Shoal Lake

Water for the City of Winnipeg comes from Shoal Lake, which is part of the Lake of the Woods. Our staff test Shoal Lake and the intake (where the water enters the aqueduct) at Indian Bay as part of our routine water quality testing program. We take samples at the intake every week during the open water season and every two weeks during the rest of the year. We also take samples from the watershed in Shoal Lake from May to October.

We test these samples for

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

By taking these samples, we track seasonal changes in water quality and determine the effects (if any) of human activity within the Shoal Lake watershed.

The intake for the aqueduct is at the west end of Indian Bay. Water entering the intake passes through bar screens and a coarse filter before being disinfected by chlorine gas. We add sufficient chlorine to maintain a free chlorine residual of 0.3 mg/L in the water in the aqueduct when it enters Deacon Reservoir.

Winnipeg

Water and Waste Department

What is Being Measured	How it's Measured	Guideline or Regulation	Shoal Lake Average	Shoal Lake Range	Comments
Odour	odour number	inoffensive	175	12 to more than 200	Raw water - guideline does not apply
Geosmin	parts per trillion	no guideline	4	less than 2 to 13	Common taste and odour compound
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	38,900	2490 to 165,000	Algae contribute to odours and cause filter clogging
Chlorophyll-a	parts per billion	no guideline	8.7	<1.0 to 18.4	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	26 samples taken in 2001
Giardia	cysts per 100 litres	no guideline	<1	<1 to 5.7	26 samples taken in 2001 - 1 positive result
Turbidity (clearness)	units	no more than 1.0	0.95	0.20 to 2.3	Raw water - guideline does not apply
Colour, Apparent	units	no guideline	13	8 to 20	Coloured water may be offensive
Total Solids	parts per million	no more than 500	108	71 to 130	Raw water - guideline does not apply
Conductivity	microsiemens per centimetre	no guideline	153	140 to 167	Another measure of dissolved solids
pH	units	between 6.5 and 8.5	8.0	7.0 to 8.8	Raw water - guideline does not apply
Total Alkalinity	parts per million as calcium carbonate	no guideline	80	74 to 88	–
Total Hardness	parts per million as calcium carbonate	no guideline	80	72 to 89	80 to 100 parts per million is recommended
Total Organic Carbon	parts per million	no guideline	10	9 to 11	–
Soluble Organic Carbon	parts per million	no guideline	10	9 to 11	–
Total Kjeldahl Nitrogen (TKN)	parts per million	no guideline	0.52	0.22 to 0.75	TKN is a combination of ammonia and organic nitrogen
Total Phosphorus	parts per million	no guideline	0.02	0.0120 to 0.0244	Phosphorous can contribute to algae growth
Total Soluble Phosphorus	parts per million	no guideline	<0.002	<0.002 to 0.003	–
Fluoride	parts per million	no more than 1.5	0.06	0.05 to 0.06	Background fluoride in Shoal Lake
Nitrate	parts per million	no more than 10	<0.04	<0.04 to 0.06	–
Chloride	parts per million	no more than 250	<2	<2	Raw water - guideline does not apply
Sulfate	parts per million	no more than 500	<10	<10	Raw water - guideline does not apply
Trihalomethanes	parts per billion	no more than 100	<0.5	<0.5	No Trihalomethanes in unchlorinated water
Haloacetic acids	parts per billion	no guideline	2	<2 to 4.4	No Haloacetic acids in unchlorinated water
Calcium	parts per million	no guideline	21.4	18.6 to 24.0	Contributes to hardness
Magnesium	parts per million	no guideline	6.01	5.20 to 6.60	Contributes to hardness

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Sodium	parts per million	no more than 200	2.13	1.80 to 2.30	Raw water - guideline does not apply
Potassium	parts per million	no guideline	1.3	1.10 to 1.40	–
Iron	parts per million	no more than 0.30	<0.05	<0.05	Raw water - guideline does not apply
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	<0.05	<0.05	Raw water - guideline does not apply