NEW YORK CITY
DRINKING WATER QUALITY TESTING RESULTS 2002

DETECTED PARAMETERS

PARAMETERS	NYS DOH MCL	US EPA MCLG	CATSKILL/DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	
CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS												
Alkalinity (mg/L CaCO3)	-		227	9.7 - 30.2	15	46	36.9 - 61	54.3	228	4.7 - 196.2	65.5	Erosion of natural deposits
Aluminum (µg/L)	50 - 200 [1]		218	4 - 34	13	46	ND - 14	9	47	ND - 15	5	Erosion of natural deposits
Barium (mg/L)	2	2	221	0.01 - 0.03	0.02	46	0.02 - 0.03	0.03	59	ND - 0.1	0.02	Erosion of natural deposits
Calcium (mg/L)	-		302	5.4 - 12.8	7.6	53	13.8 - 27.9	23.2	233	7.7 - 83.3	25.5	Erosion of natural deposits
Chloride (mg/L)	250		637	9 - 65	12	96	29 - 71	55	222	10 - 87	41	Naturally occurring; road salt
Chlorine Residual, free (mg/L)	4 [2]		9208	0.04 - 2.2	0.8	1396	0.06 - 1.7	0.8	624	0.04 - 1.9	0.9	Water additive for disinfection
Color - distribution system (color units)	-		8108	3 - 48	7	1032	5 - 40	12	624	1 - 44	5	Presence of iron, manganese, and organics in water
Color - entry points (color units)	15 [3]		1103	3 - 22	7	365	**6 - 35**	14	350	**1 - 22**	5	Iron and manganese; or organic sources, such as algal growth
Copper (mg/L)	1.3 [4]	1.3	307	ND - 0.06	0.01	53	0.01 - 0.12	0.02	223	ND - 0.52	0.04	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Corrosivity (Langelier index)	0 [1, 5]		217	-2.7 to -1.7	-2.2	46	-1.4 to -0.9	-1.2	87	-3.9 to - 0.8	-1.0	
Fluoride (mg/L)	2.2 [3]		1680	0.03 - 2.7	0.9	409	0.3 - 1.1	1	616	0.2 - 2.2	1.1	Erosion of natural deposits; water additive which promotes strong teeth; runoff from fertilizer
Hardness (mg/L CaCO3)	-		229	19 - 47	26	46	57 - 106	92	232	34 - 352	110	Erosion of natural deposits
Hardness (grains/gallon[US]CaCO3)[6]	-		229	1 - 2.7	1.5	46	3.3 - 6.2	5.3	232	2 - 20.5	6.4	Erosion of natural deposits
Iron (µg/L)	300 [3, 7]		270	**20 - 1020**	60	383	30 - 390	100	218	ND - 3620	290	Naturally occurring
Lead (µg/L)	15 [4]	0	293	ND - 20	0.7	49	ND - 20	0.6	220	ND - 16	0.8	Corrosion of household plumbing systems; erosion of natural deposits
Magnesium (mg/L)	-		229	1.3 - 3.7	1.8	46	4.6- 9.1	7.7	232	2.8 - 35.2	11.5	Erosion of natural deposits
Manganese (µg/L)	300 [3, 7]		273	**12 - 371**	44	383	21 - 227	87	218	ND - 331	52	Naturally occurring
Nickel (µg/L)	-		221	ND	ND	46	ND	ND	59	ND - 5	ND	Erosion of natural deposits
