

Appendix G: Magnitude of Trend Tables

Table G1: Trend Magnitude Table for Non-Metals on Alberta/Saskatchewan Border – Flow-Weighted Trend

Parameter	Battle River			Beaver River			Cold River			North Saskatchewan River			Red Deer River near Bindloss			South Saskatchewan River		
	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change
Nutrients																		
Ammonia Dissolved	-0.000997	-4.87%	-9.74%	-0.001061	-8.59%	-17.2%	0.0005489	23.87%	47.73%	↔			-0.000893	-17.2%	-34.5%	-0.001221	-16.5%	-32.9%
Nitrate as N	-0.000076	-32.3%	-64.7%	-0.001441	-5.13%	-10.3%	↔			-0.006197	-13.5%	-26.9%	-0.000052	-0.11%	-0.23%	↔		
Nitrogen Total	↔			↔			0.002242	2.52%	5.04%	-0.02225	-18.6%	-37.2%	↔			0.008935	3.81%	7.62%
Phosphorous Total	0.0008223	3.59%	7.18%	↔			↔			-0.002085	-12.5%	-25.0%	-0.000367	-0.88%	-1.75%	-0.001228	-5.04%	-10.1%
Phosphorous Dissolved	↔			-0.000498	-12.3%	-24.6%	↔			-0.001425	-88.1%	-176%	-0.000099	-5.39%	-10.8%	-0.000266	-25.8%	-51.5%
Major Ions																		
Chloride Dissolved	0.2969	4.41%	8.82%	↔			-0.0125	-11.0%	-21.9%	↔			0.0908	6.33%	12.66%	0.1383	7.46%	14.92%
Fluoride Dissolved	0.001204	2.47%	4.95%	-0.000249	-0.98%	-1.95%	7.3x10 ⁻⁷	0.00%	0.01%	-0.000575%	-2.12%	-4.23%	0.0005605	1.87%	3.74%	0.001244	3.85%	7.69%
Sodium Dissolved/Filtered	0.4522	1.65%	3.31%	-0.08433	-2.79%	-5.58%	↔			↔			↔			0.1417	3.80%	7.59%
Sulphate Dissolved	0.3392	1.01%	2.01%	-0.168	-9.62%	-19.2%	-0.0676	-11.6%	-23.3%	0.3305	3.51%	7.02%	↔			0.2974	2.25%	4.50%
Total Dissolved Solids (TDS)	3.822	2.73%	5.47%	↔			↔			0.7868	1.97%	3.93%	1.337	2.22%	4.44%	1.668	3.33%	6.65%
Physicals																		
Oxygen Dissolved	↔			↔			0.08753	3.57%	7.15%	↔			↔			↔		
pH – Field	0.01343	0.81%	1.62%	0.01266	0.78%	1.56%	0.01957	1.15%	2.31%	0.00963	0.59%	1.17%	0.008754	0.52%	1.04%	0.008335	0.49%	0.99%
Sodium Adsorption Ratio (SAR)	0.00869	1.23%	2.46%	-0.001625	-1.62%	-3.24%	↔			↔			↔			0.00418	3.47%	6.95%
Total Suspended Solids (TSS)	0.3053	3.04%	6.09%	0.06881	2.74%	5.48%	↔			↔			↔			↔		

Table G2: Trend Magnitude Table for Metals on Alberta/Saskatchewan Border – Flow-Weighted Trend

