



Decew Falls Water Treatment Plant

Regional Municipality of Niagara

2022 Annual Water Quality Report

(Prepared under Ontario Regulation 170/03)

January 1 to December 31, 2022

Ministry of the Environment, Conservation and Parks

Municipal Drinking Water License # 007-102

Drinking Water Works Permit # 007-202

Decew Falls Water Treatment Plant - 2022 Annual Water Quality Report

This annual water quality report summarizes the quality of drinking water from the Decew Falls Water Treatment Plant, drinking water system number 220002066, from January 1 to December 31, 2022.

This report satisfies the requirements of Ontario Regulation 170/03 – Drinking Water Systems.

Description of Drinking Water System

A conventional surface water treatment plant incorporates the following steps in its purification process:

- Zebra mussel control
- Travelling screens
- Coagulation
- Flocculation
- Sedimentation
- Filtration
- Disinfection

The plant consists of three separate treatment trains; referred to as Plant 1, Plant 2, and Plant 3, with a combined rated capacity of 227,300 m³/day. Primary disinfection is achieved utilizing sodium hypochlorite with ultraviolet light as enhancement.

The Decew Falls Water Treatment Plant supplies drinking water to the City of St. Catharines (260003279), City of Thorold (260004313), Town of Niagara-on-the-Lake (260001380), and sections of the Town of Lincoln (260004306) in the Niagara region. The Water Treatment Plant is located at 2700 Decew Road.

The water treatment chemicals used over this reporting period are:

- Sodium Hypochlorite
- Aluminum Sulphate

Monetary Expenses Incurred

To ensure safe and efficient operations, the following major repairs or upgrade projects took place:

Water Treatment Plant Infrastructure/ System Infrastructure

York road Water main – Design

Stork Road Water main Replacement – Design

Bypass Channel – Design

Reservoir and Storage Program Decew Berm - Design

Decew Valve house Rehab – Design

Plant 1 GAC Replacement – Design

Water main Replacement Vineland - Design

Virgil Elevated tank – construction completed 2022

Plant 3 Contract 1 – construction and completion

Plant 3 Contract 2/LLP Upgrades – Design

Downing St Transmission Main Replacement – construction and completion
 High lift Rightsizing – Design
 Intake and Valve House Rehab – Design
 Meter Replacement Gatehouse – Design
 Victoria Ave Water main - Design
 Plant 2 Upgrades – Design
 Decew UV Upgrade – Conceptual design
 Plant 1 and 2 Mixing System – Design

Summary of Adverse Water Quality Incidents

The following table summarizes the notices of adverse water quality incidents submitted in accordance with the Safe Drinking Water Act. Adverse water quality incidents are reported to the Spills Action Centre and the Medical Officer of Health.

Where there have been no adverse water quality incidents for the reporting period, the table will show “NIL”.

Incident Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
2022/07/28	Decew Falls Drinking Water Sytem	Filter 14 was found without a flow to the turbidity meter when the filter was in service.	Flow was restored to filter 14(0.30 L/min), and grab samples were taken for all three filters.	2022 /07/28
2022/11/01	Decew Falls Drinking Water System	Flushing fire hydrant (42001031) at 590 York Road staff had a chlorine residual of 0.00 mg/L	Flushed hydrants to representative residuals (all results 0.90mg/L or greater) Took Bacti sample as per Public Health	2022/11/01

Water Quality Test Results

Reported results that are shown with “ND” (non-detect) instead of a numerical value indicates that the sample result is below the lowest possible detection limit for the parameter.

Microbiological Testing

Microbiological testing carried out under Schedule 10 of Ontario Regulation 170/03 – Drinking Water systems, during this reporting period.

Location	Number of Samples	Range of E.Coli Results (minimum number)-(maximum number)	Range of Total Coliform Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure
Raw	50	0 - 30	0 – 3,400	Not applicable	CFU/100ml
Treated	152	0	0	Not detectable	CFU/100ml
Distribution	262	0	0 - 12	Not detectable	CFU/100ml

*Prescribed standards are copied from Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards.

Heterotrophic Plate Count Testing

Heterotrophic plate count (HPC) testing is conducted on some treated and distribution system samples. The HPC test is used as a tool to monitor overall quality, but the results are not indicators of water safety. There is no prescribed standard for HPC.

