

Deacon Reservoir Outlet



Deacon Reservoir is a storage reservoir just east of Winnipeg. There are 4 open cells at Deacon, which together hold 8.8 billion litres, enough water to supply Winnipeg for about 20 days. We rechlorinate the water with chlorine gas as it leaves Deacon Reservoir. We add sufficient chlorine to maintain a free chlorine residual of at least 0.3 mg/L in the water before it is rechlorinated in the regional pumping stations. Before the water leaves Deacon Reservoir, we also add to the water precise amounts of fluoride (to prevent tooth decay) and orthophosphate (forms a protective coating inside water pipes as part of our Lead Control Program).

We test the water entering and leaving Deacon Reservoir every week during warm weather and every two weeks during the winter. We track seasonal variations in water quality as the water passes through the aqueduct and Deacon Reservoir.

At Deacon Reservoir we test for

- ▶ Routine water chemistry
- ▶ Taste and odour compounds
- ▶ Metals
- ▶ Disinfection by-products
- ▶ Bacteria and protozoa
- ▶ Toxins produced by algae

In addition to this routine testing, the Province subsidizes the cost of testing the water for further contaminants including:

- ▶ Metals
- ▶ Herbicides and pesticides
- ▶ PCBs

What is Being Measured	How it's Measured	Guideline or Regulation	Deacon Reservoir Average	Deacon Reservoir Range	Comments
Odour	odour number	inoffensive	70	10 to >200	Raw water - guideline does not apply
Geosmin	parts per trillion	no guideline	3	less than 2 to 34	Common taste and odour compound
IPMP - 2- isopropyl-3-methoxypyrazine	parts per trillion	no guideline	<2	<2	Common taste and odour compound
IBMP - 2-isobutyl-3-methoxypyrazine	parts per trillion	no guideline	<2	<2	Common taste and odour compound
MIB - 2-methylisoborneol	parts per trillion	no guideline	<10	<10	Common taste and odour compound
246 TCA - 2,4,6-trichloroanisole	parts per trillion	no guideline	<2	<2	Common taste and odour compound
236 TCA - 2,3,6-trichloroanisole	parts per trillion	no guideline	<2	<2	Common taste and odour compound
345 TCV - 3,4,5-trichloroveratrole	parts per trillion	no guideline	<2	<2	Common taste and odour compound
Plankton (algae) count	cells per millilitre	no guideline	29,300	900 to 285,000	Algae contribute to odours and cause filter clogging
Chlorophyll-a	parts per billion	no guideline	3.7	<1.0 to 11.5	Chlorophyll is found in algae
Microcystin LR	parts per billion	no more than 1.5	<0.3	<0.3	Raw water - guideline does not apply
Cryptosporidium	oocysts per 100 litres	no guideline	<1	<1 to 1	42 samples taken in 2001 - 1 positive result
Giardia	cysts per 100 litres	no guideline	<1	<1 to 3.3	42 samples taken in 2001 - 1 positive result
Turbidity (clearness)	units	no more than 1.0	0.78	0.25 to 5.3	Raw water - guideline does not apply
Colour, True	units	no more than 15	5	<5 to 5	Raw water - guideline does not apply
Total Dissolved Solids	mg/L	no more than 500	98	88 to 110	Raw water - guideline does not apply
Conductivity	microsiemens per centimetre	no guideline	164	151 to 176	Another measure of dissolved solids
pH	units	between 6.5 and 8.5	7.34	7.14 to 7.49	Raw water - guideline does not apply
Temperature	° C	no more than 15	9.2	0.8 to 22.6	Raw water - guideline does not apply
Total Alkalinity	parts per million as calcium carbonate	no guideline	77.2	68 to 93.5	–
Total Hardness	parts per million as calcium carbonate	no guideline	81.8	78.7 to 86.2	80 to 100 parts per million is recommended
Total Organic Carbon	parts per million	no guideline	10.3	9.1 to 12	–
Total Inorganic Carbon	parts per million	no guideline	18	16 to 21	–
Total Kjeldahl Nitrogen (TKN)	parts per million	no guideline	1.0	0.5 to 1.8	TKN is a combination of ammonia and organic nitrogen
Total Phosphorus	parts per million	no guideline	0.017	0.012 to 0.023	Phosphorous can contribute to algae growth
Total Particulate Phosphorus	parts per million	no guideline	0.0008	0.002 to 0.014	–
Total Soluble Phosphorus	parts per million	no guideline	0.010	0.007 to 0.012	–
Ammonia Dissolved	parts per million	no guideline	0.04	0.01 to 0.06	–
Nitrate	parts per million	no more than 10	0.03	0.01 to 0.07	Raw water - guideline does not apply
Chloride	parts per million	no more than 250	6.7	4.9 to <10	Raw water - guideline does not apply
Sulfate	parts per million	no more than 500	2.8	2.4 to <10	Raw water - guideline does not apply
Chlorine (combined)	parts per million	no more than 3	<0.08	<0.08 to 0.22	Raw water - guideline does not apply
Chlorine (free)	parts per million	no guideline	<0.05	<0.05	–
Trihalomethanes	parts per billion	no more than 100	53	9.8 to 125	Raw water - guideline does not apply

