

TOWNSHIP OF HURON-KINLOSS

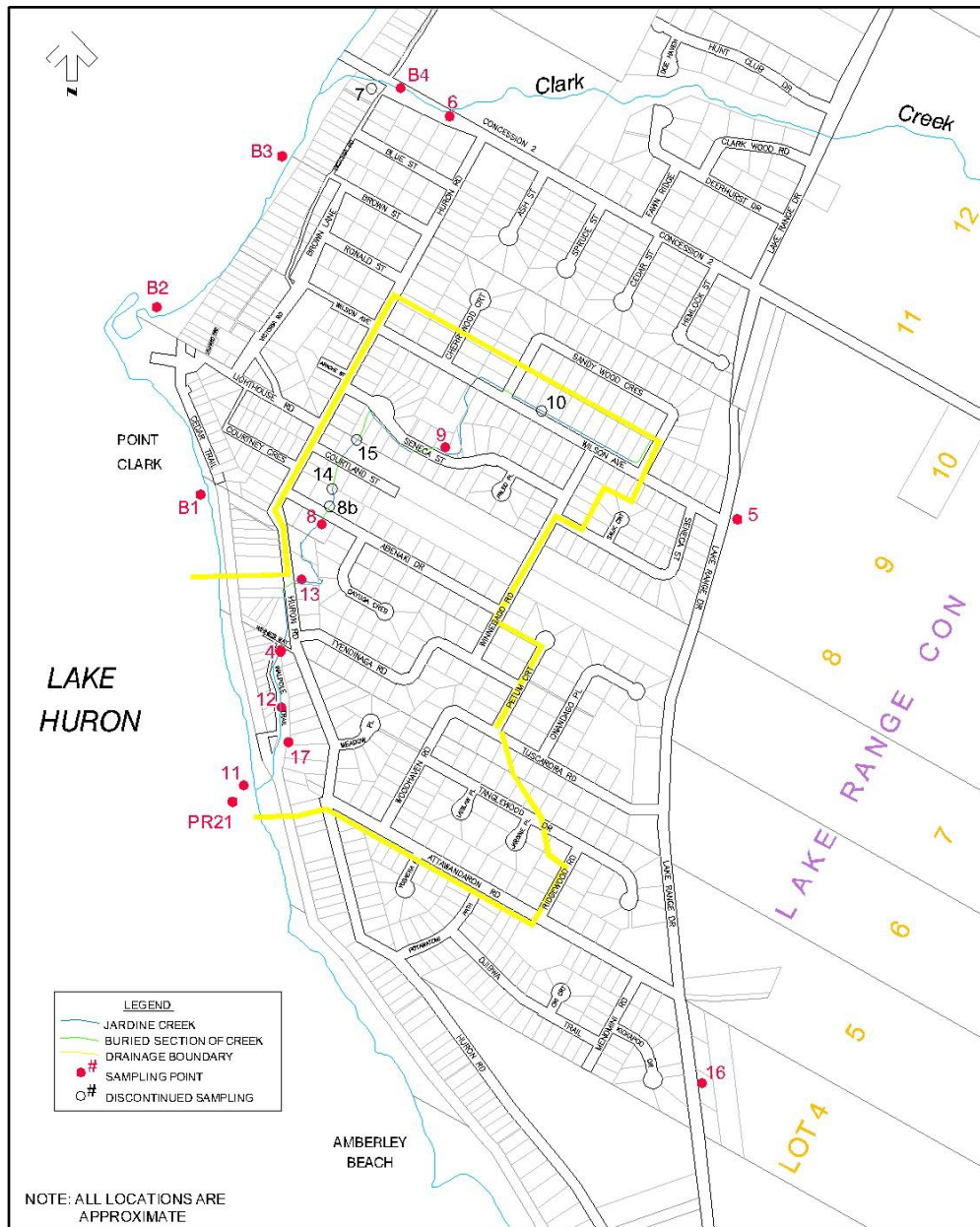
ANNUAL REPORTING SURFACE WATER QUALITY MONITORING

January 15, 2024



Surface Water Quality Sampling

- Why are we doing this sampling?
- Where are we sampling?
- What do we do?
- What parameters are we sampling?
- What influences the results?
- Sample results
- What does it mean?



NOTE: ALL LOCATIONS ARE APPROXIMATE



Township of Huron-Kinloss
Point Clark
Water Quality Monitoring Program

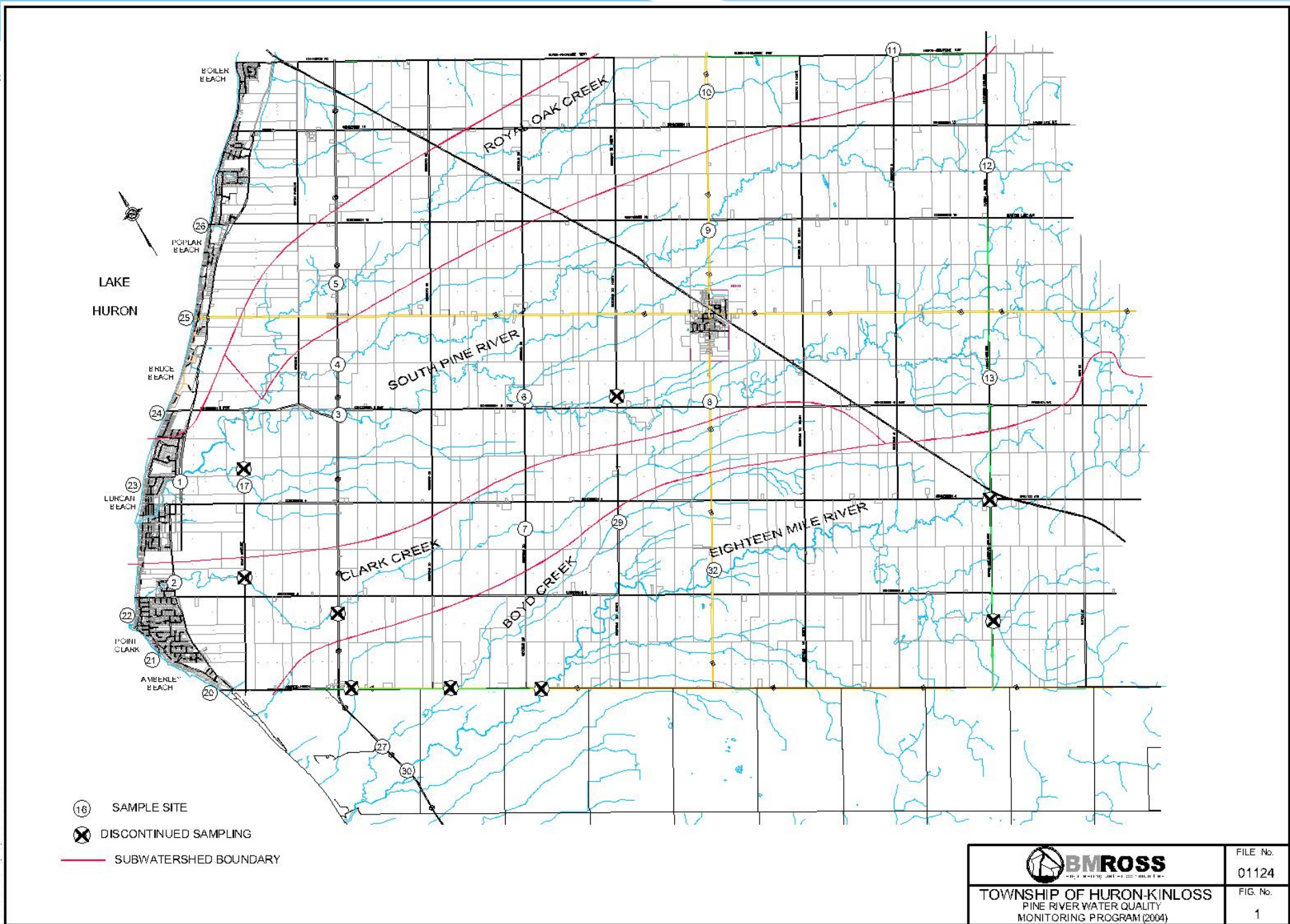
2005

DATE
May 12, 2005

PROJECT No.
93147

SCALE
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FIGURE No.
1



**2023 Sampling Season
Precipitation**

Sampling Year	Seasonal Precipitation (March-November)
2023	592.3 mm
2022	551.9 mm
2021	797.3 mm
2020	507.3 mm
2019	624.7 mm
2018	656.9 mm
2017	771.4 mm
2016	704.9 mm
2015	544.6 mm
2014	695.9 mm
2013	720.3 mm
2012	406.9 mm
2011	833.3 mm
2010	608.5 mm
2009	582.9 mm
2008	972.4 mm
2007	584.0 mm
2006	661.2 mm
2005	564.9 mm
2004	496.8 mm
2003	514.0 mm
2002	491.6 mm

