

APPENDIX C

WATER CHEMISTRY DATA AND SUPPLEMENTAL PLOTS

Appendix C1

Water Chemistry – Meadowbank Study Area Lakes

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Month & Area		Aquatic Life Guideline ¹	Meadowbank Screening Values ²			Inuggugayualik Lake (INUG)									
Area-Replicate ID	March					March	April/May	April/May	July	July	August	August	September	September	
Date	INUG-156		INUG-157	INUG-158	INUG-159	INUG-160	INUG-161	INUG-162	INUG-163	INUG-164	INUG-165				
Time	14-Mar-2024		14-Mar-2024	29-Apr-2024	29-Apr-2024	12-Jul-2024	12-Jul-2024	10-Aug-2024	10-Aug-2024	17-Sep-2024	17-Sep-2024				
ALS Sample ID	11:50		11:15	00:00	00:00	14:00	14:30	15:40	14:48	13:05	13:40				
			Meadowbank	Wally Lake	Thresholds	VA24A6007-001	VA24A6007-002	VA24B0466-001	VA24B0466-002	VA24B7634-001	VA24B7634-002	VA24C1019-003 VA24C2044-011	VA24C1019-004 VA24C2044-014	VA24C5723-001	VA24C5723-002
Field Measurements (Surface 3m)															
Dissolved Oxygen (mg/L)						19	16	17	17	11	11	10	10	11	12
Specific Conductivity (µS/cm)						21	20	21	21	18	18	18	18	17	31
pH	6.5 - 9.0		6.4-8.15	6.54 - 8.34	6.5 - 9.0	6.5	7.1	7.0	6.5	6.9	6.7	6.6	6.5	6.5	6.4
Temperature (°C)						0.57	0.67	0.85	0.77	8.6	8.5	15	14	8.5	8.5
Physical Tests (mg/L)															
Conductivity (µS/cm)			27	37	27	20	25	25	25	19	19	18	18	19	19
Alkalinity - Bicarbonate			8.7	18	9.0	6.6	7.2	7.2	7.8	5.5	5.4	6.2	6.1	6.0	6.1
Alkalinity - Carbonate			2.0	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Total (as CaCO ₃)			8.7	18	9.0	6.6	7.2	7.2	7.8	5.5	5.4	6.2	6.1	6.0	6.1
Hardness (as CaCO ₃), dissolved			9.5	17	10	7.6	8.6	8.6	9.2	6.7	6.6	6.7	6.7	6.6	6.7
Hardness (as CaCO ₃), from total Ca/Mg					10	7.4	8.4	8.4	8.8	6.6	6.5	6.7	6.7	7.0	6.9
Total Dissolved Solids (TDS)			19	25	17	14	16	16	16	11	14	17	17	11	9.6
Total Suspended Solids (TSS)			3.0	3.0	5.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)					0.15	0.11	<0.10	0.12	0.12	0.51	0.56	0.27	0.32	0.33	0.29
pH (Laboratory)	6.47-7.95		6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.1	7.0	7.2	7.2	7.1	7.1	7.0	7.0	7.0	7.0
Anions and Nutrients (mg/L)															
Ammonia (as N) ³	equation		0.065	0.067	0.13	0.020	0.016	0.024	0.023	0.0072	0.0067	0.0064	0.0066	<0.0050	0.0065
Bromide						<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	120		60	60	120	1.2	0.83	1.0	1.1	0.81	0.82	0.82	0.81	0.84	0.84
Fluoride	0.12		0.088	0.080	0.12	0.096	0.073	0.086	0.089	0.064	0.064	0.068	0.067	0.071	0.073
Total Kjeldahl Nitrogen			0.17	0.16		0.20	0.14	0.15	0.16	0.14	0.13	0.17	0.15	0.13	0.14
Nitrate (as N)	3.0		1.5	1.5	3.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06		0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)			0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	0.0019	<0.0010	<0.0010
Phosphorus (P) - Total	0.01		0.0051	0.0067	0.010	0.0023	0.0022	<0.0020	0.0021	0.0033	0.012	0.0030	0.0029	0.0032	0.0046
Phosphorus (P) - Total Diss.						<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Reactive Silica (as SiO ₂)			1.0	1.1		0.64	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sulphate (SO ₄)			65	65	128	1.6	1.2	1.4	1.5	1.1	1.1	1.1	1.1	1.1	1.1
Cyanides (mg/L)															
Free Cyanide	0.005					<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-
Total Cyanide						<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon			2.5	3.2		2.7	2.7	2.3	2.6	2.1	2.2	2.0	2.1	2.5	2.2
Total Organic Carbon			2.6	4.1		2.7	2.3	2.2	2.5	1.8	2.1	1.9	2.1	2.4	2.4
Total Metals (mg/L)															
Aluminum ¹	equation		0.053	0.053	0.10	0.0048	0.0050	0.0038	0.0041	0.015	0.014	0.0074	0.0071	0.011	0.010
Antimony			0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005		0.0026	0.0026	0.0050	0.00015	0.00011	0.00013	0.00014	0.00012	0.00012	0.00012	0.00013	0.00012	0.00012
Barium			0.50	0.50	1.0	0.0026	0.0019	0.0023	0.0024	0.0023	0.0022	0.0019	0.0018	0.0019	0.0020
Beryllium			0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth						<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium ³	equation		0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium			2.4	4.9		2.0	1.5	1.7	1.8	1.3	1.3	1.3	1.3	1.4	1.4
Cesium						<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium ⁴	0.001		0.0025	0.0026	0.0050	<0.00010	<0.00010	0.00019	0.00013	0.00018	0.00013	<0.00010	0.00010	0.00012	0.00012
Cobalt	0.00077			0.00077		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper ³	equation		0.0012	0.0015	0.0020	0.00057	<0.00050	0.00063	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3		0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	0.030	0.032	0.015	0.015	0.025	0.023
Lead ³	equation		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	0.00006	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium			0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium			0.93	1.4		1.2	0.90	1.0	1.1	0.81	0.79	0.82	0.82	0.84	0.85
Manganese ³	equation		0.32	0.33	See note 3	0.00084	0.00099	0.00081	0.00076	0.0069	0.0071	0.0025	0.0027	0.0030	0.0029
Mercury	0.000026		0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073		0.037	0.037	0.073	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel ³	equation		0.013	0.013	0.025	0.00051	<0.00050	<0.00050	0.00053	0.00051	0.00051	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus			0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050				

Table C1-1. Water quality results from the 2024 CREMP, Meadowbank study area lakes.

Lake & Area		Meadowbank Screening Values ²			Pipe Dream Lake (PDL)												
Month	Aquatic Life Guideline ¹				Triggers		Thresholds	March	March	April/May	April/May	July	July	August	August	September	September
Area-Replicate ID								PDL-121	PDL-122	PDL-123	PDL-124	PDL-125	PDL-126	PDL-127	PDL-128	PDL-129	PDL-130
Date								08-Mar-2024	08-Mar-2024	30-Apr-2024	30-Apr-2024	12-Jul-2024	12-Jul-2024	11-Aug-2024	11-Aug-2024	06-Sep-2024	06-Sep-2024
Time					10:45	11:20	00:00	00:00	12:15	12:45	09:48	10:34	10:15	10:50			
ALS Sample ID		Meadowbank	Wally Lake		VA24A5461-005 VA24A6007-014	VA24A5461-006 VA24A6007-015	VA24B0466-003	VA24B0466-004	VA24B7634-003	VA24B7634-004	VA24C1019-001 VA24C2044-019	VA24C1019-002 VA24C2044-021	VA24C4308-008	VA24C4308-009			
Field Measurements (Surface 3m)																	
Dissolved Oxygen (mg/L)					19	19	18	17	12	12	9.1	9.0	11	11			
Specific Conductivity (µS/cm)					29	29	34	30	26	25	26	26	24	24			
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	6.5	6.7	6.3	6.3	7.0	7.0	6.9	6.9	7.2	7.0			
Temperature (°C)					0.64	0.60	0.60	0.69	6.2	6.9	13	14	11	10			
Physical Tests (mg/L)																	
Conductivity (µS/cm)		27	37		35	34	37	34	27	27	27	26	27	27			
Alkalinity - Bicarbonate		8.7	18		12	12	12	11	8.4	8.3	8.8	8.8	8.7	8.5			
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Alkalinity - Total (as CaCO ₃)		8.7	18		12	12	12	11	8.4	8.3	8.8	8.8	8.7	8.5			
Hardness (as CaCO ₃), dissolved		9.5	17		13	13	15	13	11	10	11	11	10	10			
Hardness (as CaCO ₃), from total Ca/Mg					13	14	14	13	10	10	11	11	10	10			
Total Dissolved Solids (TDS)		19	25		23	23	23	21	18	18	20	19	20	18			
Total Suspended Solids (TSS)		3.0	3.0	5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Turbidity (NTU)					0.18	0.14	<0.10	<0.10	0.18	0.20	0.16	0.15	0.19	0.18			
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.4	7.3	7.4	7.4	7.3	7.3	7.2	7.2	7.2	7.2			
Anions and Nutrients (mg/L)																	
Ammonia (as N) ¹	equation	0.065	0.067	0.13	0.014	0.015	0.017	0.017	<0.0050	<0.0050	0.014	0.0077	0.0071	<0.0050			
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050			
Chloride	120	60	60	120	1.0	1.1	1.1	1.0	0.83	0.81	0.81	0.81	0.86	0.87			
Fluoride	0.12	0.088	0.080	0.12	0.046	0.043	0.053	0.049	0.042	0.041	0.040	0.039	0.044	0.044			
Total Kjeldahl Nitrogen		0.17	0.16		0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.082	0.081			
Nitrate (as N)	3.0	1.5	1.5	3.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010			
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	0.0018	<0.0010	<0.0010			
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	0.0023	0.0031	<0.0020	0.0020	0.0042	0.0022	<0.0020	<0.0020	<0.0020	<0.0020			
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	<0.0020	<0.0020	<0.0020	<0.0020			
Reactive Silica (as SiO ₂)		1.0	1.1		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Sulphate (SO ₄)		65	65	128	2.6	2.6	2.9	2.6	2.1	2.1	2.1	2.1	2.2	2.2			
Cyanides (mg/L)																	
Free Cyanide	0.005				<0.0010	-	<0.0050	-	<0.0010	-	<0.0010	-	<0.0010	-			
Total Cyanide					<0.0010	-	<0.0050	-	<0.0010	-	<0.0010	-	<0.0010	-			
Organic / Inorganic Carbon (mg/L)																	
Dissolved Organic Carbon		2.5	3.2		1.9	2.0	1.8	1.7	1.5	1.6	1.8	1.4	1.7	1.9			
Total Organic Carbon		2.6	4.1		1.9	1.9	1.9	1.8	1.5	1.4	1.5	1.5	1.7	1.5			
Total Metals (mg/L)																	
Aluminum ³	equation	0.053	0.053	0.10	<0.0030	<0.0030	<0.0030	<0.0030	0.0051	0.0054	0.0043	0.0044	0.0037	0.0037			
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
Arsenic	0.005	0.0026	0.0026	0.0050	0.00025	0.00024	0.00023	0.00022	0.00021	0.00023	0.00021	0.00022	0.00021	0.00022			
Barium		0.50	0.50	1.0	0.0027	0.0026	0.0028	0.0025	0.0022	0.0022	0.0021	0.0022	0.0021	0.0021			
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100			
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050			
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			
Cadmium ³	equation	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050			
Calcium		2.4	4.9		3.4	3.5	3.6	3.2	2.6	2.6	2.6	2.7	2.6	2.6			
Cesium					<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010			
Chromium ¹	0.001	0.0025	0.0026	0.0050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
Copper ³	equation	0.0012	0.0015	0.0020	0.00057	0.00054	0.00051	0.00050	0.00052	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050			
Iron	0.3	0.16	0.30		<0.010	<0.010	<0.010	<0.010	0.011	0.014	<0.010	<0.010	<0.010	<0.010			
Lead ³	equation	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050			
Lithium		0.0020	0.0020		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			
Magnesium		0.93	1.4		1.2	1.2	1.3	1.1	0.93	0.93	0.96	0.97	0.96	0.95			
Manganese ³	equation	0.32	0.33	See note 3	0.00071	0.00060	0.00048	0.00046	0.00027	0.00028	0.00019	0.00018	0.00019	0.00020			
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050			
Molybdenum	0.073	0.037	0.037	0.073	0.00007	0.00007	0.00008	0.00007	0.00028	0.00005	0.00006	0.00006	0.00006	0.00005			
Nickel ³	equation	0.013	0.013	0.025	0.00077	0.00075	0.00073	0.00066	0.00073	0.00072	0.00061	0.00065	0.00060	0.00058			
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050			
Potassium		0.58	0.59		0.48	0.48	0.58	0.52	0.37	0.37	0.41	0.42	0.36	0.37			
Rubidium					0.00062	0.00063	0.00070	0.00067	0.00050	0.00051	0.00051	0.00054	0.00049	0.00048			
Selenium	0.001	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050			
Silicon		0.20	0.65		0.21	0.23	0.21	0.21	0.20	0.20	0.18	0.20	0.16	0.16			
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010			
Sodium		1.2	0.72		0.67	0.68	0.74	0.67	0.59	0.58	0.54	0.53	0.54	0.54			
Strontium		1.25	1.26	2.5	0.014	0.015	0.016	0.015	0.012	0.011	0.012	0.012	0.012	0.012			
Sulfur					0.74	0.78	1.0	0.99	0.65	0.69	0.70	0.86	0.68	0.81			
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010			
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030			
Uranium	0.015	0.0075	0.0075	0.015	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003			
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050			
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030			
Dissolved Metals (mg/L)																	
Aluminum ³	equation	0.026	0.026	0.050	<0.0010	0.0012	0.0012	0.0027	0.0018	0.0011	0.0018	0.0016	0.0021	0.0014			
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
Arsenic		0.0026	0.0026	0.0050	0.00022	0.00023	0.00024	0.00021	0.00019	0.00018	0.00018	0.00020	0.00023	0.00018			
Barium		0.50	0.50	1.0	0.0027	0.0026	0.0028	0.0025	0.0023	0.0020	0.0020	0.0020	0.0021	0.0021			
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100			
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050			

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimut, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimut, 2022b) for more details.
3. "**equation**" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123	Bolded concentrations exceed the trigger value.
123	Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to [Section 3.3](#) for details).

strikethrough = results flagged as unreliable in the QC assessment.

"-" not analyzed/not sampled.

Table C1-1. Water quality results from the 2024 CREMP, Meadowbank study area lakes.

Lake & Area		Aquatic Life Guideline ¹			Meadowbank Screening Values ²		Third Portage Lake - East Basin (TPE)								
Month	March						March	April/May	April/May	July	July	August	August	September	September
Area-Replicate ID	TPE-168						TPE-169	TPE-170	TPE-171	TPE-172	TPE-173	TPE-174	TPE-175	TPE-176	TPE-177
Date	08-Mar-2024						08-Mar-2024	26-Apr-2024	26-Apr-2024	02-Jul-2024	02-Jul-2024	12-Aug-2024	12-Aug-2024	05-Sep-2024	05-Sep-2024
Time															
ALS Sample ID															
Field Measurements (Surface 3m)															
Dissolved Oxygen (mg/L)					20	18	17	17	13	13	9.8	9.7	11	11	
Specific Conductivity (µS/cm)					39	32	37	38	31	30	30	30	29	29	
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	6.4	6.3	6.3	6.4	6.5	6.4	7.2	7.4	7.0	6.9	
Temperature (°C)					0.27	0.60	0.66	0.77	5.9	6.1	15	15	10	9.6	
Physical Tests (mg/L)															
Conductivity (µS/cm)		27	37		42	37	43	42	32	32	31	31	32	31	
Alkalinity - Bicarbonate		8.7	18		11	9.4	10	9.9	7.9	7.9	8.2	8.3	8.3	8.2	
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity - Total (as CaCO ₃)		8.7	18		11	9.4	10	9.9	7.9	7.9	8.2	8.3	8.3	8.2	
Hardness (as CaCO ₃), dissolved		9.5	17		15	13	15	15	11	11	11	11	11	11	
Hardness (as CaCO ₃), from total Ca/Mg					15	13	15	15	11	11	11	11	11	11	
Total Dissolved Solids (TDS)		19	25		27	24	23	23	20	19	24	22	16	19	
Total Suspended Solids (TSS)		3.0	3.0	5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Turbidity (NTU)					<0.10	0.15	<0.10	<0.10	0.19	0.19	0.15	0.22	0.30	0.21	
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.3	7.3	7.4	7.4	7.2	7.1	7.2	7.2	7.1	7.1	
Anions and Nutrients (mg/L)															
Ammonia (as N) ¹	equation	0.065	0.067	0.13	0.016	0.014	0.017	0.018	0.0059	0.0081	0.020	0.017	<0.0050	0.0078	
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Chloride	120	60	60	120	1.0	0.89	1.1	1.0	0.80	0.79	0.81	0.81	0.84	0.82	
Fluoride	0.12	0.088	0.080	0.12	0.095	0.083	0.10	0.099	0.073	0.071	0.081	0.082	0.086	0.083	
Total Kjeldahl Nitrogen		0.17	0.16		0.11	0.10	0.11	0.11	0.089	0.094	0.12	0.10	0.076	0.081	
Nitrate (as N)	3.0	1.5	1.5	3.0	0.0086	0.0070	0.0099	0.013	0.013	0.015	<0.0050	<0.0050	<0.0050	<0.0050	
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	0.0023	<0.0020	<0.0020	<0.0020	0.0023	0.0025	<0.0020	0.0026	<0.0020	<0.0020	
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.064	<0.0020	<0.0020	
Reactive Silica (as SiO ₂)		1.0	1.1		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Sulphate (SO ₄)		65	65	128	6.1	5.4	6.3	6.2	4.8	4.7	4.8	4.8	4.9	4.9	
Cyanides (mg/L)															
Free Cyanide	0.005				<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	
Total Cyanide					<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon		2.5	3.2		1.6	1.3	1.7	1.6	1.2	1.4	1.5	2.2	1.1	1.1	
Total Organic Carbon		2.6	4.1		1.7	1.4	1.4	1.6	1.4	1.6	1.3	1.4	1.2	1.2	
Total Metals (mg/L)															
Aluminum ¹	equation	0.053	0.053	0.10	<0.0030	<0.0030	<0.0030	<0.0030	0.0075	0.0074	0.024	0.0064	0.0056	0.0049	
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic	0.005	0.0026	0.0026	0.0050	0.00056	0.00041	0.00046	0.00045	0.00058	0.00054	0.00054	0.00054	0.00066	0.00046	
Barium		0.50	0.50	1.0	0.0036	0.0032	0.0037	0.0039	0.0032	0.0030	0.0027	0.0026	0.0026	0.0027	
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Cadmium ³	equation	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Calcium		2.4	4.9		3.6	3.2	3.5	3.5	2.7	2.7	2.8	2.8	2.7	2.6	
Cesium					0.00002	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00002	0.00001	
Chromium ¹	0.001	0.0025	0.0026	0.0050	<0.00010	<0.00010	<0.00010	<0.00010	0.00022	0.00010	0.00014	<0.00010	<0.00010	<0.00010	
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Copper ³	equation	0.0012	0.0015	0.0020	0.00050	<0.00050	<0.00050	<0.00050	0.00053	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	
Iron	0.3	0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	0.015	0.014	0.014	0.014	0.014	0.013	
Lead ³	equation	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Magnesium		0.93	1.4		1.4	1.2	1.4	1.4	1.1	1.1	1.1	1.1	1.1	1.0	
Manganese ³	equation	0.32	0.33	See note 3	0.00040	0.00039	0.00030	0.00030	0.00023	0.00026	0.00015	0.00013	0.00015	0.00015	
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Molybdenum	0.073	0.037	0.037	0.073	0.00014	0.00012	0.00014	0.00013	0.00011	0.00010	0.00012	0.00013	0.00011	0.00012	
Nickel ¹	equation	0.013	0.013	0.025	0.00068	0.00054	0.00059	0.00061	0.00072	0.00070	0.00051	<0.00050	<0.00050	<0.00050	
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium		0.58	0.59		0.67	0.59	0.78	0.76	0.53	0.51	0.54	0.52	0.54	0.50	
Rubidium					0.0011	0.00088	0.0010	0.0012	0.00091	0.00082	0.00082	0.00093	0.00094	0.00085	
Selenium	0.001	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Silicon		0.20	0.65		0.17	0.16	0.18	0.17	0.18	0.18	0.14	0.13	0.13	0.13	
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium		1.2	0.72		1.3	1.7	1.3	1.3	0.98	0.91	1.0	1.0	0.96	0.97	
Strontium		1.25	1.26	2.5	0.016	0.014	0.017	0.017	0.013	0.013	0.013	0.013	0.012	0.013	
Sulfur					1.8	1.6	2.2	2.3	1.7	1.6	1.5	1.4	1.8	1.7	
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
Uranium	0.015	0.0075	0.0075	0.015	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	
Dissolved Metals (mg/L)															
Aluminum ¹	equation	0.026	0.026	0.050	<0.0010	0.0010	<0.0010	0.0010	0.0016	0.0028	0.0027	0.0029	0.0014	0.0020	
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic		0.0026	0.0026	0.0050	0.00050	0.00038	0.00066	0.00056	0.00061	0.00078	0.00051	0.00046	0.00045	0.00039	
Barium		0.50	0.50	1.0	0.0037	0.0032	0.0038	0.0039	0.0028	0.0029	0.0027	0.0025	0.0026	0.0026	
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Cadmium		0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050				

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimut, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimut, 2022b) for more details.
3. "**equation**" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to [Section 3.3](#) for details).

strikethrough = results flagged as unreliable in the QC assessment.

"-" not analyzed/not sampled.

Table C1-1. Water quality results from the 2024 CREMP, Meadowbank study area lakes.

Lake & Area		Aquatic Life Guideline ¹	Meadowbank Screening Values ²			Third Portage Lake - North Basin (TPN)									
Month	March					March	May	May	July	July	August	August	September	September	
Area-Replicate ID	TPN-168		TPN-169	TPN-170	TPN-171	TPN-172	TPN-173	TPN-174	TPN-175	TPN-176	TPN-177				
Date	07-Mar-2024		07-Mar-2024	26-Apr-2024	26-Apr-2024	09-Jul-2024	09-Jul-2024	09-Aug-2024	09-Aug-2024	05-Sep-2024	05-Sep-2024				
Time	12:40, 14:00		13:00, 14:30	00:00	00:00	09:35	10:00	00:00	00:00	13:50	14:30				
ALS Sample ID	VA24A5461-001	VA24A5461-002	VA24B0466-007	VA24B0466-008	VA24B7099-001	VA24B7099-002	VA24C1019-008	VA24C1019-009	VA24C4308-003	VA24C4308-005					
						VA24A6007-009	VA24A6007-010		VA24C2044-022	VA24C2044-016					
Field Measurements (Surface 3m)															
Dissolved Oxygen (mg/L)					18	19	19	18	14	13	11	11	11	11	
Specific Conductivity (µS/cm)					30	36	36	34	30	30	32	32	27	27	
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	6.3	6.3	6.3	6.3	6.8	6.7	6.6	6.6	7.1	7.0	
Temperature (°C)					0.49	0.39	0.43	0.47	6.0	5.5	11	12	10	10	
Physical Tests (mg/L)															
Conductivity (µS/cm)		27	37		34	40	42	41	29	29	30	29	29	29	
Alkalinity - Bicarbonate		8.7	18		7.9	10	9.3	9.0	7.4	6.9	6.7	6.8	7.6	6.6	
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity - Total (as CaCO ₃)		8.7	18		7.9	10	9.3	9.0	7.4	6.9	6.7	6.8	7.6	6.6	
Hardness (as CaCO ₃), dissolved		9.5	17		12	13	18	14	9.6	9.5	10	9.8	9.5	9.7	
Hardness (as CaCO ₃), from total Ca/Mg					12	13	14	13	10	9.9	9.8	10	9.6	9.6	
Total Dissolved Solids (TDS)		19	25		20	19	30	22	18	19	19	20	23	18	
Total Suspended Solids (TSS)		3.0	3.0	5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Turbidity (NTU)					0.20	<0.10	<0.10	<0.10	0.12	0.14	0.15	0.14	0.17	0.15	
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.1	7.3	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1	
Anions and Nutrients (mg/L)															
Ammonia (as N) ³	equation	0.065	0.067	0.13	0.011	0.013	0.012	0.015	<0.0050	<0.0050	0.015	0.0079	0.0067	0.019	
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Chloride	120	60	60	120	0.92	1.0	1.2	1.1	0.80	0.79	0.80	0.80	0.86	0.86	
Fluoride	0.12	0.088	0.080	0.12	0.074	0.080	0.096	0.093	0.064	0.064	0.064	0.063	0.075	0.074	
Total Kjeldahl Nitrogen		0.17	0.16		0.085	0.099	0.11	0.11	0.080	0.077	0.10	0.10	0.082	0.085	
Nitrate (as N)	3.0	1.5	1.5	3.0	0.0056	0.0054	0.0083	0.0065	0.0084	0.0094	<0.0050	<0.0050	<0.0050	<0.0050	
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	0.0014	<0.0010	<0.0010	
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.014	<0.0020	<0.0020	
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0024	<0.0020	0.036	<0.0020	<0.0020	
Reactive Silica (as SiO ₂)		1.0	1.1		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Sulphate (SO ₄)		65	65	128	5.2	5.7	6.3	6.2	4.4	4.3	4.4	4.4	4.7	4.7	
Cyanides (mg/L)															
Free Cyanide	0.005				-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	
Total Cyanide					-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon		2.5	3.2		1.5	1.6	2.0	1.7	1.4	1.3	1.2	2.9	1.2	1.4	
Total Organic Carbon		2.6	4.1		1.3	1.6	1.6	1.5	1.2	1.2	1.2	1.4	1.1	1.2	
Total Metals (mg/L)															
Aluminum ¹	equation	0.053	0.053	0.10	0.0031	<0.0030	<0.0030	<0.0030	0.0072	0.0064	0.0043	0.0045	0.0042	0.0044	
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic	0.005	0.0026	0.0026	0.0050	0.00023	0.00025	0.00028	0.00026	0.00025	0.00027	0.00022	0.00024	0.00022	0.00022	
Barium		0.50	0.50	1.0	0.0033	0.0037	0.0040	0.0038	0.0029	0.0028	0.0027	0.0028	0.0028	0.0028	
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Cadmium ³	equation	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Calcium		2.4	4.9		2.9	3.1	3.3	3.2	2.3	2.3	2.3	2.4	2.3	2.3	
Cesium					<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium ⁴	0.001	0.0025	0.0026	0.0050	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Copper ³	equation	0.0012	0.0015	0.0020	<0.00050	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Iron	0.3	0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Lead ³	equation	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	0.00009	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Magnesium		0.93	1.4		1.1	1.2	1.4	1.3	1.0	0.99	0.98	0.98	0.96	0.95	
Manganese ⁵	equation	0.32	0.33	See note 3	0.00051	0.00046	0.00045	0.00038	0.00019	0.0018	0.0013	0.0016	0.0013	0.0014	
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Molybdenum	0.073	0.037	0.037	0.073	0.00011	0.00013	0.00013	0.00013	0.00010	0.00011	0.00009	0.00009	0.00010	0.00.	