Nitrate (mg/L nitrogen)	10	10	631	0.10 - 1.09	0.19	96	0.04 - 0.31	0.21	222	ND - 9.87	2.93	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/L nitrogen)	1	1	217	ND - 0.005	0.002	46	0.001 - 0.004	0.002	84	ND - 0.006	0.001	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
pH (pH units)[8]	6.5 - 8.5 [1]		9211	6.2 - 8.1	7.1	1397	6.9 - 7.4	7.2	624	6.3 - 8.2	7.3	
Phosphate, Ortho- (mg/L)	-		9207	ND - 3.3	2.1	1394	0.1 - 3.3	2.1	624	0.5 - 3	1.6	Water additive for corrosion control
Phosphate, Total (mg/L)	-		0	-	-	0	-	-	26	0.6 - 5.4	3.7	Water additive for corrosion control
Potassium (mg/L)	-		218	0.6 - 1.2	0.7	46	1.4 - 2.5	2.1	47	0.7 - 2.4	1.3	Erosion of natural deposits
Silica [silicon oxide] (mg/L)	-		226	0.8 - 5.1	2	46	1.8 - 3.7	3.1	174	3.5 - 24.4	12.8	Erosion of natural deposits
Sodium (mg/L)	NDL[9]		218	3 - 14	9	46	16 - 31	25	92	6 - 54	28	Naturally occurring; road salt; water softeners; animal waste
Specific Conductance (µmho/cm)	-		9211	80 - 191	100	1397	192 - 391	315	624	140 - 732	323	
Strontium (µg/L)	-		218	20 - 40	30	46	50 - 90	70	47	30 - 150	70	Erosion of natural deposits
Sulfate (mg/L)	250		637	6.3 - 14.3	7.1	96	8.5 - 13.7	11.6	222	11.3 - 103.6	35.1	Naturally occurring
Temperature (°F)	-		9211	36 - 79	55	1397	39 - 76	55	624	42 - 82	59	
Total Dissolved Solids (mg/L)	500 [1]		217	28 - 132	58	46	117 - 298	186	92	65 - 419	223	Metals and salts naturally occurring in the soil; organic matter
Total Organic Carbon (mg/L carbon)	-		217	1.2 - 2.1	1.5	46	2.2 - 3.3	2.8	48	ND - 1.5	0.8	Organic matter naturally present in the environment
Turbidity[10] - distribution system (NTU)	5 [11]		8108	0.7 - 1.3	1	1032	0.9 - 1.4	1.1	624	0.5 - 0.9	0.6	Soil runoff
Turbidity[10] - entry points (NTU)	1 [12]		-	-	-	365		**1.7**	-	-	-	Soil runoff
UV 254 Absorbency (absorbency unit)	-		217	0.021 - 0.045	0.029	46	0.038 - 0.069	0.057	48	0.01 - 0.05	0.021	Organic matter naturally present in the environment
Zinc (mg/L)	5		232	ND - 0.024	0.002	46	ND - 0.005	0.001	211	ND - 0.594	0.072	Naturally occurring
MICROBIAL PARAMETERS												
Total Coliform Bacteria (% of samples positive/month)	5%	0	9169	ND - 0.5%	0.2%	1397	ND - 2.0%	0.3%	661	ND - 1.5%	0.2%	Naturally present in the environment
E. coli (CFU/100mL)	[13]	0	9169	1		1397	ND		661	ND		Human and animal fecal waste
Heterotrophic Plate Count (CFU/mL)	TT	-	3952	ND - 96	ND	626	ND - 15	ND	261	ND - 3	ND	Naturally present in the environment