→ 23 inches

→ 33 inches

→ 19 inches

Figure 3.1 - 2023 Precipitation at Goderich, TCID: WGD

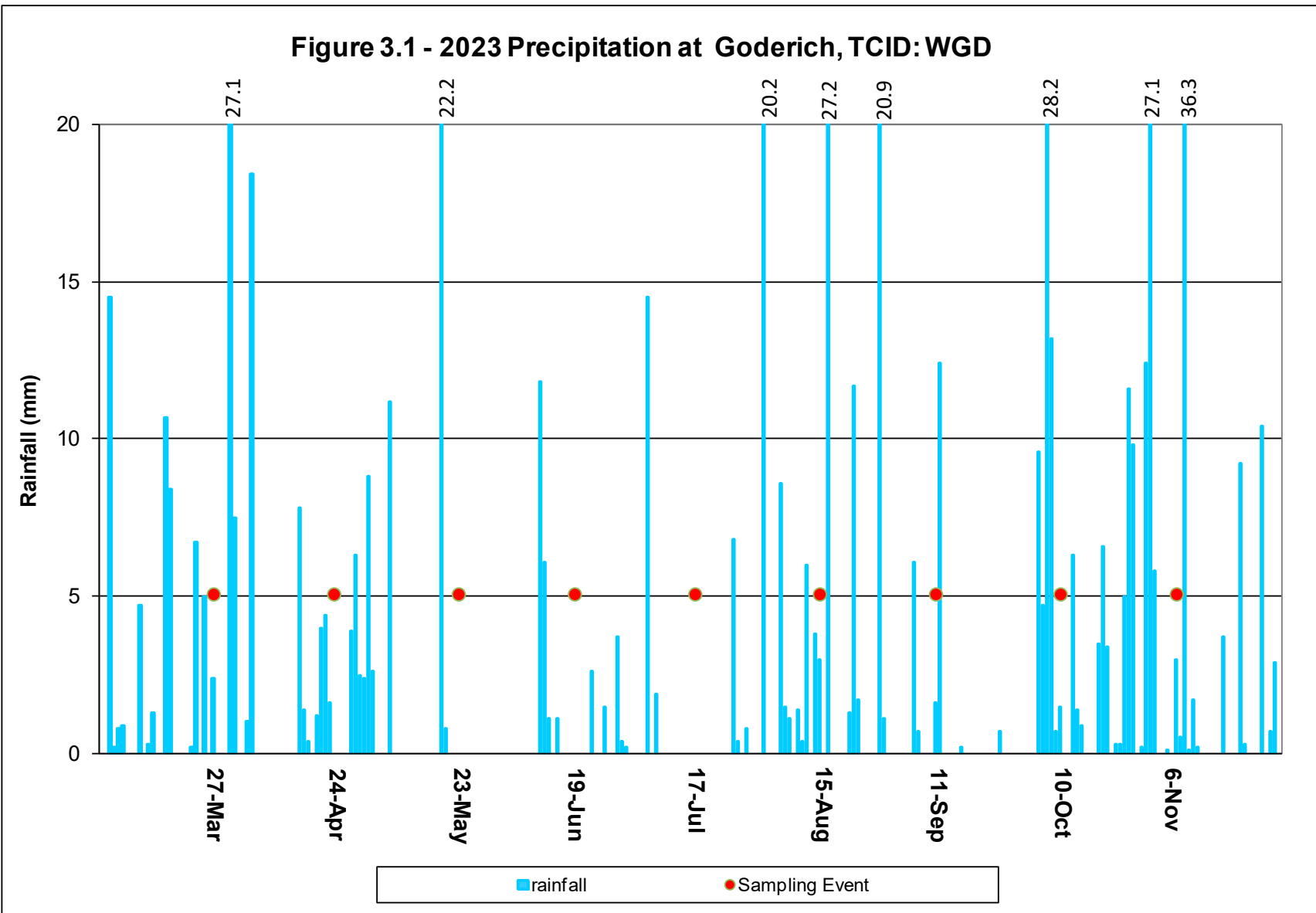
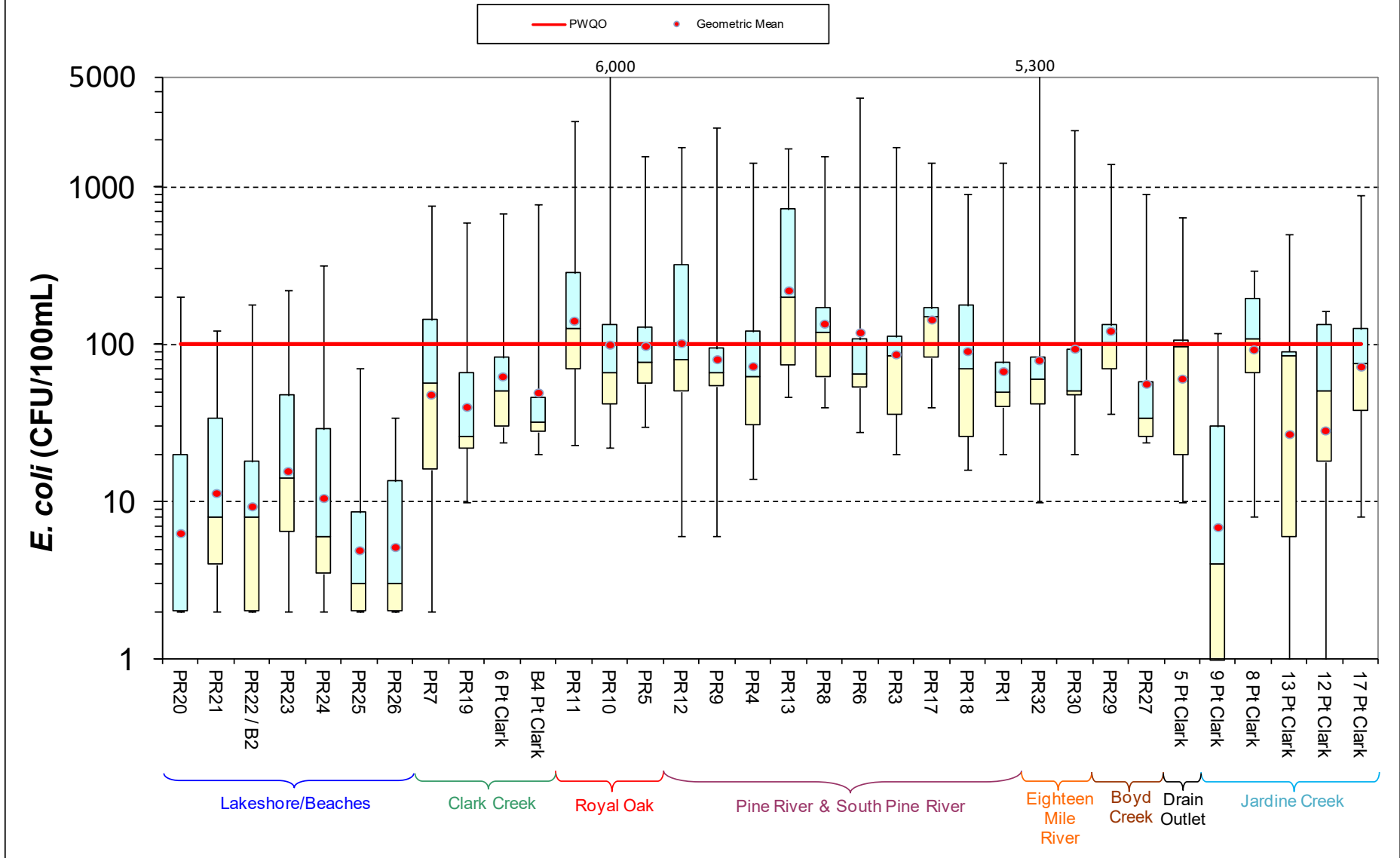
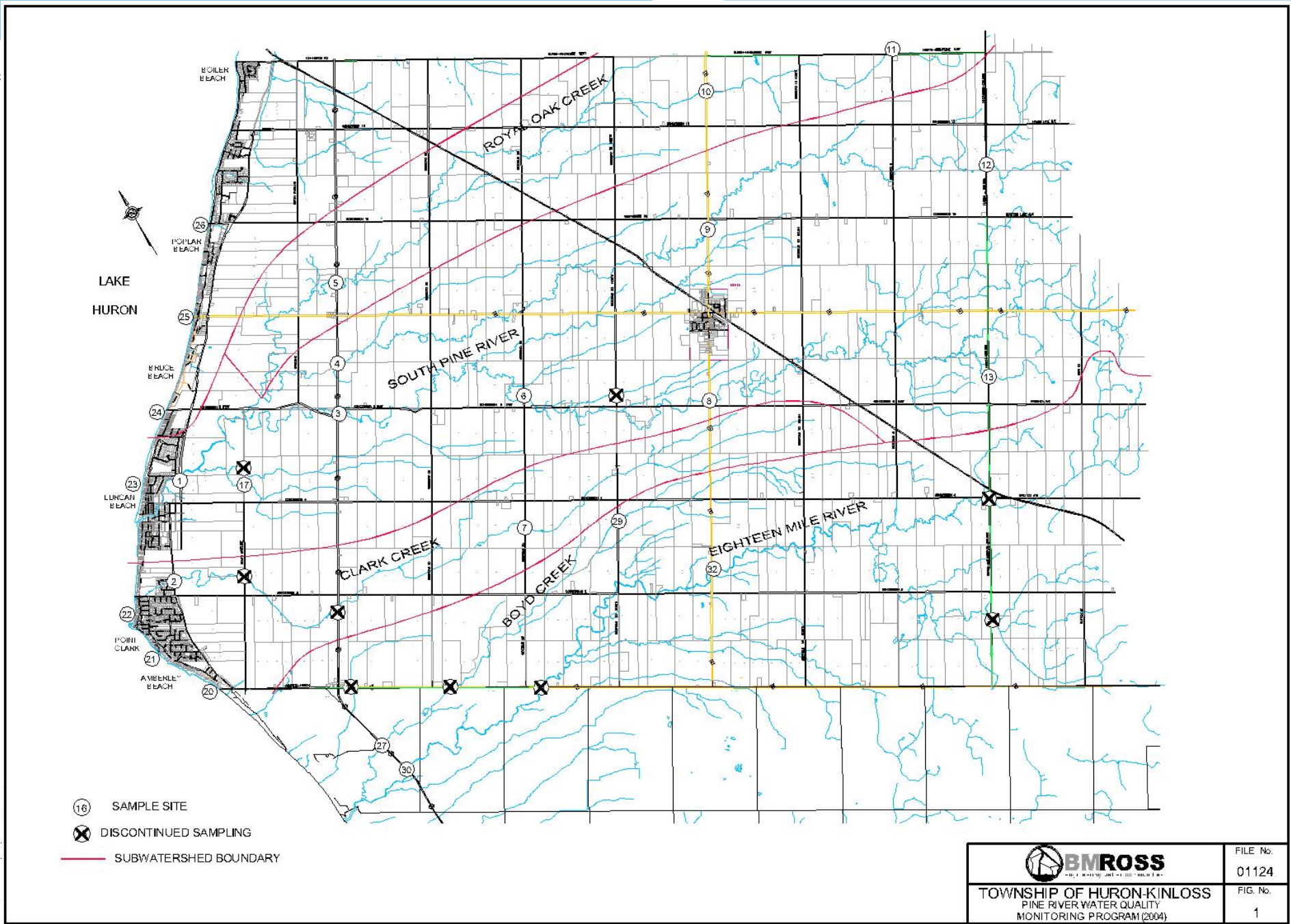
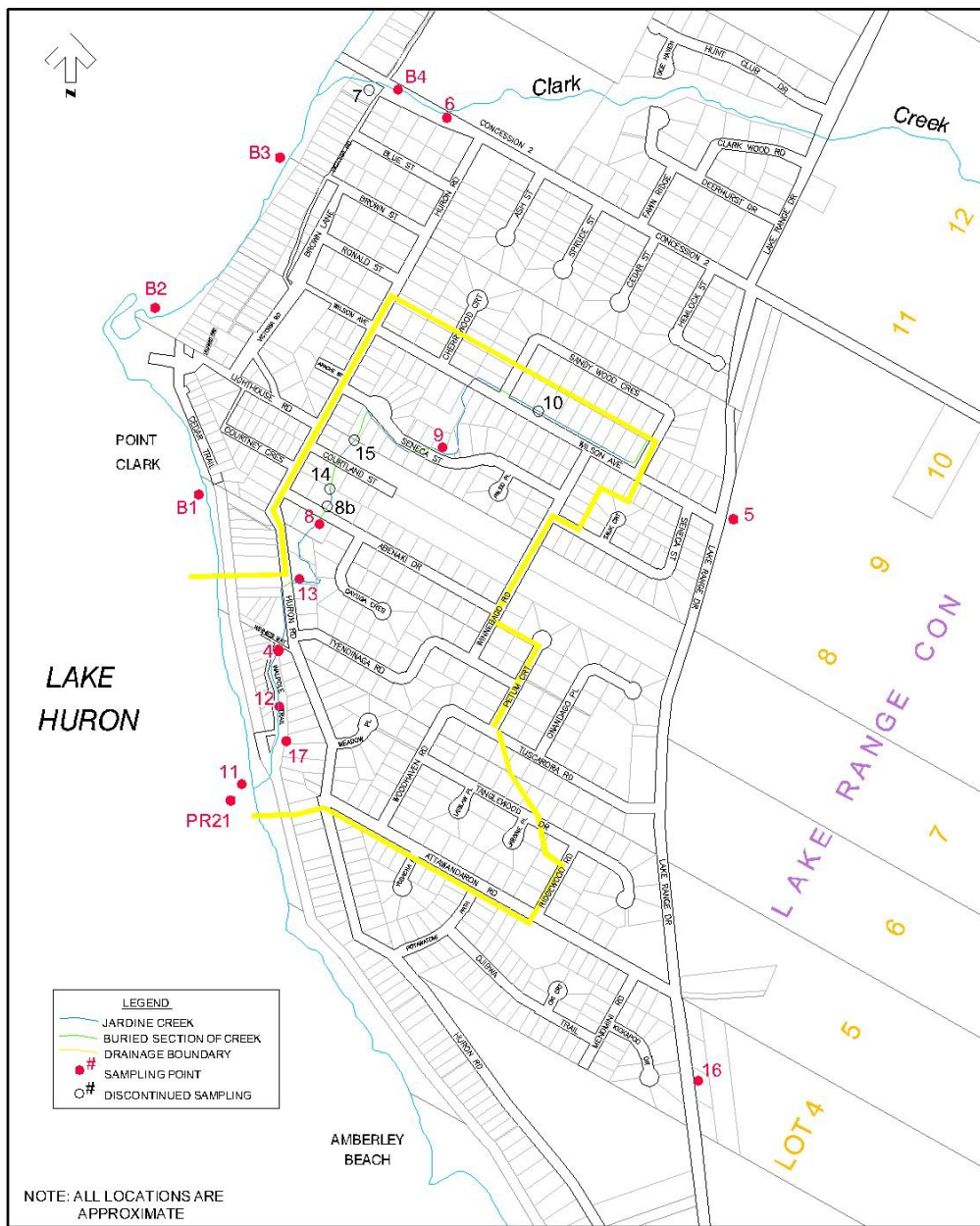


