



DRINKING WATER QUALITY QUARTERLY REPORT

July 1 – September 30, 2001



TRANSPORTATION & WORKS

ENVIRONMENT DIVISION

RESPECTFULLY SUBMITTED BY:

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City of Thunder Bay: *Quarterly Water Quality Report* **For the Period of July 1 - September 30, 2001**

What is the Quarterly Water Quality Report?

The City of Thunder Bay is pleased to present its *Water Quality Report*, issued at the end of each quarter, to provide consumers with information about our water supply operations and drinking water quality.

In compliance with provincial regulation 459/00, this quarterly report includes:

- A description of Thunder Bay's water supply system;
- treatment processes and quality assurance methods;
- process flow diagrams for each plant;
- compliance provisions;
- glossary of terms; and
- a summary of water analysis results for this quarter.

What's new in this quarter's report?

Updated information:

- New summary tables of water quality analysis for the period July 1 – September 30, 2001.
- Information about lead in drinking water.
- Customer service information.
- Publications available and links to other sources of information about drinking water, water quality and conservation.

What are the new provisions in Regulation 459/00?

Regulation 459/00, also known as Ontario's new Drinking Water Protection Regulation, came into effect on August 26, 2000 to provide an enforceable standard focusing on the treatment and testing of drinking water supplies in Ontario. The regulation includes provisions for public access to information and notification of adverse test results.

How is the safety of our drinking water assured?

In Thunder Bay, we have a supply of surface water of very good quality... consistently delivered to us from two water treatment plant sources – Bare Point on Lake Superior and Loch Lomond on Mount McKay. Ministry of Environment Regulation 459/00 sets out a mandatory requirement for facilities using surface water as a source that requires chemically assisted filtration and disinfection or other treatment capable of providing water of equal or better quality. No water can be allowed to enter the distribution system unless it has been treated with chlorination or equivalent. Samples shall be taken and evaluated, at a frequency set by the Ministry, for a number of parameters as outlined in the Regulations. A summary table for any result in exceedance of parameters is provided at the end of this report.

Water quality is monitored at both plants 24 hours a day, seven days a week. Water treatment plants must meet strict provincial standards and regulations. Each plant operates under an Ontario Ministry of Environment Certificate of Approval. We are committed to quality and continuous improvement in accordance with Ontario's water quality standards.

We take the job of monitoring water quality very seriously. Each year, independent labs test more than 2,400 samples for potential contaminants. Our testing program meets, and in many areas, exceeds, regulatory requirements.

Today, City of Thunder Bay residents enjoy drinking water of excellent quality. We are committed to making sure we have a water system that will continue to meet our needs tomorrow and beyond.

City of Thunder Bay: *Quarterly Water Quality Report* For the Period of July 1 - September 30, 2001

Are we in compliance with Regulation 459/00?

Enviro-Test Laboratories, an accredited, independent lab, provides all required drinking water testing. The Enviro-Test Lab is accredited to analyze all microbiological parameters, metals and general water quality parameters, while partner labs in Winnipeg and Edmonton are accredited for testing the volatile organics, pesticides and PCBs.

All operational staff at both Thunder Bay Water Treatment Plants have all required Water Treatment Plant Certification.

The City's drinking water testing/analysis program was carefully reviewed following enactment of the new water protection legislation in August 2000. We are required to take 112 samples per month from the distribution system for bacterial testing. We have exceeded this requirement for many years, averaging 180 samples per month, and will continue to do so.

Quarterly testing for volatile organics (18 parameters), pesticides and PCBs (48 parameters), as well as testing for heavy metals was implemented to meet legislated requirements. Previously, the majority of these parameters had been tested twice a year through the MOE Drinking Water Surveillance Program (DWSP). Our reports from the MOE's DWSP can be viewed on their website at <http://www.ene.gov.on.ca/envision/dwsp9899/dwsp.htm>.

The City of Thunder Bay's in-house lead monitoring program also exceeded provincial requirements, but is being maintained to monitor homes in older sections of the distribution system that have lead service connections.

In total, the City monitors over 100 parameters in its drinking water on a regular basis.

Where does our water come from?

Residents of Thunder Bay have two surface water supply sources. The Bare Point Water Treatment Plant supplies most of Thunder Bay north of the Neebing River with water from Lake Superior. The Loch Lomond Microfiltration Plant supplies most residents south of the river with water from Loch Lomond.

Water from Bare Point and Loch Lomond is distributed to consumers through a network of 672 km of water mains.

The total population of Thunder Bay is 116,152. The City's water treatment system serves 106,983 people; representing 92% of the population.

Bare Point Water Treatment Plant is located at the north limit of the City, having a current operational capacity of 14 million imperial gallons per day (64 million litres per day). The plant draws water from the world's largest body of fresh water - Lake Superior.

Treatment processes at the Bare Point Water Treatment Plant include raw water screening, pre-chlorination, chemically assisted coagulation-flocculation using alum and polymer, sand - anthracite filtration and post chlorine disinfection.

Bare Point's distribution system consists of four pressure zones, three pumping stations and three reservoirs. The attached flow diagram illustrates plant operations.

Loch Lomond Water Treatment Plant is located south of the city on Mount McKay. Loch Lomond supplies water to the south portion of Thunder Bay. This plant draws water from Loch Lomond, partially situated within the Fort William First Nation Reserve.

The new Loch Lomond temporary filtration system, built in 1998 has an operational capacity of 6.25 million imperial gallons per day (28 million litres per day). Treatment

City of Thunder Bay: *Quarterly Water Quality Report* **For the Period of July 1 - September 30, 2001**

processes include ultrafiltration membrane technology, the addition of sodium silicate for corrosion control and chlorine for disinfection.

The Loch Lomond distribution system consists of two pressure zones, one reservoir and two pumping stations. The pumping stations are available to pump Bare Point water into the Thunder Bay south distribution system during seasonal or high demand periods. A process flow diagram of Loch Lomond operations is attached.

Who is responsible for water treatment in Thunder Bay?

The City of Thunder Bay's Environment Division oversees the treatment and distribution of water to consumers. The Environment Division is made up of several sections. The Water Treatment Plants are responsible for the treatment, sampling and distribution of water. The Sewer & Water Section is responsible for the operation and maintenance of the water distribution system.

Our qualified staff at the Water Treatment Plants consists of:

- ? Supervisor (1)
- ? Chief Operators (2)
- ? Certified Operators (6)
- ? Certified Maintenance Relief Operators (2)
- ? Electrician (1)
- ? Controls Technician (1)
- ? Water Quality Technician (1)
- ? Leadhand Electrician (1)

We have a highly qualified team, certified by the Ontario Environmental Training Consortium. Staff are continually trained in accordance with provincial regulations. In addition, the new drinking water regulations require that all water treatment staff performing water testing complete an additional 36 hours of specialized training over the next three years.

Customer Service

Call 683-8141 to speak with our Qualified Customer Service staff about treated water produced in the plants, or water quality at your home or business.

If you have concerns about water quality, a day and time will be arranged for a water sample to be taken with your convenience in mind. Samples are taken by a qualified operator, in test specific bottles. Our staff will deliver samples to the laboratory for analysis. Homeowners will be informed promptly of test results. If there is any need for concern, further investigation will be undertaken.

We welcome your comments on the Drinking Water Quality Quarterly Report. Let us know what you like about the report or if there is other information you would like to see included. See 'Where can I get further information?' at the end of this report for phone, address and e-mail contact details.

Tours of Water Treatment Plant facilities can be arranged by calling Mr. Bernie Cook at 683-8141.

What is found in our source water?

Water taken directly from a surface water source is not suitable for human consumption as it contains impurities. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

Parameters affecting the quality of water can be characterized as:

- ? microbiological – bacterial, algae and other living organisms;
- ? chemical – substances dissolved in water from manufactured or natural sources; or
- ? physical – materials that make the water appear cloudy.