Location	Number of Samples	Range of HPC Results (minimum number)-(maximum number)	Unit of Measure
Treated	152	0 - 5	CFU/ml
Distribution	262	0 - 14	CFU/ml

Operational Testing

Operational testing carried out under Schedule 7 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. An analyzer continuously monitors the water treatment process and records results on a predetermined frequency. Where continuous monitors are used, 8760 is reflected as the number of samples.

Parameter	Number of Samples	Range of Results (minimum number)-(maximum number)	Unit of Measure
Filter Turbidity	8760	0.016 – 0.256	NTU*
Treated Chlorine	8760	0.52- 1.90	mg/L

*NTU (nephelometric turbidity units) is a unit that measures the lack of water clarity.

Additional Testing

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of Legal Instrument Issued	Location: Parameter	Date Sampled	Result Value or Range (minimum number)-(maximum number)	Requirement	Unit of Measure
Municipal Drinking Water License Issue 12 August 13, 2021	Environmental Discharge: Free Chlorine Residual	Weekly (January – December)	0	< 0.02	mg/L
Municipal Drinking Water License Issue 12 August 13, 2021	Environmental Discharge: Total Suspended Solids	Weekly (January – December)	< 3-146	25 (annual average)	mg/L
Municipal Drinking Water License Issue 12 August 13, 2021	Raw: Microcystin	Weekly (June – October)	ND – 0.00018	0.0015*	mg/L
Municipal Drinking Water License Issue 12 August 13, 2021	Treated: Microcystin	Weekly (June – October)	ND – 0.00017	0.0015*	mg/L

*Prescribed standards are copied from Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards.

Inorganic Testing

Inorganic parameter testing carried out under Schedule 13 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. Inorganic substances include heavy metals and dissolved minerals that may be present in treated drinking water.

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Antimony	4	2022-12-14	< 0.0005	0.006	mg/L	No
Arsenic	4	2022-12-14	< 0.001	0.01	mg/L	No
Barium	4	2022-12-14	0.017	1.0	mg/L	No
Boron	4	2022-12-14	0.013	5.0	mg/L	No
Cadmium	4	2022-12-14	< 0.0001	0.005	mg/L	No
Chromium	4	2022-12-14	0.002	0.05	mg/L	No
Fluoride	4	2022-12-14	< 0.06	1.5	mg/L	No
Mercury	4	2022-12-14	< 0.0001	0.001	mg/L	No

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Nitrate	4	2022-12-14	0.06	1.0	mg/L	No
Nitrite	4	2022-12-14	< 0.05	10.0	mg/L	No
Selenium	4	2022-12-14	0.0029	0.05	mg/L	No
Sodium	4	2022-12-14	11.221	20	mg/L	No
Uranium	4	2022-12-14	< 0.001	0.02	mg/L	No

*Prescribed standards are copied from Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards. The prescribed standard for sodium is copied from Ontario Regulation 170/03 – Drinking Water Systems.

Lead Testing

Lead testing carried out under Schedule 15.1 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period.

Location	Number of Samples	Last Sample Date	Range of Lead Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Treated	8	2022-11-15	ND	0.010	mg/L	No
Distribution	8	2022-11-15	ND	0.010	mg/L	No

*Prescribed standards are copied from Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards.

Organic Testing

Organic parameter testing carried out under Schedule 13 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. Trace organic test parameters include: volatile organic substances, pesticides, solvents, dioxins, PCB's, and disinfection by-products.

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
1,1-Dichloroethylene (vinylidene chloride)	4	2022-11-15	ND	0.014	mg/L	No
1,2-Dichlorobenzene	4	2022-11-15	ND	0.2	mg/L	No
1,2-Dichloroethane	4	2022-11-15	ND	0.005	mg/L	No
1,4-Dichlorobenzene	4	2022-11-15	ND	0.005	mg/L	No
2,3,4,6-Tetrachlorophenol	4	2022-11-15	ND	0.1	mg/L	No
2,4,6-Trichlorophenol	4	2022-11-15	ND	0.005	mg/L	No

