

Lindsay Ops Leachate  
2019

Exceeds Bylaw Value  
Exceeds PWQO Value

Parameters	CKL Sewer Bylaw Limits (mg/L)	Provincial Water Quality Objectives (mg/L)	Jan. Results (mg/L)	Feb. Results (mg/L)	Mar. Results (mg/L)	April. Results (mg/L)	April. Results (mg/L) new cell	May Results (mg/L)	June Results (mg/L)	July Results (mg/L)	August Results (mg/L)	September Results (mg/L)	October. Results (mg/L) new cell	Oct Results (mg/L)	Nov Results (mg/L)	Dec Results (mg/L)
Hardness (CaCO3)	N/A	N/A	593	596	544	653	925	557	475	628	649	664	1090	666	610	580
Alkalinity (CaCO3)	N/A	N/A	609	599	601	482	1270	528	531	693	773	759	2380	731	610	543
Biochemical Oxygen Demand (BOD)	300	N/A	<3	19	8	7	262	4	3	5	4	n/a	62	< 3	5	5
TDS	N/A	N/A	991	1005	972	928	1550	796	743	1045	1144	1258	4318	1226	1017	868
Dissolved Organic Carbon	N/A	N/A	13.1	13.4	13.5	12.9	207	14.8	12.1	16.1	18.5	1.3	130	11.4	10	8.2
COD	N/A	N/A	73	62	63	56	644	40	38	76	78	112	692	87	59	50
Chloride	N/A	N/A	176	199	198	127	27.5	107	106	138	202	307	887	278	201	146
Ammonia (N) - Total	N/A	<b>1.11</b>	<b>17.6</b>	<b>17.6</b>	<b>16.9</b>	<b>14.1</b>	<b>10</b>	<b>9.71</b>	<b>10.5</b>	<b>20.9</b>	<b>26.6</b>	<b>28.4</b>	<b>350</b>	<b>27.9</b>	<b>17.4</b>	<b>11.8</b>
Fluoride	<b>10</b>	N/A	0.2	0.1	< 0.1	< 0.1	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 3	< 0.1	< 0.1	< 0.1
Phenolic, 4AAP	<b>1</b>	<b>0.001</b>	<b>0.012</b>	<0.002	< 0.002	< 0.002	<b>0.14</b>	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulphate	N/A	N/A	45	42	48	139	10	38	34	33	22	15	121	17	49	50
Nitrite	N/A	N/A	<0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05
Nitrate	N/A	N/A	0.08	0.15	0.18	0.16	< 0.05	0.42	0.32	< 0.05	< 0.05	< 0.05	< 1	< 0.05	0.21	0.49
Kjeldahl Nitrogen - Total	<b>50</b>	N/A	19.7	20.5	20.8	17.6	<b>104</b>	10.9	10.5	25.2	30.7	35.8	<b>364</b>	35.3	18	14.9
Aluminum - Total	<b>50</b>	<b>0.075*</b>	<b>0.27</b>	<b>0.12</b>	<b>0.12</b>	<b>0.68</b>	<b>0.13</b>	<b>0.1</b>	<b>0.08</b>	<b>0.15</b>	<b>0.1</b>	<b>0.07</b>	<b>0.62</b>	<b>0.1</b>	<b>0.11</b>	<b>0.11</b>
Antimony - Total	<b>5</b>	<b>0.02</b>	<0.0005	<0.0001	< 0.0005	0.0006	0.0022	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.002	< 0.0005	< 0.0005	< 0.0005
Arsenic - Total	<b>1</b>	<b>0.1</b>	0.0024	0.0013	0.0008	0.0013	0.0107	0.0013	0.0009	0.0026	0.0012	0.0014	0.0189	0.0013	0.0015	0.0012
Barium	N/A	N/A	0.331	0.297	0.253	0.245	0.362	0.211	0.159	0.394	0.382	0.471	0.82	< 0.462	0.313	0.226
Beryllium	N/A	<b>1.1**</b>	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	N/A	0.2	<b>0.382</b>	<b>0.426</b>	<b>0.37</b>	<b>0.299</b>	<b>2.95</b>	<b>0.281</b>	<b>0.278</b>	<b>0.509</b>	<b>0.54</b>	<b>0.632</b>	<b>9.68</b>	<b>0.605</b>	<b>0.411</b>	<b>0.3</b>
Cadmium - Total	<b>0.7</b>	<b>0.0002</b>	<0.00007	<0.00015	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Calcium	N/A	N/A	179	175	160	211	273	184	154	184	186	180	267	182	184	185
Chromium - Total	<b>2.8</b>	<b>0.0099</b>	0.017	0.011	0.012	0.161	0.013	0.004	0.001	0.013	< 0.001	0.004	0.037	0.003	0.01	0.004
Cobalt - Total	<b>5</b>	<b>0.0009</b>	0.0013	0.007	0.0013	0.0025	0.0052	0.0009	0.0011	0.0015	0.001	0.0011	0.0159	0.0013	0.001	0.0008