Figure 3.2: *E. coli* Spatial Trends 2023







NOTE: ALL LOCATIONS ARE APPROXIMATE

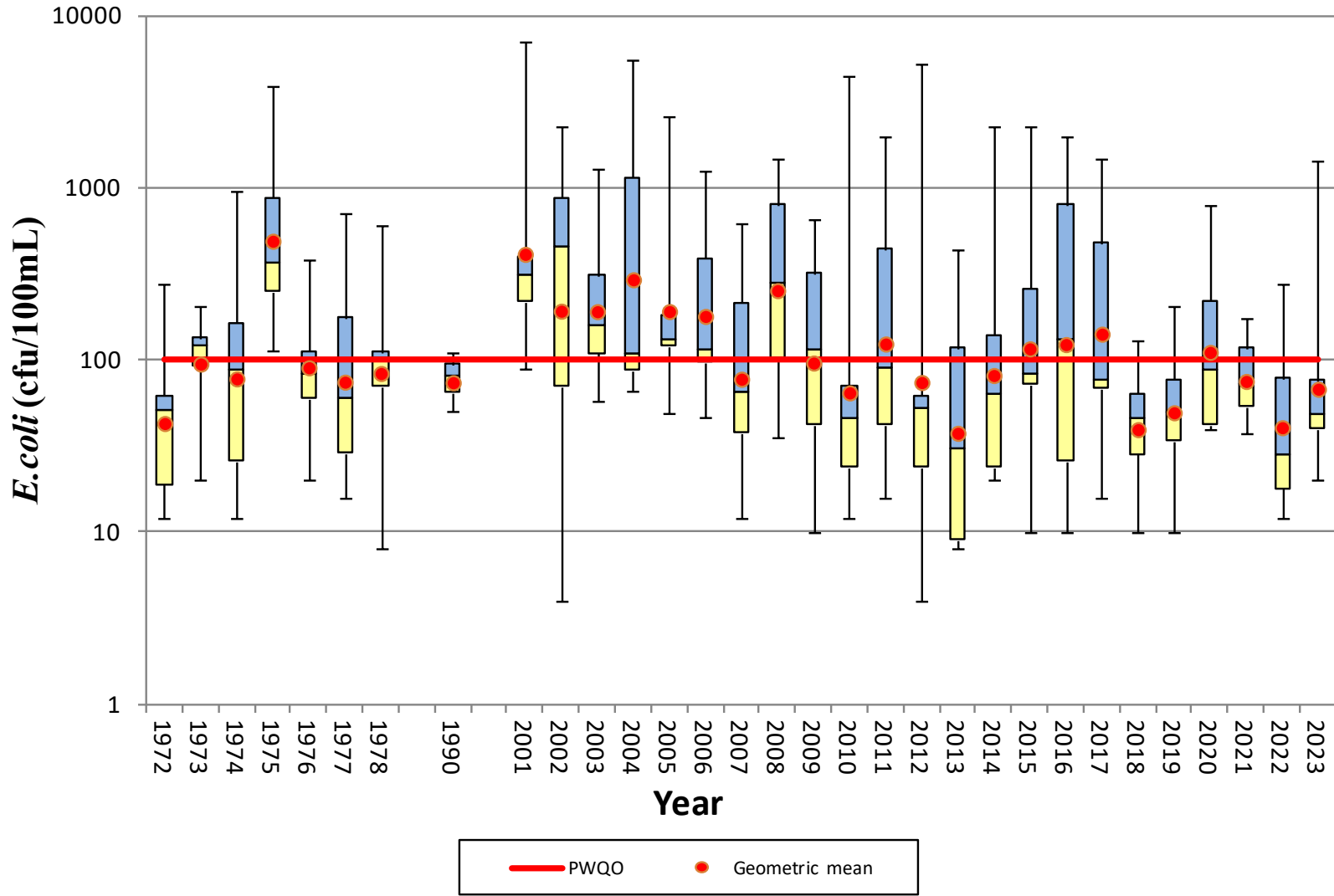


Township of Huron-Kinloss
 Point Clark
 Water Quality Monitoring Program
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 1

Figure 4.1
***E. coli* Concentrations at Site PR1**



Municipality of Huron-Kinloss
Pine River Water Quality Monitoring Program
2023 Sampling Results