City of Thunder Bay: *Quarterly Water Quality Report* For the Period of July 1 - September 30, 2001

Detailed descriptions of raw water characteristics can be found in the Ontario Drinking Water Standards. These are available on the Ministry of Environment web site at www.ene.gov.on.ca under "New Drinking Water Protection Regulation".

Definitions of water industry

terms:

The following list defines terms used in this report.

WTP: *Water Treatment Plant.*

MOE: The *Ontario Ministry of Environment* is the principal body regulating the quality of drinking water in Ontario.

MOH: The *Ontario Ministry of Health* immediately becomes involved when any health related water quality parameters are exceeded.

MAC: The *Maximum Acceptable Concentration.* This is a health-related drinking water standard established for contaminants that have known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.

IMAC: The *Interim Maximum Acceptable Concentration.* This is a health-related Ontario Drinking Water Standard established for contaminants when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

AO: *Aesthetic objective.* This is a parameter limit set for aesthetic appeal of water, such as colour and taste.

OG: *Operational Guidelines.* These are plant guidelines setting parameters that need to be controlled to ensure optimum water treatment.

Parameter: *Parameters* are substances that water is tested for.

PCB: Polychlorinated Biphenyl. This is a group of compounds which are among the most persistent pollutants in the global ecosystem. In the past, PCBs were marketed extensively

for a wide variety of purposes but are no longer manufactured or used.

mg/L: *Milligrams per liter.* This is the standard measure of concentration of a parameter in water, sometimes also called parts per million (ppm).

ug/L: *Micrograms per litre,* also called parts per billion (ppb). This concentration is 1000 times more sensitive than mg/L (1000 ug = 1mg)

pg/L: *Picograms per litre.* This is equivalent to 10^{-12} grams.

THM: *Trihalomethanes.*

Trihalomethanes are the most widely occurring synthetic organics found in chlorinated drinking water. The four most common detected trihalomethanes in drinking water are chloroform, bromodichloromethane, chlorodibromomethane and bromoform. The main source of trihalomethanes in drinking water is the result of the action of chlorine reacting with naturally occurring organic compounds present in the water.

ND: *Non Detectable Limits.* This means that the results are below the laboratory detection limits. This is the bacteriological standard for water free of total coliform, fecal coliform or e-coli.

PLC: *Programmable Logic Controller.* A PLC is used to control plant system operations by computer.

What do test results indicate for this quarter?

The City of Thunder Bay's Environment Division has taken all necessary measures to comply with the Drinking Water Protection Regulations and the Ontario Drinking Water Standards.

Microbiological Results

Microbiological tests are considered the most important series of tests performed in drinking water analysis. They include Total Coliform bacteria, E. Coli bacteria, and Heterotroph bacteria, measured by Heterotrophic Plate Count (HPC). These bacteria are usually not

City of Thunder Bay: *Quarterly Water Quality Report* **For the Period of July 1 - September 30, 2001**

harmful to human health, but instead serve as important indicators of possible contamination of the water supply. Sewage plants, farm livestock, septic systems and wildlife can cause contamination. The presence of microbial pathogens could lead to outbreaks of water borne disease.

It should be noted that microbiological testing will occasionally detect the presence of bacteria in isolated samples, typically due to the sensitive nature of the testing. These occurrences do not usually pose a threat to public health and are normally resolved by taking repeat samples to determine water quality. In contrast, it is situations of confirmed and persistent bacteria presence that are cause for concern and corrective actions.

During the third quarter, the Bare Point Distribution System was tested 295 times for Total Coliform, E. Coli and Fecal Coliform, and 73 times for HPC. As well the Loch Lomond Distribution System was tested 289 times for Total Coliform, E. Coli and Fecal Coliform, and 73 times for HPC. Out of these tests the Bare Point Distribution System had 3 routine and 4 re-test findings of total Coliform, and 1 positive test for Fecal Coliform, and the Loch Lomond Distribution System had 5 routine and 2 re-test findings of Total Coliform and 1 finding of elevated Trihalomethanes.

In each instance, Environment Division staff immediately notified the District Health Unit and the Ministry of the Environment as per Provincial Regulations. In addition to verbal notification, copies of the notification reports were faxed to the same locations.

Operational Parameters

Operational Parameters are key treatment parameters that are monitored both by the water treatment operators and in line continuous monitoring equipment (chlorine analyzers, turbidity meters etc.). These parameters are analyzed on a routine, some daily some monthly, basis at the water treatment plants.

Values for these parameters are set as Operational Guidelines (OG) and Aesthetic Objectives (AO) as opposed to the Microbiological Results that must abide by the MAC and IMAC limits. This is because these parameters do not pose any health related risks to consumers.

In this quarter both plants were well below the guidelines for most of the parameters. The only parameter that had instances of elevated levels was colour. According to the Ontario Drinking Water Standards, "The aesthetic objective for colour is 5 True Colour Units (TCU). Water can have a faint yellow/brown colour which is often caused by organic materials created by the decay of vegetation. Sometimes the colour of water is impacted by iron or manganese compounds produced by processes occurring in natural sediments or in aquifers. The presence of organic materials are the main cause of disinfection by-products when water is treated with chlorine." The colour readings for both Loch Lomond and Bare Point appeared elevated on limited occasions. Bare Point recorded colour readings as high as 8 TCUs and Loch Lomond as high as 14 TCU. As previously stated, colour is not a health related parameter.

Volatile Organics

In this quarter, a total of 46 tests were done on volatile organic parameters. Of these, 12 gave detectable results, all of which were forms of THMs. The system average in the Loch Lomond supply was 90 mg/L, below the MAC of 100 mg/L. However, THM formation in the system extremities is still a concern with the running average being at 103.8 mg/L, just above the limit. Changes in the chlorination procedures are being implemented at Loch Lomond to further reduce THM formation.

Pesticides & PCBs

A total of 96 tests were done in this quarter for various pesticides and PCBs. No detectable

City of Thunder Bay: *Quarterly Water Quality Report* For the Period of July 1 - September 30, 2001

amounts of any of these materials were found in either water supply.

Inorganics & General Chemistry

56 tests were done on the Loch Lomond supply for various metals and general chemistry parameters. A similar number of tests were done on the Bare Point supply. These parameters provide the overall chemical characteristics or 'profile' of the water and can be used to set or change treatment process levels. All 24 test results on the four health related parameters; arsenic, lead, nitrate and nitrite, were well below the MAC limits.

Trihalomethanes (THMs)

Trihalomethanes are one group of disinfection by-products, which result from the use of chlorine to disinfect water and eliminate disease causing micro organisms that may be present in raw water sources. The maximum limit for THMs in water is 100 micrograms per litre (mg/L) or parts per billion (ppb). In December 1995, a report was released by the Great Lakes Basin Cancer Risk Assessment Study which linked long term use (over 35 years) of water containing elevated THM levels to an increased risk of bladder and colon cancer. THM levels that were below 0.05 mg/L were not a cause for concern.

It must be emphasized that the primary and over-riding public health concern is to provide water that is microbiologically safe. In fact, the use of chlorination is one of the most significant public health advances of the century.

Is lead a concern in our drinking water?

In Thunder Bay our source water supplies, both raw and treated, have lead levels below 2.0 ug/L. The Ontario Drinking Water Standard for lead is 10 ug/L, so we are well below the safe and allowable limit.

Before the water reaches the tap, older soldered plumbing joints in homes and some lead connections to homes may leach lead into the water. Not all homes have lead connections. Elevated lead levels have been detected in a small number of homes where consumers have very lengthy lead service pipes connecting their home to the City's water system. Testing in homes with copper services and shorter lead services show levels within the Provincial Standards.

Older lead water main connections and in home use of lead solder can result in lead leaching into the water causing elevated levels. The longer the water is in contact with the lead, the greater will be the chance of lead contamination. For example, the first water that comes from the faucet after long periods of non-use may have unacceptable levels of lead in it.

The City of Thunder Bay recently completed a Corrosion Study in the Bare Point Distribution System that allowed us to determine which corrosion inhibitor would be most effective in our water supply. Plans for the addition of the inhibitor will begin with the expansion of the Bare Point Water Treatment Plant.