LEAD AND COPPER RULE SAMPLING AT RESIDENTIAL WATER TAPS: January - June 2002

PARAMETERS	NYS DOH AL	US EPA MCLG	# SAMPLES	RANGE	90th PERCENTILE VALUES	# SAMPLES EXCEEDING AL	SOURCES IN DRINKING WATER
Copper (mg/L)	1.3	1.3	107	0.01 - 0.43	0.31	0	Corrosion of household plumbing systems
Lead (µg/L)	15	0	107	ND - 38	15	11	Corrosion of household plumbing systems

Highlighted and bolded values indicate an exceedence occurred

DETECTED PARAMETERS (continued)

PARAMETERS	NYS DOH MCL	US EPA MCLG	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	
ORGANIC CONTAMINANTS												
Disinfection By-Products detected:												
Bromochloroacetic acid (µg/L)	50		247	ND - 4	2	54	ND - 4	2	24	ND - 2	1	By-product of drinking water chlorination
Chloral Hydrate (µg/L)	50		16	1.6 - 11	5.3	3	4.9 - 8	6.4	-	-	-	By-product of drinking water chlorination
Chloropicrin (µg/L)	50		16	0.3 - 0.7	0.4	3	0.4 - 0.9	0.5	-	-	-	By-product of drinking water chlorination
Haloacetic acid 5 (HAA5) (µg/L)	60 [14]		236	12 - 63	34	45	32 - 71	49	20	1 - 25	14	By-product of drinking water chlorination
Haloacetonitriles (HANs) (µg/L)	50		16	1.2 - 5	2.9	3	5 - 9.1	7.1	-	-	-	By-product of drinking water chlorination
Halogenated ketones (HKs) (µg/L)	50		16	1.5 - 4.5	2.6	3	3.5 - 5.5	4.6	-	-	-	By-product of drinking water chlorination
Total Organic Halogen (µg/L)			217	85 - 200	137	46	181 - 257	215	47	ND - 131	57	By-product of drinking water chlorination
Total Trihalomethanes (µg/L)	80 [14]		568	9 - 58	31	97	24 - 87	48	150	ND - 44	18	By-product of drinking water chlorination
Principal Organic Contaminants detected:												
Bromomethane (µg/L)	5		568	ND	ND	97	ND - 0.6	ND*	149	ND - 0.6	< 0.5	Used to kill a variety of pests; used to make other chemicals or as a solvent to get oil out of nuts, seeds, and wool
n-Butylbenzene (µg/L)	5		568	ND	ND	97	ND	ND	150	ND - 0.6	< 0.5	Solvent used in organic synthesis
Carbon Tetrachloride (µg/L)	5	0	568	ND	ND	97	ND	ND	150	ND - 0.6	ND*	Discharge from chemical plants and other industrial activities
Dichlorodifluoromethane (µg/L)	5		567	ND	ND	97	ND	ND	149	ND - 2.2	< 0.5	Refrigerant; aerosol propellant; foaming agent
Styrene (µg/L)	5	100	568	ND	ND	97	ND	ND	150	ND - 0.6	ND*	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene (µg/L)	5	0	568	ND	ND	97	ND	ND	148	ND - 4.7	0.8	Discharge from dry cleaners
Toluene (µg/L)	5	1000	568	ND	ND	97	ND	ND	150	ND - 1.9	< 0.5	Discharge from petroleum factories
1,2,3-Trichlorobenzene (µg/L)	5		568	ND	ND	97	ND	ND	150	ND - 0.7	ND*	Discharge from textile finishing factories
1,2,4-Trichlorobenzene (µg/L)	5	70	568	ND	ND	97	ND	ND	150	ND - 0.6	ND*	Discharge from textile finishing factories
Trichloroethene (µg/L)	5	0	568	ND	ND	97	ND	ND	150	ND - 1.7	< 0.5	Residual of cleaning solvents and metal degreasers
m-Xylene (µg/L)	5	10,000 (total)	568	ND	ND	97	ND	ND	150	ND - 1.8	ND*	Leaks from gasoline tanks; discharge from petroleum factories; leaching of solvent from lining of potable water tanks
o-Xylene (µg/L)	5	10,000 (total)	568	ND	ND	97	ND	ND	150	ND - 0.7	ND*	Leaks from gasoline tanks; discharge from petroleum factories; leaching of solvent from lining of potable water tanks
p-Xylene (µg/L)	5	10,000 (total)	568	ND	ND	97	ND	ND	150	ND - 1.8	ND*	Leaks from gasoline tanks; discharge from petroleum factories; leaching of solvent from lining of potable water tanks
Specified Organic Contaminants detected:												
Dieldrin (µg/L)	5		3	ND	ND	2	ND	ND	12	ND - 0.07	ND*	Pesticide used in agriculture for soil and seed treatment; used in treatment of wood and mothproofing of woolen products; by-product of the pesticide aldrin. In the US, most uses were banned in 1987; however it is still found in our environment from past years.
Unspecified Organic Chemicals detected:												
Acetone (µg/L)	50		550	ND - 25	5	95	ND	ND	143	ND - 22	< 10	Occurs naturally and is used in the production of paints, varnishes, plastics, adhesives, organic chemicals and alcohol. Also used to clean and dry parts of precision equipment
DCPA Metabolites (µg/L)	50		3	ND	ND	1	ND	ND	10	ND - 0.77	0.37	Runoff from pesticide use
Methyl tert-butyl ether (MTBE) (µg/L)	50		568	ND	ND	97	ND	ND	150	ND - 1.3	< 0.5	Additive to gasoline in the water

UNDETECTED PARAMETERS

UNDETECTED CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS

Antimony, Arsenic, Asbestos [15], Beryllium, Bromide, Cadmium, Chlorate, Chromium, Cyanide, Foaming Agents, Gross Alpha Particle, Lithium, Mercury, Selenium, Silver, 90Strontium - radiological, Thallium, Tritium (3H) - radiological