GREEN	Below Guideline
RED	=> 100 cfu/100mL
GREY	No Data

E. Coli (cfu/100mL)

SAMPLE ID	LOCATION	Sample Date									
		Mar 27	April 24	May 23	Jun 19	Jul 17	Aug 15	Sep 11	Oct 10	Nov 6	
PR1	Pine River-Bridge on Lake Range Road, south of Lurgan Road	90	46	40	20	68	26	49	1420	76	
PR3	South Pine River-Bridge on Hwy. 21 at 6th Conc.	84	32	130	56	100	20	36	1800	112	
PR4	Pine River Tributary-Bridge on Hwy. 21 North of 6th Conc.	72	31	120	170	22	48	14	1440	62	
PR5	Pine River Tributary-Bridge on Hwy. 21 North of 8th Conc.	142	128	68	30	86	76	40	1580	56	
PR6	South Pine River-Bridge on Sideroad 25 North of 6th Conc.	78	40	28	60	64	108	720	3700	53	
PR7 - Upstream	Clark Creek-Culvert on Sideroad 25 South of 4th Conc.	114	< 2	6	144	56	48	220	760	16	
PR8	South Pine River-Culvert on the 15th North of 6th Conc.	40	58	144	172	228	108	62	1560	118	
PR9	Pine River-Bridge on the 15th South of 10th Conc.	94	66	34	6	160	54	90	2380	64	
PR10	Royal Oak Creek-Bridge on the 15th North of the 12th Conc.	50	156	22	66	134	78	34	6000	42	
PR11	Royal Oak Creek-Culvert on Sideroad 5 north Huron-Kincardine East	284	286	30	70	148	124	126	2620	23	
PR12	Pine River-Bridge on Huron Twp./Kinloss Twp. Boundary South of 12th Conc.	6	12	68	322	1800	80	120	920	50	
PR13	South Pine River-Bridge on Huron Twp./Kinloss Twp. Boundary South of 8th Conc.	200	46	116	370	760	720	46	1760	74	
PR17 - Upstream	Pine River Tributary-Southern Culvert on South Baseline Road North of 4th Conc.	200	98	164	170	72	82	150	1440	40	
PR18 - Upstream	Pine River Tributary- Middle Culvert on South Baseline Road North of 4th Conc.	16	26	70	76	176	64	880	900	22	
PR19 - Upstream	Clark Creek-Southern Culvert on South Baseline Road North of 2nd Conc.	24	14	26	40	92	66	10	600	22	
PR20	Beach at Hwy. 86 -Amberely Road.	2	2	< 2	2	200	22	6	20	2	
PR21	Beach off of Attawandron Road-Public Walkway	4	< 2	4	8	122	2	30	34	52	
PR22	Beach-Point Clark Swimming Area	2	4	< 2	< 2	180	8	18	12	58	
PR23	Lurgan Beach-Public Walkway	220	10	2	< 2	100	8	18	Overgrown	30	
PR24	Beach at 6th Conc.	38	4	< 2	2	320	4	8	Overgrown	26	
PR25	Beach at 8th Conc.	2	4	< 2	< 2	70	10	< 2	Overgrown	8	
PR26	Beach at 10th Conc.	4	8	< 2	< 2	34	30	2	Overgrown	2	
PR27	Boyd Creek at Hwy. 21 before Amberely	34	38	34	26	158	26	24	900	58	
PR29	Boyd Creek on Sideroad 20 North of 6th Conc.	102	74	104	296	132	70	58	1400	36	
PR30	Eighteen Mile Creek at Hwy. 21 before Amberely	380	50	80	20	92	40	48	2300	48	
PR32	Eighteen Mile Creek on the 15th North of 2nd Conc.	76	30	82	54	42	98	10	5300	60	
B4	Clark Creek at the Lake	28	20	46	30	134	20	32	780	36	
5	Ditch at field drain outlet, Lake Range Road	16	10	22	96	106	106	20	640	238	
6	New outlet to Clark Creek across from 3491 2nd Conc.	24	28	32	82	114	30	76	680	50	
8	Jardine Creek at Abenaki St.	8	66	254	296	64	108	68	196	148	
9	Jardine Creek at Seneca	30	4	Dry	Dry	< 2	94	Dry	118	14	
12	Halfway to lake from Road	70	18	30	152	134	50	Dry	164	2	
13	CSP where creek crosses Huron Rd.	14	6	146	84	90	500	1400	84	< 2	
17	Outlet in Jardine Creek between sites 11 & 12	58	8	38	125	75	28	88	880	158	