Loch Lomond has been treating water with sodium silicate for a few years now to help reduce lead levels.

The following precautions taken in your home will minimize the risk of lead intake:

- Flush your toilet before you run drinking water if your water has not been used for long periods during the day or night.
- Run the cold water for a minute or two after periods of non-use. Letting the water run will usually remove any water affected by lead. This water can be saved for other uses such as watering your plants.
- Use cold water for cooking. Hot water can initiate the leaching of lead more quickly than cold water.

City of Thunder Bay: *Quarterly Water Quality Report* **For the Period of July 1 - September 30, 2001**

If you believe that the water in your home has high lead levels and would like to have the water tested, contact the Water Quality Technician at the Bare Point Water Treatment Plant, and he will arrange a time to collect water sample.

Is bottled water better for you?

Consumers should be aware that the production of bottled water is not regulated to the same degree as water treated in a Water Treatment Facility.

Should people at risk of infection take special precautions?

Immuno-compromised persons and those undergoing cancer therapy, such as chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders can be more vulnerable to contaminants in drinking water. People at risk from infections should seek advice about drinking water from their health care providers.

Please note changes to tables:

The format of the test result tables has been revised in response to suggestions of the *Canadian Environmental Defence Fund*. The attached tables are now formatted to summarize exceedances only. Tables include tests completed, test results, ranges and actions taken to resolve exceedances which occurred during the quarter June 30 to September 30, 2001.

Complete listings of test results for all parameters is available on our web page at www.city.thunder-bay.on.ca, or by contacting the Bare Point Water Treatment Plant at 684-8141.

City of Thunder Bay: *Quarterly Water Quality Report*
For the Period of July 1 - September 30, 2001

Summary Table - Notifications to the MOE

Bare Point Distribution System

I.D. & Location #	Date Received	Type of Exceedance	Corrective Action Taken	Date Action Taken	Results	Follow Up Action
A1-06 DSN 57	Aug-06	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 7 & August 8	All results OK	None Required
A1-11a DSN 42	Aug-24	Total & Fecal Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 24 & August 25	Both Sets of Results Failed	Resamples Required
A1-11b DSN 42	Aug-25	Total & Fecal Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 25 & August 26	Both Sets of Results Failed	Resamples Required
A1-11c DSN 42	Aug-27	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 28 & August 29	All results OK	None Required
A1-16 DSN 16	Sep-14	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	Sept. 14 & Sept. 15	All results OK	None Required

Above are all of the adverse water samples results for the Bare Point Distribution System this quarter. Adverse location A1-11 (a,b,c) were the result of insufficient flushing of a new water main. New and replacement water mains are installed at various locations each summer to improve the water distribution system. This replacement main was not sufficiently flushed prior to being sampled. This was the cause of the adverse water results. The Environment Division staff worked quickly to address this situation. The main was flushed, chlorinated, cleaned and put in to service. Flushing of the distribution system in summer months insures water quality is maintained. The flushing program is an essential part of the THM reduction program.

The other two occurrences were flushed and re-sampled showing no further indication of Total Coliform.

City of Thunder Bay: *Quarterly Water Quality Report*
For the Period of July 1 - September 30, 2001

Loch Lomond Distribution System

I.D. & Location #	Date Received	Type of Exceedance	Corrective Action Taken	Date Action Taken	Results	Follow Up Action
A1-7a DSS 76	Aug-10	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 11 & August 12	Aug 11- OK Aug 12- Failed	Resamples Required
A1-7b DSS 76	Aug-15	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 15 & August 16	Aug 15- OK Aug 16- Failed	Resamples Required
A1-7c DSS 76	Aug-19	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 19 & August 20	Both Sets of Results OK	None Required
A1-8 DSS 77	Aug-11	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 11 & August 12	Both Sets of Results OK	None Required
A1-12 DSS 44	Aug-25	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	August 25 & August 26	Both Sets of Results OK	None Required
A1 - 13	Sep-07	High THM	Introduction of Post Chlorination at Loch Lomond	Fall of 2001	Not Available	To be Completed
A1-14 DSS76	Sep-10	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	Sept. 10 & Sept 11	Both Sets of Results OK	None Required
A1-15 DSS 15	Sep-14	Total Coliform	Flushed area and resampled 3 locations on 2 consecutive days	Sept. 14 & Sept 15	Both Sets of Results OK	None Required

Flushing the main to increase water flow and maintain a supply of fresh water rectified this problem at main A1. The city has put a flushing program for this main and other ‘problem’ areas to ensure fresh drinking water for all consumers. The Environment Division staff is looking in to the possibility of reconstructing the main so that it is no longer a “dead end” but rather have it tied in to other surrounding mains so that it is continually being utilized and flushed. The other two adverse locations were quickly flushed and re-sampled showing no other signs of coliform.

City of Thunder Bay: *Quarterly Water Quality Report* For the Period of July 1 - September 30, 2001

Where can I get further information?



**GIVE US A CALL
TRANSPORTATION & WORKS**

Phone: 684-2195 (daytime)
684-3117 (after hours)*

* 4:30 pm to 8 am & holidays.

Or e-mail us at rchuchman@city.thunder-bay.on.ca

Bare Point Water Treatment Plant

R.R.#13

171 Bare Point Road,
Thunder Bay, ON, P7B 5E4

Phone: 683-8141 (24 hours)

Supervisor: Don W. Kmill

MOE Waterworks No. 220000273

MOE Certificate of Approval

No. 7-0748-90-006

Loch Lomond Water Treatment Plant

R.R.#4

151 Reservoir Road, Thunder Bay, ON, P7C
4Z2

Phone: 622-0944 or

683-8141 (24 hours)

Supervisor: Don W. Kmill

MOE Waterworks No. 220000282

MOE Certificate of Approval

No. 7-0706-98-006

Additional Contacts:

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Environment Division

Phone: 684-2836

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E-mail:

dmatson@city.thunder-bay.on.ca

Ross Chuchman, Chief Chemist

Environment Division

Phone: 687-3537

Fax: 345-1909

E-mail:

rchuchman@city.thunder-bay.on.ca


Publications

If you wish to obtain one of the publications below, submit the title of the publication you wish to receive by email to


kwalkinshaw@city.thunder-bay.on.ca

Or call at 684-2195.

Water Efficiency Publications

 *Homeowner's Guide Water Conservation Program*, City of Thunder Bay
Environment Division.

 *Thunder Bay Water Saver's Guide*, City of Thunder Bay
Environment Division.

 *Household Guide to Water Efficiency*,
Canadian Mortgage and Housing
Corporation, 2000

General Publications


 *Water Treatment Plants & Distribution Systems Annual Report*, City of Thunder Bay,
Environment Division

Information for Children

 *The Story of Drinking Water*, Copyright
American Water Works Association

Water Information Available Online. Check out these links:

 Drinking Water Protection Regulation
<http://www.ene.gov.on.ca/envision/WaterReg/WaterReg.htm>

 Water Treatment Plants
<http://www.city.thunder-bay.on.ca/water/theplants.html>

City of Thunder Bay: *Quarterly Water Quality Report* **For the Period of July 1 - September 30, 2001**