Table C1-1. Water quality results from the 2024 CREMP, Meadowbank study area lakes.

Month		Aquatic Life Guideline ¹	Meadowbank Screening Values ²			Second Portage Lake (SP)														
Area-Replicate ID						March	March	April/May	April/May	July	July	August	August	September	September					
Date			Triggers			SP-168	SP-169	SP-170	SP-171	SP-172	SP-173	SP-174	SP-175	SP-176	SP-177					
Time						09-Mar-2024	09-Mar-2024	27-Apr-2024	27-Apr-2024	03-Jul-2024	02-Jul-2024	14-Aug-2024	14-Aug-2024	08-Sep-2024	08-Sep-2024					
ALS Sample ID			Meadowbank	Wally Lake	Thresholds	15:30, 16:15 VA24A4997-001 VA24A6007-007	14:00, 16:00 VA24A4997-002 VA24A6007-008	00:00 VA24B0466-005	00:00 VA24B0466-006	11:30 VA24B6824-008 VA24C2044-004	11:30 VA24B6824-005	09:30 VA24C2044-002	09:05 VA24C2044-001	13:15 VA24C4308-011	13:45 VA24C4308-012					
Field Measurements (Surface 3m)																				
Dissolved Oxygen (mg/L)						17	18	15	18	12	12	8.7	8.7	11	11					
Specific Conductivity (µS/cm)						42	46	49	50	42	41	41	41	36	37					
pH						6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	6.5	6.8	6.6	6.6	7.2	7.4					
Temperature (°C)						0.73	0.72	0.81	0.90	7.7	8.2	14	15	9.7	9.8					
Physical Tests (mg/L)																				
Conductivity (µS/cm)						50	53	56	56	42	41	42	43	41	42					
Alkalinity - Bicarbonate						14	15	15	15	12	12	12	13	11	11					
Alkalinity - Carbonate						2.0	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0					
Alkalinity - Hydroxide						<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0					
Alkalinity - Total (as CaCO ₃)						8.7	18	14	15	12	12	12	13	11	11					
Hardness (as CaCO ₃), dissolved						9.5	17	21	23	22	21	17	16	16	16					
Hardness (as CaCO ₃), from total Ca/Mg						20	21	20	21	17	17	16	16	16	16					
Total Dissolved Solids (TDS)						19	25	28	32	34	33	28	26	21	28	25	23			
Total Suspended Solids (TSS)						3.0	3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Turbidity (NTU)						0.34	0.11	<0.10	<0.10	0.26	0.40	0.20	0.20	0.22	0.20					
pH (Laboratory)						6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.3	7.4	7.5	7.5	7.2	7.4	7.3				
Anions and Nutrients (mg/L)																				
Ammonia (as N) ³						equation	0.065	0.067	0.13	0.018	0.013	0.017	0.018	<0.0050	<0.0050	0.020	0.035	0.0067	0.0061	
Bromide										<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Chloride						120	60	60	120	1.2	1.2	1.3	1.3	1.1	1.0	0.92	0.91	0.98	1.0	
Fluoride						0.12	0.088	0.080	0.12	0.086	0.091	0.097	0.098	0.066	0.066	0.075	0.071	0.080	0.079	
Total Kjeldahl Nitrogen							0.17	0.16		0.17	0.13	0.13	0.15	0.12	0.12	0.13	0.15	0.087	0.11	
Nitrate (as N)						3.0	1.5	1.5	3.0	0.016	0.013	0.017	0.017	0.0055	0.0062	<0.0050	<0.0050	<0.0050	<0.0050	
Nitrite (as N)						0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Ortho Phosphate (as P)							0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	
Phosphorus (P) - Total						0.01	0.0051	0.0067	0.010	<0.0020	<0.0020	<0.0020	0.0043	0.0034	0.0032	0.0028	0.0028	0.0020	<0.0020	
Phosphorus (P) - Total Diss.										<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020		
Reactive Silica (as SiO ₂)							1.0	1.1		0.90	0.96	0.98	0.90	0.86	0.80	0.65	0.66	0.60	0.63	
Sulphate (SO ₄)							65	65	128	6.7	7.1	7.2	7.3	5.7	5.7	5.3	5.2	5.7	5.7	
Cyanides (mg/L)																				
Free Cyanide						0.005				<0.0010	-	-	-	<0.0010	-	<0.0010	-	<0.0010	-	
Total Cyanide										<0.0010	-	-	-	<0.0010	-	<0.0010	-	<0.0010	-	
Organic / Inorganic Carbon (mg/L)																				
Dissolved Organic Carbon							2.5	3.2		2.3	1.9	2.2	2.1	1.9	1.8	2.0	2.0	1.6	1.7	
Total Organic Carbon							2.6	4.1		2.7	2.1	2.1	2.1	2.0	2.1	2.2	1.9	1.6	1.7	
Total Metals (mg/L)																				
Aluminum ¹						equation	0.053	0.053	0.10	<0.0030	0.0031	<0.0030	<0.0030	0.011	0.011	0.0048	0.0056	<0.0030	<0.0030	
Antimony							0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic						0.005	0.0026	0.0026	0.0050	0.00050	0.00049	0.00045	0.00048	0.00042	0.00050	0.00045	0.00043	0.00041	0.00041	
Barium							0.50	0.50	1.0	0.0033	0.0038	0.0036	0.0036	0.0030	0.0032	0.0028	0.0027	0.0026	0.0027	
Beryllium							0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
Bismuth										<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron						1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Cadmium ³						equation	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Calcium							2.4	4.9		5.1	5.4	5.2	5.5	4.5	4.4	4.2	4.2	4.0	4.2	
Cesium										<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium ⁴						0.001	0.0025	0.0026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	
Cobalt						0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Copper ³						equation	0.0012	0.0015	0.0020	0.00084	0.00089	0.00084	0.00086	0.00087	0.00075	0.00070	0.00067	0.00056	0.00057	
Iron						0.3	0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	0.028	0.029	0.021	0.023	<0.010	<0.010	
Lead ³						equation	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium							0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Magnesium							0.93	1.4		1.7	1.8	1.8	1.8	1.5	1.5	1.4	1.4	1.4	1.4	
Manganese ³						equation	0.32	0.33	See note 3	0.00065	0.00067	0.00046	0.00056	0.0030	0.0031	0.0021	0.0019	0.0011	0.00095	
Mercury						0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Molybdenum						0.073	0.037	0.037	0.073	0.00015	0.00017	0.00015	0.00015	0.00011	0.00012	0.00013	0.00014	0.00014	0.00014	

Table C1-1. Water quality results from the 2024 CREMP, Meadowbank study area lakes.

Lake & Area		Meadowbank Screening Values ²			Wally Lake (WAL)									
Month	Aquatic Life Guideline ¹				March	March	April/May	April/May	July	July	August	August	September	September
Area-Replicate ID					WAL-137	WAL-138	WAL-139	WAL-140	WAL-141	WAL-142	WAL-143	WAL-144	WAL-145	WAL-146
Date					08-Mar-2024	08-Mar-2024	27-Apr-2024	27-Apr-2024	03-Jun-2024	03-Jun-2024	09-Aug-2024	09-Aug-2024	05-Sep-2024	05-Sep-2024
Time					14:30	15:00	00:00	00:00	15:30	16:00	15:19	16:20	11:05	11:35
ALS Sample ID		Meadowbank	Wally Lake	Thresholds	VA24A5461-008 VA24A6007-017	VA24A5461-009 VA24A6007-018	VA24B0466-011	VA24B0466-012	VA24B6824-007	VA24B6824-006	VA24C1019-005 VA24C2044-020	VA24C1019-006 VA24C2044-024	VA24C4308-006	VA24C4308-007
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					18	15	12	12	12	12	10	10	11	11
Specific Conductivity (µS/cm)					70	51	58	66	37	40	41	42	41	42
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	6.6	6.6	6.3	6.4	6.8	6.9	7.1	7.4	7.5	7.3
Temperature (°C)					1.3	1.5	1.7	2.1	7.4	7.8	15	15	8.7	8.4
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		80	61	68	75	37	41	42	43	44	45
Alkalinity - Bicarbonate		8.7	18		30	23	23	25	12	13	13	14	14	14
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Total (as CaCO ₃)		8.7	18		30	23	23	25	12	13	13	14	14	14
Hardness (as CaCO ₃), dissolved		9.5	17		33	25	28	32	16	17	18	18	19	18
Hardness (as CaCO ₃), from total Ca/Mg					35	26	27	30	16	17	17	18	18	18
Total Dissolved Solids (TDS)		19	25		54	33	45	52	27	28	30	33	30	29
Total Suspended Solids (TSS)		3.0	3.0	5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)					0.16	0.17	<0.10	<0.10	0.19	0.17	0.16	0.16	0.17	0.22
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.7	7.6	7.7	7.7	7.2	7.2	7.4	7.4	7.4	7.4
Anions and Nutrients (mg/L)														
Ammonia (as N) ¹	equation	0.065	0.067	0.13	0.017	0.016	0.019	0.017	<0.0050	<0.0050	0.016	0.014	<0.0050	0.0085
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	120	60	60	120	0.94	0.75	0.85	0.93	0.53	0.55	0.58	0.58	0.62	0.62
Fluoride	0.12	0.088	0.080	0.12	0.064	0.061	0.073	0.079	0.044	0.043	0.054	0.053	0.058	0.058
Total Kjeldahl Nitrogen		0.17	0.16		0.17	0.15	0.17	0.17	0.14	0.11	0.16	0.16	0.15	0.14
Nitrate (as N)	3.0	1.5	1.5	3.0	0.018	0.011	0.015	0.016	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0026	0.0023	<0.0010	<0.0010
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	0.0024	0.0021	0.0023	0.0020	0.0070	0.0033	0.0026	0.0029	0.0023	0.0043
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	0.0022	0.0024	<0.0020	<0.0020	<0.0020	<0.0020
Reactive Silica (as SiO ₂)		1.0	1.1		2.4	1.9	2.2	2.4	1.1	1.1	1.0	1.0	1.0	1.3
Sulphate (SO ₄)		65	65	128	9.6	6.9	7.5	8.4	4.4	4.9	5.1	5.2	5.6	5.7
Cyanides (mg/L)														
Free Cyanide	0.005				<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-
Total Cyanide					<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-	<0.0010	-
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		3.1	2.9	2.8	2.9	2.5	2.1	2.0	2.7	2.0	2.0
Total Organic Carbon		2.6	4.1		3.3	3.0	2.8	3.0	2.3	2.5	2.2	2.1	2.1	2.1
Total Metals (mg/L)														
Aluminum ³	equation	0.053	0.053	0.10	<0.0030	<0.0030	0.0037	0.0050	0.0092	0.0075	0.0050	0.0054	0.0055	0.0034
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.0026	0.0026	0.0050	0.00051	0.00044	0.00039	0.00042	0.00030	0.00033	0.00040	0.00042	0.00038	0.00042
Barium		0.50	0.50	1.0	0.0044	0.0033	0.0036	0.0041	0.0024	0.0025	0.0021	0.0021	0.0020	0.0021
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium ³	equation	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		9.3	6.9	7.1	7.9	4.2	4.5	4.6	4.8	4.7	4.9
Cesium					<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium ¹	0.001	0.0025	0.0026	0.0050	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper ³	equation	0.0012	0.0015	0.0020	0.0015	0.0012	0.0013	0.0013	0.00097	0.0011	0.0010	0.0010	0.00092	0.00096
Iron	0.3	0.16	0.30		<0.010	<0.010	<0.010	<0.010	0.020	0.020	0.017	0.016	0.015	0.016
Lead ³	equation	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		2.8	2.1	2.2	2.5	1.3	1.4	1.5	1.5	1.5	1.5
Manganese ³	equation	0.32	0.33	See note 3	0.0019	0.0011	0.0010	0.00092	0.0030	0.0028	0.0014	0.0011	0.0014	0.0012
Mercury	0.00026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.037	0.073	0.00022	0.00020	0.00021	0.00022	0.00011	0.00014	0.00015	0.00018	0.00018	0.00018
Nickel ³	equation	0.013	0.013	0.025	0.00065	<0.00050	0.00050	0.00056	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		0.75	0.61	0.76	0.82	0.41	0.41	0.49	0.49	0.44	0.44
Rubidium					0.0010	0.00096	0.0010	0.0011	0.00068	0.00061	0.00072	0.00072	0.00071	0.00068
Selenium	0.001	0.00053	0.00053	0.0010	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.20	0.65		1.3	0.97	1.1	1.2	0.56	0.54	0.55	0.54	0.52	0.58
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		1.0	0.82	0.95	1.0	0.58	0.57	0.62	0.61	0.62	0.63
Strontium		1.25	1.26	2.5	0.47	0.034	0.037	0.042	0.022	0.024	0.024	0.025	0.027	0.027
Sulfur					3.1	2.3	2.8	2.8	1.5	1.7	1.6	1.8	1.7	1.8
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.015	0.0075	0.0075	0.015	0.00008	0.00005	0.00006	0.00006	0.00005	0.00006	0.00006	0.00006	0.00005	0.00005
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals (mg/L)														
Aluminum ³	equation	0.026	0.026	0.050	0.0015	<0.0010	0.0012	0.0011	0.0097	0.0054	0.0029	0.0039	0.0024	0.0012
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.0026	0.0026	0.0050	0.00050	0.00038	0.00052	0.00049	0.00030	0.00033	0.00033	0.00042	0.00035	0.00036
Barium		0.50	0.50	1.0	0.0044	0.0031	0.0038	0.0042	0.0024	0.0024	0.0020	0.0021	0.0021	0.0021
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<			

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimut, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimut, 2022b) for more details.
3. "**equation**" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123	Bolded concentrations exceed the trigger value.
123	Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to [Section 3.3](#) for details).

strikethrough = results flagged as unreliable in the QC assessment.

"-" not analyzed/not sampled.

Table C1-2. Water quality results screened against FEIS predicted concentrations for Third Portage Lake, 2024.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L)				Third Portage Lake East Basin (TPE)									
		Third Portage Lake ²													
Area-Replicate ID	CCME (2012) Guideline ¹	Upper Mixing Estimate (169 Mm ³)		Mid-range Mixing Estimate (92 Mm ³)		TPE-168	TPE-169	TPE-170	TPE-171	TPE-173	TPE-172	TPE-174	TPE-175	TPE-176	TPE-177
Depth (m)		Without Dike	With Dike	Without Dike	With Dike	3	3	3	3	3	3	3	3	3	3
Date		Leaching	Leaching	Leaching	Leaching	08-Mar-2024	08-Mar-2024	26-Apr-2024	26-Apr-2024	02-Jul-2024	02-Jul-2024	12-Aug-2024	12-Aug-2024	05-Sep-2024	05-Sep-2024
Physical Tests (mg/L)															
Alkalinity - Total (as CaCO3)			4.1	4.1		4.2		4.2							
Hardness (as CaCO3), dissolved			5.7	6.0		6.0		6.4							
Anions and Nutrients (mg/L)															
Ammonia (as N) ³		equation	0.033	0.033		0.050		0.050							
Chloride		120	0.80	0.80		1.0		1.1							
Fluoride		0.12	0.070	0.080		0.070		0.090							
Nitrate (as N)		3.0	0.035	0.036		0.057		0.059							
Ortho Phosphate (as P)			0.0022	0.0022		0.0024		0.0024							
Phosphorus (P) - Total		0.0040	0.0027	0.0029		0.0032		0.0035							
Sulphate (SO ₄)			1.7	1.7		2.0		2.0							
Total Metals (mg/L)															
Aluminum ³		equation	0.0070	0.0090		0.0070		0.010							
Antimony			0.00056	0.00057		0.00060		0.00062							
Arsenic		0.0050	0.00062	0.00062		0.00072		0.00072							
Barium			0.020	0.022		0.020		0.023							
Beryllium			0.0010	0.0010		0.0010		0.0010							
Bismuth			0.10	0.10		0.10		0.10							
Boron		1.5	0.00001	0.00001		0.00001		0.00001							
Cadmium ³		equation	<0.000051	<0.000051		<0.000052		<0.000052							
Calcium			1.3	1.4		1.5		1.5							
Chromium ⁴		0.001	0.0010	0.0010		0.0010		0.0010							
Cobalt			0.0040	0.0013		0.00040		0.0017							
Copper ³		equation	0.0012	0.0012		0.0013		0.0013							
Iron ³		0.3	0.030	0.030		0.030		0.030							
Lead ³		equation	0.00060	0.00060		0.00060		0.00070							
Lithium			0.0050	0.0050		0.0050		0.0050							
Magnesium			0.60	0.60		0.60		0.70							
Manganese ³			0.0090	0.052		0.015		0.072							
Mercury		0.000026	0.00005	0.00005		0.00005		0.00005							
Molybdenum		0.073	0.0010	0.0010		0.0010		0.0010							
Nickel ³		equation	0.0016	0.0016		0.0020		0.0021							
Potassium			2.0	2.1		2.0		2.1							
Selenium		0.001	0.0010	0.0010		0.0010		0.0010							
Silicon			0.010	0.080		0.020		0.12							
Silver		0.0001	0.00002	0.00002		0.00002		0.00002							
Sodium			2.0	2.0		2.0		2.1							
Strontium			0.0020	0.0050		0.0040		0.0070							
Thallium		0.0008	0.00020	0.00020		0.00020		0.00020							
Uranium		0.015	0.00020	0.00020		0.00020		0.00030							
Vanadium			0.030	0.030		0.030		0.030							
Zinc ³		equation	0.011	0.011		0.015		0.015							

- Notes:
1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.
 2. Whole lake data are given for a range of mixing conditions, representing mid-range and upper mixing estimate for the north basin discharge location. The model includes treated water releases from the project (Years 1 to 4), and long-term substance loading due to leaching from the Bay-Goose dike (Cumberland, 2005).
 3. "equation" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
 4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

Upper-range Mixing Estimate (169 Mm ³):
● Shaded cells = concentrations exceed the prediction "Without Dike Leaching."
● Bordered cells = concentrations exceed the prediction "With Dike Leaching."
Mid-range Mixing Estimate (92 Mm ³):
● Bold = concentrations exceed the prediction "Without Dike Leaching."
● Bold italicized = concentrations exceed the prediction "With Dike Leaching."

Italicized numbers are below detection limits.

"," not analyzed/not sampled.

Table C1-2. Water quality results screened against FEIS predicted concentrations for Third Portage Lake, 2024.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L)				Third Portage Lake North Basin (TPN)									
		Third Portage Lake ²													
Area-Replicate ID	CCME (2012)	Upper Mixing Estimate (169 Mm ³)		Mid-range Mixing Estimate (92 Mm ³)		TPN-168	TPN-169	TPN-171	TPN-170	TPN-172	TPN-173	TPN-174	TPN-175	TPN-176	TPN-177
Depth (m)	Guideline ¹	Without Dike	With Dike	Without Dike	With Dike	3	3	3	3	3	3	3	3	3	3
Date		Leaching	Leaching	Leaching	Leaching	07-Mar-2024	07-Mar-2024	26-Apr-2024	26-Apr-2024	09-Jul-2024	09-Jul-2024	09-Aug-2024	09-Aug-2024	05-Sep-2024	05-Sep-2024
Physical Tests (mg/L)															
Alkalinity - Total (as CaCO ₃)			4.1	4.1	4.2	4.2									
Hardness (as CaCO ₃), dissolved			5.7	6.0	6.0	6.4									
Anions and Nutrients (mg/L)															
Ammonia (as N) ³															
Chloride															
Fluoride															
Nitrate (as N)															
Ortho Phosphate (as P)															
Phosphorus (P) - Total															
Sulphate (SO ₄)															
Total Metals (mg/L)															
Aluminum ³															
Antimony															
Arsenic															
Barium															
Beryllium															
Bismuth															
Boron															
Cadmium ³															
Calcium															
Chromium ⁴															
Cobalt															
Copper ³															
Iron															
Lead ³															
Lithium															
Magnesium															
Manganese ³															
Mercury															
Molybdenum															
Nickel ³															
Potassium															
Selenium															
Silicon															
Silver															
Sodium															
Strontium															
Thallium															
Uranium															
Vanadium															
Zinc ³															

- Notes:
1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.
 2. Whole lake data are given for a range of mixing conditions, representing mid-range and upper mixing estimate for the north basin discharge location. The model includes treated water releases from the project (Years 1 to 4), and long-term substance loading due to leaching from the Bay-Goose dike (Cumberland, 2005).
 3. **"equation"** means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
 4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

Upper-range Mixing Estimate (169 Mm ³):
● Shaded cells = concentrations exceed the prediction "Without Dike Leaching."
● Bordered cells = concentrations exceed the prediction "With Dike Leaching."
Mid-range Mixing Estimate (92 Mm ³):
● Bold = concentrations exceed the prediction "Without Dike Leaching."
● Bold italicized = concentrations exceed the prediction "With Dike Leaching."

Italicized numbers are below detection limits.

"," not analyzed/not sampled.