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Haloacetic acids	parts per billion	no guideline	50.6	14.7 to 98.9	Guideline under review by Health Canada
Carbofuran	parts per billion	no more than 0.09	<0.2	<0.2 to <2	Note: Guideline is lower than detection limit
Propoxur	parts per billion	no guideline	<0.2	<0.2 to <2	–
Aldrin	parts per billion	no more than 0.7 (Aldrin+Dieldrin)	<0.01	<0.01	Meets the guideline
Lindane (gamma-BHC)	parts per billion	no guideline	<0.01	<0.01 to <0.02	–
alpha-Chlordane	parts per billion	no guideline	<0.01	<0.01	–
gamma-Chlordane	parts per billion	no guideline	<0.01	<0.01	–
Chlordane-Cis	parts per billion	no guideline	<0.01	no range available	–
Chlordane-Trans	parts per billion	no guideline	<0.01	no range available	–
p,p-DDT	parts per billion	no guideline	<0.01	<0.01 to <0.03	–
Dieldrin	parts per billion	no more than 0.7 (Aldrin+Dieldrin)	<0.02	<0.02	Meets the guideline
Heptachlor	parts per billion	no guideline	<0.02	<0.02	–
Heptachlor Epoxide	parts per billion	no guideline	<0.01	<0.01	–
Methoxychlor	parts per billion	no more than 900	<0.04	<0.04	Meets the guideline
alpha-BHC	parts per billion	no guideline	<0.02	<0.02	–
beta-BHC	parts per billion	no guideline	<0.03	<0.03	–
delta-BHC	parts per billion	no guideline	<0.01	<0.01	–
p,p-DDD	parts per billion	no guideline	<0.03	<0.03	–
o,p-DDE	parts per billion	no guideline	<0.01	<0.01 to <0.04	–
p,p-DDE	parts per billion	no guideline	<0.01	<0.01	–
Endosulfan 1	parts per billion	no guideline	<0.01	<0.01	–
Endrin	parts per billion	no guideline	<0.02	<0.02	–
Mirex	parts per billion	no guideline	<0.02	<0.02	–
Simazine	parts per billion	no more than 10	<0.1	<0.1 to <0.5	Meets the guideline
Alachor	parts per billion	no guideline	<0.2	<0.2 to <2	–
Atrazine	parts per billion	no more than 5	<0.1	<0.1 to <0.5	Meets the guideline
Bromacyl	parts per billion	no guideline	<0.2	<0.2 to <1	–
Metribuzin	parts per billion	no more than 80	<0.2	<0.2 to <1	Meets the guideline
Azinphos methyl	parts per billion	no more than 20	<2	<1 to <5	Meets the guideline
Chlorpyrifos	parts per billion	no more than 900	<0.1	<0.1 to <0.8	Meets the guideline
Diazinon	parts per billion	no more than 20	<0.03	<0.03 to <0.5	Meets the guideline
Dimethoate	parts per billion	no more than 20	<0.2	<0.2 to <1	Meets the guideline
Malathion	parts per billion	no more than 190	<0.2	<0.2 to <0.9	Meets the guideline
Parathion	parts per billion	no more than 50	<0.2	<0.2	Meets the guideline
Terbufos	parts per billion	no more than 1	<0.5	<0.5 to <0.7	Meets the guideline