 Questions & Answers about Drinking
Water Quality

<http://www.city.thunder-bay.on.ca/water/Q&A.html>

 Water Conservation Tips

<http://www.city.thunder-bay.on.ca/water/tips.html>

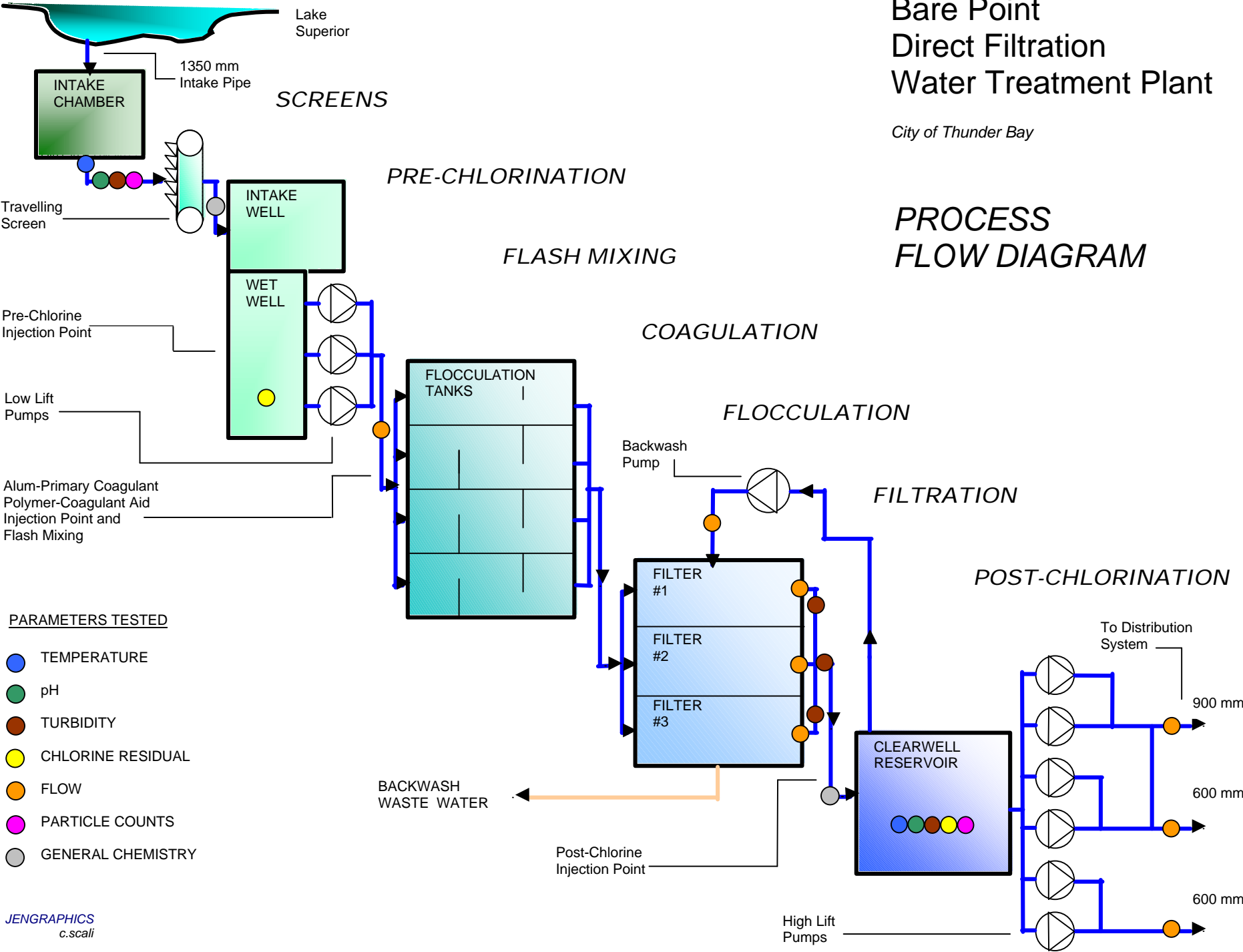
Videos

 Quality Behind the Tap
City of Thunder Bay, 1998

Bare Point Direct Filtration Water Treatment Plant

City of Thunder Bay

PROCESS FLOW DIAGRAM



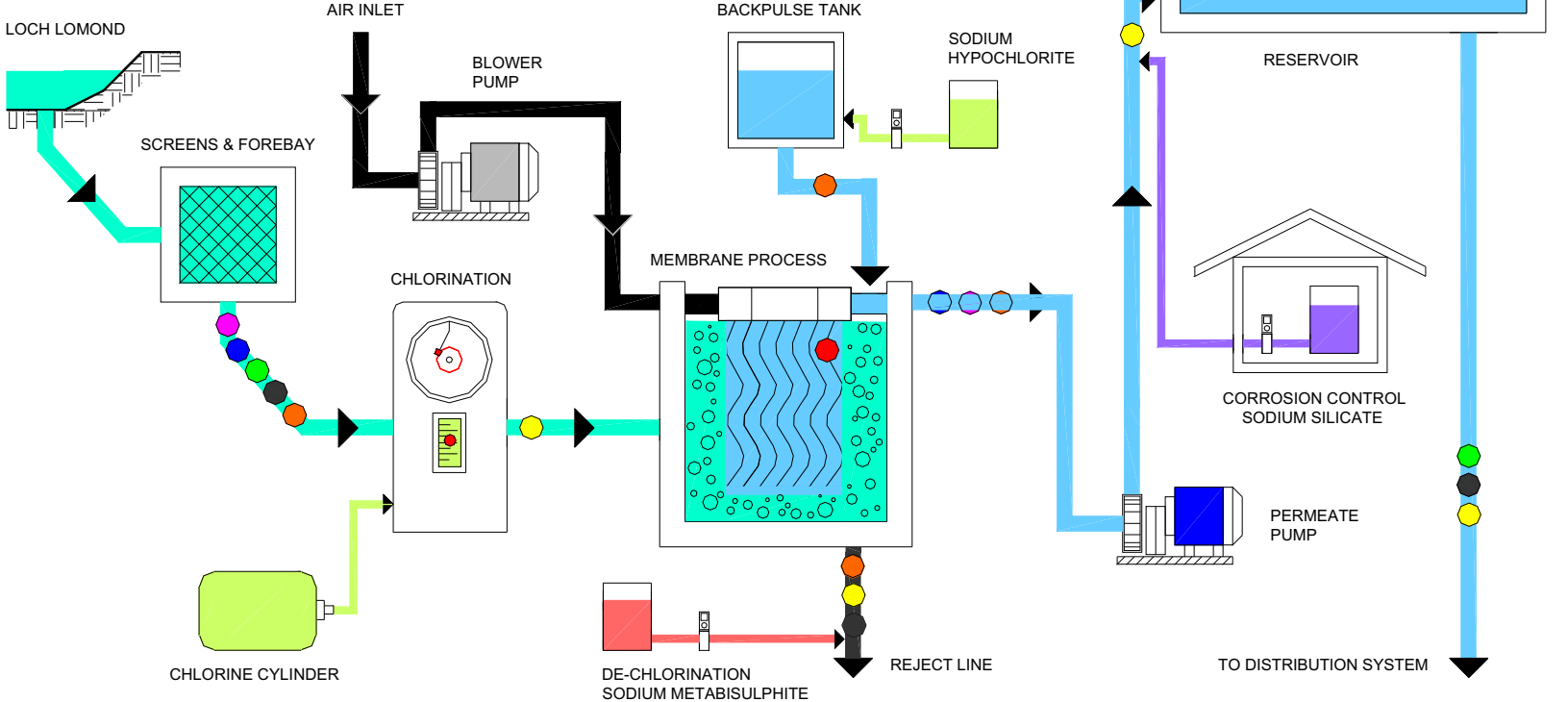
PARAMETERS TESTED

- TEMPERATURE
- pH
- TURBIDITY
- CHLORINE RESIDUAL
- FLOW
- PARTICLE COUNTS
- GENERAL CHEMISTRY

Loch Lomond Temporary Membrane Water Treatment Plant

City of Thunder Bay

PROCESS FLOW DIAGRAM



- | | | | |
|---|---|--|---|
| ● TEMPERATURE | ● TURBIDITY | ● FLOW | ● TRANSMEMBRANE PRESSURE |
| ● pH | ● CHLORINE RESIDUAL | ● PARTICLE COUNTS | |