Table C1-3. Water quality results screened against FEIS predicted concentrations for Second Portage Lake, 2024.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L)				Second Portage Lake (SP)									
Area-Replicate ID	CCME (2012) Guideline ²	Second Portage Lake ²				Second Portage Lake (SP)									
		Upper Mixing Estimate (169 Mm) ³		Mid-range Mixing Estimate (92 Mm) ³		SP-168		SP-169		SP-171		SP-170		SP-172	
		Without Dike Leaching	With Dike Leaching	Without Dike Leaching	With Dike Leaching	3	3	3	3	3	3	3	3	3	3
Depth (m)						09-Mar-2024	09-Mar-2024	27-Apr-2024	27-Apr-2024	03-Jul-2024	03-Jul-2024	02-Jul-2024	14-Aug-2024	14-Aug-2024	08-Sep-2024
Date															
Physical Tests (mg/L)															
Alkalinity - Total		7.0	7.0	7.0	7.0	14	15	15	15	12	12	12	12	13	11
Hardness (as CaCO ₃), dissolved		8.9	8.9	8.9	8.9	21	23	22	21	17	16	16	16	16	16
Anions and Nutrients (mg/L)															
Ammonia (as N) ³	<i>equation</i>	0.025	0.025	0.031	0.031	0.018	0.013	0.017	0.018	<0.0050	<0.0050	0.020	0.035	0.067	0.0061
Chloride	120	0.70	0.70	0.80	0.80	1.2	1.2	1.3	1.3	1.1	1.0	0.92	0.91	0.98	1.0
Fluoride	0.120	0.070	0.071	0.070	0.071	0.086	0.091	0.097	0.098	0.066	0.066	0.075	0.071	0.080	0.079
Nitrate (as N)	3.0	0.017	0.017	0.025	0.025	0.016	0.013	0.017	0.017	0.0055	0.0062	<0.0050	<0.0050	<0.0050	<0.0050
Ortho Phosphate (as P)		0.0030	0.0030	0.0030	0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.0040	0.0030	0.0030	0.0031	0.0031	<0.0020	<0.0020	<0.0020	0.0043	0.0034	0.0032	0.0028	0.0028	0.0020	<0.0020
Sulphate (SO ₄)		2.8	2.8	2.8	2.8	6.7	7.1	7.2	7.3	5.7	5.7	5.3	5.2	5.7	5.7
Total Metals (mg/L)															
Aluminum ³	<i>equation</i>	0.0070	0.0070	0.0070	0.0070	<0.0030	0.0031	<0.0030	<0.0030	0.011	0.011	0.0048	0.0056	<0.0030	<0.0030
Antimony		0.00050	0.00050	0.00050	0.00050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.0050	0.00050	0.00050	0.00060	0.00060	0.00050	0.00049	0.00045	0.00048	0.00042	0.00050	0.00045	0.00043	0.00041	0.00041
Barium		0.020	0.020	0.020	0.020	0.0033	0.0038	0.0036	0.0036	0.0030	0.0032	0.0028	0.0027	0.0026	0.0027
Beryllium		0.0010	0.0010	0.0010	0.0010	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth		0.10	0.10	0.10	0.10	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.00001	0.00001	0.00001	0.00001	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium ³	<i>equation</i>	<0.000050	<0.000050	<0.000051	<0.000051	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.3	2.3	2.3	2.3	5.1	5.4	5.2	5.5	4.5	4.4	4.2	4.2	4.0	4.2
Chromium ⁴	0.001	0.0010	0.0010	0.0010	0.0010	<0.00050	<0.00050	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt		0.00030	0.00040	0.00030	0.00040	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper ²	<i>equation</i>	0.0011	0.0011	0.0011	0.0011	0.00084	0.00089	0.00084	0.00086	0.00087	0.00075	0.00070	0.00067	0.00056	0.00057
Iron	0.3	0.030	0.030	0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.028	0.029	0.021	0.023	<0.010	<0.010
Lead ³	<i>equation</i>	0.00090	0.00090	0.00090	0.00090	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0050	0.0050	0.0050	0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.80	0.80	0.80	0.80	1.7	1.8	1.8	1.8	1.5	1.5	1.4	1.4	1.4	1.4
Manganese ³		0.0044	0.0067	0.0066	0.0089	0.00065	0.00067	0.00046	0.00056	0.0030	0.0031	0.0021	0.0019	0.0011	0.00095
Mercury	0.000026	0.00005	0.00005	0.00005	0.00005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.0010	0.0010	0.0010	0.0010	0.00015	0.00017	0.00015	0.00015	0.00011	0.00012	0.00013	0.00014	0.00014	0.00014
Nickel ³	<i>equation</i>	0.0010	0.0010	0.0010	0.0010	<0.00050	0.00055	0.00058	0.00056	0.00064	0.00064	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus						<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		2.0	2.0	2.0	2.0	0.71	0.75	0.76	0.79	0.55	0.57	0.59	0.60	0.52	0.52
Selenium	0.001	0.0010	0.0010	0.0010	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.010	0.010	0.010	0.010	0.47	0.49	0.51	0.52	0.44	0.41	0.33	0.34	0.30	0.29
Silver	0.0001	0.00001	0.00001	0.00001	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		2.0	2.0	2.0	2.0	1.1	1.2	1.1	1.1	0.82	0.90	0.84	0.82	0.80	0.79
Thallium	0.0008	0.00020	0.00020	0.00020	0.00020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin						<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium						<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.015	0.00020	0.00020	0.00020	0.00020	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00003	0.00003
Vanadium		0.030	0.030	0.030	0.030	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc ³	<i>equation</i>	0.0070	0.0070	0.0090	0.0090	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium						<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.

2. The Second Portage Lake water quality model includes substance loading from the Third Portage and East dikes and inflow from Third Portage and Wally lakes. Changes in water quality in Second Portage Lake were modelled for two different mixing scenarios of water releases into Third Portage Lake (Cumberland, 2005).

3. "*equation*" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.

4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

Upper range Mixing Estimate (169 Mm)³:

■ Shaded cells = concentrations exceed the prediction "Without Dike Leaching."

■ Bordered cells = concentrations exceed the prediction "With Dike Leaching."

Mid-range Mixing Estimate (92 Mm)³:

■ Bold = concentrations exceed the prediction "Without Dike Leaching."

■ Bold Italicized = concentrations exceed the prediction "With Dike Leaching."

Italicized numbers are below detection limits.

*- not analyzed/not sampled.

Table C1-4. Water quality results screened against FEIS predicted concentrations for Wally Lake, 2024.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L)											
		Wally Lake ²		Wally Lake (WAL)									
		Without Dike Leaching	With Dike Leaching	WAL-137	WAL-138	WAL-139	WAL-140	WAL-141	WAL-142	WAL-143	WAL-144	WAL-145	WAL-146
Area-Replicate ID	CCME (2012) Guideline ¹			3	3	3	3	3	3	3	3	3	3
Depth (m)				08-Mar-2024	08-Mar-2024	27-Apr-2024	27-Apr-2024	03-Jul-2024	03-Jul-2024	09-Aug-2024	09-Aug-2024	05-Sep-2024	05-Sep-2024
Date													
Physical Tests (mg/L)													
Alkalinity - Total		13	13	30	23	23	25	12	13	13	14	14	14
Hardness (as CaCO ₃), dissolved		17	17	33	25	28	32	16	17	18	18	19	18
Anions and Nutrients (mg/L)													
Ammonia (as N) ³	<i>equation</i>	0.089	0.089	0.017	0.016	0.019	0.017	<0.0050	<0.0050	0.016	0.014	<0.0050	0.0085
Chloride	120	0.70	0.70	0.94	0.75	0.85	0.93	0.53	0.55	0.58	0.58	0.62	0.62
Fluoride	0.12	0.050	0.050	0.064	0.061	0.073	0.079	0.044	0.043	0.054	0.053	0.058	0.058
Nitrate (as N)	3.0	0.10	0.10	0.018	0.011	0.015	0.016	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.060			<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0030	0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0026	0.0023	<0.0010	<0.0010
Phosphorus (P) - Total	0.0040	0.0039	0.0040	0.0024	0.0021	0.0023	<0.0020	0.0070	0.0033	0.0026	0.0029	0.0023	0.0043
Sulphate (SO ₄)		5.3	5.3	9.6	6.9	7.5	8.4	4.4	4.9	5.1	5.2	5.6	5.7
Total Metals (mg/L)													
Aluminum ³	<i>equation</i>	0.012	0.013	<0.0030	<0.0030	0.0037	0.0050	0.0092	0.0075	0.0050	0.0054	0.0055	0.0034
Antimony		0.00090	0.00090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.0050	0.0050	0.0060	0.00051	0.00044	0.00039	0.00042	0.00033	0.00040	0.00040	0.00042	0.00038	0.00042
Barium		0.020	0.020	0.0044	0.0033	0.0036	0.0041	0.0024	0.0025	0.0021	0.0021	0.0020	0.0021
Beryllium		0.0010	0.0010	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth		0.10	0.10	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.00001	0.00001	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium ³	<i>equation</i>	0.00018	0.00019	<0.0000050	<0.0000050	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.7	4.7	9.3	6.9	7.1	7.9	4.2	4.5	4.6	4.8	4.7	4.9
Chromium ⁴	0.0010	0.0010	0.0010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt		0.00030	0.00030	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper ³	<i>equation</i>	0.0020	0.0020	0.0015	0.0012	0.0013	0.0013	0.00097	0.0011	0.0010	0.0010	0.00092	0.00096
Iron	0.30	0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.020	0.020	0.017	0.016	0.015	0.016
Lead ³	<i>equation</i>	0.00070	0.00070	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0050	0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		1.3	1.3	2.8	2.1	2.2	2.5	1.3	1.4	1.5	1.5	1.5	1.5
Manganese ³		0.0020	0.0020	0.0019	0.0011	0.0010	0.00092	0.0030	0.0028	0.0014	0.0011	0.0014	0.0012
Mercury	0.00003	0.00010	0.00010	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.0020	0.0020	0.00022	0.00020	0.00021	0.00022	0.00011	0.00014	0.00015	0.00018	0.00018	0.00018
Nickel ³	<i>equation</i>	0.0010	0.0010	0.00065	<0.00050	0.00050	0.00056	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	<0.00050
Potassium		2.0	2.0	0.75	0.61	0.76	0.82	0.41	0.41	0.49	0.49	0.44	0.44
Selenium	0.0010	0.0010	0.0010	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.040	0.040	1.3	0.97	1.1	1.2	0.56	0.54	0.55	0.54	0.52	0.58
Silver	0.00010	0.00002	0.00002	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		2.0	2.0	1.0	0.82	0.95	1.0	0.58	0.57	0.62	0.61	0.62	0.63
Thallium	0.00080	0.00020	0.00020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	0.015	0.00070	0.00070	0.00008	0.00005	0.00006	0.00006	0.00005	0.00006	0.00006	0.00006	0.00005	0.00005
Zinc ³	<i>equation</i>	0.013	0.013	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

- CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.
- Preliminary modelling of whole lake water quality in the receiving environment water bodies incorporates long-term loadings from the Vault dike and effluent releases from the Vault Attenuation pond (Cumberland, 2005).
- "*equation*" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. Ammonia and aluminum guidelines vary with pH; cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
- Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

- Bold** = concentrations exceed the prediction "Without Dike Leaching."
- Bold Italicized** = concentrations exceed the prediction "With Dike Leaching."

Italicized numbers are below detection limits.

"-" not analyzed/not sampled.

Table C1-5. Water and phytoplankton sampling location coordinates (GPS, UTM, NAD83) for the Meadowbank CREMP, 2024.

Area ¹	Area Type ²	Area-Replicate	Water & Phytoplankton (Monthly)				
			Month	Depth (m)	Zone	Easting	Northing
TPE	NF	TPE-limno	January	6.0	14W	638521	7210606
		TPE-limno	February	10.4	14W	638069	7211639
		TPE-limno	November	7.6	14W	637944	7211794
		TPE-limno	December	14.7	14W	638996	7211318
		TPE-168	March	5.1	14W	639688	7211644
		TPE-169	March	20 +	14W	637784	7210265
		TPE-170	April	14.5	14W	638078	7210285
		TPE-171	April	6.4	14W	638521	7211489
		TPE-172	July	5.2	14W	639687	7211833
		TPE-173	July	8.4	14W	638776	7211036
		TPE-174	August	10.7	14W	638401	7211901
		TPE-175	August	9.2	14W	639596	7212327
		TPE-176	September	17.6	14W	639409	7211803
		TPE-177	September	16.9	14W	637973	7210251
TPN	NF	TPN-limno	January	13.1	14W	636735	7213860
		TPN-limno	February	12.3	14W	636705	7214178
		TPN-limno	November	11.8	14W	637127	7213672
		TPN-limno	December	>20	14W	636531	7213445
		TPN-168	March	14.6	14W	636062	7213828
		TPN-169	March	1.9	14W	636647	7214381
		TPN-170	April	>20	14W	635024	7216087
		TPN-171	April	10.4	14W	635693	7212863
		TPN-172	July	10.8	14W	635568	7216056
		TPN-173	July	9.6	14W	636309	7214389
		TPN-174	August	27.3	14W	635370	7213717
		TPN-175	August	12.4	14W	636463	7215384
		TPN-176	September	9.1	14W	635270	7213235
		TPN-177	September	7.2	14W	635218	7216078
SP	NF	SP-limno	January	12.2	14W	640018	7213953
		SP-limno	February	14.3	14W	640412	7213511
		SP-limno	November	7.8	14W	639467	7213699
		SP-limno	December	8.8	14W	639458	7213772
		SP-168	March	12.9	14W	640068	7214068
		SP-169	March	7.2	14W	640111	7212823
		SP-170	April	5.6	14W	639910	7213787
		SP-171	April	8.0	14W	640655	7213697
		SP-172	July	8.1	14W	640062	7213640
		SP-173	July	10.9	14W	640215	7212670

Appendix C1:

Water Chemistry – Meadowbank Study Area Lakes

March 2025

Area ¹	Area Type ²	Area-Replicate	Water & Phytoplankton (Monthly)				
			Month	Depth (m)	Zone	Easting	Northing
		SP-174	August	7.5	14W	639545	7213660
		SP-175	August	13.7	14W	640773	721993
		SP-176	September	7.4	14W	639647	7214068
		SP-177	September	19.3	14W	640526	7213648
WAL	NF	WAL-limno	January	12.7	15W	360820	7220774
		WAL-limno	February	10.5	15W	360957	7220510
		WAL-limno	November	7.7	15W	360872	7220793
		WAL-limno	December	5.0	15W	360382	7221162
		WAL-137	March	1.7	15W	360395	7222416
		WAL-138	March	5.8	15W	361775	7222872
		WAL-139	April	5.9	15W	362423	7222486
		WAL-140	April	5.9	15W	361106	7221976
		WAL-141	July	5.3	15W	361859	7221866
		WAL-142	July	6.7	15W	360850	7220795
		WAL-143	August	7.8	15W	362378	7222187
		WAL-144	August	6.8	15W	360577	7221096
		WAL-145	September	13.3	14W	361926	7222663
		WAL-146	September	6.6	14W	360528	7221930
INUG	Ref	INUG-156	March	7.6	14W	622139	7214347
		INUG-157	March	15	14W	622416	7215739
		INUG-158	April	5.9	14W	622260	7214238
		INUG-159	April	7.3	14W	622709	7215333
		INUG-160	July	8.1	14W	622980	7214579
		INUG-161	July	10.3	14W	621832	7215439
		INUG-162	August	7.1	14W	622859	7215630
		INUG-163	August	7.4	14W	621946	7216048
		INUG-164	September	8.6	14W	622809	7215156
PDL	Ref	INUG-165	September	7.3	14W	622177	7216033
		PDL-121	March	12.4	14W	630089	7223596
		PDL-122	March	>20	14W	631715	7224215
		PDL-123	April	10.2	14W	630752	7223098
PDL	Ref	PDL-124	April	11.0	14W	632184	7224365
		PDL-125	July	12.7	14W	6296760	7224213
		PDL-126	July	5.8	14W	630658	7222996
		PDL-127	August	24	14W	631984	7225225
		PDL-128	August	16.5	14W	632994	7224320
		PDL-129	September	7.2	14W	632714	7224398
		PDL-130	September	9.8	14W	630285	7223179

Notes:

Appendix C1:

Water Chemistry – Meadowbank Study Area Lakes

March 2025

1. Area IDs are as follows: TPE, TPN =Third Portage Lake - East, North basins; SP=Second Portage Lake; INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake
2. Area types: NF=near-field; MF=mid-field; FF=far-field; Ref=reference.

FIGURES

Figure C1-1. Laboratory-measured conductivity (μS/cm).

Note: Conductivity data from 2014 should be interpreted with caution. See Azimuth (2015) for more details.

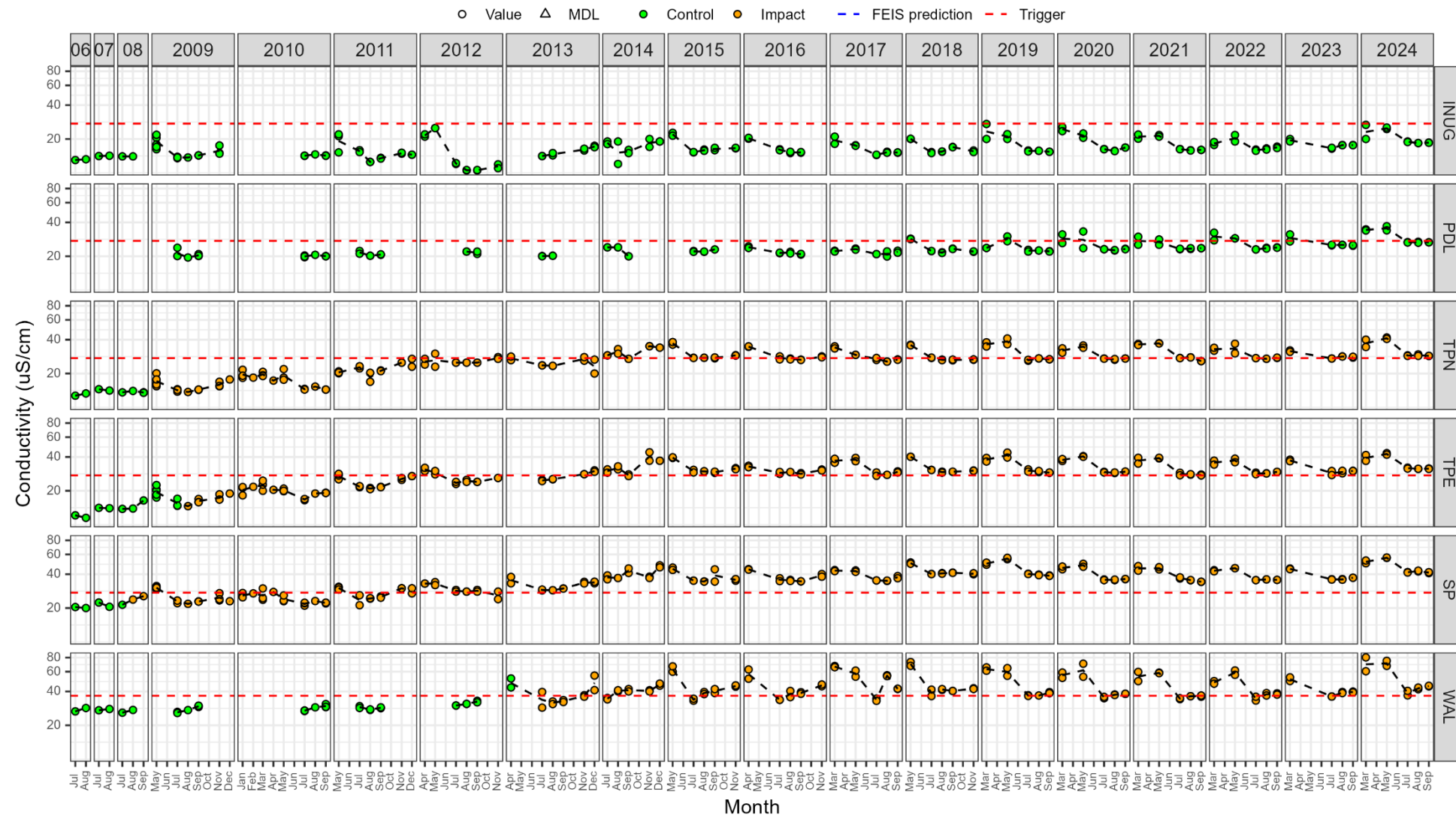


Figure C1-2. Laboratory-measured hardness (mg/L).

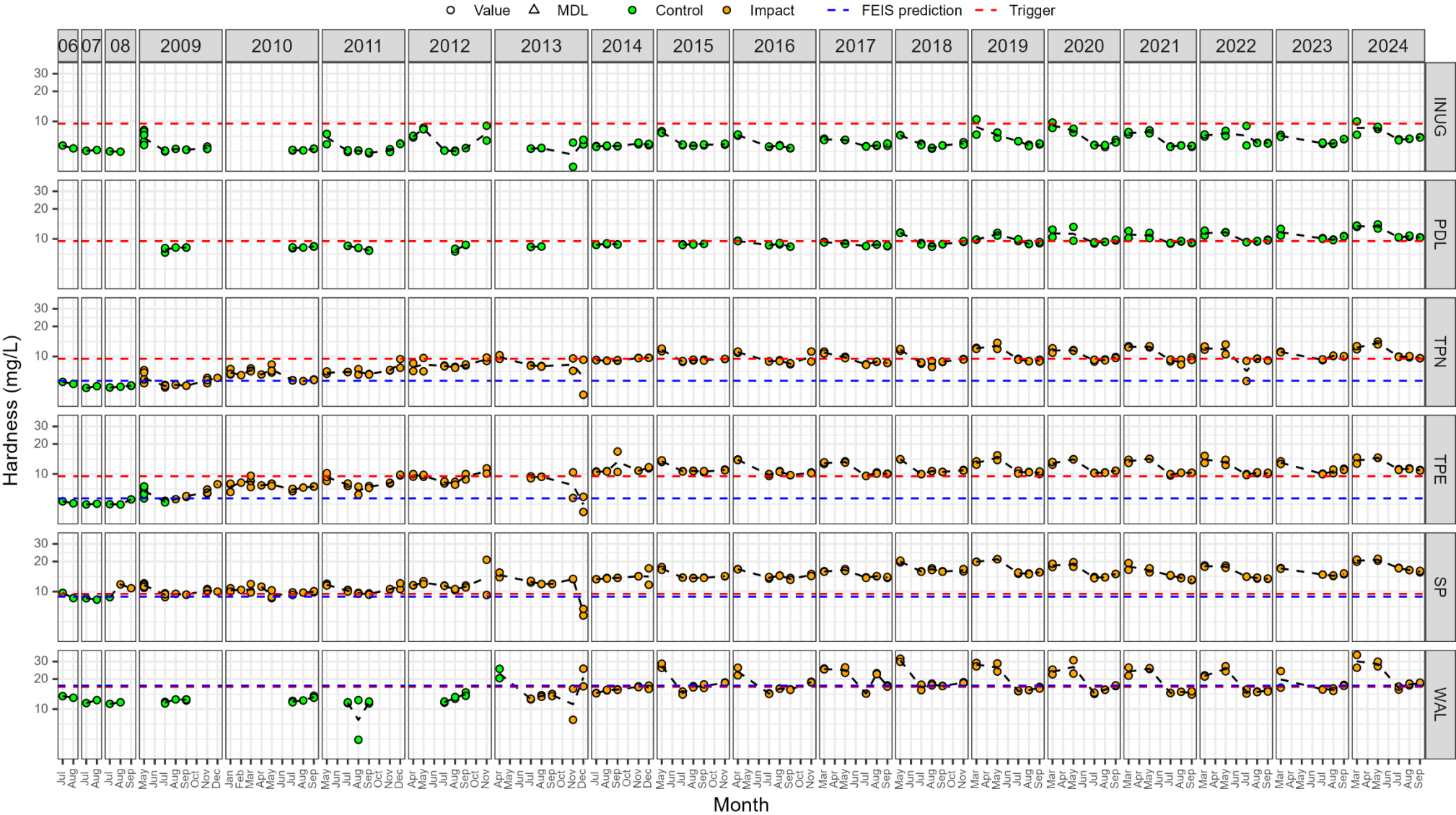


Figure C1-3. Field-measured pH.

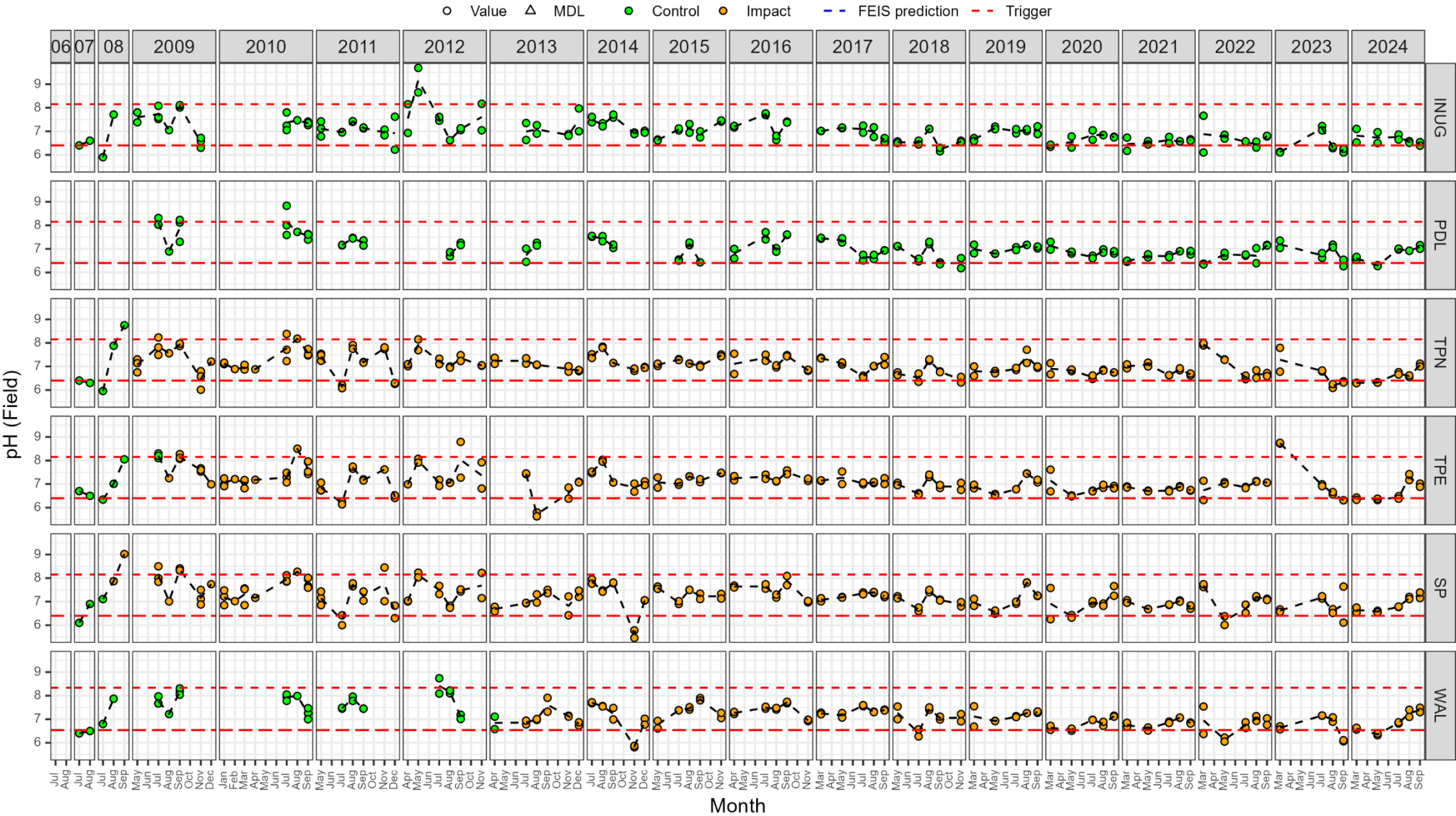


Figure C1-4. Laboratory-measured pH.

