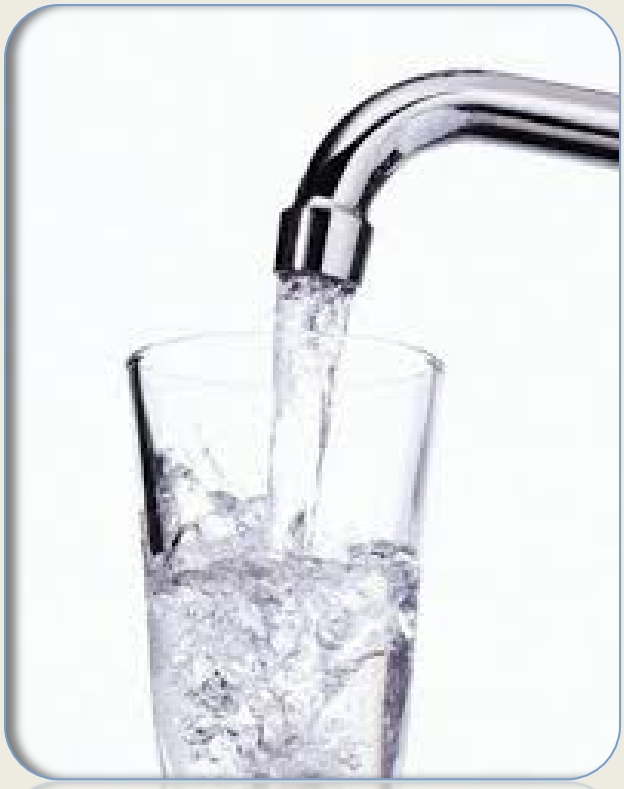
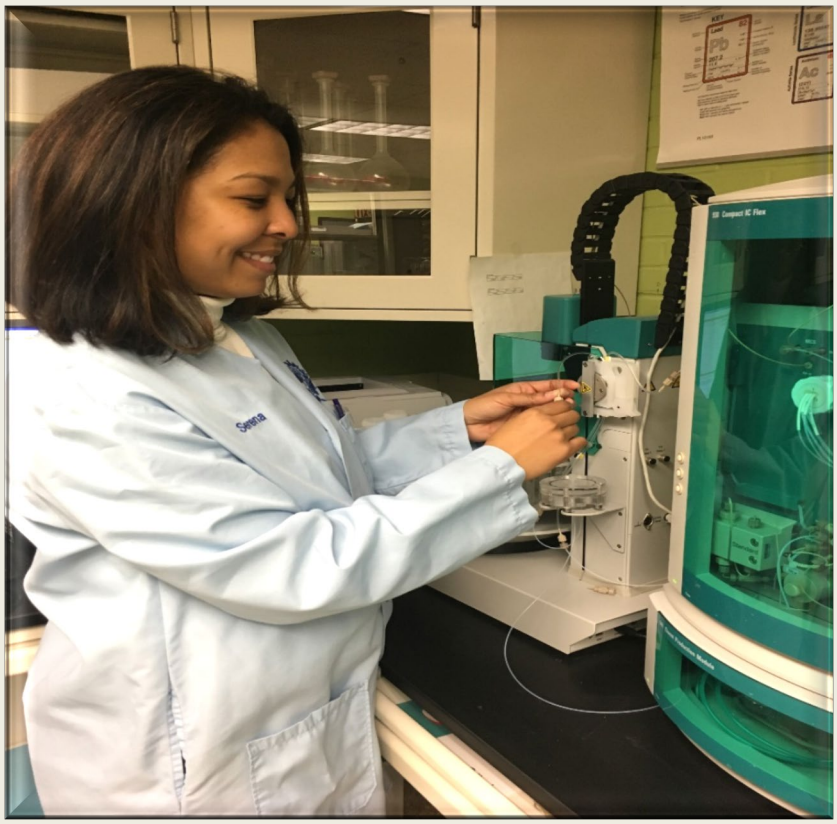
CITY OF RALEIGH 2018 DRINKING WATER QUALITY REPORT

Summarizing 2018 Water Quality Test Results





YOUR DRINKING WATER QUALITY

In the following pages, you will find an overview of the required and voluntary water testing analysis that protects our drinking water system. In order to ensure that your tap water is safe to drink, the Environmental Protection Agency prescribes regulations which limit the number of certain contaminants in water provided by public water systems. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

2018 Annual Finished Water Quality Report
Tests of Finished Water From the EM Johnson and DE Benton Water Treatment Facilities

The City of Raleigh consistently provides a reliable supply of high quality drinking water that surpasses all State and Federal drinking water quality requirements. The following tables represents levels of regulated and unregulated water quality parameters sampled in 2018. The water quality test results indicate that your drinking water complies with all of the EPA's drinking water standards in 2018. If you have any questions regarding this report, please contact the City of Raleigh Drinking Water Laboratory at (919)996-2870.