BARE POINT SYSTEM: OPERATIONAL PARAMETERS

Parameters related to Microbiological Quality	Units	AO/OG	# of Samples	# Detectable Results	Sampling Date	Range (mg/L unless stated)	Typical Source of Parameter
Turbidity	NTU	1	Continuous	Continuous	01/06/01-30/09/01	0.06 – 0.16	Suspended material in water
Free Chlorine at Plant	mg/L	0.8 – 4.0	Continuous	Continuous	01/06/01-30/09/01	0.93 – 1.31	Disinfectant added
Free Chlorine in System	mg/L	0.2 – 4.0	303	303	01/06/01-30/09/01	Trace – 1.13	Disinfectant added
pH	No units	6.5-8.5	Continuous	Continuous	01/06/01-30/09/01	6.95 – 7.29	Measure of water acidity (7.00 = neutral)
Copper	mg/L	1.0	3	3	01/06/01-30/09/01	0 - <0.07	
Iron	mg/L	0.30	3	3	01/06/01-30/09/01	0	
Alkalinity	mg/L	30-500	3	3	01/06/01-30/09/01	48.0 – 49.20	
Conductivity	uS/cm		3	3	01/06/01-30/09/01	99.0 – 107.0	
Hardness	mg/L	80-100	3	3	01/06/01-30/09/01	48.80 – 50.80	
Aluminum	mg/L	0.10	55	55	01/06/01-30/09/01	0.023 – 0.070	Erosion of natural deposits, Residues from coagulant use
Colour	TCU	5	137	137	01/06/01-30/09/01	1 – 8	Tannins and lignins from natural decay

AO – Aesthetic Objective

OG – Operational Guideline

LOCH LOMOND SYSTEM: OPERATIONAL PARAMETERS

Parameters related to Microbiological Quality	Units	AO/OG	# of Samples	# Detectable Results	Sampling Date	Range	Typical Source of Parameter
Turbidity	NTU	1	Continuous	Continuous	01/06/01-30/09/01	0.02 – 0.07	Suspended material in water
Free Chlorine at Plant	mg/L	1.1 – 4.0	Continuous	Continuous	01/06/01-30/09/01	1.32 – 2.27	Disinfectant added
Free Chlorine in System	mg/L	0.2 – 4.0	294	294	01/06/01-30/09/01	Trace – 1.73	Disinfectant added
pH	No units	6.5-8.5	Continuous	Continuous	01/06/01-30/09/01	7.50 – 8.20	Measure of water acidity (7.00 = neutral)
Copper	mg/L	1.0	3	3	01/06/01-30/09/01	0 - <0.07	
Iron	mg/L	0.30	3	3	01/06/01-30/09/01	0	
Alkalinity	mg/L	30-500	3	3	01/06/01-30/09/01	24.20 – 28.0	
Conductivity	uS/cm		3	3	01/06/01-30/09/01	62.0 – 68.0	
Hardness	mg/L	80-100	3	3	01/06/01-30/09/01	25.0 – 30.0	
Colour	TCU	5	160	160	01/06/01-30/09/01	1 – 14	Tannins and lignins from natural decay

AO – Aesthetic Objective
OG – Operational Guideline



Loch Lomond Distribution System: Routine Bacteriological Samples

Microbiological Parameters	MAC/IMAC	# of Samples	# Detect Results	Sampling Date	Range	Exceedance (#)	Typical Source of Parameter
Total Coliform	ND	289	5	07/03/01-09/28/01	Present(5)	YES (5)	Naturally present in environment
Fecal Coliform	ND	289	0	07/03/01-09/28/01	Absent	NO	Animal / human fecal waste
E. Coli	ND	289	0	07/03/01-09/28/01	Absent	NO	Animal / human fecal waste
Deterioration Indicators	--	289	0	07/03/01-09/28/01	Absent	NO	
Heterotrophic Plate Count	500	73	54	07/03/01-09/28/01	0-120	NO	Indicator of deteriorating water quality if over 500

Loch Lomond Plant Treated: Routine Bacteriological Samples

Microbiological Parameters	MAC/IMAC	# of Samples	# Detect Results	Sampling Date	Range	Exceedance (#)	Typical Source of Parameter
Total Coliform	ND	13	0	07/03/01-09/28/01	Absent	NO	Naturally present in environment
Fecal Coliform	ND	13	0	07/03/01-09/28/01	Absent	NO	Animal / human fecal waste
E. Coli	ND	13	0	07/03/01-09/28/01	Absent	NO	Animal / human fecal waste



Bare Point Distribution System: Routine Bacteriological Samples

Microbiological Parameters	MAC/IMAC	# of Samples	# Detect Results	Sampling Date	Range	Exceedance	Typical Source of Parameter
Total Coliform	ND	294	3	01/06/01-30/09/01	Present	Yes (3)	Naturally present in environment
Fecal Coliform	ND	294	1	01/06/01-30/09/01	Present	Yes (1)	Animal / human fecal waste
E. Coli	ND	294	0	01/06/01-30/09/01	Absent	No	Animal / human fecal waste
Deterioration Indicators	--	294	0	01/06/01-30/09/01	Absent	No	
Heterotrophic Plate Count	500	73	37	01/06/01-30/09/01	0 –57	No	General bacterial population

Bare Point Plant Treated: Routine Bacteriological Samples

Microbiological Parameters	MAC/IMAC	# of Samples	# Detect Results	Sampling Date	Range	Exceedance	Typical Source of Parameter
Total Coliform	ND	12	0	07/03/01-09/28/01	Absent	NO	Naturally present in environment
Fecal Coliform	ND	12	0	07/03/01-09/28/01	Absent	NO	Animal / human fecal waste
E. Coli	ND	12	0	07/03/01-09/28/01	Absent	NO	Animal / human fecal waste



Bare Point Water Treatment Plant - Volatile Organics Tests

Source Water	Parameter	MAC/ IMAC (ug/L)	# of Samples	# of Detectable Results	Date(s)	Range (ug/L)	Exceedance	Source of Parameter
Bare Point Treated	Vinyl Chloride	2	1	0	08/28/2001	<0.2	NO	
	1,1-Dichloroethylene	14	1	0	08/28/2001	<1	NO	
	Dichloromethane	50	1	0	08/28/2001	<1	NO	
	Chloroform	Note 1	1	1	08/28/2001	19	NO	Type of trihalomethane (THM)
	Carbon Tetrachloride	5	1	0	08/28/2001	<0.5	NO	
	Benzene	5	1	0	08/28/2001	<0.5	NO	
	1,2-Dichloroethane	5	1	0	08/28/2001	<0.5	NO	
	Bromodichloromethane	Note 1	1	1	08/28/2001	2	NO	Type of trihalomethane (THM)
	Toluene	24 **	1	0	08/28/2001	<1		
	Trichloroethylene	50	1	0	08/28/2001	<1	NO	
	Tetrachloroethylene	30	1	0	08/28/2001	<1	NO	
	Dibromochloromethane	Note 1	1	0	08/28/2001	<1	NO	Type of trihalomethane (THM)
	Monochlorobenzene	80	1	0	08/28/2001	<1	NO	
	Ethylbenzene	2.4**	1	0	08/28/2001	<1		
	m,p-Xylene	300*	1	0	08/28/2001	<1		
	o-Xylene	300*	1	0	08/28/2001	<1		
	Bromoform	Note 1	1	0	08/28/2001	<1	NO	Type of trihalomethane (THM)
	1,4-Dichlorobenzene	5	1	0	08/28/2001	<0.5	NO	
1,2-Dichlorobenzene	200	1	0	08/28/2001	<1	NO		
Bare Point Distr. System	THM's – System Avg.	100	3	3	08/28/2001	24.7	NO	
	Total THM's – System Extremity (2)	100	4	4	12/01/00-08/28/01	21.3(2)	NO	Disinfection by-products (total)

** NOTE 1 – Total of all trihalomethanes (chloroform & bromochloromethanes) should not exceed THM standard of 100 ug/L

(2) - THMs in the distribution system are based on a running annual average of four quarterly samples at point of max. residence (extremity)

** - Aesthetic Objective(AO). Exceedance column does not apply to these.

* - 300 ug/L is AO for total Xylenes < - Means less than the specified method detection limit