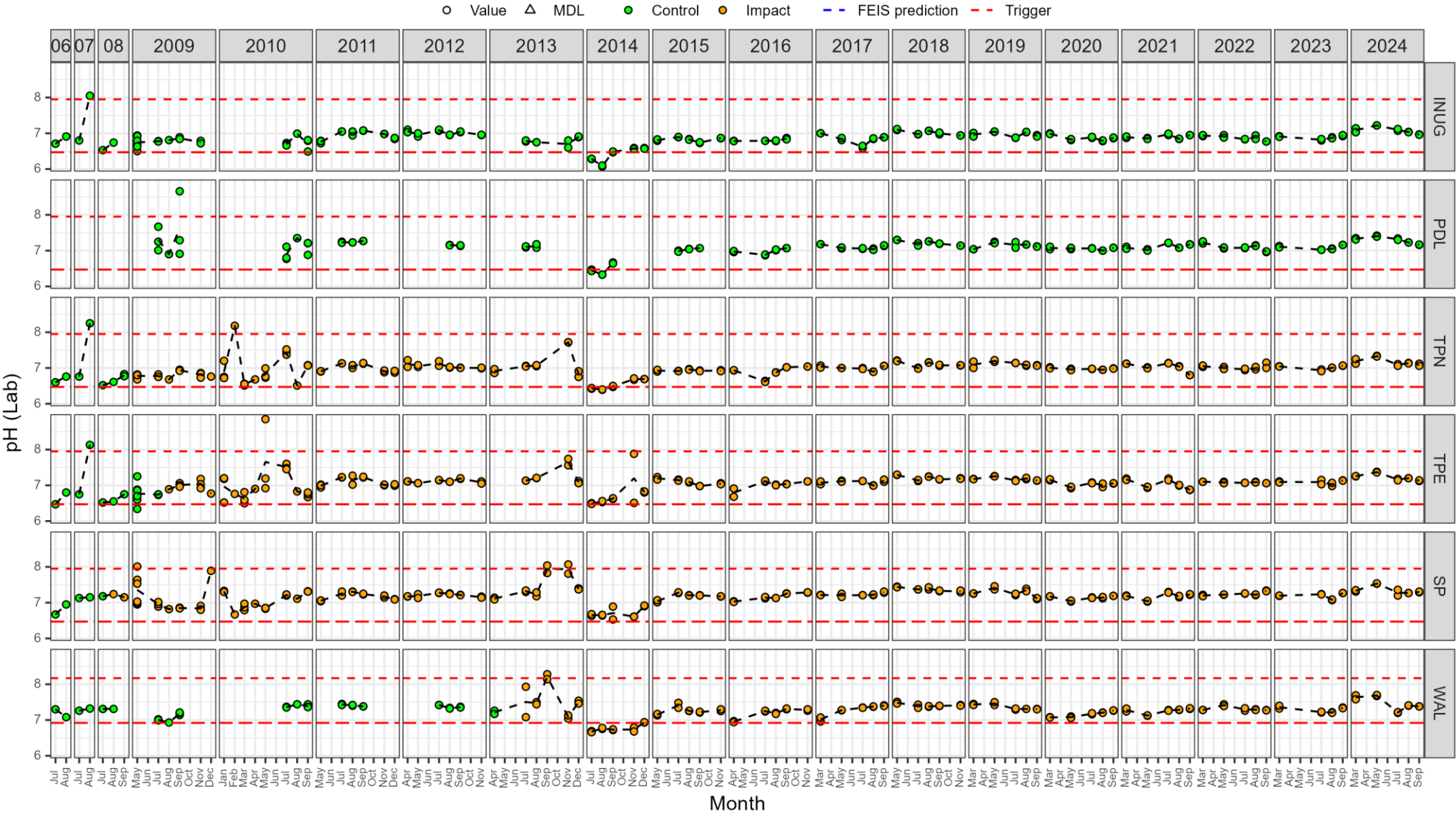


Figure C1-5. Total dissolved solids (TDS; mg/L).

Note: TDS data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

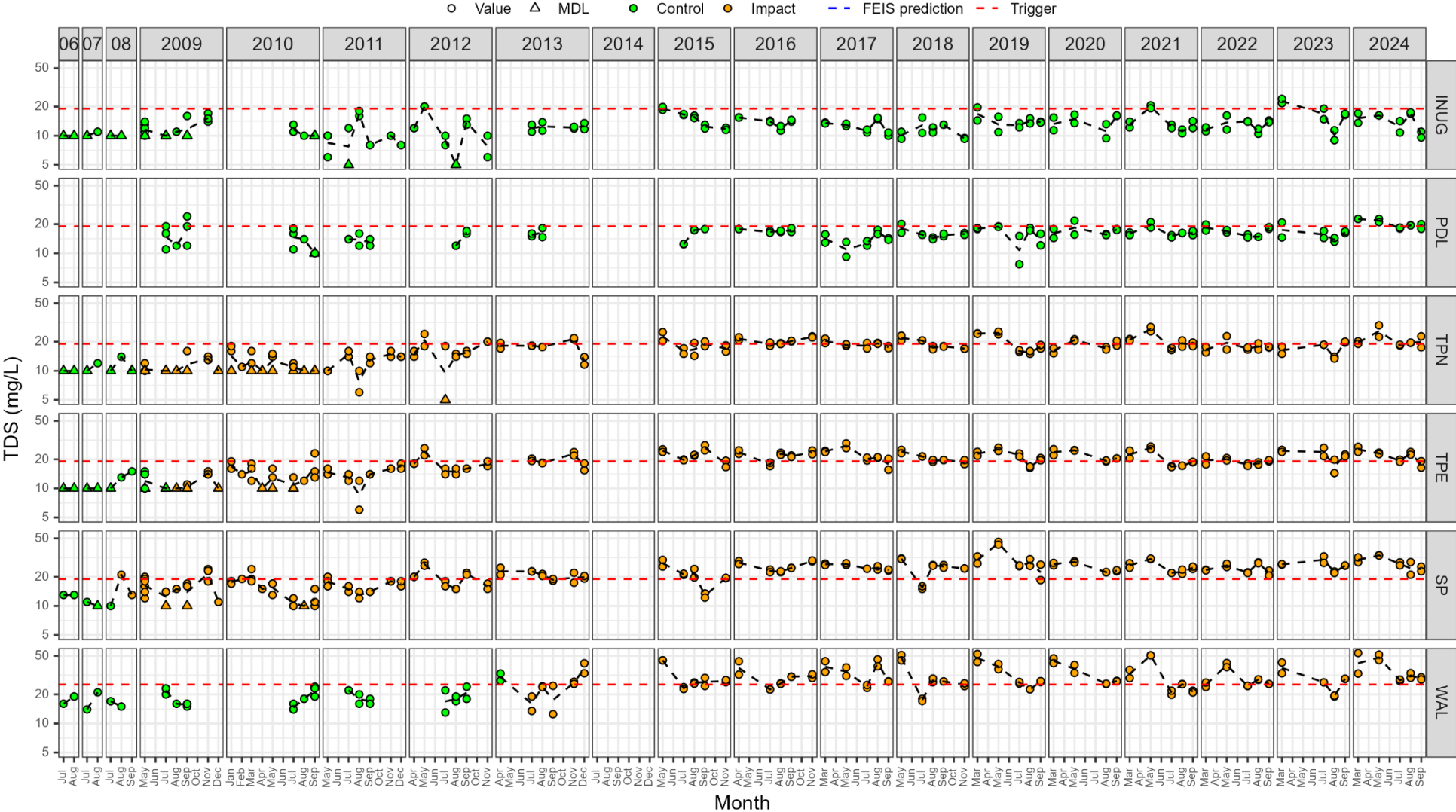


Figure C1-6. Total suspended solids (TSS; mg/L).

Note: TDS data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

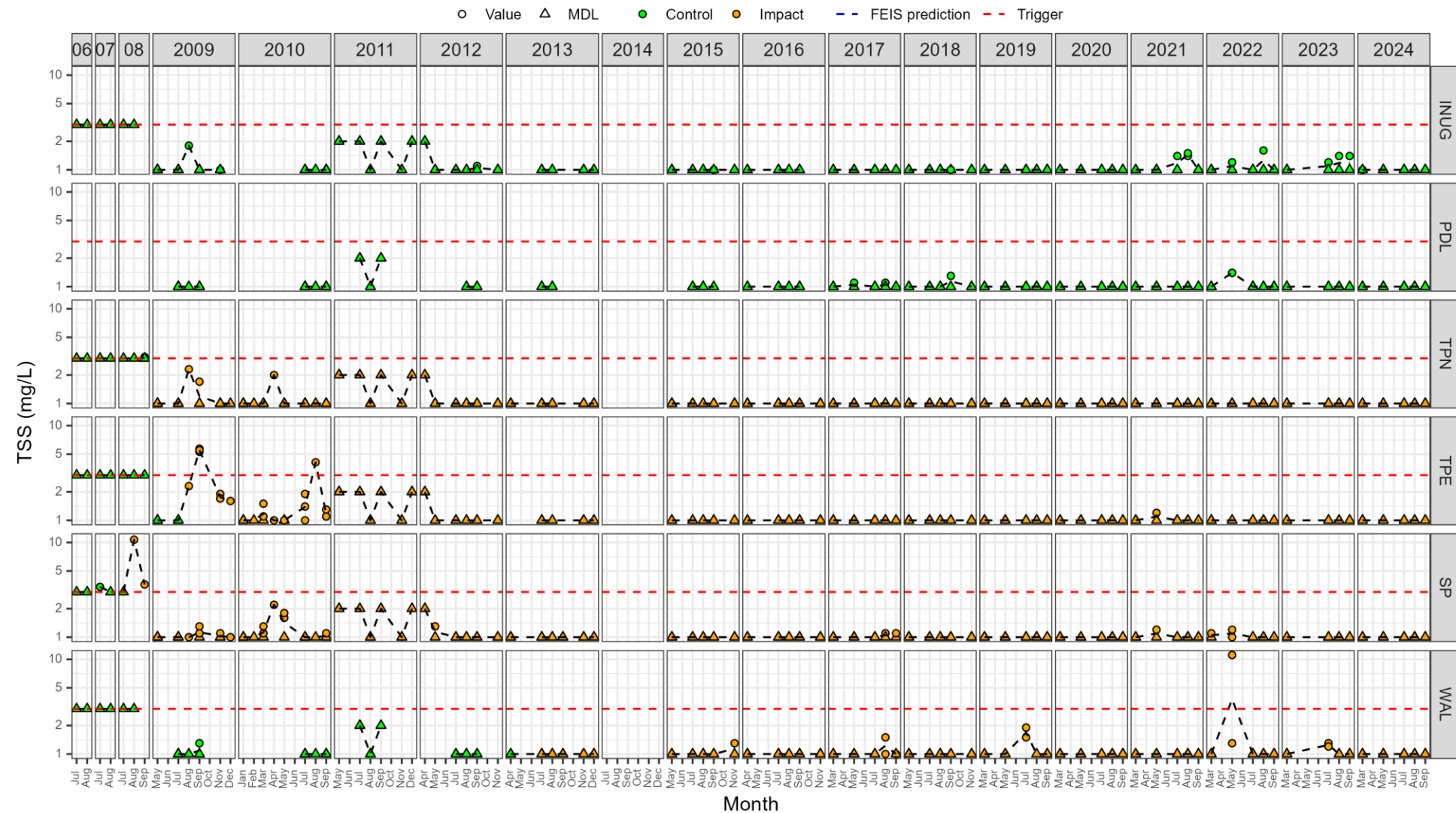


Figure C1-7. Carbonate alkalinity (mg/L).

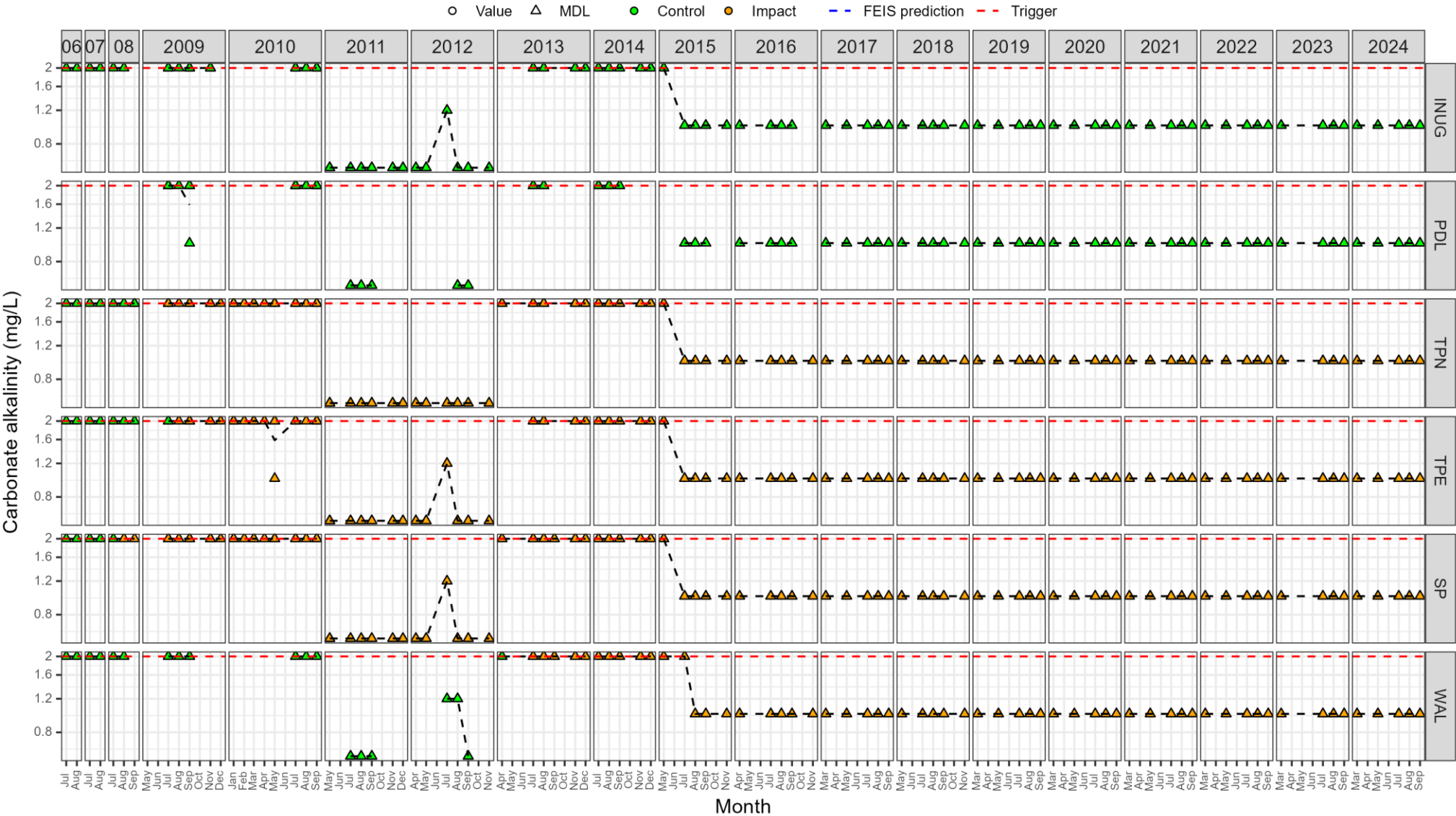


Figure C1-8. Bicarbonate alkalinity (mg/L).

Note: Bicarbonate alkalinity data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

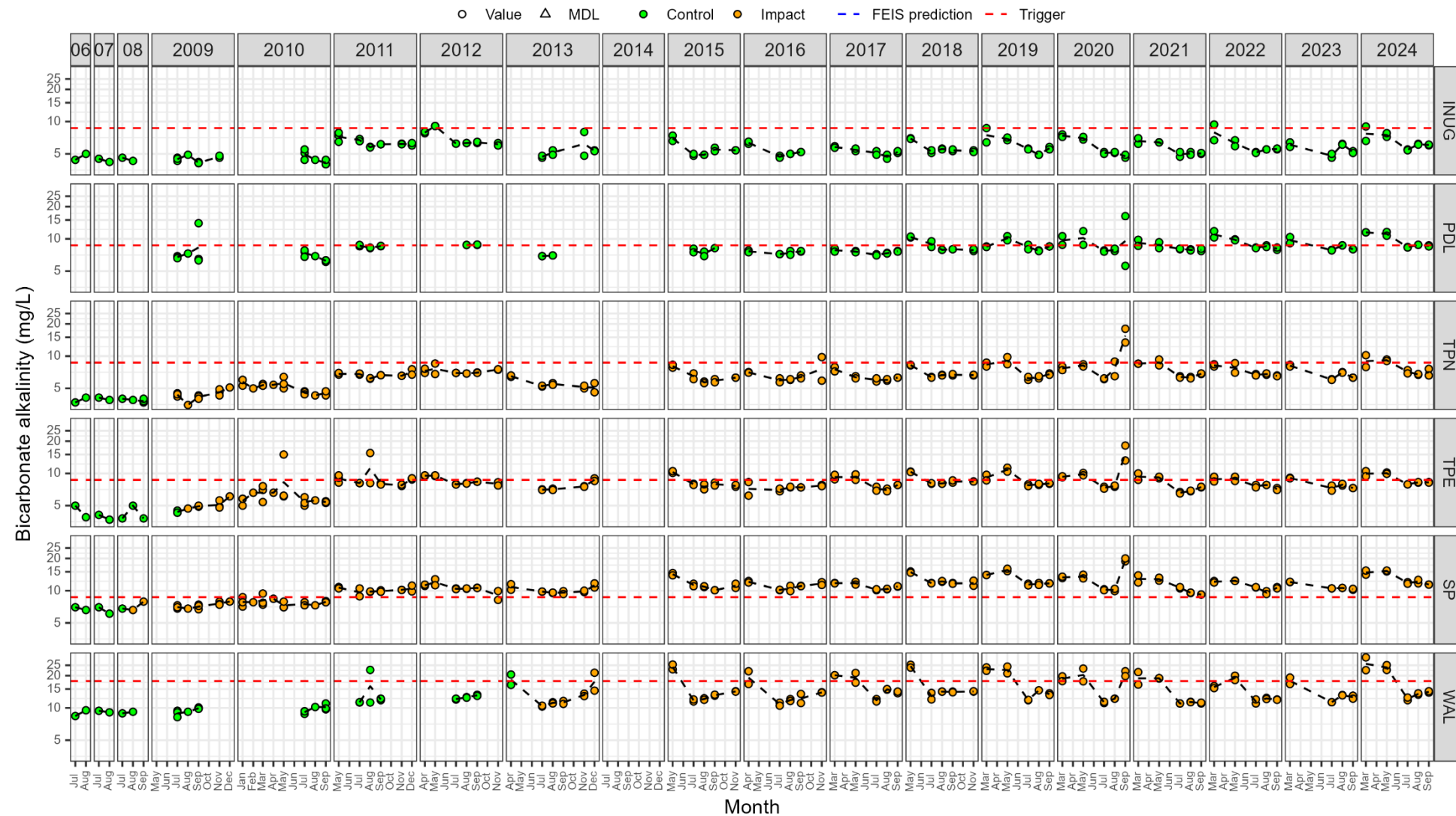


Figure C1-9. Total alkalinity (mg/L).

Note: Total alkalinity data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

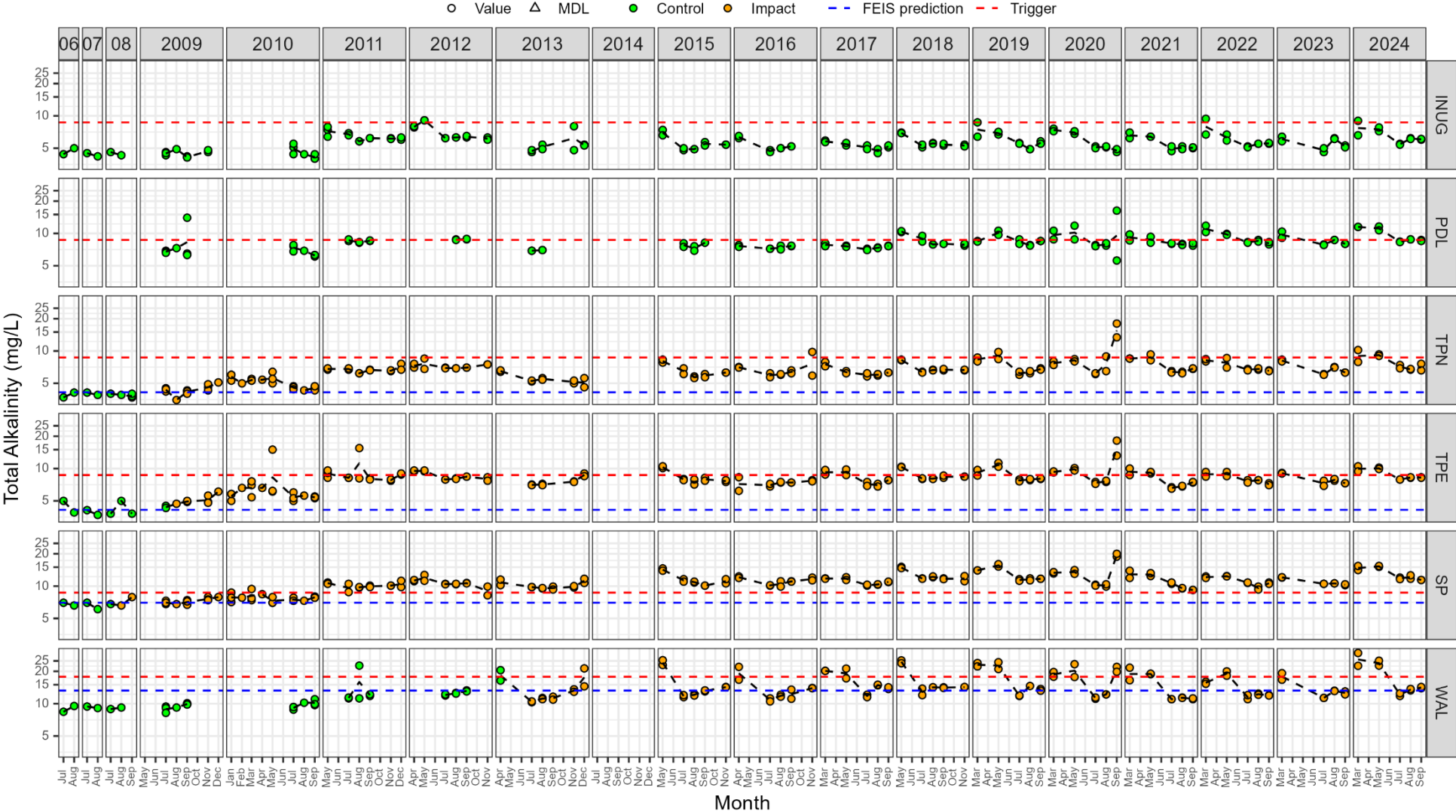


Figure C1-10. Ammonia-N (mg/L).