Microbiologicals

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Cryptosporidium, Oocysts/L *(11/13/2018)*	0	0	NA
Giardia, cyst/L *(11/13/2018)*	0	0	NA
Viruses* *(11/13/2018)*	Negative	Negative	NA

**Viruses include Adenovirus, Astrovirus, Rotavirus and Panternterovirus*

Disinfection Byproducts

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Bromate, mg/l	ND	ND	0.01
Haloacetic Acids (HAA5), ppb	18.2	12.4	60
Total Trihalomethanes (TTHMs), ppb	17.6	16.6	80
Total Organic Carbon, ppm	2.14	1.70	NA

Asbestos

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Total Asbestos (MFL)	ND	ND	7

Nitrate and Nitrite

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Nitrate, ppm	0.15	0.24	10
Nitrite, ppm	<0.1	<0.1	1

Turbidity (Combined Filter Effluent Turbidity Values)

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Turbidity, NTU (Average)	0.04	0.03	TT = 1 NTU

Minerals

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Calcium, mg/l	5.97	5.69	N/A
Sodium, mg/l	30.9	26.1	N/A
Magnesium, mg/l	2.34	1.92	N/A
Potassium, mg/l	3.04	3.90	N/A

Inorganic Chemicals

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Antimony, mg/l	ND	ND	0.006
Arsenic, mg/l	ND	ND	0.01
Barium, mg/l	ND	ND	2
Beryllium, mg/l	ND	ND	0.004
Cadmium, mg/l	ND	ND	0.005
Chromium (Total), mg/l	ND	ND	0.1
Chromium 6 (Hexavalent Chromium), mg/l	0.00005	0.00002	NA
Cyanide, mg/l	ND	ND	0.2
Fluoride, mg/l	0.67	0.73	4
Mercury, mg/l	ND	ND	0.002
Selenium, mg/l	ND	ND	0.05
Thallium, mg/l	ND	ND	0.002

Water Quality Characteristics

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Alkalinity, mg/l as CaCO3	26.1	27.3	NA
Aluminum, mg/l	ND	ND	0.2
Carbon Dioxide, mg/l	0.21	0.22	NA
Chloride, mg/l	13.2	13.6	250
Color, CU	1.1	0.75	15
Conductivity, uS/cm	213	188	NA
Hardness, Total, grains per gallon	1.39	1.28	Classified as "Soft"
Hardness, Total, mg/l as CaCO3	23.9	21.9	Classified as "Soft"
Iron, mg/l	ND	ND	0.3
Manganese, mg/l	ND	ND	0.05
Nickel, mg/l	ND	ND	NA
pH, SU	8.44	8.41	6.5 to 8.5
Silica, mg/l	6.74	8.52	NA
Sulfate, mg/l	48.7	36.3	250
Temperature, °C	19.2	19.5	NA
Total Dissolved Solids, mg/l	142	125	500
UV 254, mg/l	0.034	0.032	NA
Zinc, mg/l	ND	ND	5

Volatile Organic Chemicals (VOCs)

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Benzene, mg/l	ND	ND	0.005
Carbon Tetrachloride, mg/l	ND	ND	0.005
Chlorobenzene, mg/l	ND	ND	0.1
o-Dichlorobenzene, mg/l	ND	ND	0.6
p-Dichlorobenzene, mg/l	ND	ND	0.075
1,2-Dichloroethane, mg/l	ND	ND	0.005
1,1-Dichloroethylene, mg/l	ND	ND	0.007
cis-1,2-Dichloroethylene, mg/l	ND	ND	0.07
trans-1,2-Dichloroethylene, mg/l	ND	ND	0.1
Dichloromethane, µg/L	ND	ND	0.005
1,2-Dichloropropane, µg/L	ND	ND	0.005
Ethylbenzene, µg/L	ND	ND	0.7
Styrene, µg/L	ND	ND	0.1
Tetrachloroethylene, µg/L	ND	ND	0.005
Toluene, µg/L	ND	ND	1
1,2,4-Trichlorobenzene, µg/L	ND	ND	0.07

