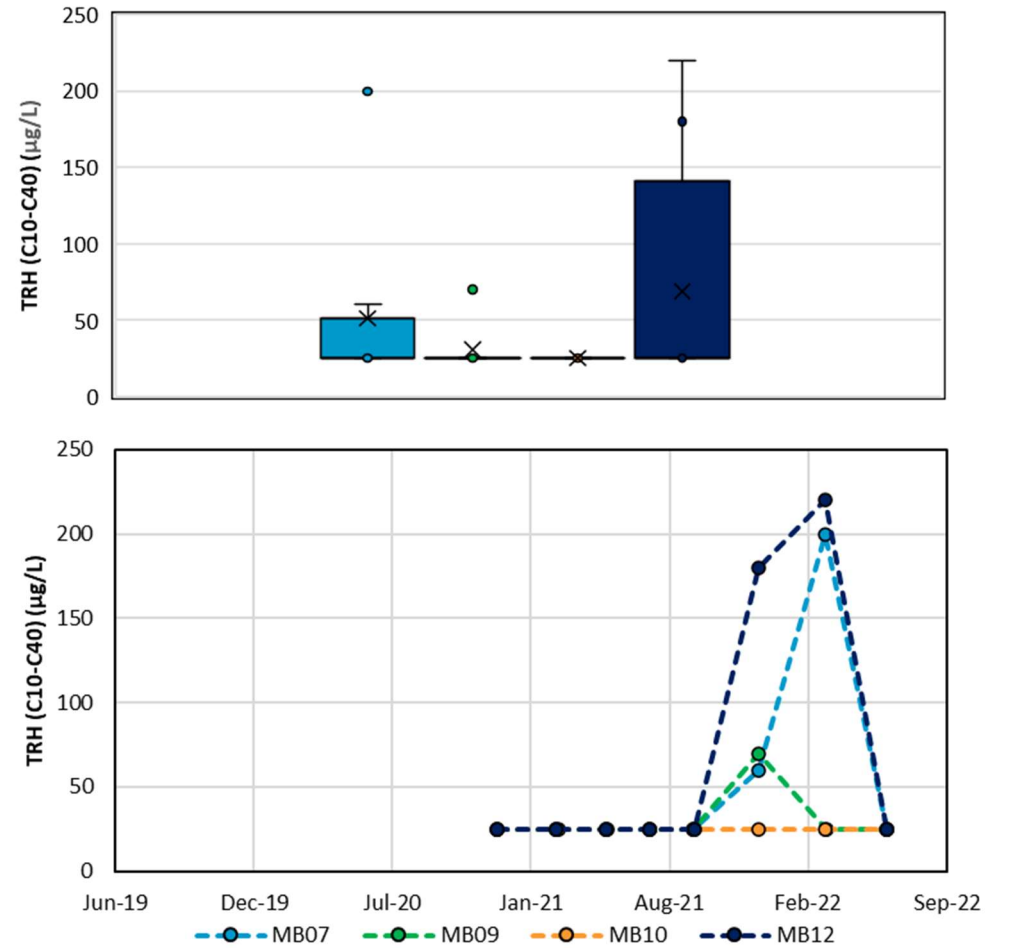


Plate 17 – Total Recoverable Hydrocarbons (TRH) C10 – C40 fraction