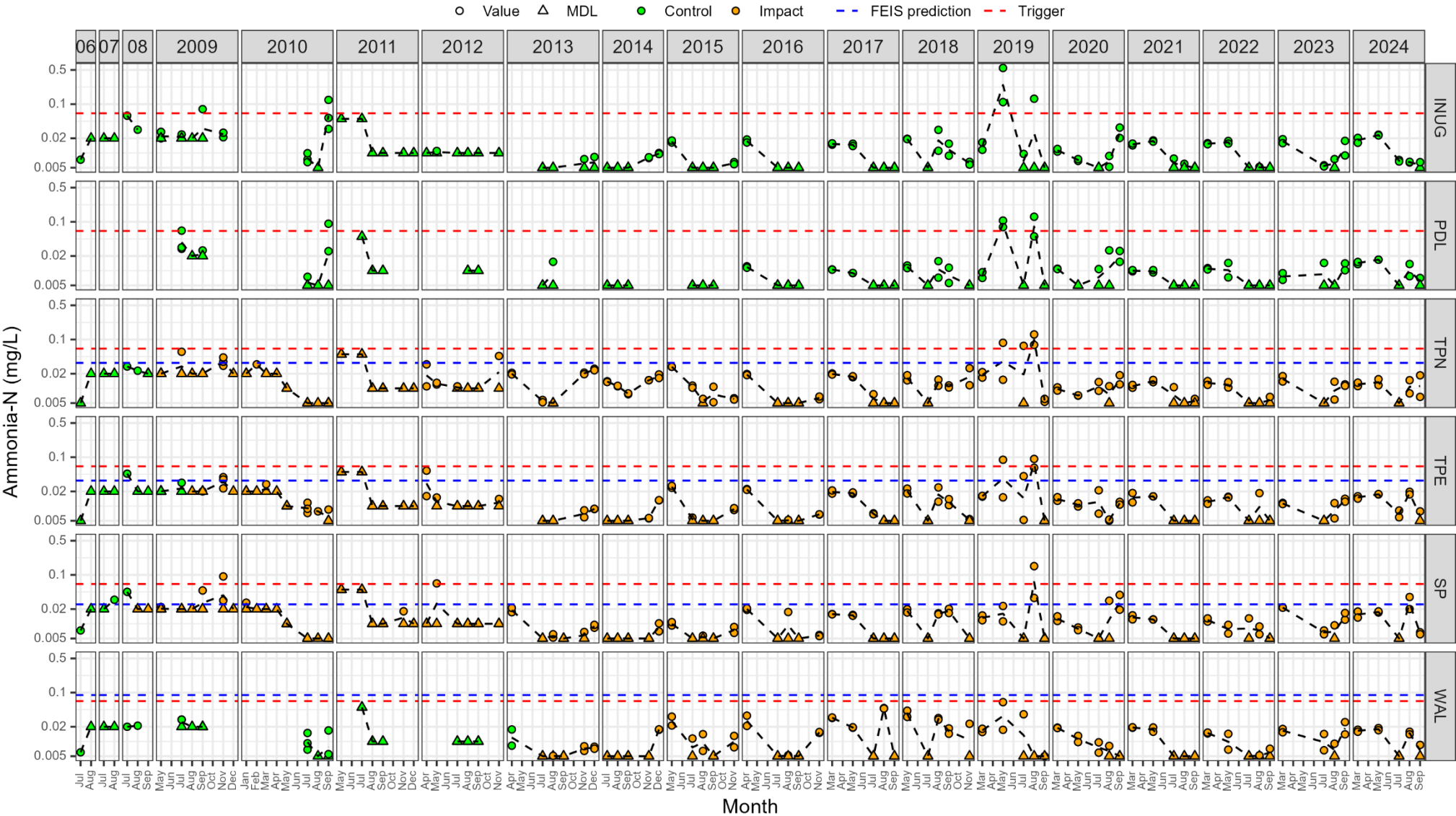


Figure C1-11. Chloride (mg/L).

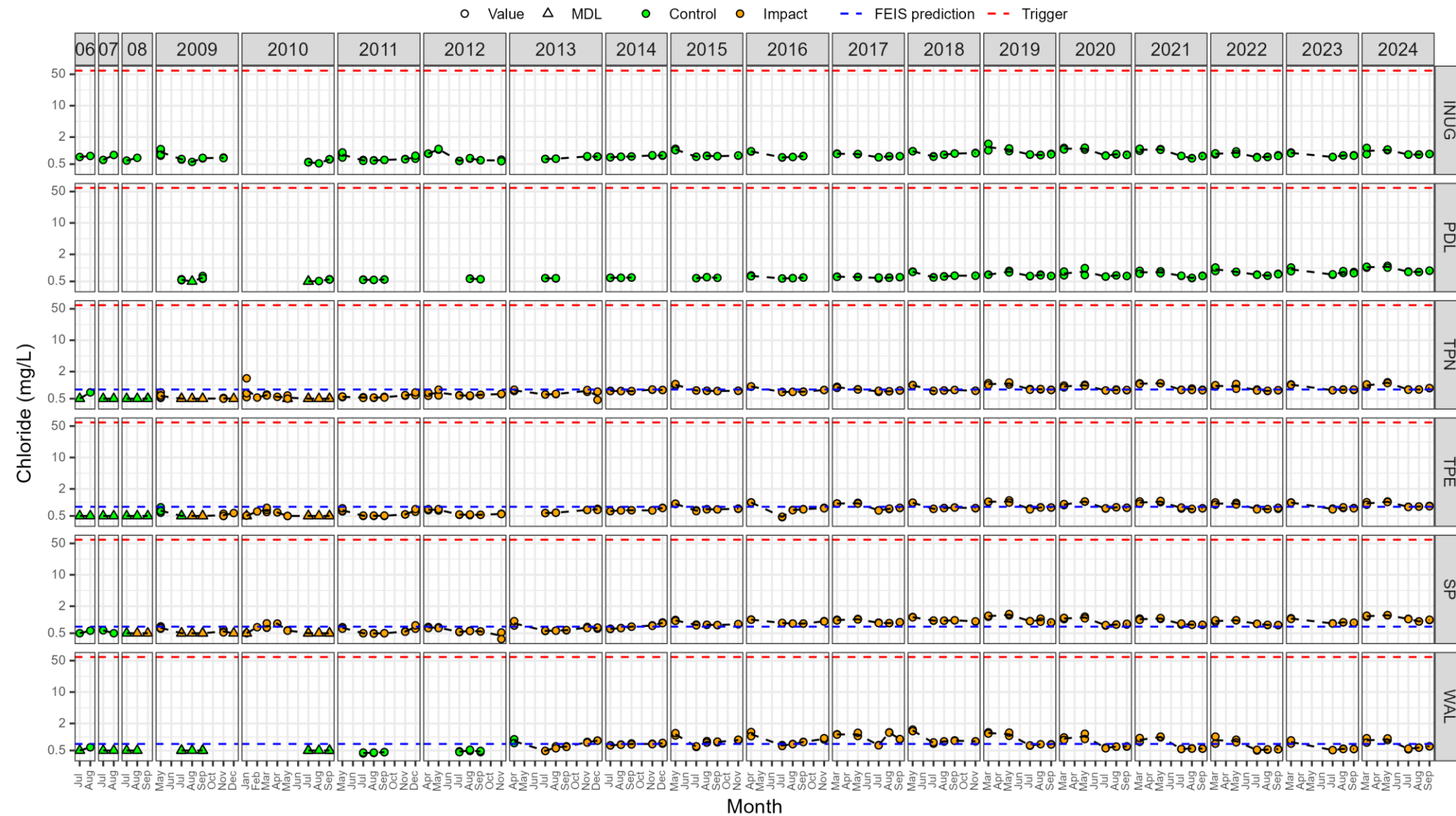


Figure C1-12. Fluoride (mg/L).

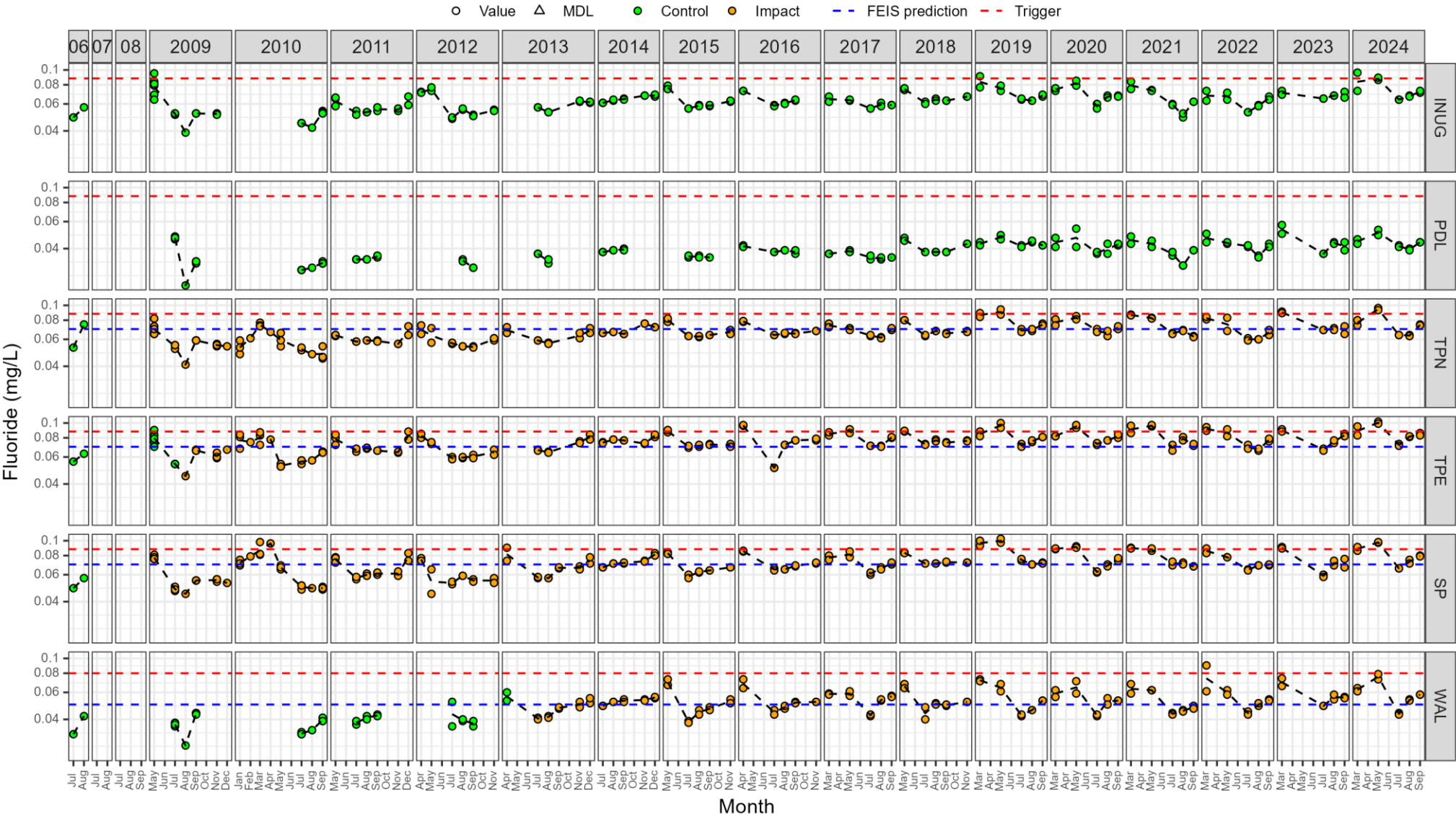


Figure C1-13. Nitrate-N (mg/L).

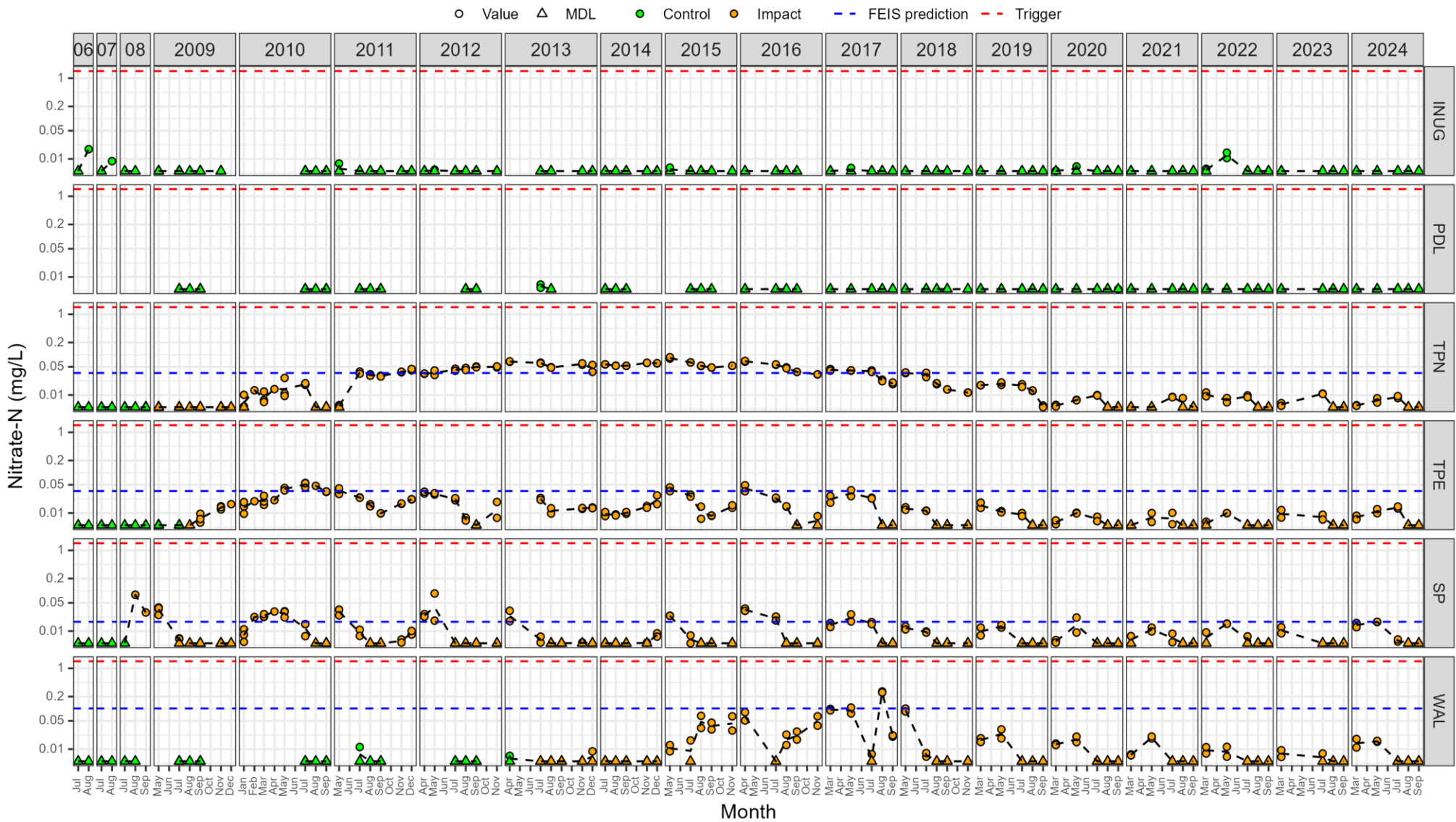


Figure C1-14. Nitrite-N (mg/L).

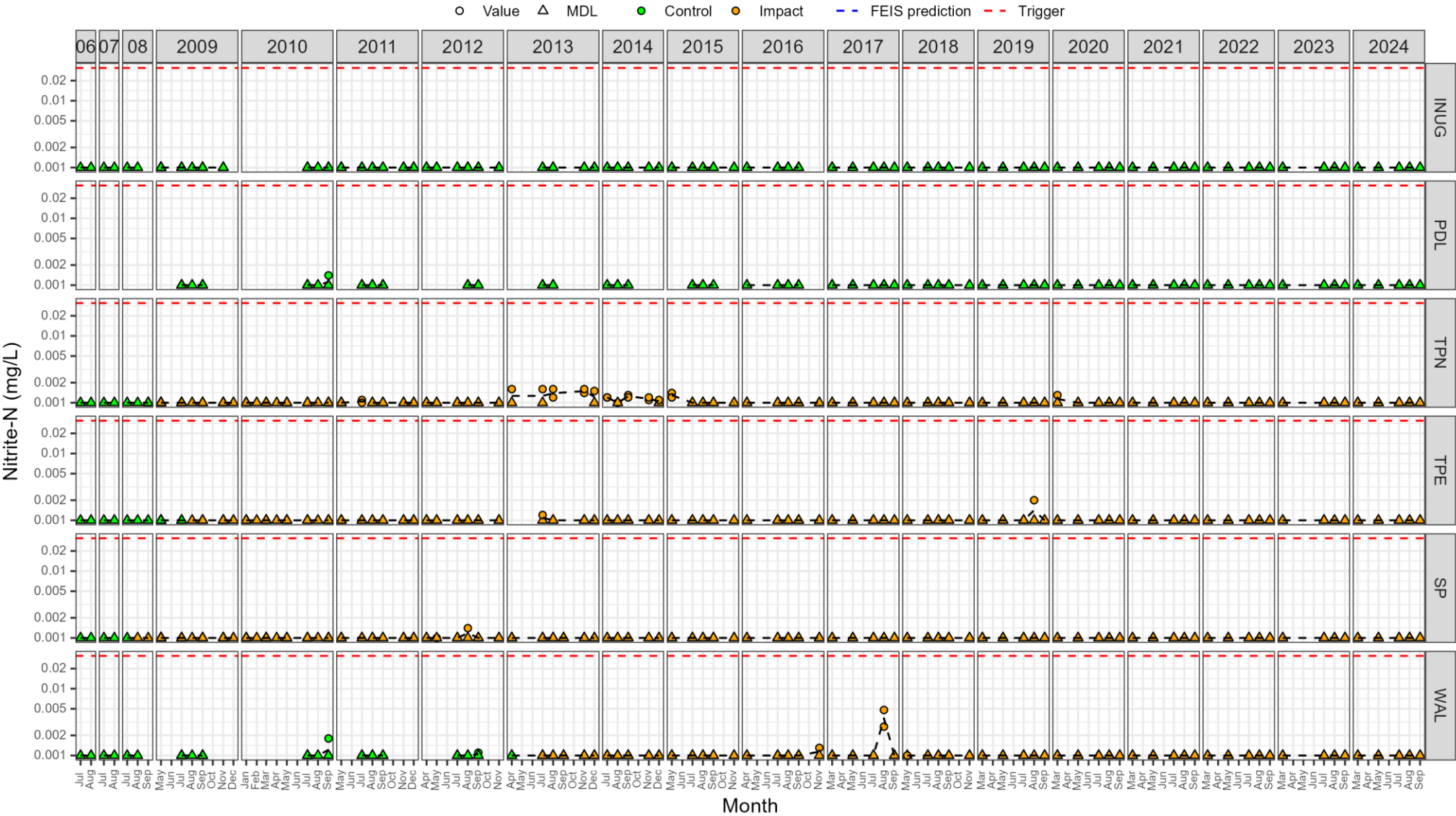


Figure C1-15. Total Kjeldahl Nitrogen (TKN; mg/L).

Note: TKN data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

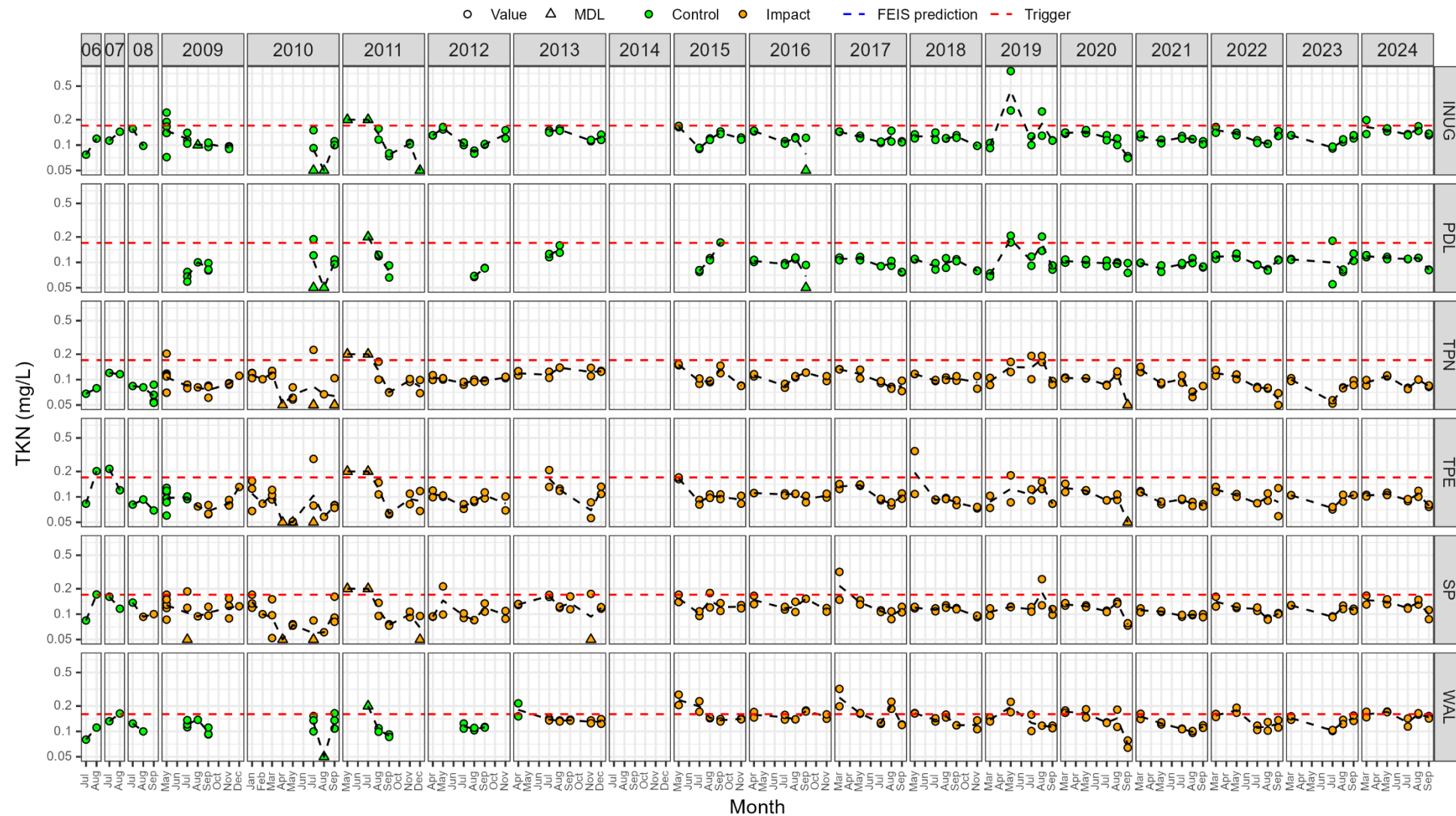


Figure C1-16. Total phosphorus (mg/L).

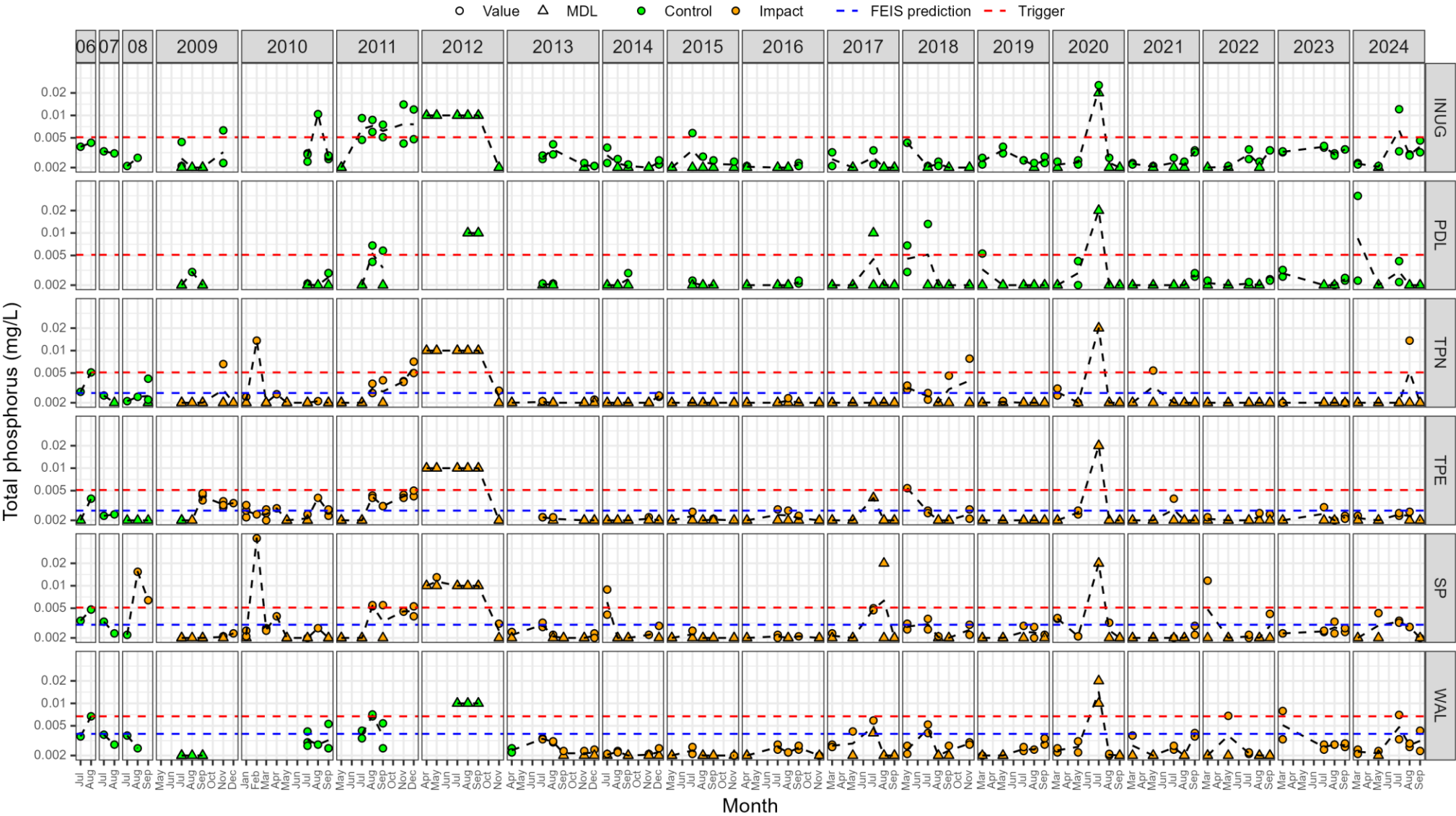


Figure C1-17. Ortho-phosphate (mg/L).