Copper - Total	<b>2</b>	<b>0.005</b>	0.0042	0.0011	0.0011	0.0062	0.011	0.001	0.0015	0.0021	< 0.0005	< 0.0005	0.008	< 0.0005	0.0006	0.0011
Iron	<b>N/A</b>	<b>0.3</b>	<b>27.7</b>	<b>11</b>	<b>5.64</b>	<b>21</b>	<b>7.96</b>	<b>20.9</b>	<b>10.8</b>	<b>45.5</b>	<b>14.4</b>	<b>15.1</b>	<b>59.6</b>	<b>11.8</b>	<b>13.9</b>	<b>13</b>
Lead - Total	<b>1</b>	<b>0.005</b>	0.0025	0.00012	0.0002	0.0016	0.0016	0.0004	0.0001	0.0005	< 0.0001	< 0.0001	0.0013	0.0002	0.0005	0.0002
Magnesium	N/A	N/A	35.3	38.6	35.1	30.6	59.1	23.6	21.9	40.9	44.8	52	104	51.3	36.6	28.5
Manganese - Total	<b>5</b>	N/A	0.45	0.363	0.355	0.618	0.63	0.439	0.35	0.447	0.379	0.299	0.837	0.272	0.404	0.416
Mercury - Total	<b>0.01</b>	<b>0.0002</b>	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum - Total	<b>5</b>	<b>0.04</b>	<0.0005	0.0002	< 0.0005	0.0022	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0021	< 0.0005	0.0007	< 0.0005
Nickel - Total	<b>2</b>	<b>0.025</b>	0.01	0.01	0.01	<b>0.07</b>	<b>0.03</b>	< 0.01	< 0.01	0.01	< 0.01	0.01	<b>0.09</b>	0.01	0.01	< 0.01
Potassium	N/A	N/A	18.1	21.3	19.1	14.5	139	11.7	10.8	24	27.4	28.9	260	31.5	19	12.8
Phosphorus	N/A	N/A	<0.1	<0.1	< 0.1	0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.3	< 0.1	< 0.1	< 0.1
Phosphorus - Total	<b>10</b>	<b>0.01</b>	<b>0.05</b>	<b>0.03</b>	<b>0.03</b>	<b>0.1</b>	<b>0.29</b>	<b>0.05</b>	<b>0.02</b>	<b>0.05</b>	<b>0.03</b>	<b>0.03</b>	<b>3.21</b>	<b>0.06</b>	<b>0.02</b>	<b>0.04</b>
Selenium - Total	<b>1</b>	<b>0.1</b>	<0.005	<0.0001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.012	< 0.005	< 0.005	< 0.005
Silver - Total	<b>0.4</b>	<b>0.0001</b>	<0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	N/A	N/A	121	136	123	97.6	257	81.6	73	136	149	168	740	179	124	91.6
Strontium	N/A	<b>10 bq/L</b>	0.64 mg/L	0.715 mg/L	0.622	0.678	1.35	0.572	0.515	0.774	0.732	0.794	2.73	82.80%	0.679	0.6
Thallium	N/A	<b>0.0003</b>	<0.0003	<0.0005	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Vanadium	N/A	<b>0.006</b>	0.0018	0.0009	0.0008	0.0025	0.0074	0.0009	0.0005	0.0018	0.0007	0.001	0.0239	0.001	0.001	0.0007
Zinc - Total	<b>2</b>	<b>0.03</b>	0.023	0.009	<b>0.03</b>	<b>0.035</b>	<b>0.034</b>	0.009	< 0.005	0.006	< 0.005	0.005	<b>0.185</b>	< 0.005	0.018	< 0.005
Benzene	<b>0.01</b>	<b>0.1</b>	0.0023	0.0007	0.0006	< 0.5	0.0007	< 0.0005	<0.0016	0.0006	< 0.0005	0.0018	0.0017	< 0.0005	0.0015	0.0019
Toluene	<b>0.02</b>	<b>0.0008</b>	<0.0005	<0.0005	<0.0005	< 0.0005	<b>0.0126</b>	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	<b>0.06</b>	<b>0.008</b>	0.0027	<0.0005	<0.0005	< 0.0005	0.0006	< 0.0005	<0.0011	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0008
Xylene, m, p -	N/A	N/A	0.0042	<0.001	<0.001	< 0.001	0.0012	<0.001	<0.0011	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene, o -	N/A	<b>0.04</b>	0.0005	<0.0005	< 0.0005	< 0.0005	0.0006	<0.0005	<0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Xylene, m, p, o -	N/A	N/A	0.0042	<0.0011	< 0.0011	< 0.0011	0.0018	<0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011