Bare Point Water Treatment Plant – Pesticides & PCB Tests

Source Water	Parameter	MAC/ IMAC (ug/L)	# of Samples	# of Detectable Results	Date(s)	Range (ug/L)	Exceedance	Source of Parameter
Bare Point Treated Water	Alachlor	5	1	0	08/28/2001	<0.5	NO	Insecticide, herbicide and fungicide residues
	Atrazine + N-dealkylated metabolites	5	1	0	08/28/2001	<1	NO	
	Azinphos-methyl	20	1	0	08/28/2001	<2	NO	
	Chlorpyrifos	90	1	0	08/28/2001	<9	NO	
	Cyanazine	10	1	0	08/28/2001	<1	NO	
	Diazinon	20	1	0	08/28/2001	<2	NO	
	Diclofop-methyl	9	1	0	08/28/2001	<0.9	NO	
	Dimethoate	20	1	0	08/28/2001	<3	NO	
	Dinoseb	10	1	0	08/28/2001	<1	NO	
	Malathion	190	1	0	08/28/2001	<19	NO	
Metribuzin	80	1	0	08/28/2001	<8	NO		

Source Water	Parameter	MAC/ IMAC (ug/L)	# of Samples	Detectable Results	Date(s)	Range (ug/L)	Exceedance	Source of Parameter
Bare Point Treated Water (cont.)	Parathion	50	1	0	08/28/2001	<5	NO	Insecticide, herbicide and fungicide residues
	Phorate	2	1	0	08/28/2001	<0.5	NO	
	Prometryne	1	1	0	08/28/2001	<0.3	NO	
	Simazine	10	1	0	08/28/2001	<1	NO	
	Terbufos	1	1	0	08/28/2001	<1	NO	
	Triallate	230	1	0	08/28/2001	<23	NO	
	Trifluralin	45	1	0	08/28/2001	<4.5	NO	
	P,p'-DDD	30**	1	0	08/28/2001	<0.5	NO	
	P,p'-DDE	30**	1	0	08/28/2001	<0.5	NO	
	P,p'-DDT	30**	1	0	08/28/2001	<0.5	NO	
	Aldrin	0.7*	1	0	08/28/2001	<0.07	NO	
	Dieldrin	0.7*	1	0	08/28/2001	<0.07	NO	
	Heptachlor	3 ⁺	1	0	08/28/2001	<0.1	NO	
	Heptachlor Epoxide	3 ⁺	1	0	08/28/2001	<0.1	NO	
	Lindane (Total)	4	1	0	08/28/2001	<0.4	NO	
	Methoxychlor	900	1	0	08/28/2001	<90	NO	
	Metolachlor	50	1	0	08/28/2001	<5	NO	
	Chlordane	7	1	0	08/28/2001	<0.7	NO	
	Bromoxynil	5	1	0	08/28/2001	<0.5	NO	
	Dicamba	120	1	0	08/28/2001	<12	NO	
	2,4-Dichlorophenol	900	1	0	08/28/2001	<90	NO	
	2,4-D	100	1	0	08/28/2001	<10	NO	
	Pentachlorophenol	60	1	0	08/28/2001	<6	NO	
	Picloram	190	1	0	08/28/2001	<19	NO	
	2,3,4,6-Tetrachlorophenol	100	1	0	08/28/2001	<10	NO	
	2,4,6-Trichlorophenol	5	1	0	08/28/2001	<0.5	NO	
	2,4,5-T	280	1	0	08/28/2001	<28	NO	
	Glyphosate	280	1	0	08/28/2001	<28	NO	
	Diquat	70	1	0	08/28/2001	<7	NO	
	Paraquat	10	1	0	08/28/2001	<1	NO	
	Aldicarb	9	1	0	08/28/2001	<0.9	NO	
	Bendiocarb	40	1	0	08/28/2001	<8	NO	
	Carbaryl	90	1	0	08/28/2001	<9	NO	
Carbofuran	90	1	0	08/28/2001	<10	NO		
Diuron	150	1	0	08/28/2001	<15	NO		
Temephos	280	1	0	08/28/2001	<28	NO		
PCB's	3	1	0	08/28/2001	<0.3	NO	Electrical insulating oil	

< - Means less than the specified method detection limit

BARE POINT WATER TREATMENT PLANT - INORGANIC & GENERAL CHEMISTRY PARAMETERS

Source Water	Parameter	MAC/ IMAC	# of Samples	# Detectable Results	Dates	Range (mg/L)	Exceedance	Source of Parameter
Bare Point Raw Water	Aluminum	0.1**	1	1	08/28/2001	0.02		Natural sources at low levels
	Arsenic	0.025	1	0	08/28/2001	<0.0004	NO	Natural source at low levels
	Calcium		1	1	08/28/2001	14.6		Common mineral constituent
	Copper	1.0**	1	1	08/28/2001	0.0007		Corrosion of plumbing system, erosion of natural deposits
	Iron	0.3**	1	1	08/28/2001	0.023		Erosion of natural deposits, corrosion of cast iron mains
	Manganese	0.05**	1	1	08/28/2001	0.002		Erosion of natural mineral deposits
	Lead	0.01	1	0	08/28/2001	<0.0001	NO	Leaching from plumbing and service connections
	Zinc	5**	1	0	08/28/2001	<0.002		Natural sources, corrosion of plumbing
	Alkalinity	500**	1	1	08/28/2001	43		Natural sources, mostly dissolved carbonate
	Ammonia		1	0	08/28/2001	<0.05		Natural sources at low levels
	Chloride	250**	1	1	08/28/2001	1.8		Natural sources at low levels
	Conductivity (us/cm)		1	1	08/28/2001	105		Natural dissolved material in water
	Dissolved Organic Carbon	5**	1	1	08/28/2001	2		Organic matter leached into surface water from vegetation
	Hardness	100**	1	1	08/28/2001	49		Natural dissolved minerals (Ca, Mg)
	Nitrate	10	1	1	08/28/2001	0.32	NO	Natural sources at low levels, Fertilizer, septic runoff at high levels
	Nitrite	10 ⁺	1	0	08/28/2001	<0.03	NO	
	Sulphate	500**	1	1	08/28/2001	4.3		Natural mineral sources
Total Kjeldahl Nitrogen (TKN)		1	1	08/28/2001	0.21		Organic matter leached into surface water from vegetation	
Total Phenolics		1	0	08/28/2001	<0.001		Decomposition of wood	
Bare Point Treated Water	Aluminum	0.1**	1	1	08/28/2001	0.10		Natural sources at low levels
	Arsenic	0.025	1	0	08/28/2001	<0.0004	NO	Natural source at low levels
	Calcium		1	1	08/28/2001	15.0		Common mineral constituent
	Copper	1.0**	1	1	08/28/2001	0.0006		Corrosion of plumbing system, erosion of natural deposits
	Iron	0.3**	1	1	08/28/2001	0.011		Erosion of natural deposits, corrosion of cast iron mains
	Manganese	0.05**	1	1	08/28/2001	0.001		Erosion of natural mineral deposits
	Lead	0.01	1	0	08/28/2001	<0.0001	NO	Leaching from plumbing and service connections
	Sodium	200**	1	1	08/28/2001	1.73		Natural mineral constituent
	Zinc	5**	1	0	08/28/2001	<0.002		Natural sources, corrosion of plumbing
	Alkalinity	500**	1	1	08/28/2001	40		Natural sources, mostly dissolved carbonate
Ammonia		1	0	08/28/2001	<0.05		Natural sources at low levels	

