BUFFALO WATER AUTHORITY 1994 WATER QUALITY REPORT

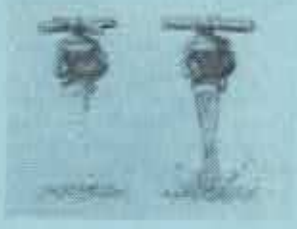
Anthony M. Masiello
Mayor

Joseph N. Giambra
Commissioner of Public Works

John F. Rehak
Director of Water

John Sole
Chairperson, Buffalo Water Board

Joseph N. Giambra
Chairperson, Buffalo Water Finance Authority



Water is Life . . . Don't waste it!

INTRODUCTION

Dear Consumers:

The following is the first annual water quality report compiled by the Buffalo Water Authority (BWA). This report is an attempt to answer your concerns about the quality and safety of water supplied to Buffalo's households and businesses. We also wish to give the consumer a sense of the BWA's future.

Included in this report is information regarding the raw water supply, water treatment and distribution, along with water quality parameters set by the state and federal government, and how Buffalo's water compares with these parameters. As you will see, the quality of Buffalo's water easily meets and exceeds the most stringent standards outlined by the state and federal regulators.

The BWA is committed to serving the community by revamping and modernizing the water treatment process to take advantage of the most effective and economical technology available. Many changes have recently taken place, and more will be undertaken in the near future in response to the changing environment and stricter government regulations.

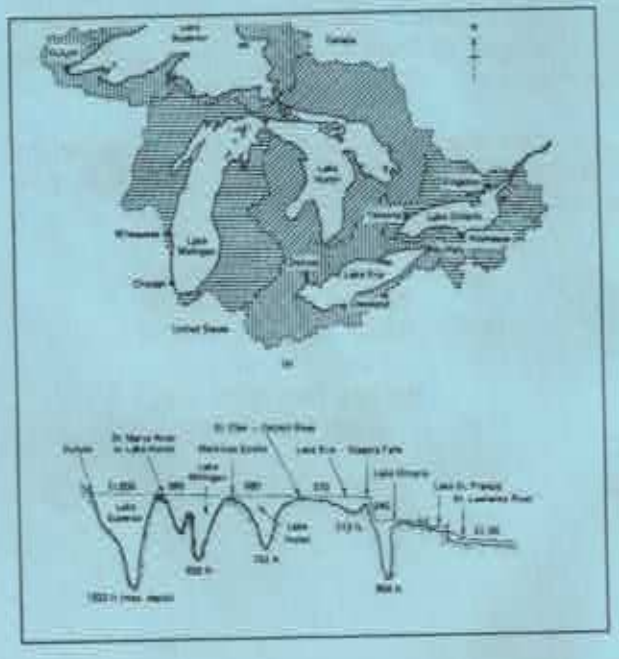
We are anxious to respond to any questions or comments you may have. Please forward your remarks to:

Samuel Campagna
Water Treatment Supvr
Buffalo Water Authority, Filtration Plant
Foot of Porter Ave.
Buffalo, New York 14201
(716) 851-4726

WATER TREATMENT AS A NATURAL PROCESS

The source of all Buffalo's water is Lake Erie. Lake Erie is the shallowest of the Great Lakes, with an average depth of only 85 ft. It also has the shortest detention time of the Great Lakes. Water remains in the lake for only 2.6 years before it is replaced by fresh water (as compared to 191 years in Lake Superior or 22.6 years in Lake Huron). It is also the siltiest of the Great Lakes. Its bottom consists of a finely grated sand, easily upset during turbulent storms.

The combination of its shallowness, short detention time and sandy unstable bottom bestows a great asset upon this body of water. The lake is able to quickly flush itself of harmful contaminants such as pesticides and other organic wastes. When Lake Erie becomes turbulent fine particles of sand and silt become agitated and suspended throughout the lake. Organic contaminants will tightly cling to these particles and will be quickly flushed from the lake. Therefore water treatment begins as a natural process due to the structure and makeup of Lake Erie



BUFFALO'S WATER TREATMENT PROCESS

Buffalo's water intake is located in Lake Erie at the mouth of the Niagara River. This region is known as the Emerald Channel, due to the sparkling clarity of the water in this area. When the water temperature exceeds 50 degrees Fahrenheit, chlorine or potassium permanganate is added to the water at the intake. This is to control zebra mussels and to help combat taste and odor problems created by there presence. The water is gravity fed to an onshore screen house located at the Colonel Ward Pumping Station Complex, by a 12 X 12foot conduit. At this screen house the water is filtered through meshed screens capturing objects such as sticks and fish.