Volatile Organic Chemicals (VOCs) ~cont

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
1,1,1-Trichoroethane, µg/L	ND	ND	0.2
1,1,2-Trichloroethane, µg/L	ND	ND	0.005
Trichloroethylene, µg/L	ND	ND	0.005
Vinyl chloride, µg/L	ND	ND	0.002
Xylenes (Total), µg/L	ND	ND	10

Synthetic Organic Chemicals (SOCs)

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
1,2-Dibromo-3-chloropropane (DBCP), µg/L	ND	ND	0.02
1,2-Dibromoethane (EDB), µg/L	ND	ND	0.01
1-Naphthol, µg/L	ND	ND	1
2,4,5-TP (Silvex), µg/L	ND	ND	0.2
2,4-D, µg/L	ND	ND	0.1
3-Hydroxycarbofuran, µg/L	ND	ND	4
Acrolor 1016, µg/L	ND	ND	0.08
Acrolor 1221, µg/L	ND	ND	0.19
Acrolor 1232, µg/L	ND	ND	0.23
Acrolor 1242, µg/L	ND	ND	0.26
Acrolor 1248, µg/L	ND	ND	0.1
Acrolor 1254, µg/L	ND	ND	0.1
Acrolor 1260, µg/L	ND	ND	0.2
Alachlor, µg/L	ND	ND	<0.2
Aldicarb sulfone, µg/L	ND	ND	0.8
Aldicarb sulfoxide, µg/L	ND	ND	0.5
Aldicarb, µg/L	ND	ND	0.5
Aldrin, µg/L	ND	ND	<0.2
Atrazine, µg/L	ND	ND	<0.1
Benzo(a)pyrene, µg/L	ND	ND	0.02
Butachlor, µg/L	ND	ND	8
Carbaryl, µg/L	ND	ND	4
Carbofuran, µg/L	ND	ND	0.9
Chlordane, µg/L	ND	ND	0.2
Dalapon, µg/L	ND	ND	1
Di(2-ethylhexyl)adipate, µg/L	ND	ND	0.6
Di(2-ethylhexyl)phthalate, µg/L	ND	ND	1.32
Dibromochloropropane, µg/L	ND	ND	0.0002
Dicamba, µg/L	ND	ND	1
Dieldrin, µg/L	ND	ND	0.2
Dinoseb, µg/L	ND	ND	0.2
Endrin, µg/L	ND	ND	0.01
Ethylene dibromide, µg/L	ND	ND	0.00005
Heptachlor epoxide, µg/L	ND	ND	0.02
Heptachlor, µg/L	ND	ND	0.04
Hexachlorobenzene, µg/L	ND	ND	0.1
Hexachlorocyclopentadiene, µg/L	ND	ND	0.1
Lindane, µg/L	ND	ND	0.02
Methomyl, µg/L	ND	ND	4
Methoxychlor, µg/L	ND	ND	0.1
Metolachlor, µg/L	ND	ND	0.8
Metribuzin, µg/L	ND	ND	0.8
Oxamyl (Vydate), µg/L	ND	ND	2
Oxamyl, µg/L	ND	ND	2

Synthetic Organic Chemicals (SOCs) ~cont

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
PCBs (Polychlorinated Biphenyls), µg/L	ND	ND	0.0005
Pentachlorophenol, µg/L	ND	ND	0.04
Picloram, µg/L	ND	ND	0.1
Propachlor, µg/L	ND	ND	6
Simazine, µg/L	ND	ND	0.07
Toxaphene, µg/L	ND	ND	1

Radionuclides

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Alpha emitters, pCi/L	<3	<3	15
Beta photon emitters, pCi/L	<4	<4	50
Combined radium (pCi/L)	<1	<1	5
Uranium, pCi/L	<0.67	<0.67	20.1
Radon, pCi/L	<100	<100	300

Perchorate and Chlorate

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
Perchlorate, ug/l	ND	0.10	0.05
Chlorate, ug/l	73	250	50

Nitrosamines

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
N-Nitrosodi-N-butylamine (NDBA), ng/L	ND	ND	2.0
N-Nitrosodi-N-propylamine (NDPA), ng/L	ND	ND	2
N-Nitrosodiethylamine (NDEA), ng/L	ND	ND	2
N-Nitrosodimethylamine (NDMA), ng/l	ND	ND	2
N-Nitrosodiphenylamine (NDPhA), ng/L	ND	ND	2
N-Nitrosomethylethylamine (NMEA),ng/L	ND	ND	2
N-Nitrosomorpholine (NMOR), ng/L	ND	ND	2
N-Nitrosopiperidine (NPIP), ng/L	ND	ND	2
N-Nitrosopyrrolidine (NPYR), ng/L	ND	ND	2