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Methyl Parathion	parts per billion	no guideline	<0.2	<0.2 to <0.6	–
Ethyl Parathion	parts per billion	no guideline	<0.9	no range available	–
2,4-D	parts per billion	no more than 100	<0.05	<0.05 to <0.5	Meets the guideline
2,4-DB	parts per billion	no guideline	<0.05	<0.05 to <0.5	–
2,4-DP	parts per billion	no guideline	<0.05	<0.05 to <0.5	–
2,4,5-T	parts per billion	no guideline	<0.05	<0.05 to <0.5	–
2,4,5-TP	parts per billion	no guideline	<0.05	<0.05 to <0.5	–
Bromoxynil	parts per billion	no more than 5	<0.02	<0.02 to <0.2	Meets the guideline
Dicamba	parts per billion	no more than 120	<0.02	<0.02 to <0.2	Meets the guideline
Dinoseb	parts per billion	no more than 10	<0.05	<0.05	Meets the guideline
MCPA	parts per billion	no guideline	<0.05	<0.05	–
MCPB	parts per billion	no guideline	<0.05	<0.05	–
MCPP	parts per billion	no guideline	<0.05	<0.05	–
Trichlopyr	parts per billion	no guideline	<0.05	<0.05	–
Deltamethrin	parts per billion	no guideline	<0.04	<0.04	–
Diclofop-methyl	parts per billion	no more than 9	<0.1	<0.1	Meets the guideline
Eptam	parts per billion	no guideline	<0.2	<0.2	–
Ethafuralin	parts per billion	no guideline	<0.02	<0.02	–
Propachlor	parts per billion	no guideline	<0.2	<0.2 to <2	–
Propanil	parts per billion	no guideline	<0.2	<0.2 to <2	–
Triallate	parts per billion	no guideline	<0.1	<0.1 to <1	–
Trifluralin	parts per billion	no more than 0.045	<0.03	<0.03	Meets the guideline
Chlorthalonil	parts per billion	no guideline	<0.06	<0.06 to <5	–
Arochlor 1016	parts per billion	no guideline	<0.1	<0.1	–
Arochlor 1221	parts per billion	no guideline	<0.1	<0.1	–
Arochlor 1232	parts per billion	no guideline	<0.1	<0.1	–
Arochlor 1242	parts per billion	no guideline	<0.1	<0.1 to <0.4	–
Arochlor 1248	parts per billion	no guideline	<0.1	<0.1 to <0.2	–
Arochlor 1254	parts per billion	no guideline	<0.1	<0.1 to <0.4	–
Arochlor 1260	parts per billion	no guideline	<0.1	<0.1	–
Calcium	parts per million	no guideline	21.8	18.8 to 23.7	Contributes to hardness
Magnesium	parts per million	no guideline	6.09	5.20 to 6.60	Contributes to hardness
Sodium	parts per million	no more than 200	2.10	1.80 to 2.30	Raw water - guideline does not apply
Potassium	parts per million	no guideline	1.23	1.00 to 1.30	–
Iron	parts per million	no more than 0.30	0.06	<0.03 to 0.08	Raw water - guideline does not apply

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Copper	parts per million	no more than 1.0	<0.05	<0.05	Raw water - guideline does not apply
Lead	parts per million	no more than 0.010	<0.002	<0.002	Raw water - guideline does not apply
Aluminum	parts per million	no guideline	<0.03	<0.03	–
Arsenic	parts per million	no more than 0.025	<0.002	<0.002	Raw water - guideline does not apply
Chromium	parts per million	no more than 0.05	<0.0003	<0.0003	Raw water - guideline does not apply
Nickel	parts per million	no guideline	<0.0010	<0.0010	–
Cadmium	parts per million	no more than 0.005	<0.00003	<0.00003	Raw water - guideline does not apply
Manganese	parts per million	no more than 0.05	<0.05	<0.05	Raw water - guideline does not apply
Zinc	parts per million	no more than 5.0	<0.052	<0.05	Raw water - guideline does not apply
Antimony	parts per million	no more than 0.006	0.0004	0.0004 to <0.001	Raw water - guideline does not apply
Barium	parts per million	no more than 1.0	0.015	0.012 to 0.019	Raw water - guideline does not apply
Beryllium	parts per million	no guideline	<0.0002	<0.0002 to <0.001	–
Bismuth	parts per million	no guideline	<0.0002	<0.0002	–
Boron	parts per million	no more than 5	0.0125	0.01 to 0.02	Raw water - guideline does not apply
Cesium	parts per million	no guideline	<0.0004	no range available	–
Cobalt	parts per million	no guideline	<0.0002	<0.0002	–
Lithium	parts per million	no guideline	0.0027	<0.001 to 0.0032	–
Molybdenum	parts per million	no guideline	0.0002	<0.0002 to 0.0003	–
Selenium	parts per million	no more than 0.01	<0.0004	<0.0004 to <0.002	Raw water - guideline does not apply
Silicon	parts per million	no guideline	1.16	0.79 to 1.52	–
Silver	parts per million	no guideline	0.00013	<0.00002 to <0.0004	–
Strontium	parts per million	no guideline	0.038	0.032 to 0.047	–
Tellurium	parts per million	no guideline	<0.0002	<0.0002	–
Thallium	parts per million	no guideline	<0.00002	<0.00002	–
Thorium	parts per million	no guideline	<0.0001	<0.0001 to 0.0003	–
Tin	parts per million	no guideline	<0.0005	<0.0002 to 0.0019	–
Titanium	parts per million	no guideline	0.0003	0.0002 to 0.0004	–
Uranium	parts per million	no more than 0.02	<0.0001	<0.0001	Raw water - guideline does not apply
Vanadium	parts per million	no guideline	<0.0002	<0.0002 to <0.001	–
Zirconium	parts per million	no more than 0.1	<0.002	<0.002	Raw water - guideline does not apply