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
2,4-Dichlorophenoxy acetic acid (2,4-D)	4	2022-11-15	ND	0.1	mg/L	No
2-4 Dichlorophenol	4	2022-11-15	ND	0.9	mg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	4	2022-11-15	ND	0.1	mg/L	No
Alachlor	4	2022-11-15	ND	0.005	mg/L	No
Atrazine + N-dealkylated metabolites	4	2022-11-15	ND	0.005	mg/L	No
Azinphos-methyl	4	2022-11-15	ND	0.02	mg/L	No
Benzene	4	2022-11-15	ND	0.001	mg/L	No
Benzo(a)pyrene	4	2022-11-15	ND	0.00001	mg/L	No
Bromoxynil	4	2022-11-15	ND	0.005	mg/L	No
Carbaryl	4	2022-11-15	ND	0.09	mg/L	No
Carbofuran	4	2022-11-15	ND	0.09	mg/L	No
Carbon Tetrachloride	2	2022-11-15	ND	0.002	mg/L	No
Chlorpyrifos	2	2022-11-15	ND	0.09	mg/L	No
Diazinon	2	2022-11-15	ND	0.02	mg/L	No
Dicamba	2	2022-11-15	ND	0.12	mg/L	No
Dichloromethane	2	2022-11-15	ND	0.05	mg/L	No
Diclofop-methyl	2	2022-11-15	ND	0.009	mg/L	No
Dimethoate	2	2022-11-15	ND	0.02	mg/L	No
Diquat	2	2022-11-15	ND	0.07	mg/L	No
Diuron	2	2022-11-15	ND	0.15	mg/L	No
Glyphosate	2	2022-11-15	ND	0.28	mg/L	No
HAA – Distribution (latest running annual average)		2022-11-15	0.016	0.080 (running annual average)	mg/L	No
Malathion	2	2022-11-15	ND	0.19	mg/L	No
Metolachlor	2	2022-11-15	ND	0.05	mg/L	No
Metribuzin	2	2022-11-15	ND	0.08	mg/L	No
Monochlorobenzene		2022-11-15	ND	0.08	mg/L	No
Paraquat	2	2022-11-15	ND	0.01	mg/L	No
Pentachlorophenol	2	2022-11-15	ND	0.06	mg/L	No
Phorate	2	2022-11-15	ND	0.002	mg/L	No
Picloram	2	2022-11-15	ND	0.19	mg/L	No

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Polychlorinated Biphenyls (PCB)	2	2022-11-15	ND	0.003	mg/L	No
Prometryne	2	2022-11-15	ND	0.001	mg/L	No
Simazine	2	2022-11-15	ND	0.01	mg/L	No
Terbufos	2	2022-11-15	ND	0.001	mg/L	No
Tetrachloroethylene	2	2022-11-15	ND	0.01	mg/L	No
THM – Distribution (latest running annual average)	12	2022-10-05	0.023	0.100 (running annual average)	mg/L	No
Triallate	2	2022-11-15	ND	0.23	mg/L	No
Trichloroethylene	2	2022-11-15	ND	0.005	mg/L	No
Trifluralin	2	2022-11-15	ND	0.045	mg/L	No
Vinyl Chloride	4	2021-11-17	ND	0.001	mg/L	No

*Prescribed standards are copied from Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards.

Parameters Exceeding Prescribed Half-Standard

Any inorganic or organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of prescribed standards documented in Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards or prescribed standards documented within Ontario Regulation 170/03 – Drinking Water Systems for large municipal residential drinking water systems.

Where there have been no instances of a half-standard exceedance for the reporting period, the table will show “NIL”.

Parameter	Result Value or Range (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Date of Sample
Sodium	13.8	<=20	mg/L	2022-11-15
	15.4	<=20	mg/L	2022-02-16
	18.2	<=20	mg/L	2022-05-25
	15.4	<=20	mg/L	2022-08-17
	17.9	<=20	mg/L	2022-05-30
	12.5	<=20	mg/L	2022-08-02
	11.2	<=20	mg/L	2022-05-02
	10.8	<=20	mg/L	2022-05-12
	11.8	<=20	mg/L	2022-08-08
	10.2	<=20	mg/L	2022-11-16
	11.1	<=20	mg/L	2022-02-07

Parameter	Result Value or Range (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Date of Sample
Sodium	14.3	<=20	mg/L	2022-05-02
	16.6	<=20	mg/L	2022-08-02
	12.8	<=20	mg/L	2022-11-21
	12.3	<=20	mg/L	2022-02-02
	13.6	<=20	mg/L	2022-05-12
	13	<=20	mg/L	2022-08-08
	11.4	<=20	mg/L	2022-11-16

*Prescribed standards are copied from Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards. The prescribed standard for sodium is copied from Ontario Regulation 170/03 – Drinking Water Systems.