UNDETECTED ORGANIC CONTAMINANTS

Principal Organic Contaminants not detected:

Benzene, Bromobenzene, Bromochloromethane, sec-Butylbenzene, tert-Butylbenzene, Chlorobenzene, Chloroethane, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2 Dichloropropane, 1,1-Dichloropropene, cis-1,3-Dichloropropene, trans-1,3 Dichloropropene, Ethylbenzene, Isopropylbenzene, p-Isopropyltoluene, Methylene chloride, n-Propylbenzene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichlorofluoromethane, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene

Specified Organic Contaminants not detected:

Alachlor, Aldicarb (Temik), Aldicarb sulfone, Aldicarb sulfoxide, Aldrin, Atrazine, Benzo(a)pyrene, Butachlor, Carbaryl, Carbofuran (Furadan), Chlordane, 2,4-D, Dalapon, 1,2-Dibromo-3-chloropropane, Dicamba, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl) phthalate, Dinoseb, Diquat, Endothall, Endrin, Ethylene dibromide (EDB), Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, 3-Hydroxycarbofuran, Lindane, Methomyl, Methoxychlor, Metolachlor, Metribuzin, Oxamyl (Vydate), Pentachlorophenol, Picloram, Polychlorobiphenyls [PCBs], Propachlor, Simazine, Toxaphene, 2,4,5-TP (Silvex), 2,3,7,8-TCDD (Dioxin), Vinyl chloride

Unspecified Organic Chemicals not detected:

Acenaphthene, Acenaphthylene, Acetochlor, Acifluorfen, tert-Amyl methyl ether, Anthracene, Bentazon, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,I]perylene, a-BHC, b-BHC, d-BHC, Bromacil, 2-Butanone (MEK), Butylbenzylphthalate, tert-butyl ethyl ether, Caffeine, a-Chlordane, g-Chlordane, Chlorobenzilate, Chloroneb, Chlorothalonil (Draconil, Bravo), Chlorpyrifos (Dursban), Chrysene, 2,4-DB, p,p'DDD, p,p'DDE, p,p'DDT, Diazinon, Dibenz[a,h]anthracene, Di-n-Butylphthalate, 3,5-Dichlorobenxoic acid, Dichlorprop, Dichlorvos (DDVP), Diethylphthalate, Diisopropyl ether, Dimethoate, Dimethylphthalate, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Di-N-octylphthalate, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, EPTC, Fluoranthene, Fluorene, Indeno[1,2,3-cd] pyrene, Isophorone, Malathion, Methiocarb, 4-Methyl-2-pentanone (MIBK), Molinate, Naphthalene, 4-Nitrophenol, trans-Nonachlor, Paraquat, Parathion, Permethrin, Phenanthrene, Prometryn, Propoxur (Baygon), Pyrene, 2,4,5-T, Terbacil, Thiobencarb, Trichlorotrifluoroethane (freon), Trifluralin

UNREGULATED CONTAMINANTS MONITORING RULE (UCMR) PARAMETERS - not detected

Acetochlor, DCPA metabolites[16], p,p'DDE, Diazinon, 2,4-Dichlorophenol, 2,4-Dinitrophenol, 2,4-Dinitotoluene, 2,6-Dinitrotoluene, 1,2-Diphenylhydrazine, Disulfoton, Diuron, EPTC, Fonofos, Linuron, 2-Methylphenol, Methyl tert-butyl ether (MTBE), Molinate, Nitrobenzene, Perchlorate, Prometon, 2,4,6-Trichlorophenol, Terbacil, Terbufos

FOOTNOTES

(1) USEPA Secondary MCL; NYSDOH has not set an MCL for this parameter.

(2) Value represents MRDL which is a level of disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. The MRDL is enforceable in the same manner as an MCL.

(3) Determination of MCL violation: If a sample exceeds the MCL, a second sample must be collected from the same location within 2 weeks. If the average of the two results exceeds the MCL, then an MCL violation has occurred.

(4) Action Level (not an MCL) measured at the tap. The data presented in this table were collected from sampling stations at the street curb. For at the tap monitoring see the next table.