Bare Point - Inorganic & General Chemistry Parameters (cont.)								
Source Water	Parameter	MAC/ IMAC	# of Samples	# Detectable Results	Dates	Range (mg/L)	Exceedance	Source of Parameter
Bare Point Treated Water (cont.)	Chloride	250**	1	1	08/28/2001	3.3		Natural sources at low levels
	Conductivity		1	1	08/28/2001	108		Natural dissolved material in water
	Dissolved Organic Carbon (DOC)	5**	1	1	08/28/2001	3		Organic matter leached into surface water from vegetation
	Hardness	100**	1	1	08/28/2001	50		Natural dissolved minerals (Ca, Mg)
	Nitrate	10	1	1	08/28/2001	0.29	NO	Natural sources at low levels, Fertilizer, septic runoff at high levels
	Nitrite	10 ⁺	1	0	08/28/2001	<0.03	NO	
	Sulphate	500**	1	1	08/28/2001	6.3		Natural mineral sources
	Total Kjeldahl Nitrogen (TKN)		1	1	08/28/2001	0.15		Organic matter leached into surface water from vegetation
Bare Point Distribution System Water	Aluminum	0.1**	1	1	08/28/2001	0.09		Natural sources at low levels
	Arsenic	0.025	1	0	08/28/2001	<0.0004	NO	Natural source at low levels
	Calcium		1	1	08/28/2001	15.2		Common mineral constituent
	Copper	1.0**	1	1	08/28/2001	0.0051		Corrosion of plumbing system, erosion of natural deposits
	Iron	0.3**	1	1	08/28/2001	0.022		Erosion of natural deposits, corrosion of cast iron mains
	Manganese	0.05**	1	1	08/28/2001	0.002		Erosion of natural mineral deposits
	Lead	0.01	1	1	08/28/2001	0.0007	NO	Leaching from plumbing and service connections
	Zinc	5**	1	0	08/28/2001	<0.002		Natural sources, corrosion of plumbing
	Alkalinity	500**	1	1	08/28/2001	40		Natural dissolved carbonate minerals
	Ammonia		1	0	08/28/2001	<0.05		Natural sources at low levels
	Chloride	250**	1	1	08/28/2001	3.3		Natural sources at low levels
	Conductivity (uS/cm)		1	1	08/28/2001	108		Natural dissolved material in water
	Dissolved Organic Carbon	5**	1	1	08/28/2001	2		Organic matter leached into surface water from vegetation
	Hardness	100**	1	1	08/28/2001	51		Natural dissolved minerals (Ca, Mg)
	Nitrate	10	1	1	08/28/2001	0.29	NO	Natural sources at low levels, Fertilizer, septic runoff at high levels
	Nitrite	10 ⁺	1	0	08/28/2001	<0.03	NO	
	Sulphate	500**	1	1	08/28/2001	6.4		Natural mineral sources
	Total Kjeldahl Nitrogen (TKN)		1	1	08/28/2001	0.15		Organic matter leached into surface water from vegetation

** -Aesthetic Objectives (AO). Exceedance column does not apply to these.

+ -Nitrite plus Nitrate MAC is 10 mg/L < - Means less than the specified method detection limit

Loch Lomond Water Treatment Plant - Volatile Organics Tests

Source Water	Parameter	MAC/IMAC (ug/L)	# of Samples	# of Detectable Results	Date(s)	Range (ug/L)	Exceedance	Source of Parameter
Loch Lomond Treated	Vinyl Chloride	2	1	0	08/31/2001	<0.2	NO	
	1,1-Dichloroethylene	14	1	0	08/31/2001	<1	NO	
	Dichloromethane	50	1	0	08/31/2001	<1	NO	
	Chloroform	Note 1	1	1	08/31/2001	62	NO	Type of trihalomethane (THM)
	Carbon Tetrachloride	5	1	0	08/31/2001	<0.5	NO	
	Benzene	5	1	0	08/31/2001	<0.5	NO	
	1,2-Dichloroethane	5	1	0	08/31/2001	<0.5	NO	
	Bromodichloromethane	Note 1	1	1	08/31/2001	2	NO	Type of trihalomethane (THM)
	Toluene	24 **	1	0	08/31/2001	<1		
	Trichloroethylene	50	1	0	08/31/2001	<1	NO	
	Tetrachloroethylene	30	1	0	08/31/2001	<1	NO	
	Dibromochloromethane	Note 1	1	0	08/31/2001	<1	NO	
	Monochlorobenzene	80	1	0	08/31/2001	<1	NO	
	Ethylbenzene	2.4**	1	0	08/31/2001	<1		
	m,p-Xylene	300*	1	0	08/31/2001	<1		
	o-Xylene	300*	1	0	08/31/2001	<1		
	Bromoform	Note 1	1	0	08/31/2001	<1	NO	
	1,4-Dichlorobenzene	5	1	0	08/31/2001	<0.5	NO	
	1,2-Dichlorobenzene	200	1	0	08/31/2001	<1	NO	
Loch Lomond Distribution System	THM's – System Avg.	100	3	3	08/31/2001	90.0	NO	
	Total THM's – System Extremity (2)	100	4	4	12/01/00-08/31/01	103.8 (2)	YES	Disinfection by-products

NOTE 1 – Total of all trihalomethanes (chloroform & bromochloromethanes) should not exceed THM standard of 100 ug/L

(3) - THMs in the distribution system are based on a running annual average of four quarterly samples at point of max. residence (extremity)

** - Aesthetic Objective(AO). Exceedance column does not apply to these

* - 300 ug/L is AO for total Xylenes

< -Means less than the specified method detection limit

Loch Lomond Water Treatment Plant – Pesticides & PCB Tests

Source Water	Parameter	MAC/ IMAC (ug/L)	# of Samples	# of Detectable Results	Date(s)	Range (ug/L)	Exceedance	Source of Parameter
Loch Lomond Treated Water	Alachlor	5	1	0	08/31/2001	<0.5	NO	Insecticide, herbicide and fungicide residues
	Atrazine + N-dealkylated metabolites	5	1	0	08/31/2001	<1	NO	
	Azinphos-methyl	20	1	0	08/31/2001	<2	NO	
	Chlorpyrifos	90	1	0	08/31/2001	<9	NO	
	Cyanazine	10	1	0	08/31/2001	<1	NO	
	Diazinon	20	1	0	08/31/2001	<2	NO	
	Diclofop-methyl	9	1	0	08/31/2001	<0.9	NO	
	Dimethoate	20	1	0	08/31/2001	<3	NO	
	Dinoseb	10	1	0	08/31/2001	<1	NO	
	Malathion	190	1	0	08/31/2001	<19	NO	
Metribuzin	80	1	0	08/31/2001	<8	NO		

Loch Lomond – Pesticides & PCB Tests (cont.)

Source Water	Parameter	MAC/ IMAC (ug/L)	# of Samples	# of Detectable Results	Date(s)	Range (ug/L)	Exceedance	Source of Parameter
Loch Lomond Treated Water (cont.)	Parathion	50	1	0	08/31/2001	<5	NO	Insecticide, herbicide and fungicide residues
	Phorate	2	1	0	08/31/2001	<0.5	NO	
	Prometryne	1	1	0	08/31/2001	<0.3	NO	
	Simazine	10	1	0	08/31/2001	<1	NO	
	Terbufos	1	1	0	08/31/2001	<1	NO	
	Triallate	230	1	0	08/31/2001	<23	NO	
	Trifluralin	45	1	0	08/31/2001	<4.5	NO	
	P,p'-DDD	30**	1	0	08/31/2001	<0.5	NO	
	P,p'-DDE	30**	1	0	08/31/2001	<0.5	NO	
	P,p'-DDT	30**	1	0	08/31/2001	<0.5	NO	
	Aldrin	0.7*	1	0	08/31/2001	<0.07	NO	
	Dieldrin	0.7*	1	0	08/31/2001	<0.07	NO	
	Heptachlor	3 ⁺	1	0	08/31/2001	<0.1	NO	
	Heptachlor Epoxide	3 ⁺	1	0	08/31/2001	<0.1	NO	
	Lindane (Total)	4	1	0	08/31/2001	<0.4	NO	
	Methoxychlor	900	1	0	08/31/2001	<90	NO	
	Metolachlor	50	1	0	08/31/2001	<5	NO	
	Chlordane	7	1	0	08/31/2001	<0.7	NO	
	Bromoxynil	5	1	0	08/31/2001	<0.5	NO	
	Dicamba	120	1	0	08/31/2001	<12	NO	
	2,4-Dichlorophenol	900	1	0	08/31/2001	<90	NO	
	2,4-D	100	1	0	08/31/2001	<10	NO	
	Pentachlorophenol	60	1	0	08/31/2001	<6	NO	
	Picloram	190	1	0	08/31/2001	<19	NO	
	2,3,4,6-Tetrachlorophenol	100	1	0	08/31/2001	<10	NO	
	2,4,6-Trichlorophenol	5	1	0	08/31/2001	<0.5	NO	
	2,4,5-T	280	1	0	08/31/2001	<28	NO	
	Glyphosate	280	1	0	08/31/2001	<28	NO	
	Diquat	70	1	0	08/31/2001	<7	NO	
	Paraquat	10	1	0	08/31/2001	<1	NO	
	Aldicarb	9	1	0	08/31/2001	<0.9	NO	
	Bendiocarb	40	1	0	08/31/2001	<8	NO	
	Carbaryl	90	1	0	08/31/2001	<9	NO	
Carbofuran	90	1	0	08/31/2001	<10	NO		
Diuron	150	1	0	08/31/2001	<15	NO		
Temephos	280	1	0	08/31/2001	<28	NO		
PCB's	3	1	0	08/31/2001	<0.3	NO	Electrical insulating oil	