Gravity delivers the water through a conduit where chlorine, fluoride, and polyaluminum chloride (PAC) are added. Chlorine is used to disinfect the water and control zebra mussels and other organisms. Fluoride is added to guard against tooth decay. PAC is a chemical coagulant designed to cause fine particles in the water to bind together forming floc.

Pumps direct the rushing water to an underground basin. Once thoroughly mixed, most of the debris in the water is allowed to settle out into the settling basin as sludge. The sludge is pumped to the Buffalo Sewer Authority for further treatment.

The water still containing some floc, is directed over rapid sand filter beds. It is here, by gravity and water pressure, final filtration takes place.

The quality and safety of the water is tested by an in house laboratory at every stage of the treatment process. The water is then pumped through the water mains to the community, where further tests are conducted from samples taken throughout the City, including private homes, businesses, and public facilities. This is done to make certain the water continues to remain high in quality and safety.

WATER DISTRIBUTION

Water is essential for all life. Besides drinking, bathing and recreation, water is used to fight fires, and has countless industrial application. The City of Buffalo pumps approximately 110 million gallons of treated water every day. This water must be transported, after treatment, throughout the city. Pumps transport the treated water from a 28 million gallon clear well, located below the filter beds, through 2 large conduits. After receiving a pressure boost from auxiliary pumps, the water travels through 800 miles of pipes and 25,000 valves to 90,000 service connections and 7,800 fire hydrants.

This enormous network of pipes, valves, service connections and hydrants are diligently maintained, day and night, throughout all seasons. A crew of 57 service workers are called upon to respond to any number of circumstances, which can interrupt the distribution of treated water.

GETTING TO THE BOTTOM OF IT

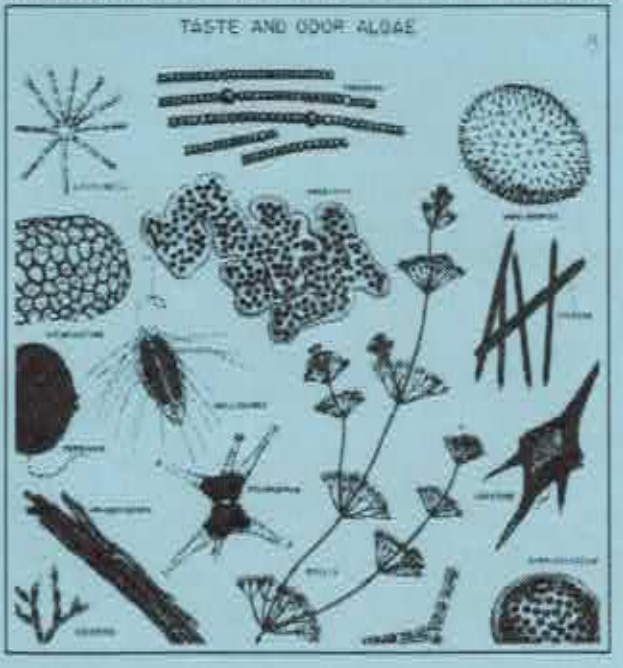
Buffalo Watr Department worker Carl Makzewski climbs out of a deep hole in Gittere Street Sunday as co-workers John Trimper, left; Tom Huhmacher, second from right; and Eddie Mackowiak prepare to pump the hole dry. A break in a 6-inch water main eroded soil beneath the street, causing a cave-in, which swallowed a parked car. The car, which was towed away, was not seriously damaged. Water services to the area, interrupted about noon, was restored in less than three hours.

AESTHETIC QUALITY

Taste and odor is one component of drinking water's aesthetic quality. The Water Authority in recent years has been experiencing some of the worst episodes of summer taste and odors in its 70 year history. Although water sometimes has a taste and odor, it is 100% safe to drink.

Decaying vegetation and byproducts of microbia are probably the most universal sources of taste and odor problems in surface water. The organisms most often linked to taste and odor problems are the filamentous bacteria actinomycetes and the blue-green algae.

Two highly studied byproducts of actinomycetes and blue-green algae are geosmin and methylisoborneol (MIB). These compounds are responsible for the common earthy-musty odors in water supplies and have been isolated from many genera of actinomycetes and of blue-green algae. Both geosmin and MIB can have odor threshold concentrations of less than 10 parts per trillion.



DRINKING WATER STANDARDS

The Safe Drinking Water Act (SDWA) was passed in 1974 because of congressional concern about organic chemical contaminants in drinking water and uneven state supervision of public drinking water supplies.