(5) A Langelier Index of less than zero indicates corrosive tendencies.

(6) Hardness of up to 3 grains per gallon is considered soft water; between 3 and 9 is moderately hard water.

(7) If iron and manganese are present, the total concentration of both should not exceed 500 µg/L. Values in the groundwater system above the MCL are not a violation because the water at particular wells is treated, as allowed by the State, to meet aesthetic concerns.

(8) The average for pH is the median value.

(9) Water containing more than 20 mg/L of sodium should not be used for drinking by people on severely restricted sodium diets. Water containing more than 270 mg/L of sodium should not be used for drinking by people on moderately restricted sodium diets.

(10) Turbidity is a measure of cloudiness of the water. Turbidity is monitored because it is a good indicator of water quality and can hinder the effectiveness of disinfection.

(11) This MCL for turbidity is the monthly average rounded off to the nearest whole number. Data presented are the range and average of monthly averages.

(12) This MCL only applies to the Croton System. The value presented is the highest monthly average for 2002.

(13) If a sample and its repeat sample are both positive for coliform bacteria and one of the two samples is positive for *E. coli*, then an MCL violation has occurred.

(14) USEPA MCLs for HAA5 and TTHMs are the calculated quarterly running average. In 2002, the MCL was never exceeded. Data presented are the range of individual sampling results and the highest running quarterly average.

(15) The NYSDOH has issued a waiver for asbestos monitoring in the Groundwater System since no asbestos cement pipes are used anywhere in the distribution system.

(16) Under the UCMR monitoring, none of the UCMR parameters were detected except for one sample collected on 6/10/02 at site W36T which detected DCPA Metabolites at 1.4 µg/L. DCPA Metabolites and MTBE, both analytes being evaluated under the UCMR, were detected in groundwater samples collected as part of DEP's routine monitoring as noted in the table above.

* The contaminant was detected in only one sample. The level found was below the MCL.

EXCEEDENCES

Color:

In the Croton System there were 7 color violations at the entry point on 1/01/02, 1/14/02, 3/1/02, 6/22/02, 6/27/02, 8/2/02, and 8/8/02. In the Groundwater System there was one color violation on 7/10/02 at the well W36T entry point. Color has no health effects unless detected in very high concentrations. In some instances, color may be objectionable to some people at as low as 5 units. Its presence is aesthetically objectionable and suggests that the water may need additional treatment.

Iron:

In the Catskill/Delaware System, the MCL for iron was exceeded on 5/10/02 at site 17550 with a value of 1020 µg/L, and on 7/8/03 at site 43250 with a value of 910 µg/L. Iron has no health effect. At 1,000 µg/L, a substantial number of people will note the bitter astringent taste of iron. Also, at this concentration, it imparts a brownish color to laundered clothing and stains plumbing fixtures with a characteristic rust color. Staining can result at levels of 50 µg/L, lower than those detectable to taste buds. Therefore, the MCL of 300 µg/L represents a reasonable compromise as adverse effects are minimized at this level. Many multivitamins may contain 3000 to 4000 µg/L of iron per capsule.

Manganese:

On the Catskill/Delaware System, the MCL for total iron and manganese of 500 µg/L was exceeded on 7/8/03 at site 43250 with a value of 910 µg/L for iron and 294 µg/L for manganese. The Food and Nutrition Board of the National Research Council determined an estimated safe and adequate daily dietary intake of manganese to be 2000-5000 µg/L for adults. However, many people's diet lead them to consume even higher amounts of manganese, especially those who consume high amounts of vegetables or are vegetarian. The infant population is of greatest concern. It would be better if the drinking water were not used to make infant formula since it already contains iron and manganese.

Excess manganese produces a brownish color in laundered goods and impairs the taste of tea, coffee, and other beverages. Elevated concentrations may cause a dark brown or black stain on porcelain plumbing fixtures. As with iron, manganese may form a coating on distribution pipes. These may slough off, causing brown blotches on laundered clothing or black particles in the water.

Turbidity:

In the Croton System, the monthly average entry point MCL for turbidity was exceeded in January and August of 2002. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. During January and August, disinfection levels were far above the requirements, ensuring that NYC's drinking water was safe to consume. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. Please pay special attention to the additional statement in this document regarding *Cryptosporidium*.