Metals	Battle River			Beaver River			Cold River			North Saskatchewan River			Red Deer River near Bindloss			South Saskatchewan River		
	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change
Aluminum Total	-3.877	-4.41%	-8.83%	↔			-0.3531	-63.1%	-126%	-5.846	-3.59%	-7.19%	↔			-14.19	-4.16%	-8.32%
Boron Dissolved	Step			↔			Step			Step			Step			Step		
Cadmium Total	>20%			>20%			>20%			>20%			>20%			>20%		
Chromium Total	↔			-0.01462	-30.3%	-60.6%	>20%			-0.02566	-10.5%	-21.0%	↔			-0.02045	-5.44%	-10.9%
Cobalt Dissolved	-0.08403	-148%	-296%	-0.03641	-247%	-493%	>20%			-0.06496	-407%	-814%	-0.06755	-331%	-663%	-0.06518	-310%	-621%
Cobalt Total	↔			-0.009019	-24.6%	-49.1%	>20%			-0.01129	-7.38%	-14.8%	↔			-0.01122	-4.06%	-8.13%
Copper Dissolved	-0.09507	-35.0%	-69.9%	>20%			>20%			Step			-0.06794	-22.4%	-44.9%	-0.03875	-20.5%	-41.0%
Copper Total	-0.04362	-8.06%	-16.1%	-0.01325	-10.6%	-21.2%	>20%			-0.04298	-9.65%	-19.3%	↔			-0.04297	-5.39%	-10.8%
Iron Dissolved	↔			↔			>20%			↔			-0.2737	-4.72%	-9.43%	↔		
Iron Total	↔			Step			↔			↔			-41.63	-3.81%	-7.62%	-33.22	-7.05%	-14.1%
Lead Total	>20%			>20%			>20%			>20%			↔			>20%		
Lithium Dissolved	1.047	7.73%	15.47%	↔			↔			↔			↔			↔		
Lithium Total	-1.965	-12.9%	-25.7%	↔			↔			↔			↔			-0.1579	-8.50%	-17.0%
Manganese Dissolved	↔			-1.035	-12.9%	-25.8%	>20%			Step			↔			↔		
Manganese Total	↔			↔			↔			↔			↔			-1.208	-8.12%	-16.2%
Molybdenum Dissolved	-0.07641	-24.0%	-48.0%	-0.03355	-36.0%	-72.0%	>20%			-0.04645	-21.9%	-43.8%	-0.05906	-22.5%	-45.0%	-0.0415	-16.6%	-33.2%
Molybdenum Total	↔			-0.01301	-11.9%	-23.8%	↔			↔			↔			Step		
Nickel Total	↔			Step			>20%			↔			↔			↔		
Vanadium Total	↔			Step			Step			↔			↔			-0.03371	-5.00%	-10.0%
Zinc Dissolved	>20%			>20%			>20%			>20%			>20%			>20%		
Zinc Total	↔			↔			>20%			↔			↔			↔		

Table G3: Trend Magnitude Table for Non-Metals on Saskatchewan/Manitoba Border – Flow-Weighted Trend

Parameter	Assiniboine River			Carrot River			Churchill River			Qu'Appelle River			Red Deer River at Erwood			Saskatchewan River		
	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change
Nutrients																		
Ammonia Dissolved		↔			↔		-0.001445	-74.1%	-148%		↔		-0.000908	-6.54%	-13.1%	-0.000812	-12.6%	-25.2%
Nitrate as N	-0.000189	-0.22%	-0.44%	-0.000173	-0.39%	-0.77%		↔			↔		-0.000085	-0.12%	-0.23%	-0.000511	-2.54%	-5.09%
Nitrogen Total		↔		0.0273	8.78%	17.57%		↔			↔			↔			↔	
Phosphorous Total		↔		0.001208	4.54%	9.07%		↔		-0.002471	-7.47%	-14.9%	0.0002274	1.79%	3.57%	-0.000324	-4.06%	-8.12%
Phosphorous Total Dissolved		↔		0.0003758	6.89%	13.78%		↔		-0.001978	-9.52%	-19.0%	0.0001251	2.21%	4.42%	-0.000046	-3.18%	-6.36%
Major Ions																		
Chloride Dissolved	0.2281	4.55%	9/10%	-1.581	-5.26%	-10.5%		↔			↔		0.03487	3.36%	6.71%	0.04454	2.83%	5.66%
Fluoride Dissolved	0.001186	2.82%	5.65%	0.001082	3.01%	6.01%	0.0005355	2.68%	5.36%		↔		0.001058	3.57%	7.13%	0.0009021	3.07%	6.14%
Sodium Dissolved/Filtered	0.2992	3.04%	6.08%	-0.9035	-4.85%	-9.70%		↔		-0.5096	-1.70%	-3.39%	0.09519	2.99%	5.99%		↔	
Sulphate Dissolved	0.6101	1.20%	2.39%		↔			↔			↔			↔		0.189	1.64%	3.29%
Total Dissolved Solids (TDS)	2.987	2.12%	4.23%		↔			↔			↔		3.96	5.30%	10.61%	0.6596	1.37%	2.74%
Physicals																		
Oxygen Dissolved	-0.04643	-2.53%	-5.07%		↔			↔		-0.03806	-1.71%	-3.41%		↔		-0.03791	-1.74%	-3.49%
pH – Field		↔		0.004507	0.29%	0.57%	0.01294	0.79%	1.58%		↔			↔		0.007655	0.46%	0.92%
Sodium Adsorption Ratio (SAR)	0.004109	2.14%	4.28%	-0.02428	-5.69%	-11.4%	0.0007124	1.45%	2.89%		↔		0.001834	2.28%	4.56%		↔	
Total Suspended Solids (TSS)	0.08931	1.18%	2.37%	0.1558	1.85%	3.71%		↔			↔			↔			↔	