Figure 3.1 - 2023 Precipitation at Goderich, TCID: WGD

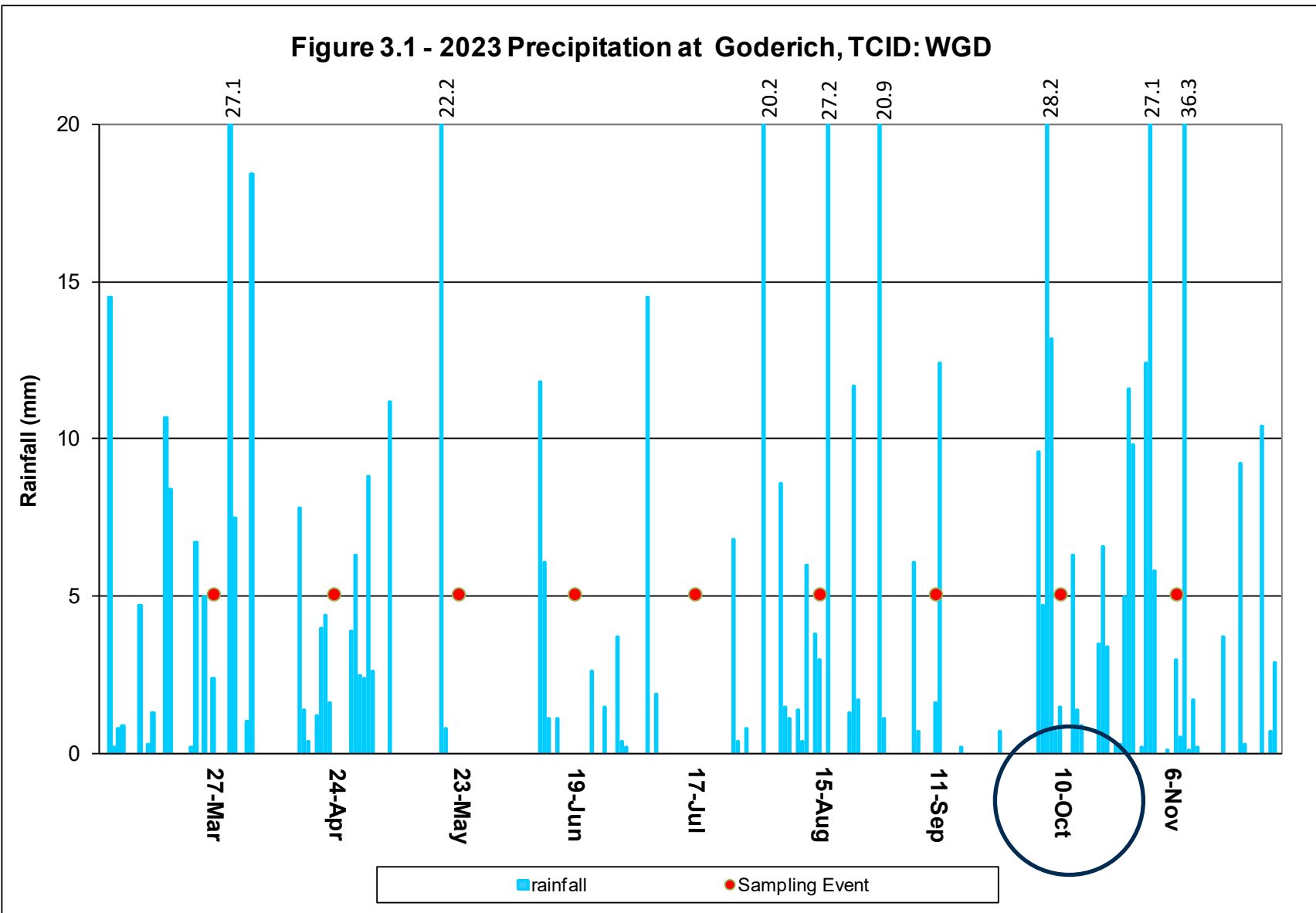


Figure 3.3: Nitrate Spatial Trends 2023

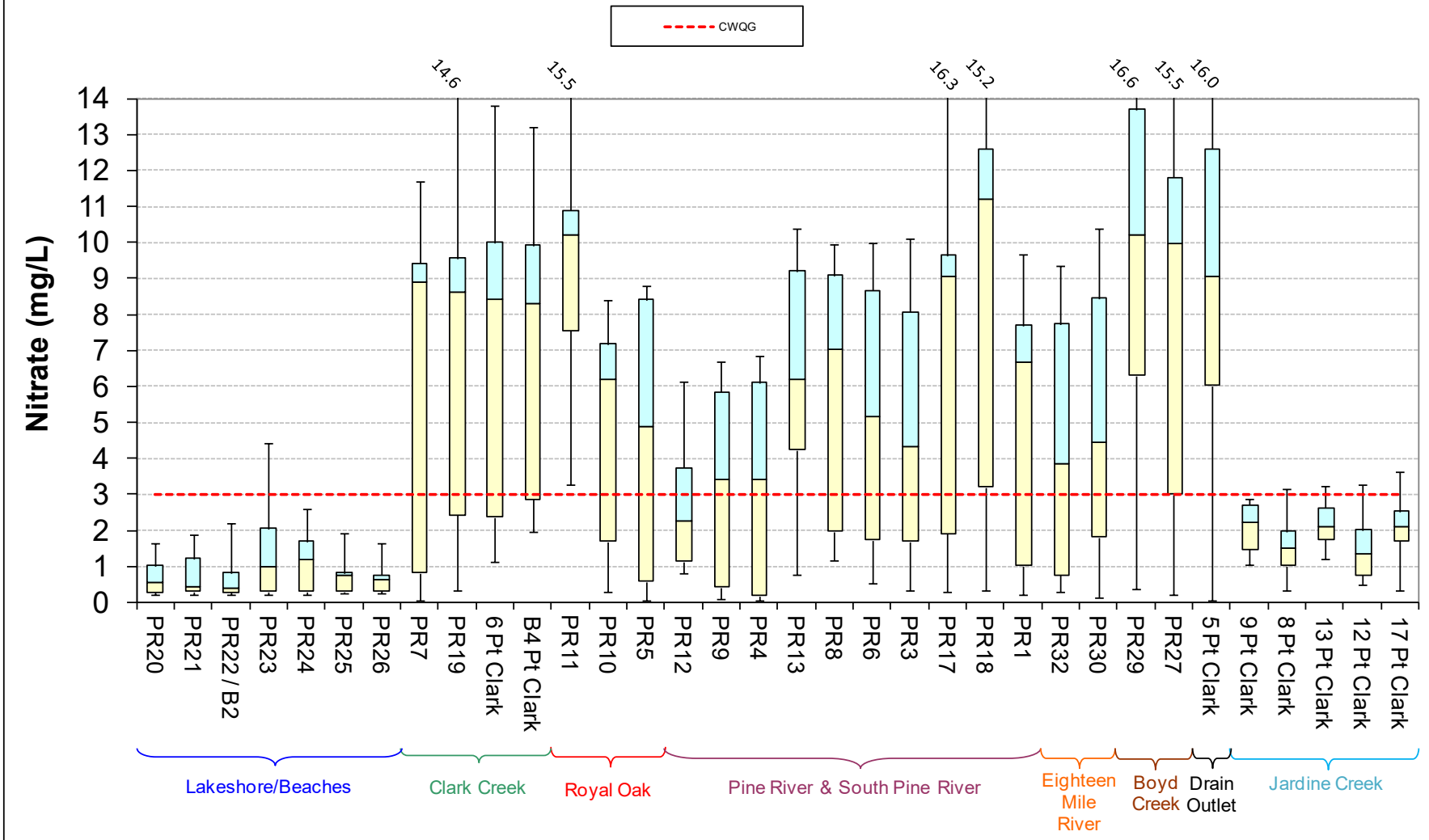
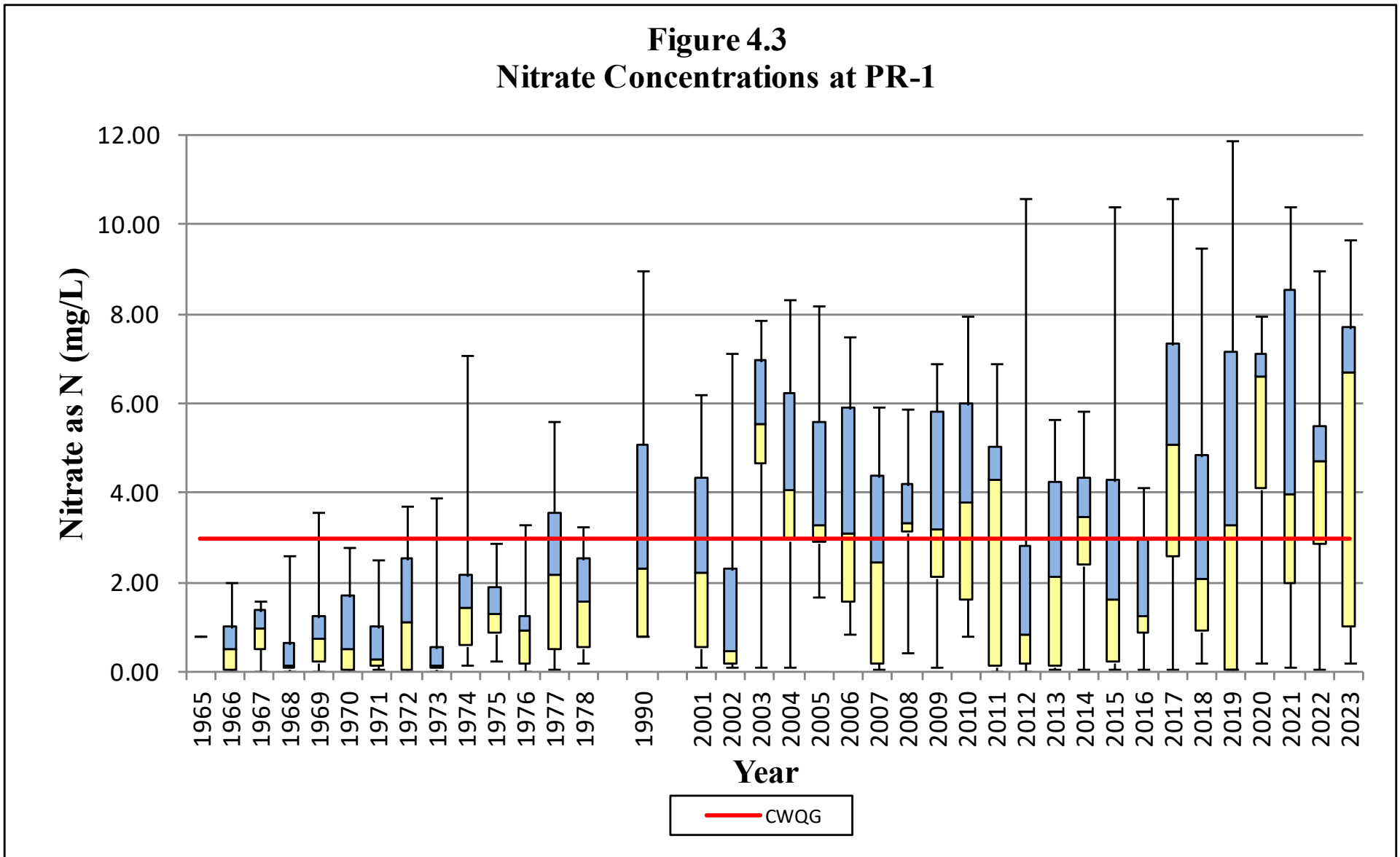
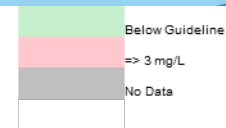


Figure 4.3
Nitrate Concentrations at PR-1



Municipality of Huron-Kinloss
Pine River Water Quality Monitoring Program
2023 Sampling Results



Nitrates as N (mg/L)

Sample Date

SAMPLE ID	LOCATION	Sample Date								
		Mar 27	April 24	May 23	Jun 19	Jul 17	Aug 15	Sep 11	Oct 10	Nov 6
PR1	Pine River-Bridge on Lake Range Road, south of Lurgan Road	6.72	4.56	9.69	0.64	6.68	1.02	0.23	8.20	7.70
PR3	South Pine River-Bridge on Hwy. 21 at 6th Conc.	7.30	4.32	10.10	0.34	3.75	1.70	0.76	8.33	8.07
PR4	Pine River Tributary-Bridge on Hwy. 21 North of 6th Conc.	5.30	3.41	6.84	0.12	1.58	0.19	< 0.06	6.10	6.24
PR5	Pine River Tributary-Bridge on Hwy. 21 North of 8th Conc.	5.45	4.87	8.81	0.58	1.89	< 0.06	0.11	8.42	8.51
PR6	South Pine River-Bridge on Sideroad 25 North of 6th Conc.	6.56	4.46	10.00	0.52	5.14	1.74	1.04	8.69	8.67
PR7 - Upstream	Clark Creek-Culvert on Sideroad 25 South of 4th Conc.	9.86	8.88	11.70	0.81	8.14	0.21	< 0.06	9.19	9.42
PR8	South Pine River-Culvert on the 15th North of 6th Conc.	7.04	5.05	9.96	1.52	9.63	1.97	1.18	9.02	9.08
PR9	Pine River-Bridge on the 15th South of 10th Conc.	5.10	3.39	6.68	0.43	3.18	0.28	0.08	6.08	5.84
PR10	Royal Oak Creek-Bridge on the 15th North of the 12th Conc.	6.21	4.72	8.41	1.68	8.14	0.91	0.28	7.18	6.39
PR11	Royal Oak Creek-Culvert on Sideroad 5 north Huron-Kincardine East	7.56	7.09	12.00	10.20	15.50	10.90	3.28	10.20	8.35
PR12	Pine River-Bridge on Huron Twp./Kinloss Twp. Boundary South of 12th Conc.	2.97	1.61	6.13	0.80	2.25	0.95	1.14	3.74	4.09
PR13	South Pine River-Bridge on Huron Twp./Kinloss Twp. Boundary South of 8th Conc.	6.00	6.18	10.40	4.24	10.20	2.70	0.76	9.20	8.29
PR17 - Upstream	Pine River Tributary-Southern Culvert on South Baseline Road North of 4th Conc.	9.00	9.05	13.70	0.29	16.30	1.91	1.44	9.34	9.65
PR18 - Upstream	Pine River Tributary-Middle Culvert on South Baseline Road North of 4th Conc.	12.00	11.20	15.20	3.20	13.50	1.73	0.32	12.60	10.00
PR19 - Upstream	Clark Creek-Southern Culvert on South Baseline Road North of 2nd Conc.	9.56	8.74	14.60	2.42	12.20	1.36	0.34	8.45	8.63
PR20	Beach at Hwy. 86 -Amberely Road.	1.44	1.01	0.53	0.26	0.64	0.30	0.23	0.28	1.65
PR21	Beach off of Attawandron Road-Public Walkway	1.21	1.33	0.43	0.22	0.43	0.30	0.29	0.33	1.89
PR22	Beach-Point Clark Swimming Area	0.82	2.20	0.50	0.20	0.40	0.31	0.28	0.28	1.42
PR23	Lurgan Beach-Public Walkway	2.25	1.59	0.75	0.23	0.97	0.29	0.29	2.06	4.41
PR24	Beach at 6th Conc.	1.69	2.23	0.34	0.21	1.17	0.29	0.29	1.18	2.60
PR25	Beach at 8th Conc.	0.80	1.92	0.31	0.27	0.82	0.32	0.29	0.99	0.74
PR26	Beach at 10th Conc.	1.40	1.64	0.41	0.25	0.64	0.32	0.26	0.70	0.75
PR27	Boyd Creek at Hwy. 21 before Amberely	9.95	8.28	15.50	3.00	10.90	0.20	0.45	11.80	12.20
PR29	Boyd Creek on Sideroad 20 North of 6th Conc.	10.20	9.39	16.60	6.31	10.60	0.76	0.38	15.10	13.70
PR30	Eighteen Mile Creek at Hwy. 21 before Amberely	6.16	4.46	10.40	2.31	1.82	0.13	0.35	9.57	8.44
PR32	Eighteen Mile Creek on the 15th North of 2nd Conc.	5.51	3.86	9.34	0.75	1.78	0.28	0.31	8.82	7.74
B4	Clark Creek at the Lake	9.91	7.58	13.20	2.87	12.60	2.32	1.98	8.62	8.31
5	Ditch at field drain outlet, Lake Range Road	9.06	11.60	15.10	12.60	16.00	0.35	0.07	6.02	8.21
6	New outlet to Clark Creek across from 3491 2nd Conc.	10.00	8.02	13.80	2.36	13.10	1.78	1.11	8.69	8.41
8	Jardine Creek at Abenaki St.	3.17	2.53	1.98	1.01	1.32	0.32	1.49	0.84	1.91
9	Jardine Creek at Seneca	2.76	1.90	Dry	Dry	1.34	2.88	Dry	1.04	2.51
12	Halfway to lake from Road	3.27	2.54	1.83	0.84	0.73	0.51	Dry	0.77	1.82
13	CSP where creek crosses Huron Rd.	3.25	3.04	2.58	2.09	1.75	1.46	1.99	1.22	2.63
17	Outlet in Jardine Creek between sites 11 & 12	3.63	2.53	1.71	2.11	1.41	0.34	2.25	1.88	2.54