The SDWA required the USEPA to set enforceable standards for health-related drinking water contaminants to apply to all public water systems.

In addition to health-related enforceable standards, the SDWA required the USEPA to set nonenforceable federal guidelines for contaminants that may adversely affect the aesthetic quality of drinking water.

In the 1979s and 1980s the focus of the USEPA efforts was on (1) synthetic organic chemicals (SOCs) in drinking water resulting from industrial contamination of surface water supplies and on (2) organic contaminants that were produced in the disinfection process, i.e., trihalomethanes (THMs).

Supplemental lead and copper testing was completed in December 1993. Action levels were set for these contaminants.

The results for 1993's required testing are listed in the following table. The allowable concentration is the maximum contaminant level (MCL).

Notes:
CONC = Concentration
< - less than
BDL = Below Detectable Limit
NLS = No Limit Set
NTU = Nephelometric Turbidity Unit

BUFFALO WATER AUTHORITY TEST RESULTS FOR 1993

COMPOUNDS	ALLOWABLE CONC.	ENTRY POINT	
	MCL (mg/L)	RANGE (mg/L)	AVG (mg/L)
PRIMARY COMPOUNDS/INORGANIC			
Arsenic	0.05		< 0.005
Barium	1		< 0.02
Cadmium	0.005		< 0.005
Chromium	0.1		0.01
Copper	1.3	90th Percentile	0.15
Lead	0.015	90th Percentile	0.012
Mercury	0.002		< 0.0002
Selenium	0.01		< 0.005
Silver	0.05		< 0.01
Antimony	0.006		< 0.003
Beryllium	0.004		0.003
Nickel	0.1		< 0.015
Thallium	0.002		< 0.001
Cyanide	0.2		< 0.010
Sulfate	250		23
Nitrite Nitrogen	< 1	<0.003	< 0.004
Nitrate Nitrogen	10	0.25 - 2.03	0.92
PRIMARY COUMPOUNDS/ORGANIC			
Primary Organic Cmpds.			
(POCs)(39 total)	0.005		< 0.0005
Total Trihalomethanes	0.1		< 0.027
Synthetic Organic Cmpds.			
Pesticide(SOCs)(15 total)	Varies		BDL
SECONDARY COMPOUNDS			
Chloride	250		16
Fluoride	2.1	0.10 - 1.17	0.78
Iron	0.3	0.020 - 0.030	0.025
Manganese	0.3	18.8 - 2.5	22
Zinc	5		-
Color	15 units	1 - 10	5
UNREGULATED COMPOUNDS			
Alkalinity	NLS	71 - 90	85
Aluminum	NLS	0.110 - 0.230	< 0.200
Calcium	NLS	31.8 - 36.2	34.8
Magnesium	NLS	7.8 - 8.4	8.1
Hardness	NLS	117.6 - 135	125.2
Sodium	NLS	8.7 - 8.7	8.5
Total Dissolved Solids	NLS	141 - 187	162
Phosphorus	NLS		-
Silicon	NLS		-
Total Organic Carbon	NLS		-
OTHER COMPOUNDS			
pH (acidity)		7.3 - 7.9	7.7
Turbidity	0.5 NTU	0.15 - 1.6	0.35
Coliform Bacteria	< 1/100ml		< 1/100ml

THE FUTURE OF BUFFALO'S WATER TREATMENT

The commitment to ensure lasting quality and safety in our community's water supply impels the BWA to keep abreast of modern water treatment technology. Two impending additions to Buffalo's water treatment process will assist in this undertaking.

The first modification will be the addition of mechanical flocculators (large paddles), and a baffle system constructed in our settling basin. This will allow better control of the coagulant reaction process, and will insure an even cleaner, clearer water.

The second modification will be the addition of a corrosion control system. This system has the ability to coat waterlines, guarding the water against lead and copper contamination in homes and businesses that have internal lead pipes, lead service lines and copper pipes with lead solder joints.

Legislation mandates, regulatory processes, and policies contribute to the development of national drinking water regulations and guidelines in the United States.

Overall, the quality of drinking water in the United States is good. As technology advances, the ability to assess hazardous contamination in public water supplies is heightened. This results in the implementation of additional and more stringent drinking water standards. Demands upon water suppliers for more frequent monitoring and more sophisticated treatment processes to assure higher quality drinking water will increase along with the cost of public drinking water. Thus, the responsibility for assuring the safety of drinking water at the tap will be shared by federal, state, and local authorities; the public water suppliers; and consumers.

"This Water Quality Report has been prepared by Samuel Campagna, Water Treatment Supervisor, with the assistance of Leonard Milioto, Chemist."