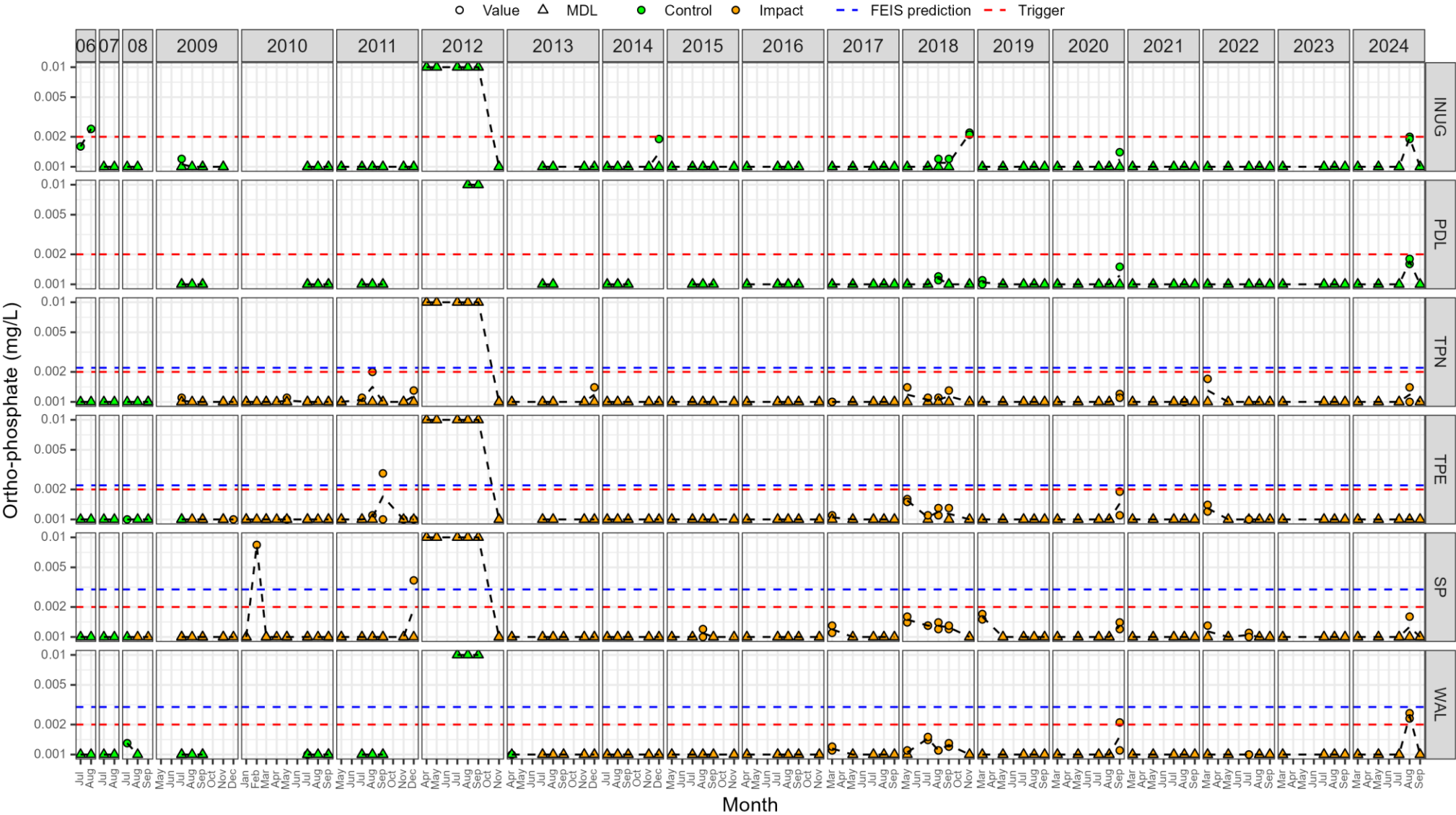


Figure C1-18. **Reactive silica (mg/L).**

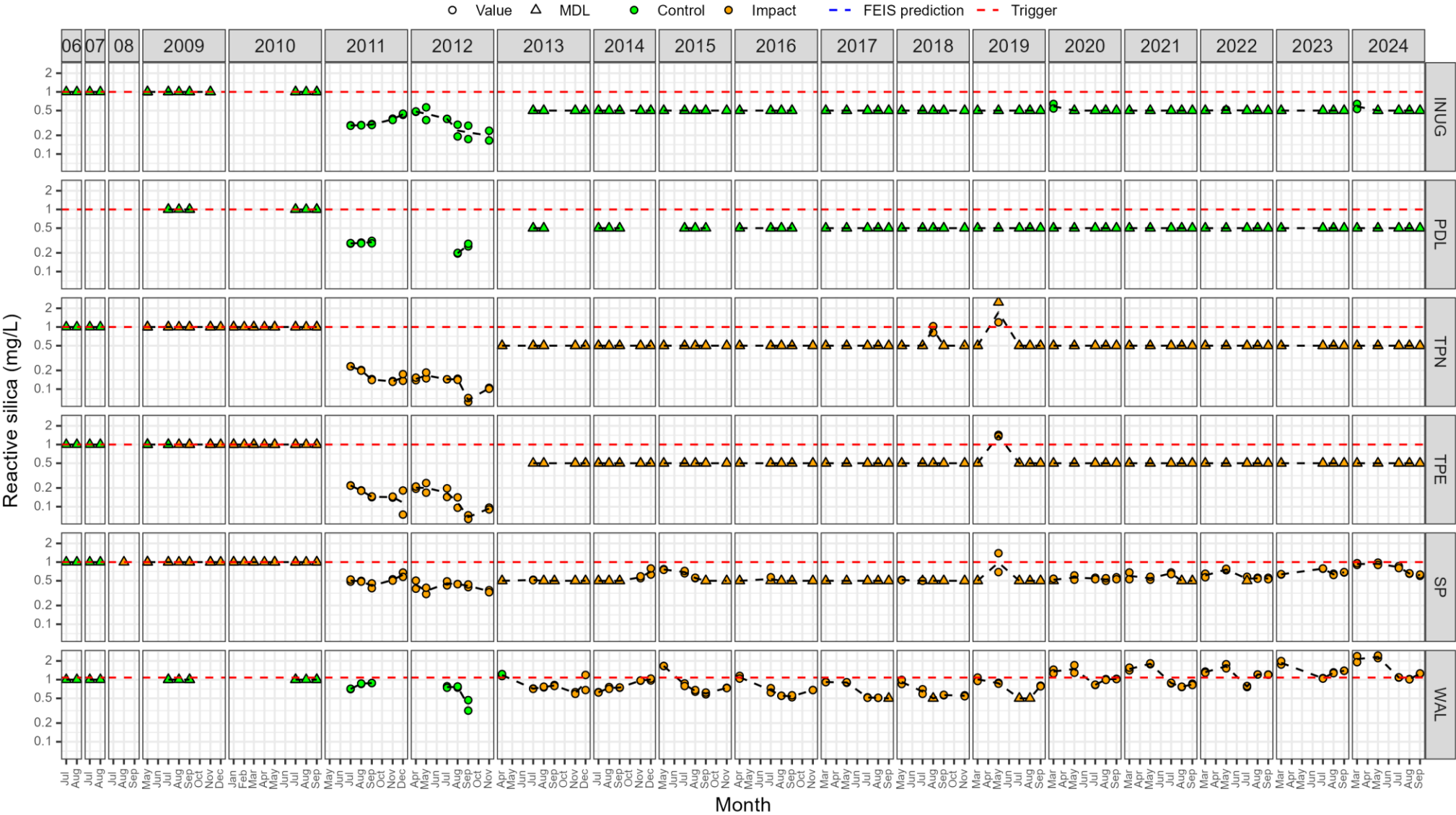


Figure C1-19. Sulphate (mg/L).

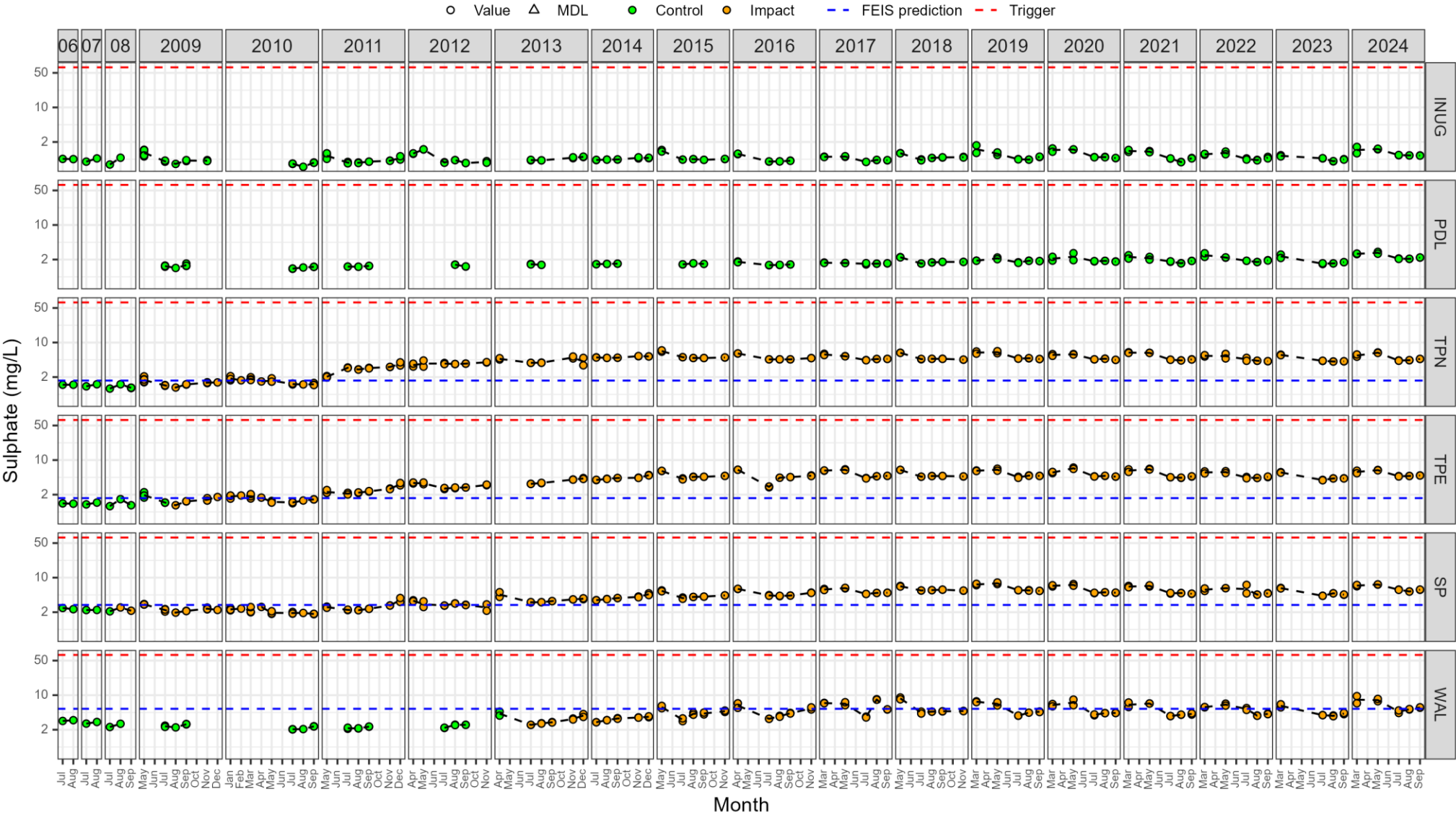


Figure C1-20. Dissolved Organic Carbon (DOC; mg/L).

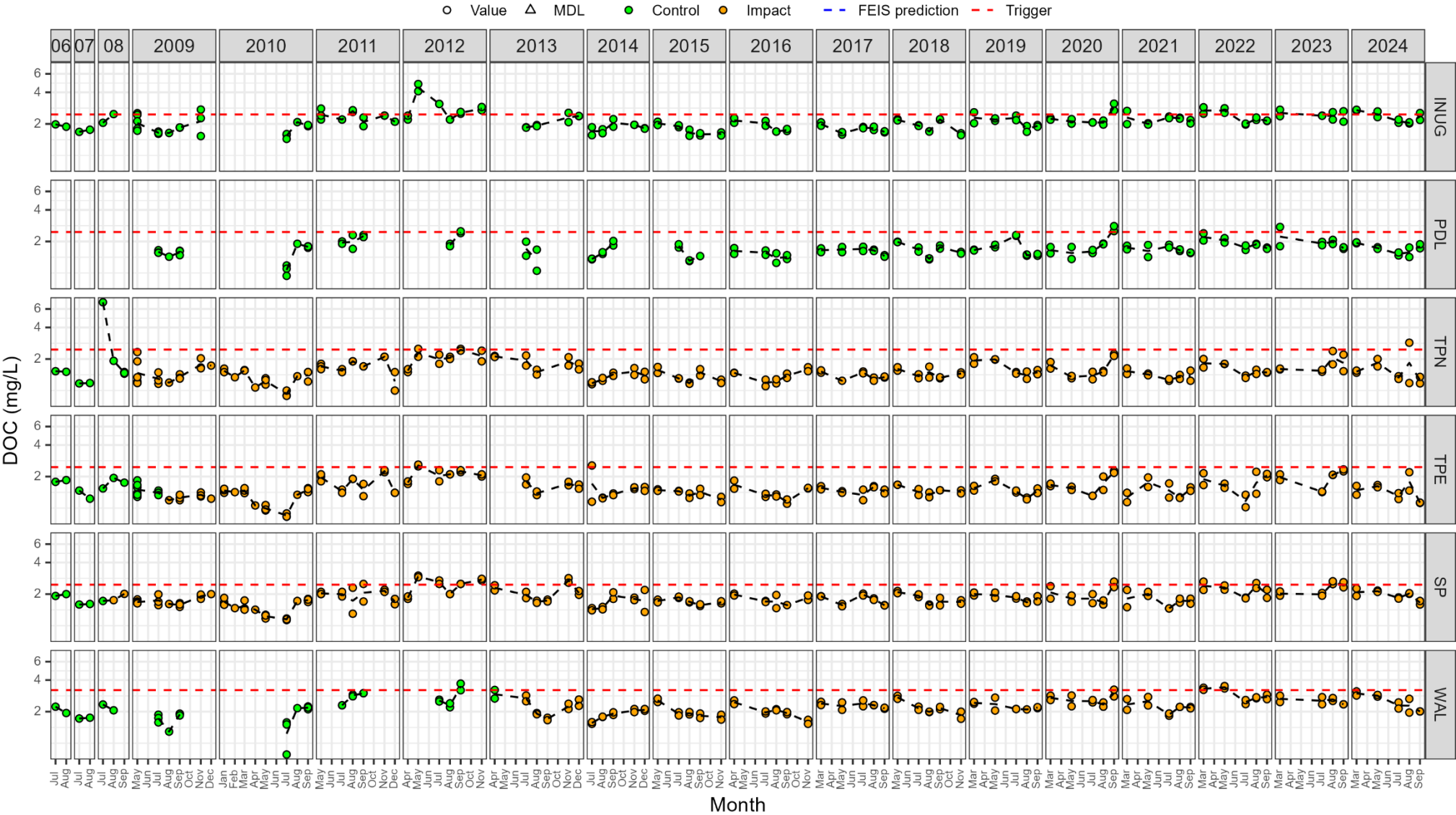


Figure C1-21. Total Organic Carbon (TOC; mg/L).

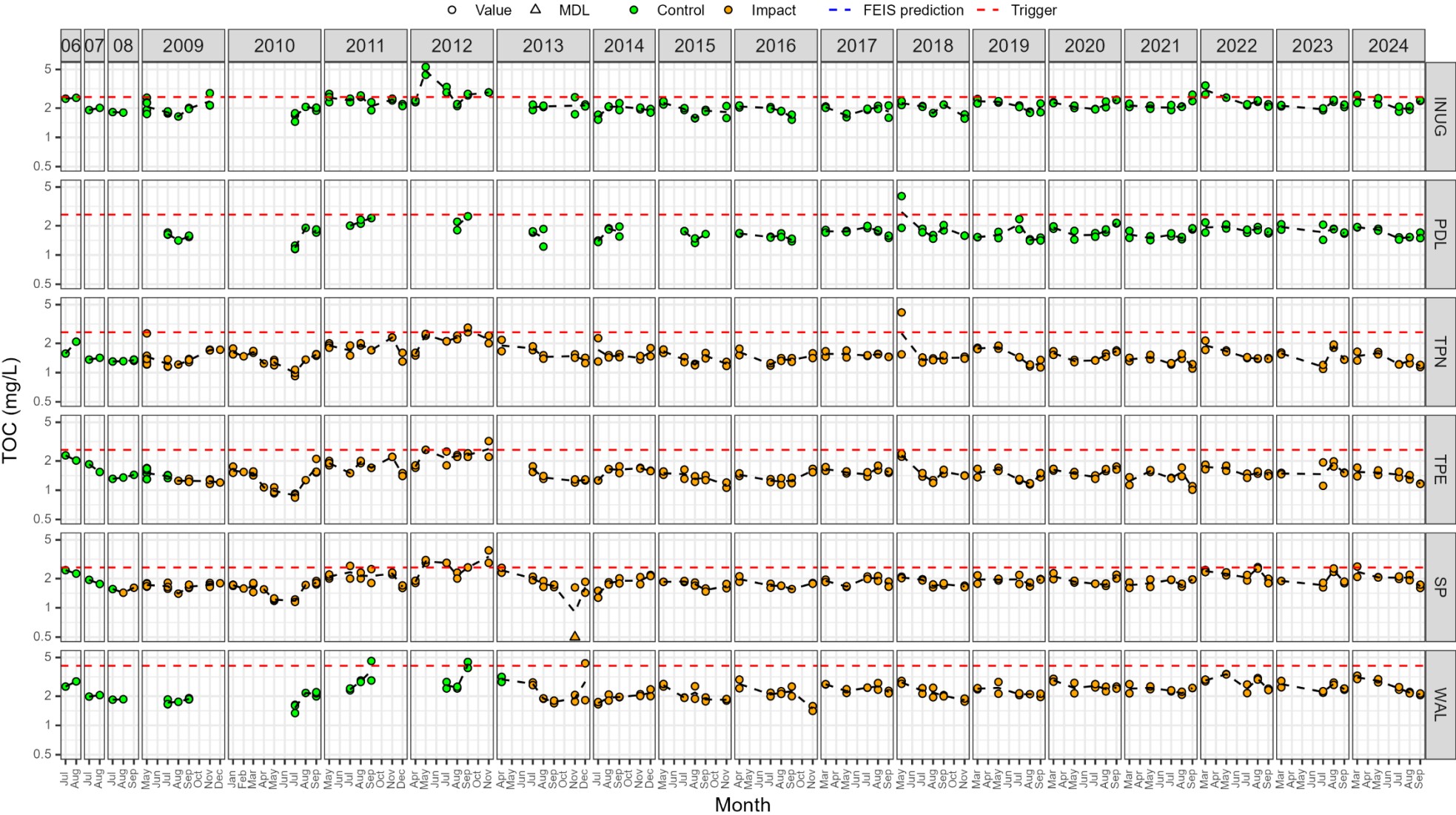


Figure C1-22. Total aluminum (mg/L).

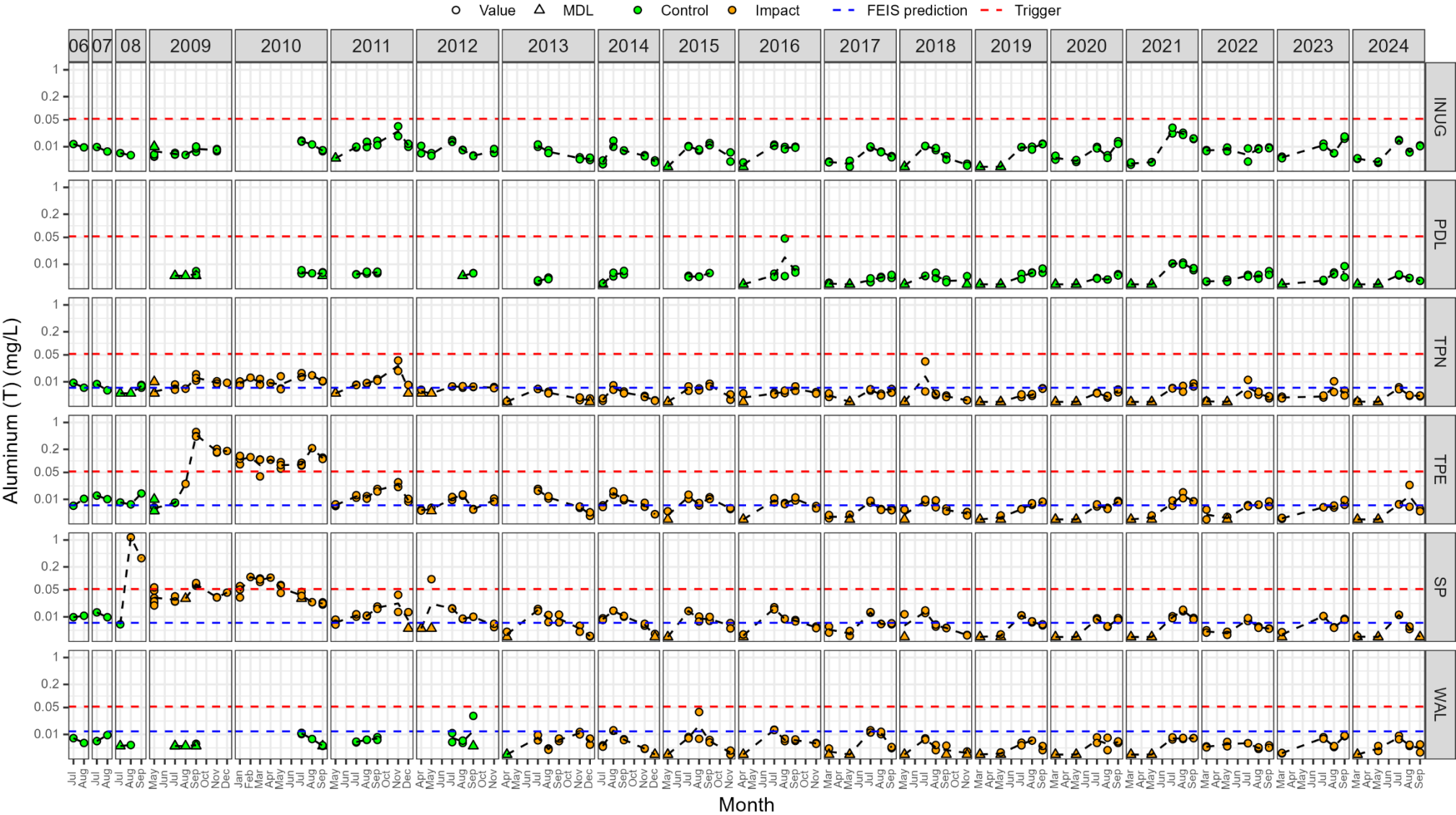


Figure C1-23. Total antimony (mg/L).