Aldehydes

Contaminant	EMJ Water Plant	DEB Water Plant	MCL
Acetaldehyde, ug/l	7.2	7.0	NA
Benzaldehyde, ug/l	ND	ND	NA
Butanal, ug/l	ND	ND	NA
Crotonaldehyde, ug/l	ND	ND	NA
Cyclohexanone, ug/l	ND	ND	NA
Decanal, ug/l	ND	ND	NA
Formaldehyde, ug/l	17	ND	NA
Glyoxal, ug/l	ND	ND	NA
Heptanal, ug/l	ND	ND	NA
Hexanal, ug/l	ND	ND	NA
Methyl glyoxal, ug/l	ND	ND	NA
Nonanal, ug/l	ND	ND	NA
Octanal, ug/l	ND	ND	NA
Pentanal, ug/l	ND	ND	NA
Propanal, ug/l	ND	ND	NA

Perflourinated Compounds

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
10:2 Fluorotelomer sulfonic acid (10:2 FTS), ng/L	ND	ND	2.0
4:2 Fluuorotelomer sulfonic acid (4:2 FTS), ng/L	ND	ND	2.0
6:2 Fluorotelomer sulfonic acid (6:2 FTS), ng/L	ND	ND	2.0
8:2 Fluorotelomer sulfonic acid (8:2 FTS), ng/L	ND	ND	2.0
ADONA, ng/L	ND	ND	2.0
F-53B Major, ng/L	ND	ND	2.0
F-53B Minor, ng/L	ND	ND	2.0
GenX, ng/L	ND	ND	5.0
N-ethyl Perfluorooctanesulfonamideoacetic acid, ng/L	ND	ND	2.0
N-ethylperfluorooctane sulfonamide (NEtFOSA), ng/L	ND	ND	2.0
N-ethylperfluorooctane sulfonamideoethanol, ng/L	ND	ND	2.0
N-methoyperfluorooctane sulfonamidoethanol, ng/L	ND	ND	2.0
N-methyl Perfluorooctanesulfonamidoacetic acid, ng/L	ND	ND	2.0
N-methylperfluorooctane sulfonamide (NMeFOSA), ng/L	ND	ND	2.0
Perfloononanoic acid (PFNA), ng/L	ND	ND	2.0
Perflouro-3-methoxypropanoic acid (PFMOPrA), ng/L	ND	ND	5.0
Perfluoro-2-methoxyethoxyacetic acid, ng/L	ND	ND	5.0
Perfluoro-4-isopropoxybutanoic aicd, ng/L	ND	ND	5.0
Perfluoro-4-methoxybutanoic acid (PFMOBA), ng/L	ND	ND	5.0
Perfluorobutanesulfonic acid (PFBS), ng/L	**2.7**	ND	2.0
Perfluorobutanoic acid (PFBA), ng/L	**5.9**	ND	5.0
Perfluorodecanesulfonic acid (PFDS), ng/L	ND	ND	2.0
Perfluorodecanoic acid (PFDA), ng/L	ND	ND	2.0
Perfluorododecanesulfonic acid (PFDoS), ng/L	ND	ND	2.0
Perfluorododecanoic acid (PFDoA), ng/L	ND	ND	2.0
Perfluoroheptanesulfonic acid (PFHpS), ng/L	ND	ND	2.0
Perfluoroheptanoic acid (PFHpA), ng/L	ND	ND	2.0
Perfluorohexadecanoic acid (PFHxDA), ng/L	ND	ND	2.0
Perfluorohexanesulfonic acid (PFHxS), ng/L	ND	ND	2.0
Perfluorohexanoic acid (PFHxA), ng/L	**3.3**	**2.1**	2.0
Perfluorononanesulfonic acid (PFNS), ng/L	ND	ND	2.0
Perfluorooctane sulfonamide (PFOSA), ng/L	ND	ND	2.0
Perfluorooctanesulfonic acid (PFOS), ng/L	**4.2**	ND	2.0
Perfluorooctanoic acid (PFOA), ng/L	**3.7**	**2.1**	2.0
Perfluoropentanesulfonic acid (PFPeS), ng/L	ND	ND	2.0
Perfluoropentanoic acid (PFPeA), ng/L	**3.7**	**2.4**	2.0
Perfluorotetradecanoic acid (PFTeDA), ng/L	ND	ND	2.0
Perfluorotridecanoic acid (PFTrDA), ng/L	ND	ND	2.0
Perfluoroundecanoic acid (PFUnA), ng/L	ND	ND	2.0