Parameters	Limits	Provincial Water Quality Objectives	Jan. Results	Feb. Results	Mar. Results	April. Results	Apr. Results New Cell	May. Results	June. Results	July. Results	Aug. Results	Sept. Results	Oct. Results New Cell	Oct Results	Nov Results	Dec Results
pH (at 25 °C)	6.0 - 9.5	6.5 - 8.5	7.34	7.68	7.6	7.34	7.74	7.13	7.35	6.95	7.4	7.28	7.87	7.66	7.6	7.37
Conductivity (at 25 °C)	N/A	N/A	1750 µm ho/cm	1780 µm ho/cm	1790 µmho/cm	1590 µmho/cm	3490 µmho/cm	1370 µmho/cm	1350 µmho/cm	1860 µmho/cm	2000 µmho/cm	2160 µmho/cm	7050 µmho/cm	2110 µmho/cm	1750 µmho/cm	1540 µmho/cm
Conductivity (calculated)	N/A	N/A	1650 µm ho/cm	1720 µm ho/cm	1664 µmho/cm	1563 µmho/cm	2403 µmho/cm	1344 µmho/cm	1267 µmho/cm	1692 µmho/cm	1928 µmho/cm	2141 µmho/cm	6453 µmho/cm	2103 µmho/cm	1725 µmho/cm	1479 µmho/cm
Anion Sum	N/A	N/A	18.1 meq/L	18.5 meq/L	18.6 meq/L	16.1 meq/L	26.4 meq/L	14.4 meq/L	14.3 meq/L	18.4 meq/L	21.6 meq/L	24.1 meq/L	75.1 meq/L	22.8 meq/L	18.9 meq/L	16 meq/L
Cation Sum	N/A	N/A	20.3 meq/L	20.2 meq/L	18.2 meq/L	18.7 meq/L	34.4 meq/L	16.8 meq/L	14.3 meq/L	23 meq/L	22.8 meq/L	24.1 meq/L	88.5 meq/L	24.5 meq/L	20.1 meq/L	17.4 meq/L
% Difference	N/A	N/A	5.77%	4.51%	1.09%	7.29%	13.10%	7.78%	0.18%	11.00%	0.02%	8.17%	3.55%	2.94%	415.00%	
Ion Ratio (AS/CS)	N/A	N/A	0.891	0.914	1.02	0.864	0.769	0.856	1	0.801	0.948	1	0.849	0.931	0.943	0.92
Sodium Adsorption Ratio	N/A	N/A	2.16	2.42	2.29	1.66	3.68	1.5	1.46	2.36	2.54	2.84	9.73	3.02	2.18	1.66
TDS (calc.) / EC (actual)	N/A	N/A	0.567	0.565	0.542	0.585	0.444	0.58	0.551	0.561	0.572	0.582	0.612	0.581	0.582	0.562
Langelier Index (at 25°C)	N/A	N/A	0.875	1.19	1.08	0.845	1.77	0.635	0.78	0.543	1.05	0.903	2.12	1.27	1.14	0.88

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Hardness (CaCO3)	N/A	N/A	609	616	556	574	370	602	654	694						
Alkalinity (CaCO3)	N/A	N/A	579	560	529	603	442	626	697	710						
Biochemical Oxygen Demand (BOD)	300	N/A	5	5	< 3	4	4	3	5	5						
TDS	N/A	N/A	896	927	791	906	1095	936	1076	1148						
Dissolved Organic Carbon	N/A	N/A	11.1	12.9	10.9	10.6	34.4	12.4	11.6	15.8						
COD	N/A	N/A	44	51	35	73	104	54	63	80						
Chloride	N/A	N/A	135	162	116	136	274	142	185	215						
Ammonia (N) - Total	N/A	N/A	13.6	12.8	10.6	16.6	0.31	16.2	21.2	25.4						
Fluoride	10	N/A	< 0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1						
Phenolic, 4AAP	1	0.001	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002						
Sulphate	N/A	N/A	46	44	42	45	94	39	34	29						
Nitrite	N/A	N/A	< 0.05	< 0.05	< 0.05	< 0.05	0.07	0.06	< 0.05	< 0.05						
Nitrate	N/A	N/A	0.11	0.18	0.36	0.16	8.54	0.15	0.09	0.91						
Kjeldahl Nitrogen - Total	50	N/A	15.8	15.8	13.2	18	4.1	19.1	27.8	33.3						
Aluminum - Total	50	0.075*	0.18	0.06	0.09	0.09	0.07	0.08	0.02	0.09						
Antimony - Total	5	0.02	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0009	< 0.0005	0.0012	< 0.0005						
Arsenic - Total	1	0.1	0.0022	0.0016	0.0014	0.0012	0.0018	0.001	0.0055	0.0012						
Barium	N/A	N/A	0.299	0.27	0.213	0.23	0.076	0.255	0.353	0.427						
Beryllium	N/A	1.1**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002						
Boron	N/A	0.2	0.356	0.327	0.259	0.334	2.74	0.324	0.519	0.559						