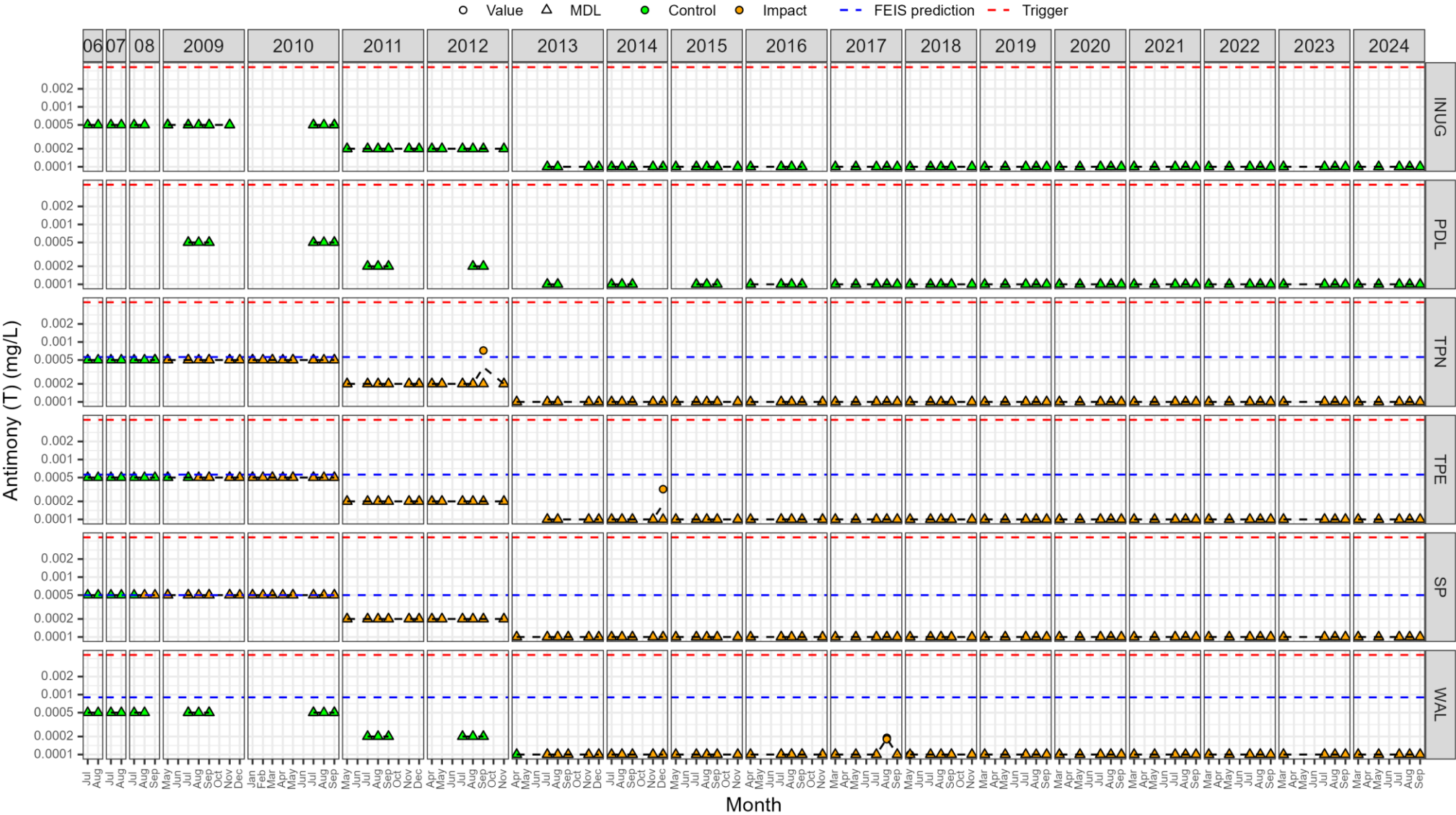


Figure C1-24. Total arsenic (mg/L).

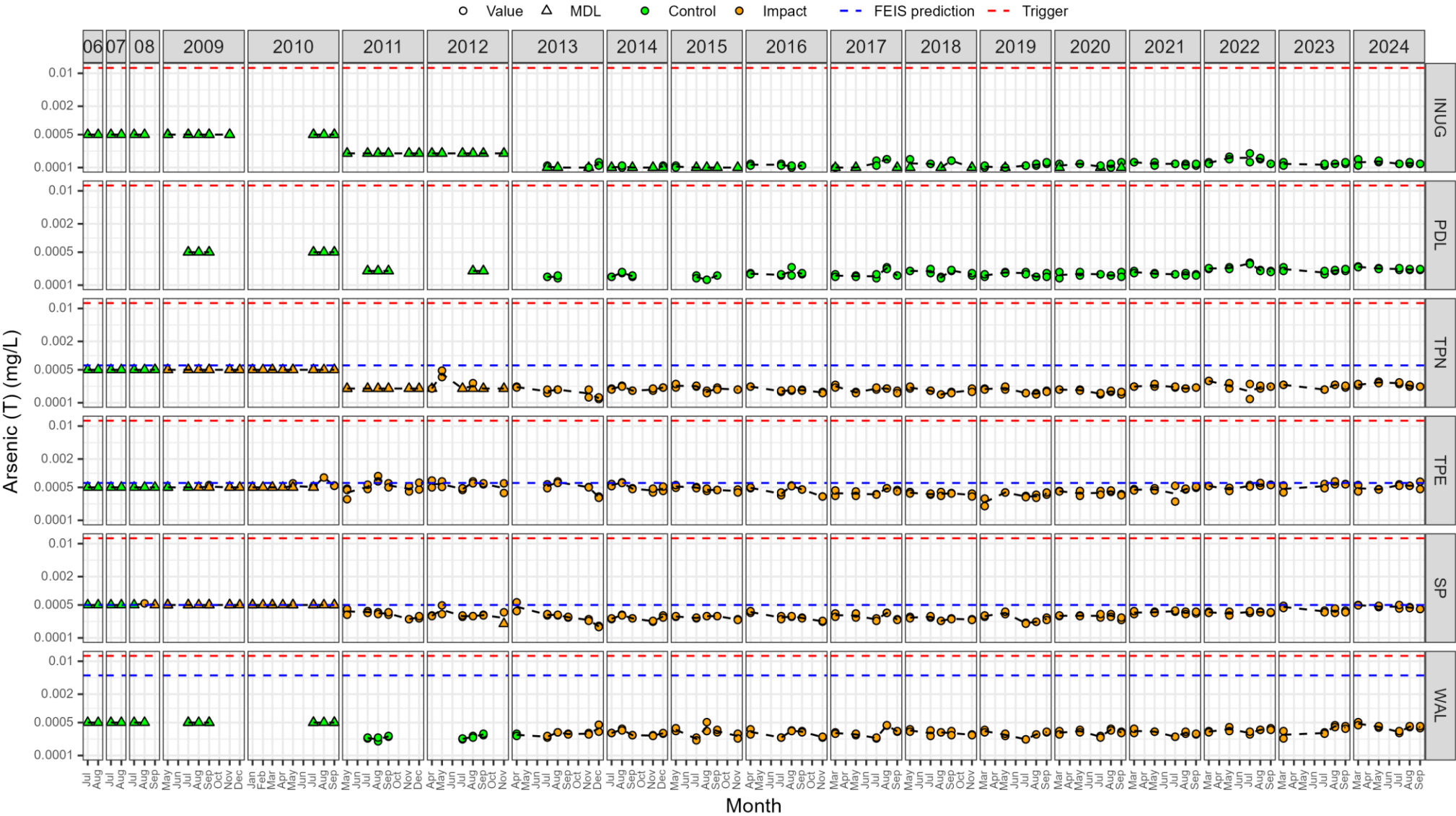


Figure C1-25. Total barium (mg/L).

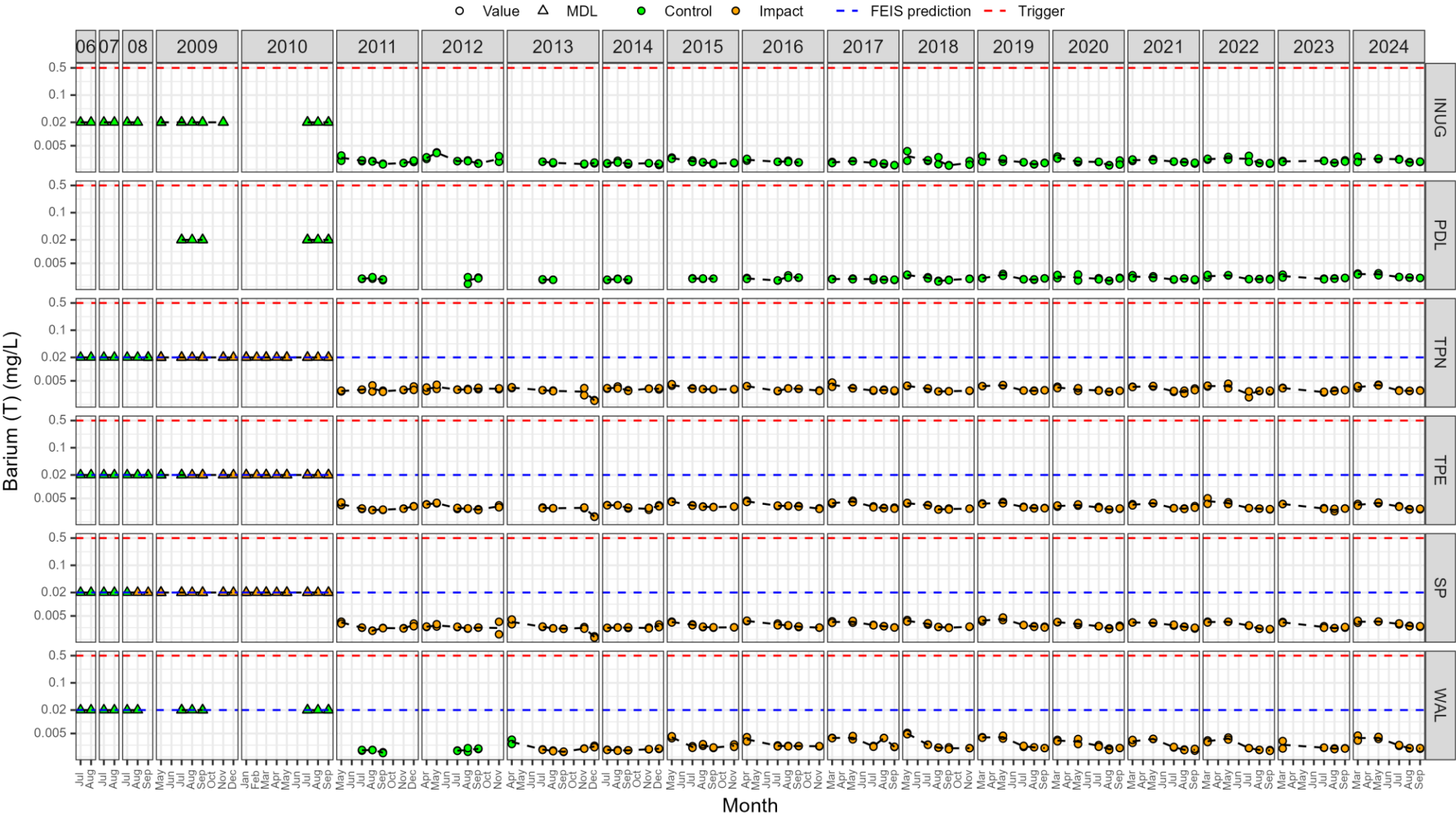


Figure C1-26. Total beryllium (mg/L).



Figure C1-27. Total boron (mg/L).

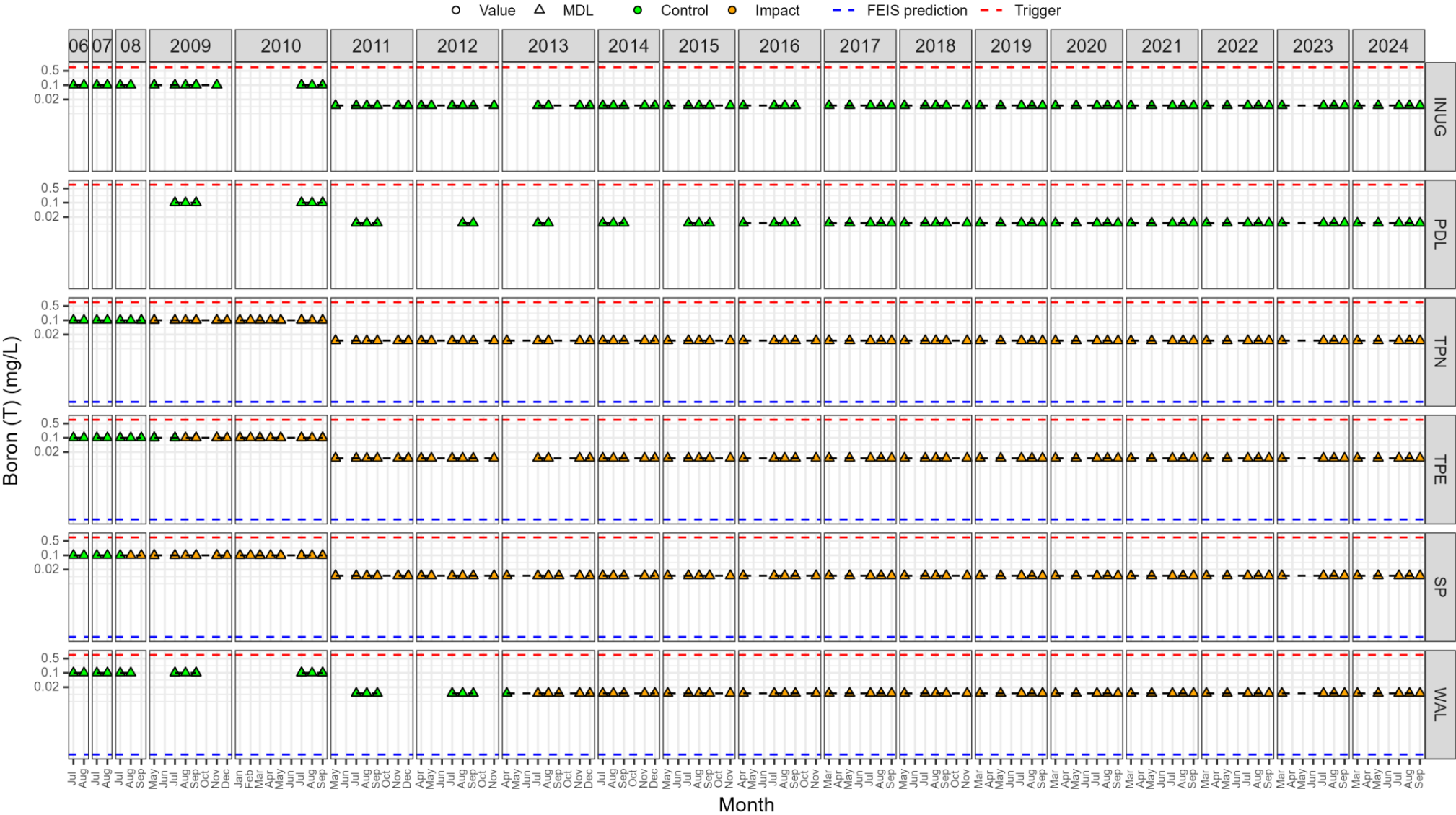


Figure C1-28. Total cadmium (mg/L).



Figure C1-29. Total calcium (mg/L).

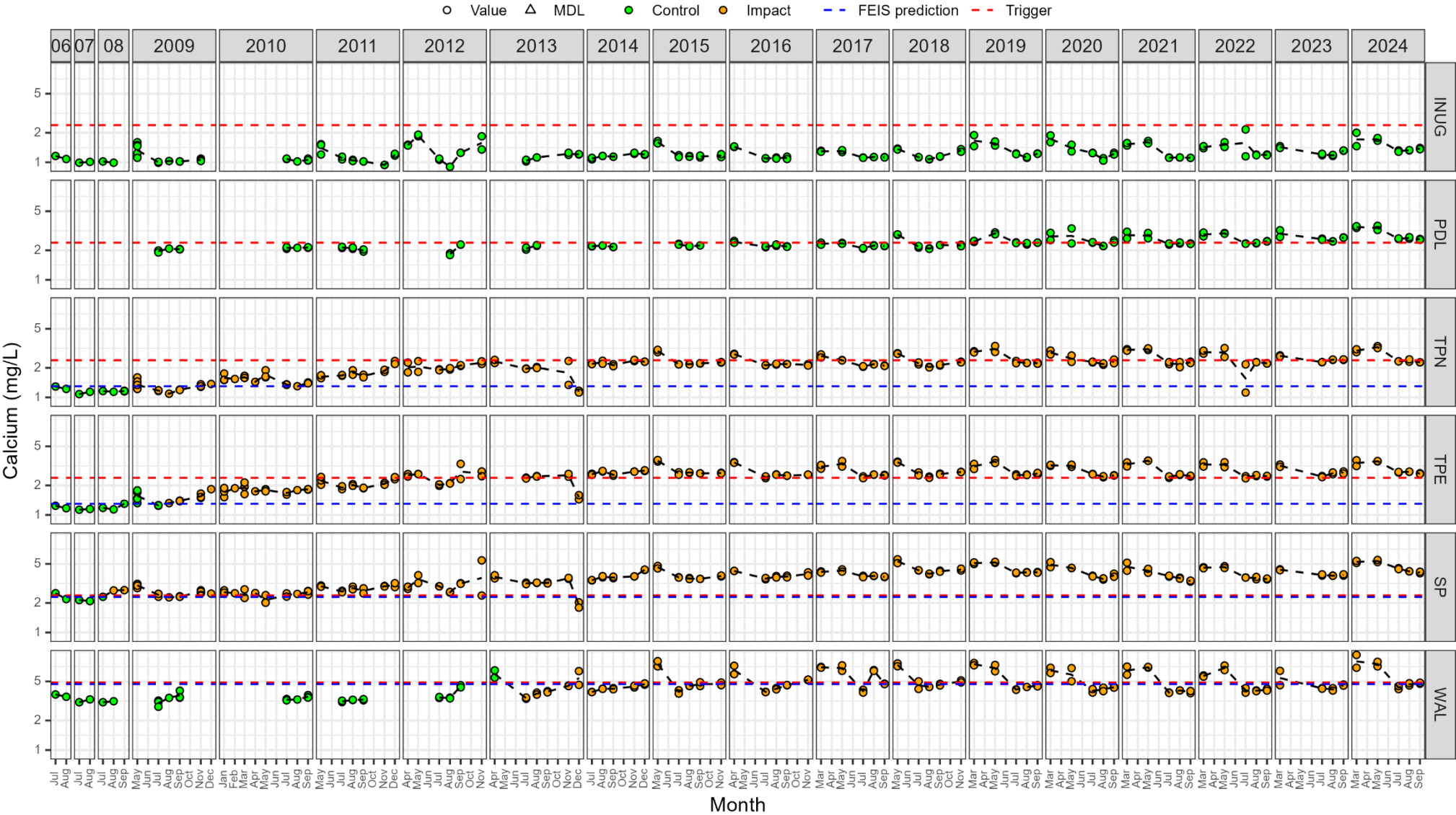


Figure C1-30. Total chromium (mg/L).

Note: The detection limit for total chromium was adjusted from 0.0001 mg/L to 0.0005 mg/L for samples collected in since May 2021.

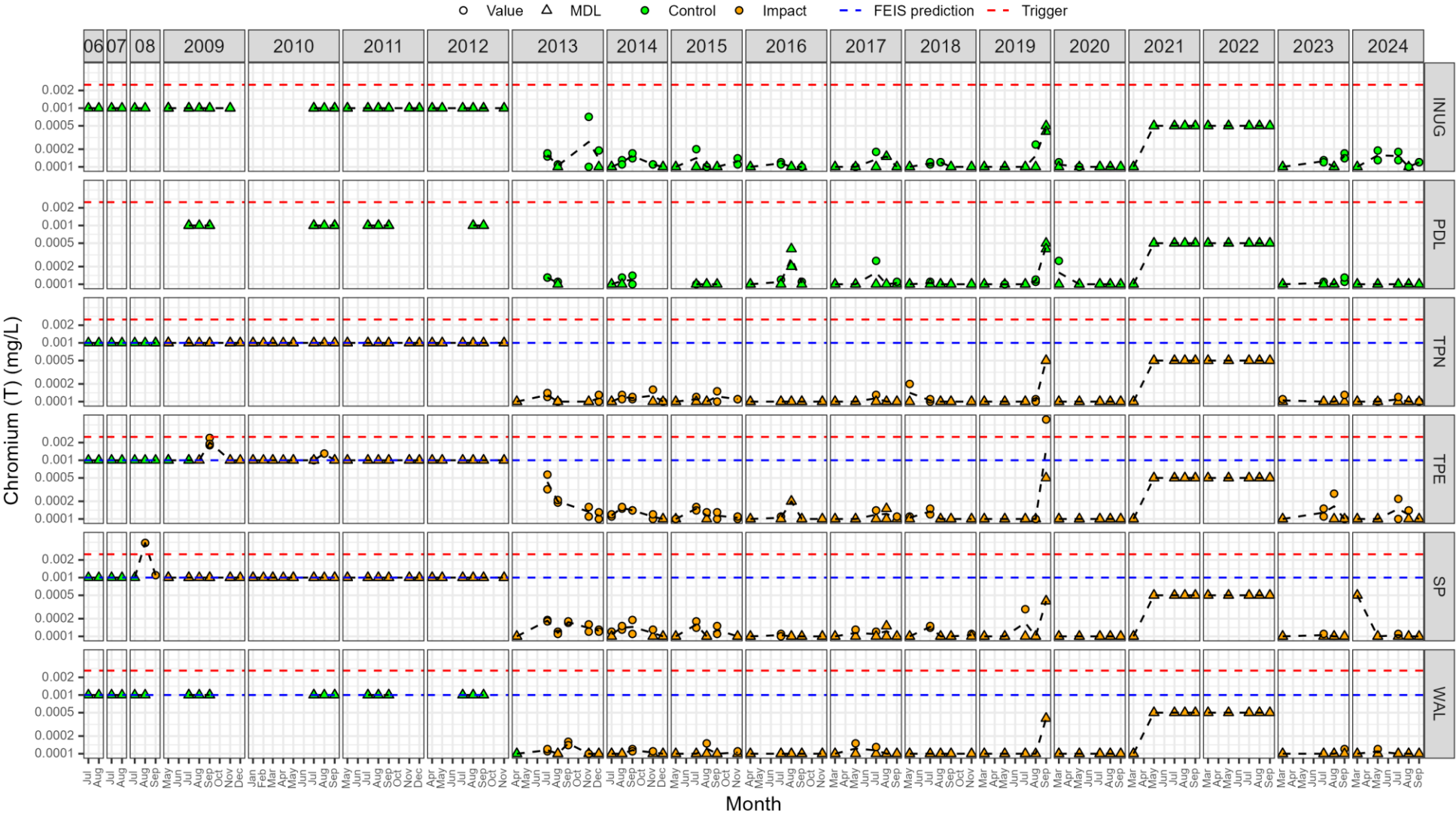


Figure C1-31. Total copper (mg/L).

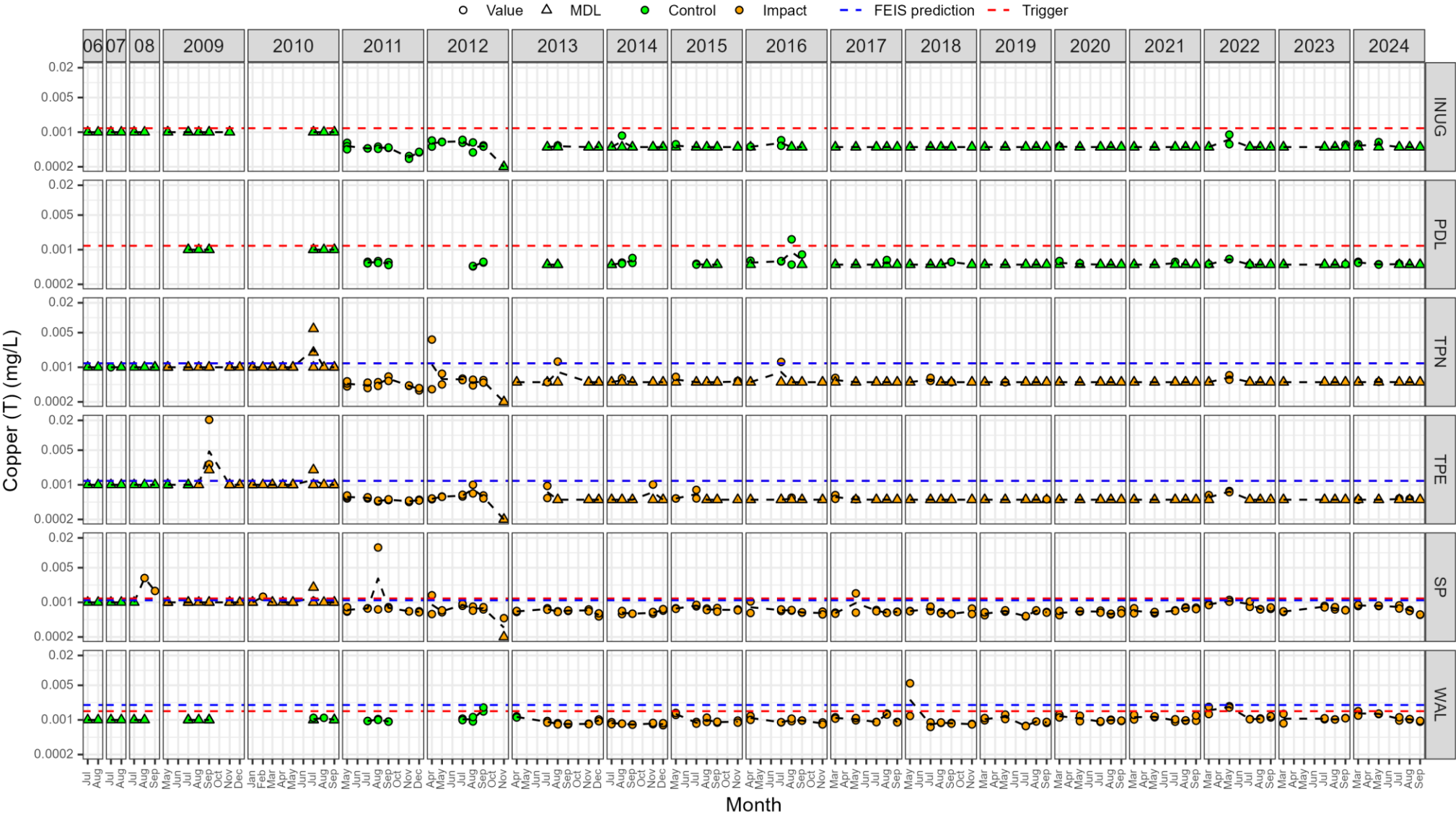


Figure C1-32. Total iron (mg/L).