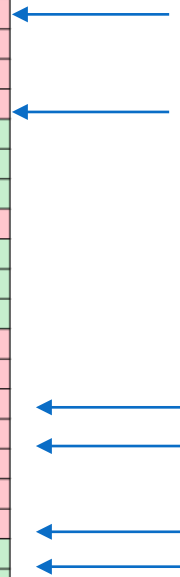


Figure 3.1 - 2023 Precipitation at Goderich, TCID: WGD

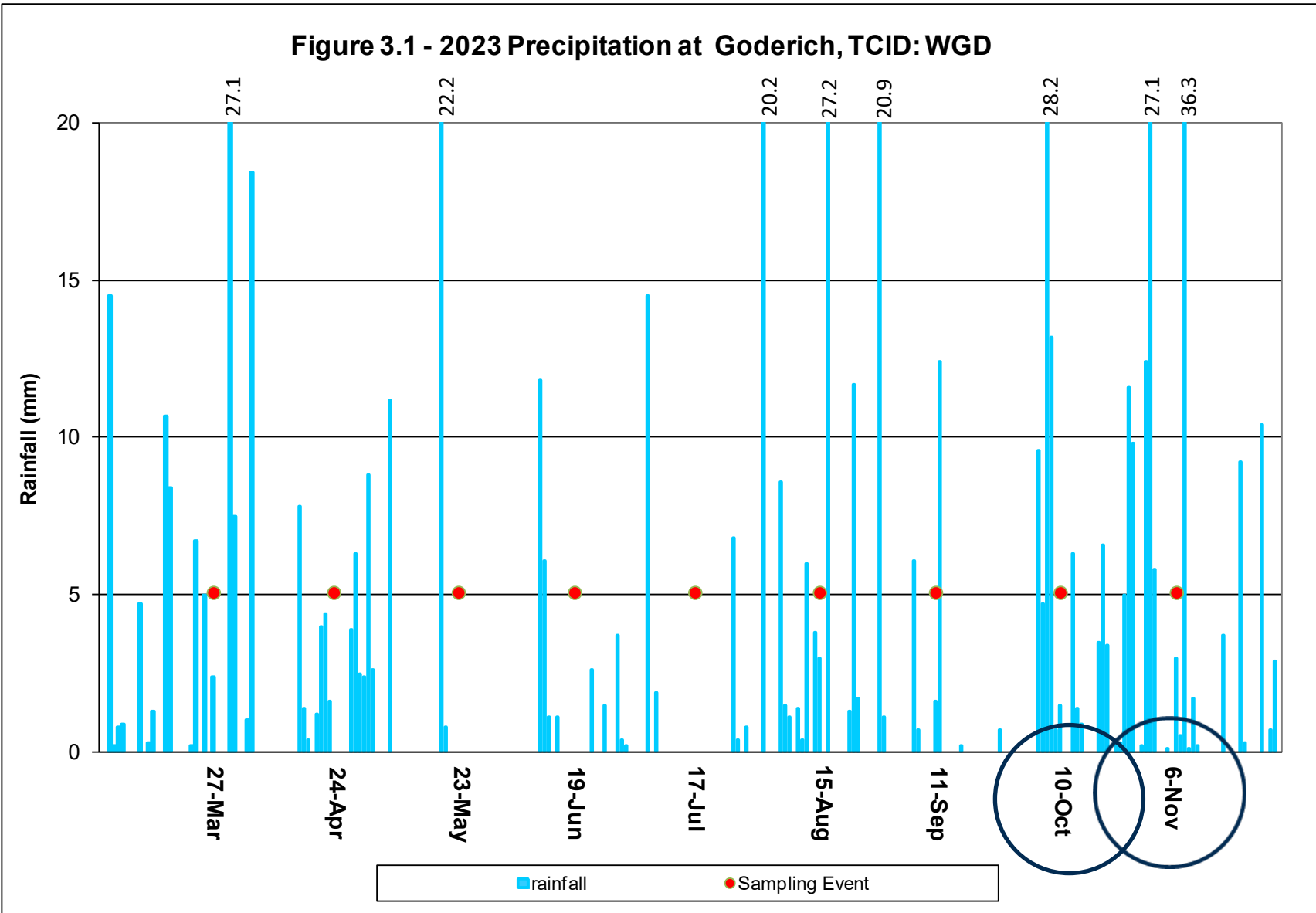


Figure 3.4: Total Phosphorus Spatial Trends 2023

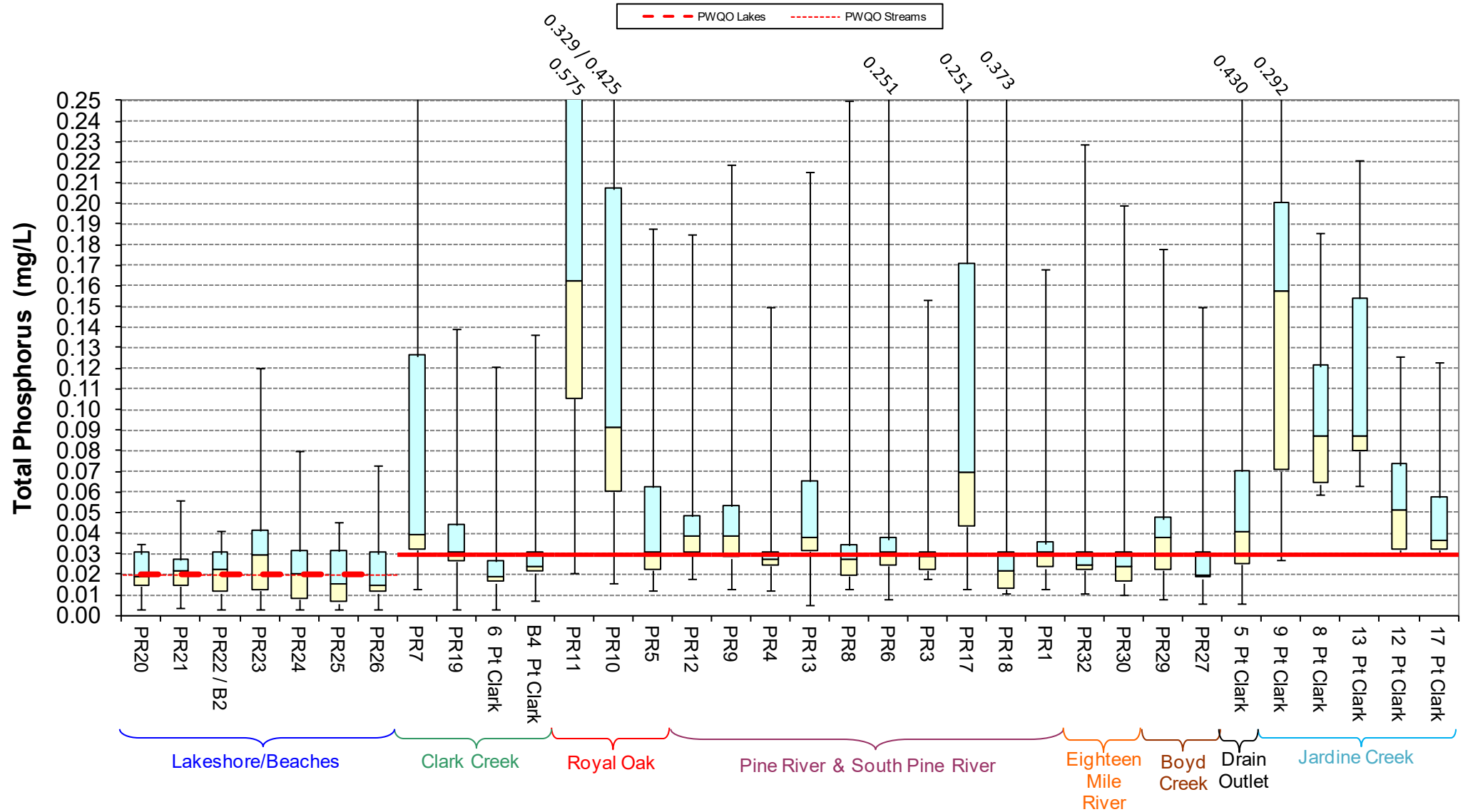
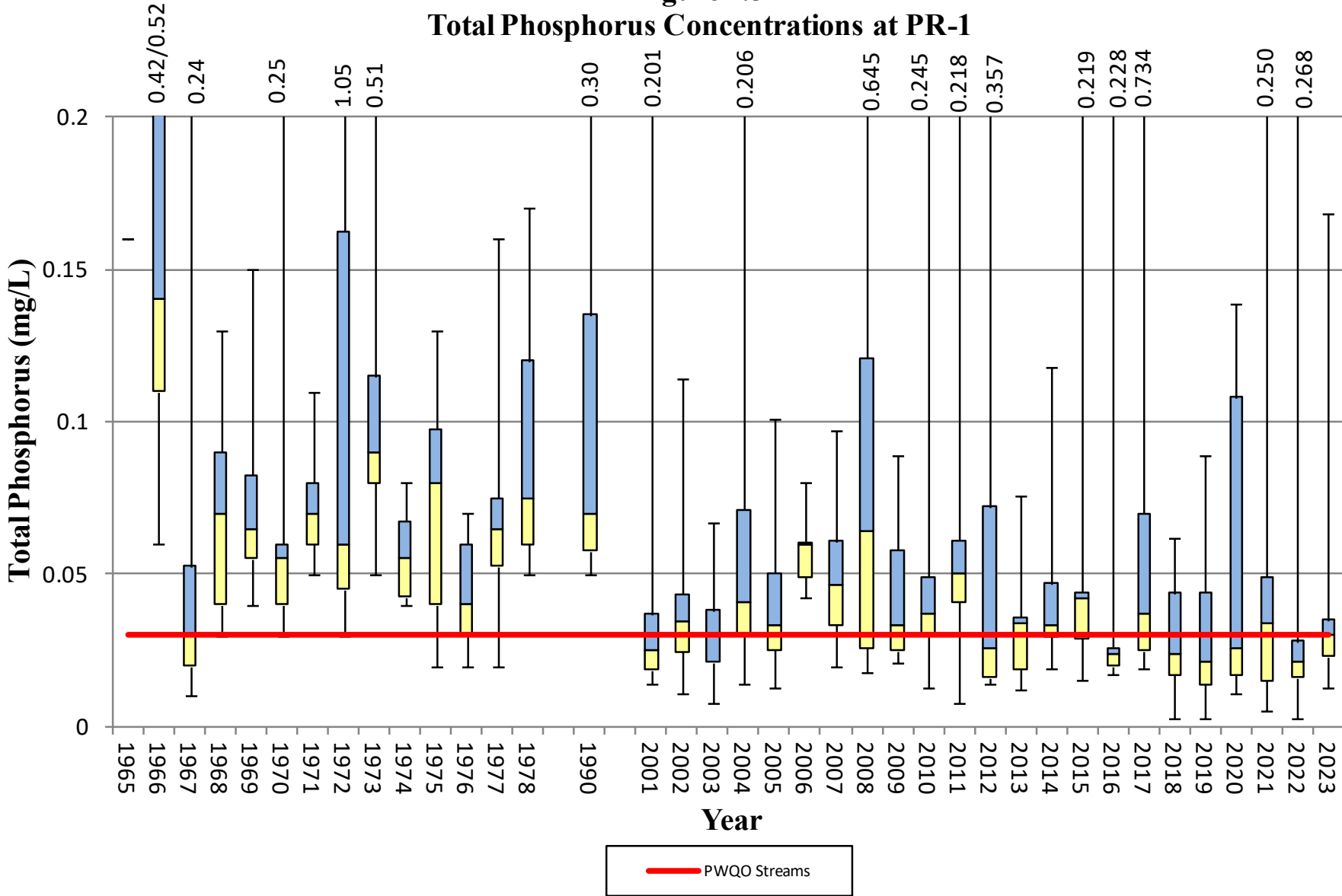