Table G4: Trend Magnitude Table for Metals on Saskatchewan/Manitoba Border – Flow-Weighted Trend

Metals	Assiniboine River			Carrot River			Churchill River			Qu'Appelle River			Red Deer River at Erwood			Saskatchewan River		
	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change	Rate Δ (Units/yr)	5 yr % Change	10 yr % Change
Aluminum Total	-4.129	-8.37%	-16.7%	↔			Step			-12.58	-27.8%	-55.5%	Step			-19.26	-19.5%	-39.0%
Boron Dissolved	Step			↔			Step			Step			↔			Step		
Cadmium Total	>20%			-0.008713	-149%	-299%	>20%			-0.007553	-163%	-326%	>20%			-0.0111	-259%	-519%
Chromium Total	↔			↔			>20%			-0.01356	-16.3%	-32.6%	>20%			↔		
Cobalt Dissolved	-0.5465	-58.4%	-117%	-0.0545	-62.9%	-126%	>20%			-0.03605	-73.2%	-146%	>20%			>20%		
Cobalt Total	↔			↔			>20%			↔			↔			-0.01508	-18.1%	-36.2%
Copper Dissolved	↔			↔			>20%			↔			0.03087	14.07%	28.15%	↔		
Copper Total	↔			-0.04773	-13.9%	-27.8%	↔			↔			↔			-0.0384	-9.56%	-19.1%
Iron Dissolved	↔			Step			Step			↔			Step			Step		
Iron Total	↔			↔			Step			-30.15	-31.9%	-63.8%	Step			-79.98	-48.9%	-97.7%
Lead Total	>20%			↔			>20%			>20%			>20%			-0.01739	-18.0%	-36.0%
Lithium Dissolved	1.502	12.34%	24.67%	↔			Step			↔			1.272	13.38%	46.76%	0.2796	14.08%	28.16%
Lithium Total	↔			↔			Step			-3.551	-16.6%	-33.2%	↔			↔		
Manganese Dissolved	↔			↔			↔			↔			↔			↔		
Manganese Total	↔			↔			↔			↔			Step			-1.724	-27.5%	-55.1%
Molybdenum Dissolved	-0.08232	-17.3%	-34.6%	↔			>20%			↔			0.09311	20.58%	41.17%	↔		
Molybdenum Total	↔			↔			↔			Step			0.08922	19.62%	39.25%	0.02801	11.01%	22.02%
Nickel Total	Step			Step			Step			Step			Step			↔		
Vanadium Total	↔			↔			Step			↔			Step			-0.03589	-11.2%	-22.5%
Zinc Dissolved	>20%			↔			>20%			-0.08468	-81.0%	-162%	>20%			>20%		
Zinc Total	-0.05717	-8.98%	-18.0%	↔			-0.03011	-32.7%	-65.5%	-0.1257	-26.2%	-52.4%	↔			-0.118	-19.5%	-39.1%