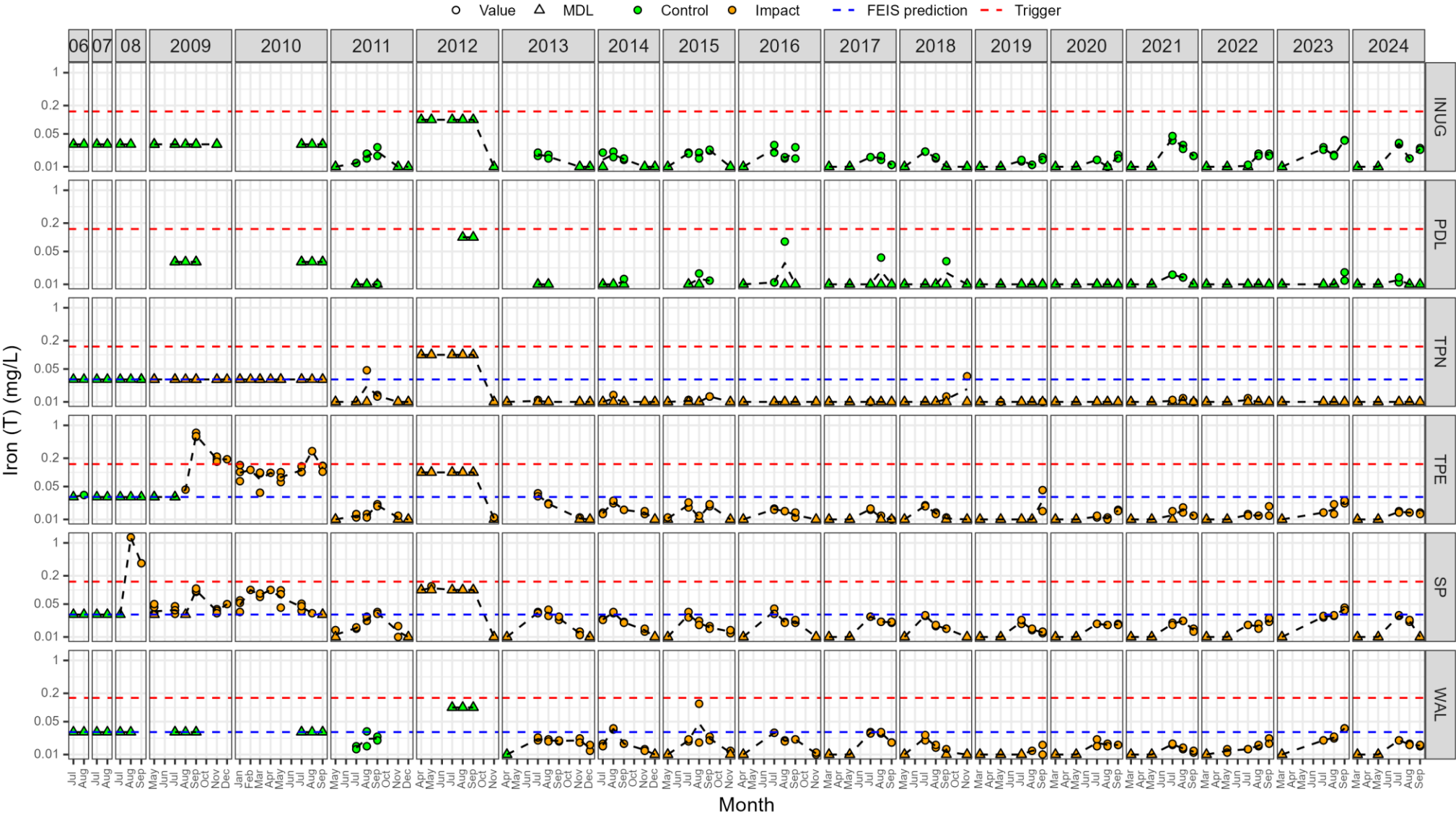


Figure C1-33. Total lead (mg/L).

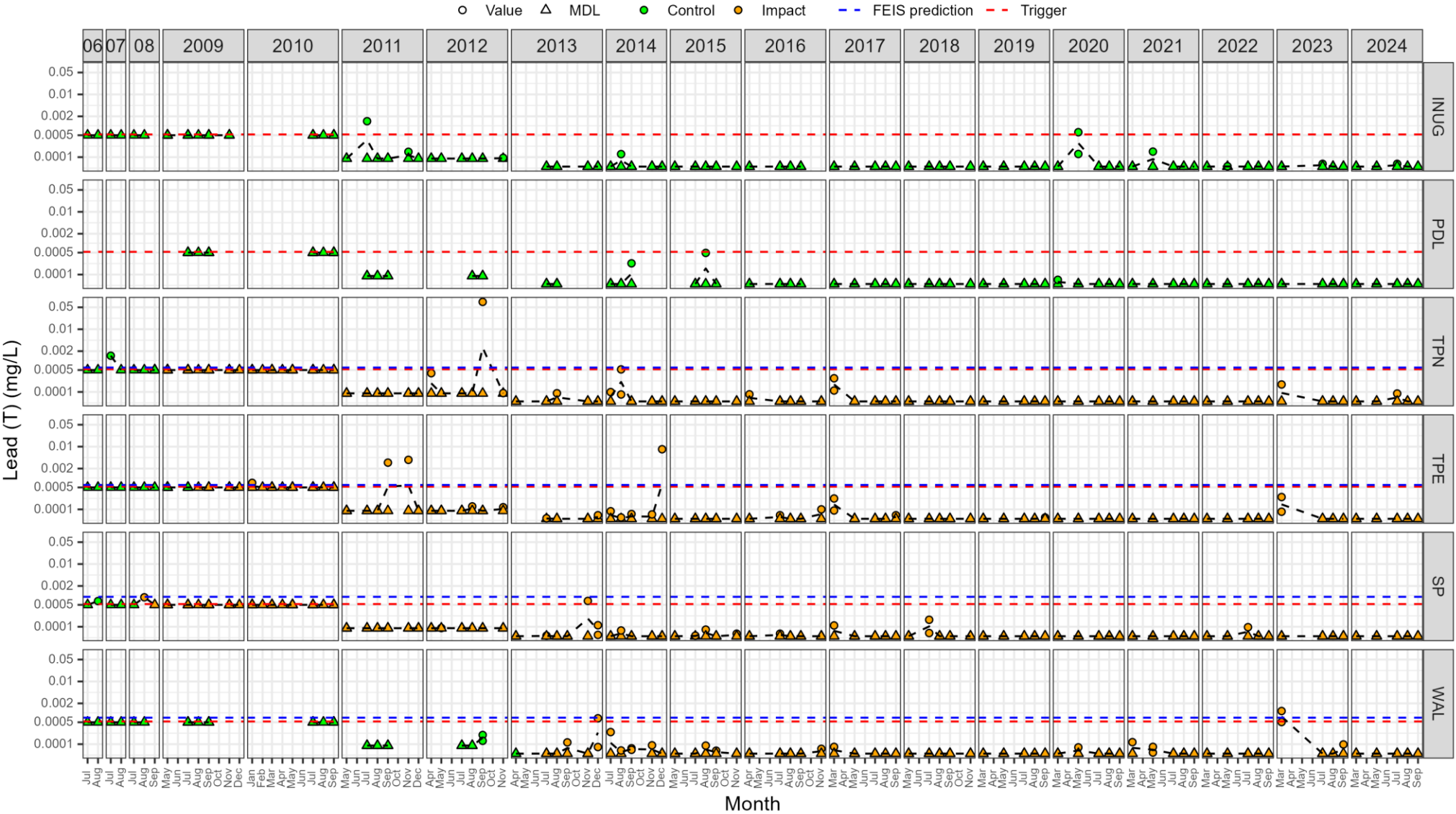


Figure C1-34. Total lithium (mg/L).

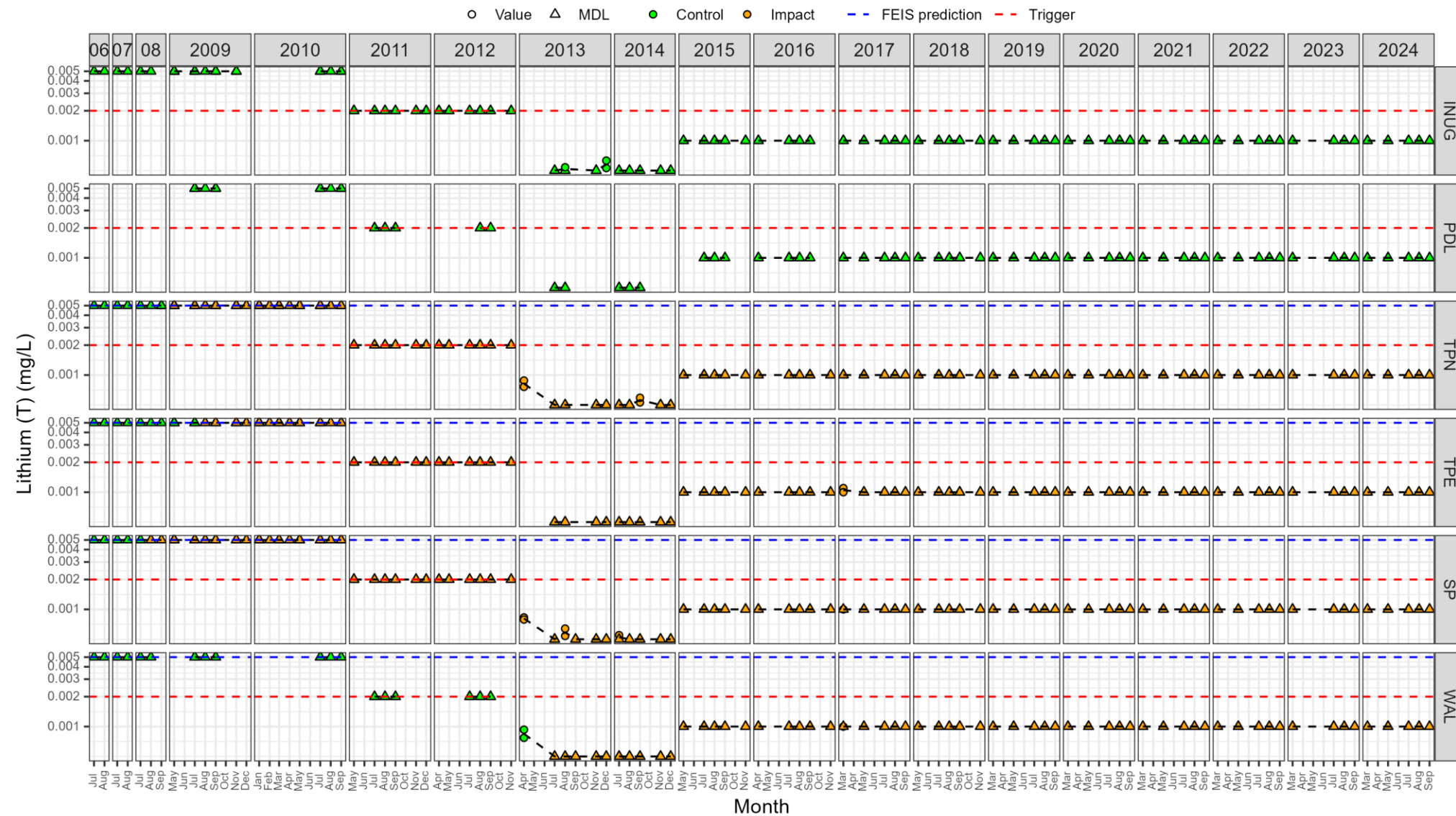


Figure C1-35. Total magnesium (mg/L).

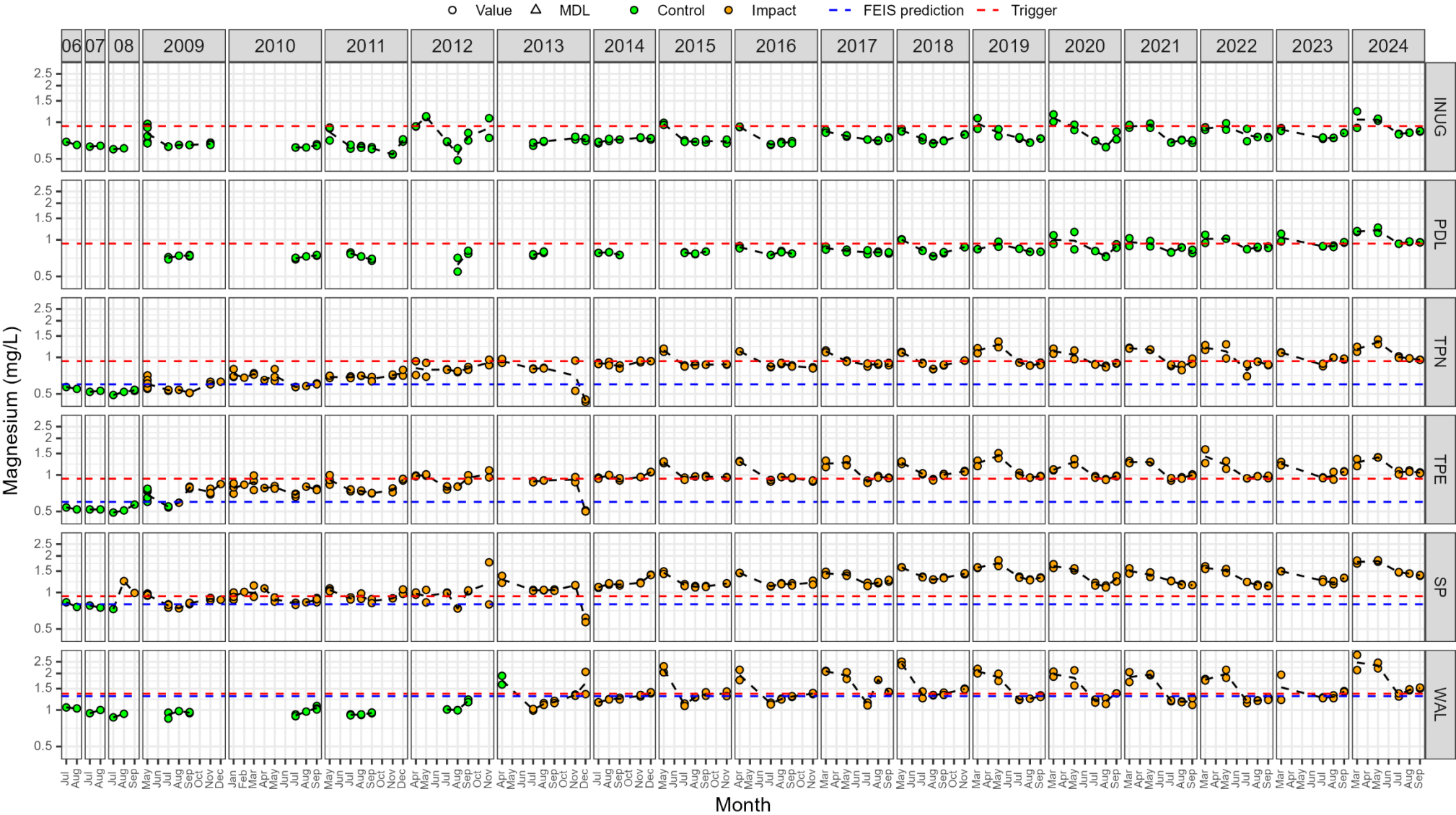


Figure C1-36. Total manganese (mg/L).

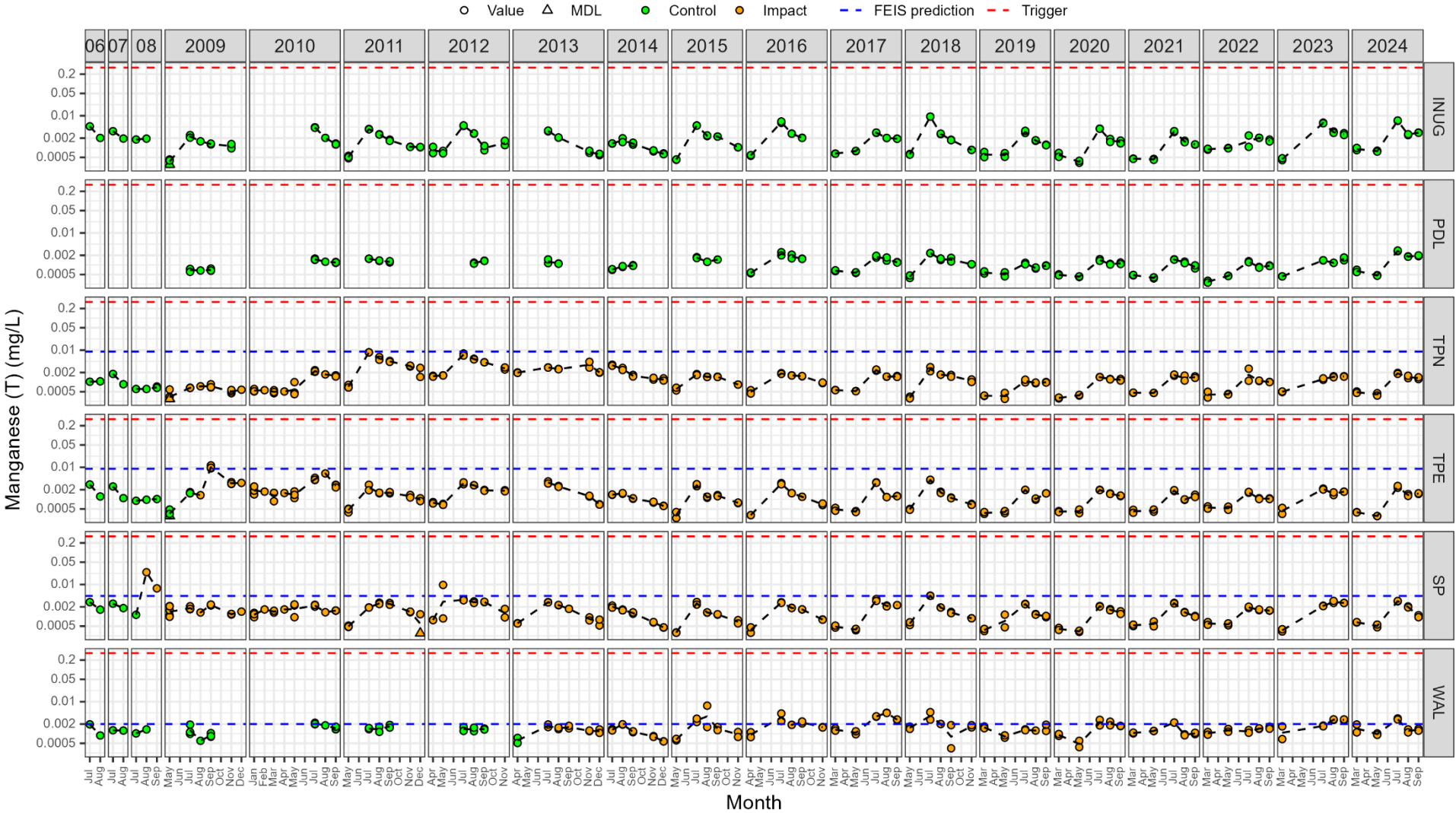


Figure C1-37. Total mercury (mg/L).

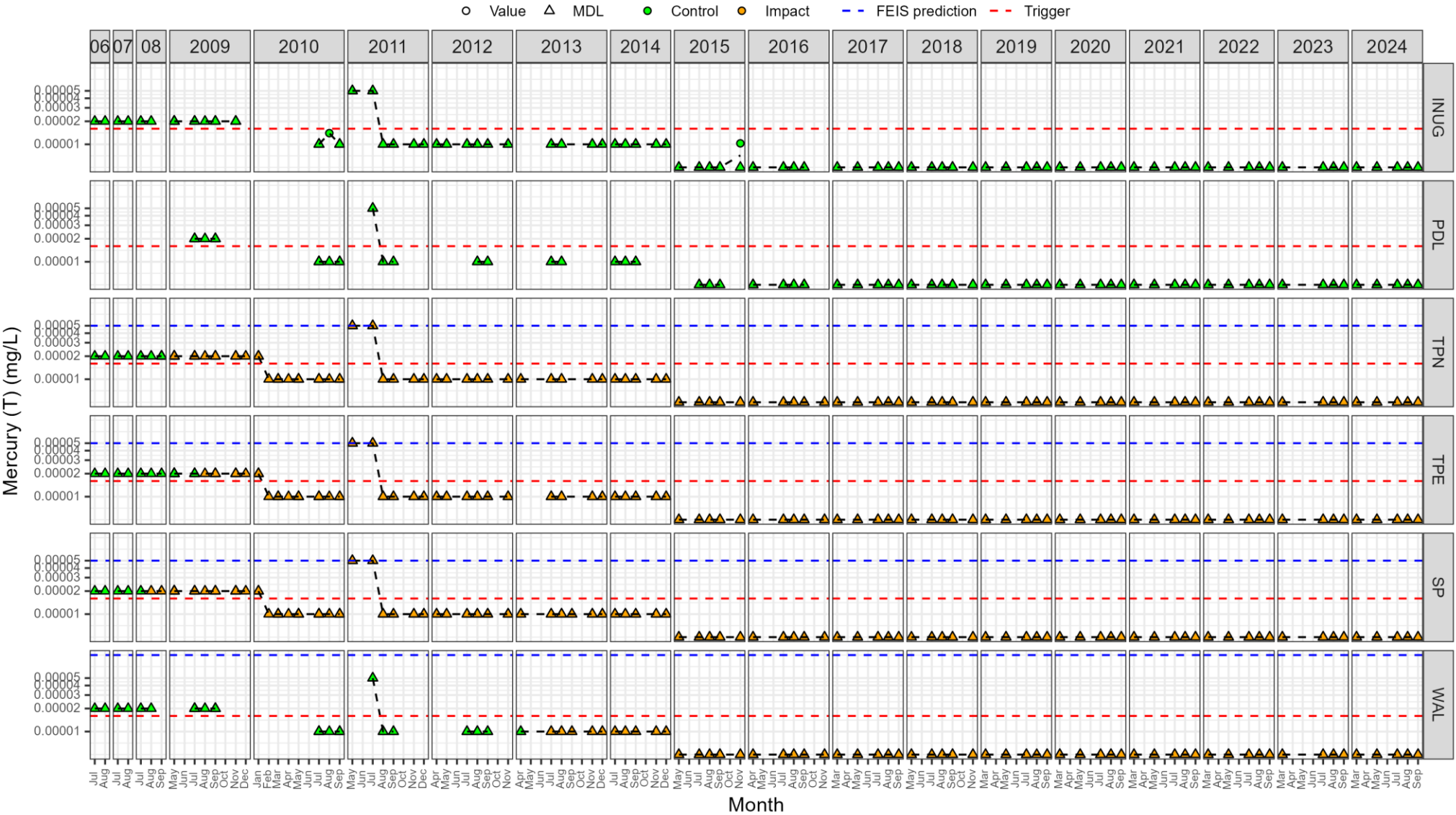


Figure C1-38. Total molybdenum (mg/L).