Figure 4.5
Total Phosphorus Concentrations at PR-1



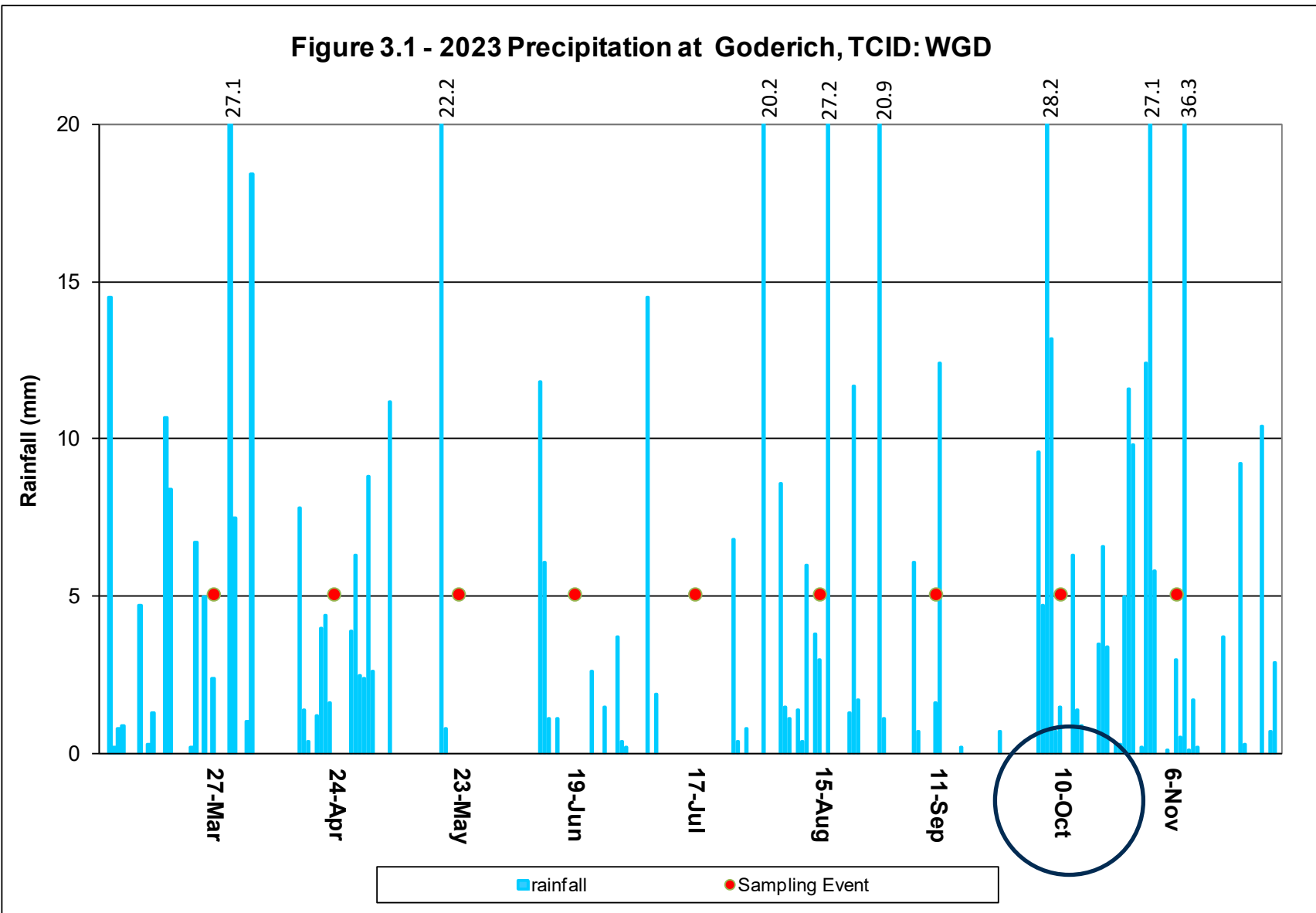
**Pine River Water Quality Monitoring Program
2023 Sampling Results**

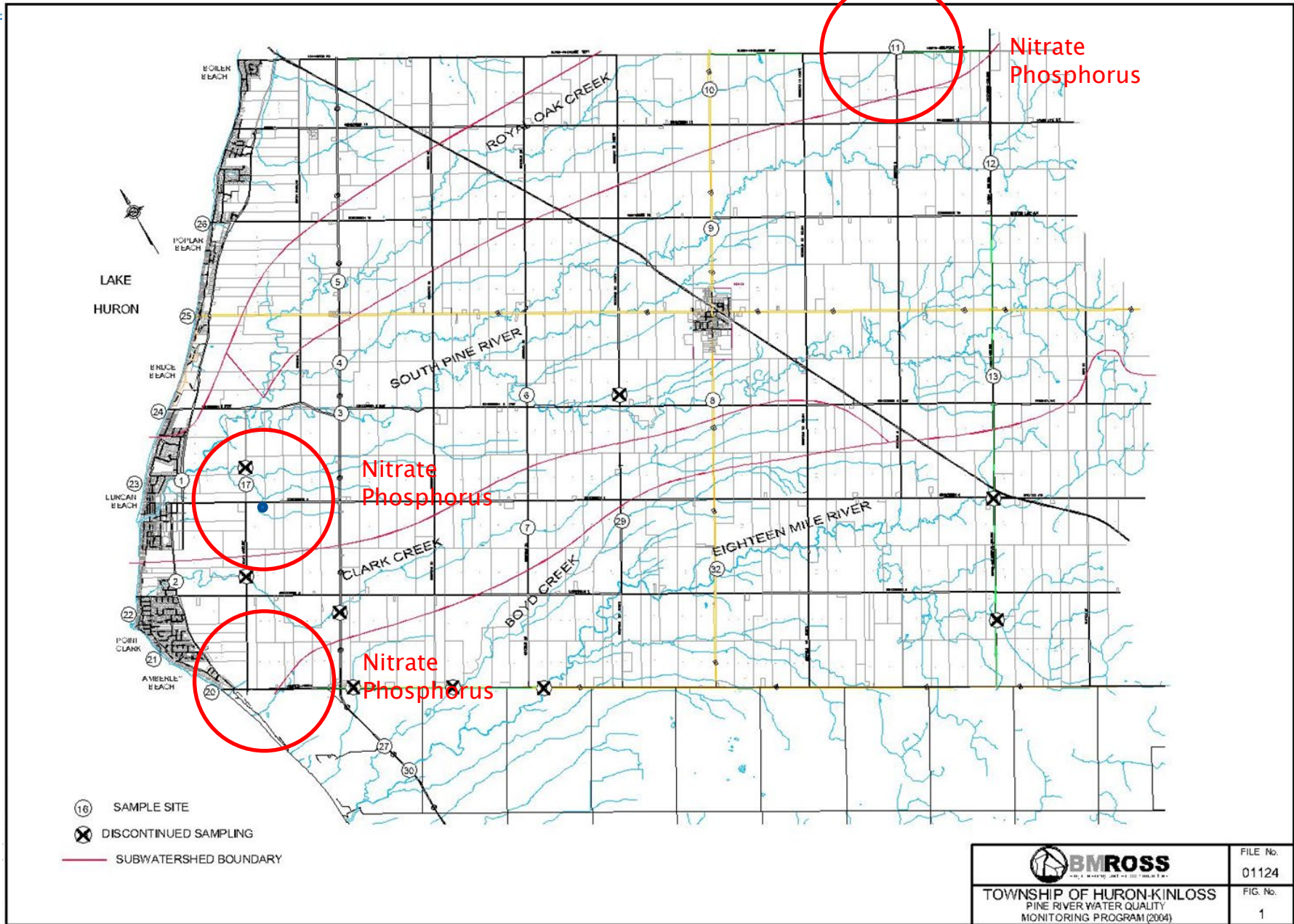
Lakes => 0.02 mg/L
Streams => 0.03 mg/L
No Data