UCMR4

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
Germanium, ug/l	ND	ND	0.3
Manganese, ug/l	**1.14**	ND	0.4
alpha-hexachlorocyclohexane, ug/l	ND	ND	0.01
Chlorpyrifos, ug/l	ND	ND	0.03
Dimethipin, ug/l	ND	ND	0.2
Ethoprop, ug/l	ND	ND	0.03
Oxyfluorfen, ug/l	ND	ND	0.05
Profenofos, ug/l	ND	ND	0.3
Tebuconazole, ug/l	ND	ND	0.2
Total Permethrin (cis- & trans-), ug/l	ND	ND	0.04

UCMR4 ~cont

Contaminant	EMJ Water Plant	DEB Water Plant	MRL
Tribufos, ug/l	ND	ND	0.07
1-Butanol, ug/l	ND	ND	2
2-Methoxyethanol, ug/l	ND	ND	0.4
2-Propen-1-ol, ug/l	ND	ND	0.5
Butylated Hydroxyanisole, ug/l	ND	ND	0.03
o-toluidine, ug/l	ND	ND	0.007
Quinoline, ug/l	**0.016**	**0.012**	0.02
Anatoxin-a, ug/l	ND	ND	0.03
Cylindrospermopsin, ug/l	ND	ND	0.09
Total Microcystins & Nodularins, ug/l	ND	ND	0.3

EMJ Water Plant Treatment Process Information

Chemical	Typical Dosage Range	Purpose of Treatment
Ozone, ppm	1 - 1.5	Oxidant
Sodium Permanganate, ppm	0.4 - 2.0	Pre Oxidant
Ferric Sulfate, ppm	50 - 90	Coagulant
Polymer, ppm	0.05 - 0.10	Coagulant Aid
Sodium Hydroxide, ppm	15 - 35	pH Control
Carbon, ppm	1 - 5	Taste and Odor and organics removal
Silicate, ppm	1	Corrosion control
Hydrofluorosilicic Acid, ppm	0.6 - 0.7	Fluoride Additive
Chlorine, ppm	6 - 7	Disinfectant
Ammonia, ppm	3.8:1 Cl2:NH3 Ratio	Disinfectant when use in conjuction with chlorine to form chloramines
Filter Aid Polymer, ppm	0.08 - 0.12	Enhanced Filtration

DEB Water Plant Treatment Process Information

Chemical	Typical Dosage Range	Purpose of Treatment
Ozone, ppm	1.8 - 3.6	Oxidant
Potassium Permanganate, ppm	1 - 2.5	Pre Oxidant
Ferric Sulfate, ppm	60 - 100	Coagulant
Polymer, ppm	0.30 - 0.60	Coagulant Aid
Sodium Hydroxide, ppm	25 - 45	pH Control
Carbon, ppm	3 - 6	Taste and Odor and organics removal
Silicate, ppm	1	Corrosion control
Hydrofluorosilicic Acid, ppm	0.6 - 0.7	Fluoride Additive
Chlorine, ppm	4.5 - 5.5	Disinfectant
Ammonia, ppm	3.5:1 Cl2:NH3 Ratio	Disinfectant when use in conjuction with chlorine to form chloramines
Filter Aid Polymer, ppm	0.08 - 0.12	Enhanced Filtration

Drinking Water Definitions:

Maximum Contaminant Level (MCL) - *The highest level of a contaminant that is allowed in drinking water.*

Million Fibers per Liter (MFL) - *Million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers*

Minimum Reporting Level (MRL) - *smallest measured concentration of a substance that can be reliably measured by using a given analytical method*

Nephelometric Turbidity Unit (NTU) - *Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticable to the average person.*

Non-Detects (ND) - *Laboratory analysis indicates that the contaminant is not present at the level of detection set for the particular methodology used.*

Not-Applicable (N/A) - *Information not applicable/not required*

Parts per billion (ppb) or Micrograms per liter (μg/L) - *One part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.*

Parts per million (ppm) or Milligrams per liter (mg/L) - *One part per million corresponds to one minute in two years or a single penny in $10,000*

Parts per trillion (ppt) or Nanograms per liter (nanograms/L) - *One part per trillion corresponds to one minute in 2,000,000 years, or a single penny in $10,000,000,000*

Picocuries per liter (pCi/L) - *Picocuries per liter is a measure of the radioactivity in water.*

Treatment Technique (TT) - *A required process intended to reduce the level of a contaminant in drinking water*