Cadmium - Total	0.7	0.0002	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070						
Calcium	N/A	N/A	192	196	182	179	83.3	188	194	202						
Chromium - Total	2.8	0.0099	0.023	0.048	0.001	0.004	0.004	0.001	0.003	0.001						
Cobalt - Total	5	0.0009	0.0008	0.0009	0.001	0.0009	0.0039	0.0008	0.0046	0.0012						
Copper - Total	2	0.005	0.0021	0.0006	0.0036	< 0.0005	0.0055	< 0.0005	0.0022	0.0006						
Iron	N/A	0.3	33.6	26	21.3	15.3	0.226	14.8	16.4	15.3						
Lead - Total	1	0.005	0.0005	0.0004	0.0002	< 0.0001	0.0002	< 0.0001	0.0006	0.0001						
Magnesium	N/A	N/A	31.4	30.7	24.5	30.9	39.4	32.1	41.2	45.9						
Manganese - Total	5	N/A	0.487	0.44	0.424	0.431	0.026	0.463	0.408	0.361						
Mercury - Total	0.01	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00013	< 0.00002	< 0.00002						
Molybdenum - Total	5	0.04	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0017	< 0.0005	0.0009	< 0.0005						
Nickel - Total	2	0.025	< 0.01	0.01	< 0.01	< 0.01	0.03	< 0.01	0.01	0.01						
Potassium	N/A	N/A	14.6	15.2	11.8	16.3	94.4	16.9	22.4	27.5						
Phosphorus	N/A	N/A	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.04						
Phosphorus - Total	10	0.01	0.03	0.03	0.02	0.01	0.05	0.02	0.02	< 0.1						
Selenium - Total	1	0.1	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005						
Silver - Total	0.4	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001						
Sodium	N/A	N/A	95.8	100	75.4	99.5	244	107	137	155						
Strontium	N/A	10 bq/L	0.664	0.641	0.54	0.6	0.671	0.644	0.73	0.734						
Thallium	N/A	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003						
Vanadium	N/A	0.006	0.0015	0.0007	0.0008	0.0006	0.0017	0.0006	0.0036	0.0008						
Zinc - Total	2	0.03	0.006	0.006	0.007	< 0.005	0.363	< 0.005	0.013	< 0.005						
Benzene	0.01	0.1	0.0014	0.001	0.0012	0.0015	< 0.0005	0.0016	0.0013	0.0014						
Toluene	0.02	0.0008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005						
Ethylbenzene	0.06	0.008	0.0003	0.0006	0.0007	0.0007	< 0.0005	0.0007	0.0006	< 0.0005						
Xylene, m, p -	N/A	N/A	0.0019	< 0.0001	< 0.0001	0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001						
Xylene, o -	N/A	0.04	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005						
Xylene, m, p, o -	N/A	N/A	0.002	0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011						

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pH (at 25 °C)	6.0 - 9.5	6.5 - 8.5	7.27	7.6	7.29	8.00	8.54	7.53	7.31	7.36						
Conductivity (at 25 °C)	N/A	N/A	1590	1590	1430	1600	2010	1650	1840	2010						
Conductivity (calculated)	N/A	N/A	1448	1557	1309	1530	1852	1584	1814	1954						
Anion Sum	N/A	N/A	16.3	16.7	14.7	16.8	19.1	17.3	19.9	20.9						
Cation Sum	N/A	N/A	18.5	19.4	15.8	18.2	20.5	19.1	22	23.9						
% Difference	N/A	N/A	6.32%	7.33%	3.62%	3.96%	3.34%	4.76%	5.07%	671.00%						
Ion Ratio (AS/CS)	N/A	N/A	0.881	0.863	0.93	0.924	0.935	0.909	0.903	0.874						
Sodium Adsorption Ratio	N/A	N/A	1.69	1.75	1.39	1.81	5.52	1.9	2.33	2.56						
TDS (calc.) / EC (actual)	N/A	N/A	0.564	0.582	0.554	0.568	0.545	0.567	0.584	0.571						
Langelier Index (at 25°C)	N/A	N/A	0.823	1.14	0.791	1.53	1.59	1.1	0.929	1						