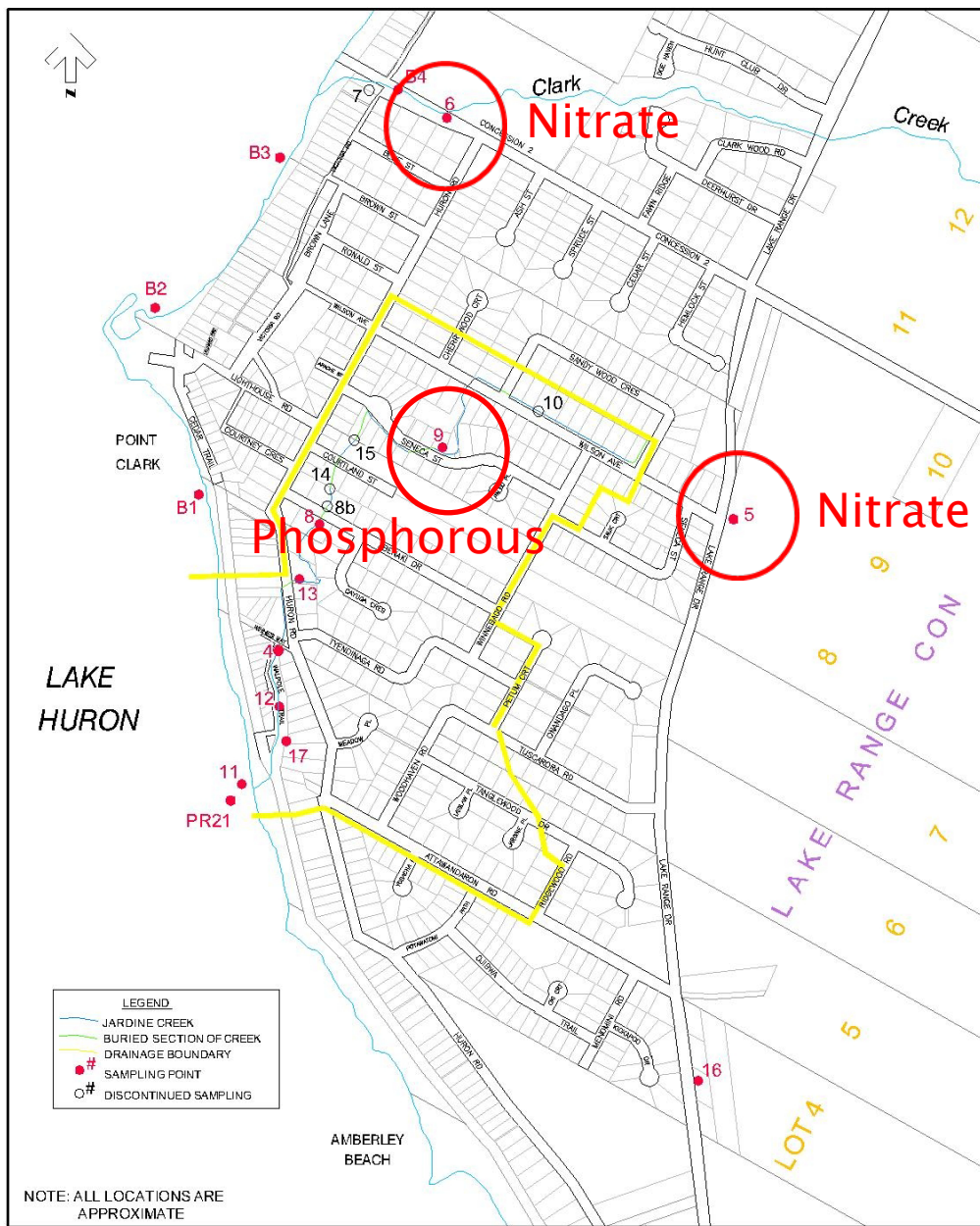
		Total Phosphorus (mg/L)								
		Sample Date								
SAMPLE ID	LOCATION	Mar 27	April 24	May 23	*Jun 19	Jul 17	Aug 15	Sep 11	Oct 10	Nov 6
PR1	Pine River-Bridge on Lake Range Road, south of Lurgan Road	0.114	0.032	0.013	< 0.03	0.024	0.023	0.021	0.168	0.035
PR3	South Pine River-Bridge on Hwy. 21 at 6th Conc.	0.097	0.029	0.018	< 0.03	0.024	0.019	0.022	0.153	0.028
PR4	Pine River Tributary-Bridge on Hwy. 21 North of 6th Conc.	0.084	0.027	0.012	< 0.03	0.015	0.025	0.024	0.150	0.028
PR5	Pine River Tributary-Bridge on Hwy. 21 North of 8th Conc.	0.114	0.022	0.018	< 0.03	0.012	0.029	0.036	0.188	0.062
PR6	South Pine River-Bridge on Sideroad 25 North of 6th Conc.	0.067	0.029	0.008	< 0.03	0.018	0.037	0.031	0.251	0.024
PR7 - Upstream	Clark Creek-Culvert on Sideroad 25 South of 4th Conc.	0.039	0.037	0.013	0.030	0.073	0.309	0.205	0.126	0.032
PR8	South Pine River-Culvert on the 15th North of 6th Conc.	0.060	0.019	0.034	< 0.03	0.013	0.027	0.018	0.250	0.019
PR9	Pine River-Bridge on the 15th South of 10th Conc.	0.039	0.013	0.085	< 0.03	0.028	0.038	0.053	0.219	0.027
PR10	Royal Oak Creek-Bridge on the 15th North of the 12th Conc.	0.091	0.049	0.016	0.060	0.110	0.207	0.22	0.293	0.068
PR11	Royal Oak Creek-Culvert on Sideroad 5 north Huron-Kincardine East	0.166	0.105	0.021	0.040	0.162	0.329	0.337	0.425	0.137
PR12	Pine River-Bridge on Huron Twp./Kinloss Twp. Boundary South of 12th Conc.	0.038	0.02	0.042	< 0.03	0.038	0.059	0.048	0.185	0.018
PR13	South Pine River-Bridge on Huron Twp./Kinloss Twp. Boundary South of 8th Conc.	0.084	0.032	0.005	< 0.03	0.037	0.039	0.065	0.215	0.031
PR17 - Upstream	Pine River Tributary-Southern Culvert on South Baseline Road North of 4th Conc.	0.043	0.069	0.013	0.040	0.068	0.251	0.171	0.211	0.079
PR18 - Upstream	Pine River Tributary- Middle Culvert on South Baseline Road North of 4th Conc.	0.012	0.013	0.021	< 0.03	0.011	0.028	0.046	0.373	0.018
PR19 - Upstream	Clark Creek-Southern Culvert on South Baseline Road North of 2nd Conc.	0.026	0.044	< 0.003	< 0.03	0.020	0.045	0.044	0.139	0.028
PR20	Beach at Hwy. 86 -Amberely Road.	0.035	0.018	< 0.003	< 0.03	0.030	0.014	0.007	0.023	0.014
PR21	Beach off of Attawandron Road-Public Walkway	0.013	0.023	0.004	< 0.03	0.056	0.021	0.014	0.019	0.027
PR22	Beach-Point Clark Swimming Area	0.022	0.025	< 0.003	< 0.03	0.041	0.011	0.007	0.011	0.038
PR23	Lurgan Beach-Public Walkway	0.120	0.041	< 0.003	< 0.03	0.014	0.012	0.004	0.052	0.029
PR24	Beach at 6th Conc.	0.080	0.048	< 0.003	< 0.03	0.017	0.008	< 0.003	0.031	0.020
PR25	Beach at 8th Conc.	0.036	0.045	< 0.003	< 0.03	0.015	0.006	< 0.003	0.031	0.009
PR26	Beach at 10th Conc.	0.052	0.073	< 0.003	< 0.03	0.014	0.012	< 0.003	0.026	0.011
PR27	Boyd Creek at Hwy. 21 before Amberely	0.041	0.017	0.006	< 0.03	0.018	0.027	0.018	0.150	0.019
PR29	Boyd Creek on Sideroad 20 North of 6th Conc.	0.039	0.011	0.008	< 0.03	0.037	0.054	0.047	0.178	0.022
PR30	Eighteen Mile Creek at Hwy. 21 before Amberely	0.089	0.012	0.01	< 0.03	0.020	0.026	0.023	0.199	0.016
PR32	Eighteen Mile Creek on the 15th North of 2nd Conc.	0.060	0.022	0.011	< 0.03	0.025	0.024	0.023	0.229	0.019
B4	Clark Creek at the Lake	0.031	0.023	0.007	< 0.03	0.017	0.023	0.021	0.136	0.021
5	Ditch at field drain outlet, Lake Range Road	0.006	0.069	0.032	0.04	0.025	0.228	0.43	0.07	0.018
6	New outlet to Clark Creek across from 3491 2nd Conc.	0.026	0.017	< 0.003	< 0.03	0.013	0.018	0.016	0.121	0.020
8	Jardine Creek at Abenaki St.	0.064	0.059	0.073	0.130	0.087	0.186	0.121	0.061	0.090
9	Jardine Creek at Seneca	0.027	0.042	Dry	Dry	0.214	0.292	Dry	0.155	0.159
12	Halfway to lake from Road	0.030	0.032	0.032	0.060	0.085	0.126	Dry	0.069	0.041
13	CSP where creek crosses Huron Rd.	0.063	0.066	0.096	0.080	0.167	0.221	0.154	0.086	0.087
17	Outlet in Jardine Creek between sites 11 & 12	0.033	0.032	0.030	< 0.03	0.057	0.123	0.073	0.045	0.036

Note *June 19 event detection limit was 0.03, results likely lower than displayed.

Figure 3.1 - 2023 Precipitation at Goderich, TCID: WGD







Township of Huron-Kinloss
 Point Clark
 Water Quality Monitoring Program
 2005

DATE
 May 12, 2005
 SCALE
 1:10,000

PROJECT No.
 93147
 FIGURE No.
 1