< - Means less than the specified method detection limit

Loch Lomond Water Treatment Plant - Inorganic & General Chemistry Parameters

Source Water	Parameter	MAC/ IMAC	# of Samples	# of Detectable Results	Dates	Range (mg/L)	Exceedance	Source of Parameter
Loch Lomond Raw	Aluminum	0.1**	1	1	08/31/2001	0.16		Natural sources at low levels
	Arsenic	0.025	1	0	08/31/2001	<0.0004	NO	Natural source at low levels
	Calcium		1	1	08/31/2001	6.63		Common mineral constituent
	Copper	1.0**	1	1	08/31/2001	0.0206		Corrosion of plumbing system, erosion of natural deposits
	Iron	0.3**	1	1	08/31/2001	0.011		Erosion of natural deposits, corrosion of cast iron mains
	Manganese	0.05**	1	1	08/31/2001	0.002		Erosion of natural mineral deposits
	Lead	0.01	1	0	08/31/2001	<0.0001	NO	Leaching from plumbing and service connections
	Zinc	5**	1	0	08/31/2001	<0.002		Natural sources, corrosion of plumbing
	Alkalinity	500**	1	1	08/31/2001	21		Natural sources, dissolved carbonate
	Ammonia		1	0	08/31/2001	<0.05		Natural sources at low levels
	Chloride	250**	1	1	08/31/2001	1.0		Natural sources at low levels
	Conductivity (uS/cm)		1	1	08/31/2001	60.3		Natural dissolved material in water
	Dissolved Organic Carbon (DOC)	5**	1	1	08/31/2001	6		Organic matter leached into surface water from vegetation
	Hardness	100**	1	1	08/31/2001	28		Natural dissolved minerals (Ca, Mg)
	Nitrate	10	1	1	08/31/2001	0.07	NO	Natural sources at low levels, Fertilizer, septic runoff at high levels
	Nitrite	10 ⁺	1	0	08/31/2001	<0.03	NO	
	Sulphate	500**	1	1	08/31/2001	5.5		Natural mineral sources
Total Kjeldahl Nitrogen (TKN)		1	1	08/31/2001	0.03		Organic matter leached into surface water from vegetation	
Total Phenolics		1	1	08/31/2001	0.003		Decomposition of wood	
Loch Lomond Treated	Aluminum	0.1**	1	1	08/31/2001	0.17		Natural sources at low levels
	Arsenic	0.025	1	0	08/31/2001	<0.0004	NO	Natural source at low levels
	Calcium		1	1	08/31/2001	6.41		Common mineral constituent
	Copper	1.0**	1	1	08/31/2001	0.0269		Corrosion of plumbing system, erosion of natural deposits
	Iron	0.3**	1	0	08/31/2001	<0.005		Erosion of natural deposits, corrosion of cast iron mains
	Manganese	0.05**	1	0	08/31/2001	<0.001		Erosion of natural mineral deposits
	Lead	0.01	1	1	08/31/2001	0.0001	NO	Leaching from plumbing and service connections
	Sodium	200**	1	1	08/31/2001	2.83		Natural mineral constituent plus sodium silicate anticorrosion additive at Loch
	Zinc	5**	1	1	08/31/2001	0.002		Natural sources, corrosion of plumbing
	Alkalinity	500**	1	1	08/31/2001	21		Natural sources, mostly dissolved carbonate
	Ammonia		1	0	08/31/2001	<0.05		Natural sources at low levels

Loch Lomond - Inorganic & General Parameters (cont.)								
Source Water	Parameter	MAC/ IMAC	# of Samples	# of Detectable Results	Dates	Range (mg/L)	Exceedance	Source of Parameter
Loch Lomond Treated Water (cont.)	Chloride	250**	1	1	08/31/2001	3.4		Natural sources at low levels
	Conductivity (uS/cm)		1	1	08/31/2001	68.1		Natural dissolved material in water
	Dissolved Organic Carbon (DOC)	5**	1	1	08/31/2001	5		Organic matter leached into surface water from vegetation
	Hardness	100**	1	1	08/31/2001	27		Natural dissolved minerals (Ca,Mg)
	Nitrate	10	1	1	08/31/2001	0.08	NO	Natural sources at low levels, Fertilizer, septic runoff at high levels
	Nitrite	10 ⁺	1	0	08/31/2001	<0.03	NO	
	Sulphate	500**	1	1	08/31/2001	5.4		Natural mineral sources
	Total Kjeldahl Nitrogen (TKN)		1	1	08/31/2001	0.02		Organic matter leached into surface water from vegetation
Loch Lomond Distribution System	Aluminum	0.1**	1	1	08/31/2001	0.15		Natural sources at low levels
	Arsenic	0.025	1	0	08/31/2001	<0.0004	NO	Natural source at low levels
	Calcium		1	1	08/31/2001	6.18		Common mineral constituent
	Copper	1.0**	1	1	08/31/2001	0.0663		Corrosion of plumbing system, erosion of natural deposits
	Iron	0.3**	1	1	08/31/2001	0.018		Erosion of natural deposits, corrosion of cast iron mains
	Manganese	0.05**	1	0	08/31/2001	<0.001		Erosion of natural mineral deposits
	Lead	0.01	1	0	08/31/2001	<0.0001	NO	Leaching from plumbing and service connections
	Zinc	5**	1	0	08/31/2001	<0.002		Natural sources, corrosion of plumbing
	Alkalinity	500**	1	1	08/31/2001	19		Natural sources - dissolved carbonates
	Ammonia		1	0	08/31/2001	<0.05		Natural sources at low levels
	Chloride	250**	1	1	08/31/2001	4.0		Natural sources at low levels
	Conductivity (uS/cm)		1	1	08/31/2001	68.3		Natural dissolved material in water
	Dissolved Organic Carbon (DOC)	5**	1	1	08/31/2001	5		Organic matter leached into surface water from vegetation
	Hardness	100**	1	1	08/31/2001	26		Natural dissolved minerals (Ca, Mg)
	Nitrate	10	1	0	08/31/2001	<0.03	NO	Natural sources at low levels, Fertilizer, septic runoff at high levels
	Nitrite	10 ⁺	1	0	08/31/2001	<0.03	NO	
	Sulphate	500**	1	1	08/31/2001	5.4		Natural mineral sources
	Total Kjeldahl Nitrogen (TKN)		1	1	08/31/2001	0.03		Organic matter leached into surface water from vegetation

** -Aesthetic Objectives (AO). Exceedance column does not apply to these. + -Nitrite plus Nitrate MAC is 10 mg/L < -Means less than the specified method detection limit