

# City of Norfolk

## Water Quality Analysis

This report covers the 3rd Quarter of 2009

Monday, November 02, 2009

### Moore's Bridges Plant

#### Primary Regulated Compounds

These are compounds for which there are actual limits called Maximum Contaminant Levels, or MCLs. The MCL is the highest level of a contaminant that is allowed in drinking water. The Environmental Protection Agency establishes these levels based on health effects research.

Compound	Result	MCL	Method
1,1,1-Trichloroethane	< 0.5 ug/L	200 ug/L	EPA 524.2
1,1,2-Trichloroethane	< 0.5 ug/L	5 ug/L	EPA 524.2
1,1-Dichloroethylene	< 0.5 ug/L	7 ug/L	EPA 524.2
1,2,4-Trichlorobenzene	< 0.5 ug/L	70 ug/L	EPA 524.2
1,2-Dichloroethane	< 0.5 ug/L	5 ug/L	EPA 524.2
1,2-Dichloropropane	< 0.5 ug/L	5 ug/L	EPA 524.2
2,3,7,8-TCDD	< 5 pg/L	30 pg/L	EPA 1613
2,4,5-TP	< 0.2 ug/L	50 ug/L	EPA 515.4
2,4-D	< 0.1 ug/L	70 ug/L	EPA 515.4
Alachlor	< 0.05 ug/L	2 ug/L	EPA 525.2
Aldicarb	< 0.5 ug/L	stayed	EPA 531.2
Aldicarb sulfone	< 0.5 ug/L	stayed	EPA 531.2
Aldicarb sulfoxide	< 0.5 ug/L	stayed	EPA 531.2
Antimony	< 0.002 mg/L	0.006 mg/L	EPA 200.8
Arsenic	< 0.002 mg/L	0.010 mg/L	EPA 200.8
Asbestos	< 0.2 MFL	7 MFL	EPA 100.2
Atrazine	< 0.05 ug/L	3 ug/L	EPA 525.2
Barium	0.039 mg/L	2 mg/L	EPA 200.8
Benzene	< 0.5 ug/L	5 ug/L	EPA 524.2
Benzo(a)pyrene	< 0.02 ug/L	0.2 ug/L	EPA 525.2
Beryllium	< 0.002 mg/L	0.004 mg/L	EPA 200.8
Cadmium	< 0.002 mg/L	0.005 mg/L	EPA 200.8
Carbofuran	< 0.5 ug/L	40 ug/L	EPA 531.2
Carbon Tetrachloride	< 0.5 ug/L	5 ug/L	EPA 524.2
Chlordane	< 0.1 ug/L	2 ug/L	EPA 505
Chlorobenzene	< 0.5 ug/L	100 ug/L	EPA 524.2
Chromium	0.002 mg/L	0.1 mg/L	EPA 200.8
cis-1,2-Dichloroethylene	< 0.5 ug/L	70 ug/L	EPA 524.2
Copper	< 0.025 mg/L	1.3 ppm	EPA 200.8
Cyanide	< 0.025 mg/L	0.2 mg/L	SM 4500-CN F
Dalapon	< 1 ug/L	200 ug/L	EPA 515.4
Di(2-ethylhexyl)adipate	< 0.6 ug/L	400 ug/L	EPA 525.2
Di(2-ethylhexyl)phthalate	< 0.6 ug/L	6 ug/L	EPA 525.2
Dibromochloropropane	< 0.01 ug/L	0.2 ug/L	EPA 504.1
Dichloromethane	< 0.5 ug/L	5 ug/L	EPA 524.2
Dinoseb	< 0.2 ug/L	7 ug/L	EPA 515.4
Diquat	< 0.4 ug/L	20 ug/L	EPA 549.2
Endothall	< 5 ug/L	100 ug/L	EPA 548.1
Endrin	< 0.01 ug/L	2 ug/L	EPA 505
Ethylbenzene	< 0.5 ug/L	700 ug/L	EPA 524.2
Ethylene dibromide	< 0.01 ug/L	0.05 ug/L	EPA 504.1
Glyphosate	< 6 ug/L	700 ug/L	EPA 547
Gross Alpha Activity	0.4 pCi/L	15 pCi/L	EPA 900.0

## Moores Bridges Plant

Gross Beta Activity	3.7 pCi/L	50 pCi/L	EPA 900.0
HAA5, Compliance Average	34 ug/L	60 ug/L	Calculated
Heptachlor	< 0.01 ug/L	0.4 ug/L	EPA 505
Heptachlor epoxide	< 0.01 ug/L	0.2 ug/L	EPA 505
Hexachlorobenzene	< 0.05 ug/L	0.2 ug/L	EPA 525.2
Hexachlorocyclopentadiene	< 0.05 ug/L	50 ug/L	EPA 525.2
Lead	< 0.003 mg/L	0.015 mg/L	EPA 200.8
Lindane	< 0.01 ug/L	0.2 ug/L	EPA 505
Mercury	<0.0002 mg/L	0.002 mg/L	EPA 245.1
Methoxychlor	< 0.05 ug/L	40 ug/L	EPA 505
Nitrate/Nitrite-N, Total	0.17 mg/L	10 mg/L	EPA 300.0
Nitrate-N	0.17 mg/L	10 mg/L	EPA 300.0
Nitrite-N	< 0.1 mg/L	1 mg/L	EPA 300.0
o-Dichlorobenzene	< 0.5 ug/L	600 ug/L	EPA 524.2
Oxamyl	< 0.5 ug/L	200 ug/L	EPA 531.2
PCB 1016	< 0.08 ug/L	0.5 ug/L	EPA 505
PCB 1221	< 0.1 ug/L	0.5 ug/L	EPA 505
PCB 1232	< 0.1 ug/L	0.5 ug/L	EPA 505
PCB 1242	< 0.1 ug/L	0.5 ug/L	EPA 505
PCB 1248	< 0.1 ug/L	0.5 ug/L	EPA 505
PCB 1254	< 0.1 ug/L	0.5 ug/L	EPA 505
PCB 1260	< 0.1 ug/L	0.5 ug/L	EPA 505
p-Dichlorobenzene	< 0.5 ug/L	75 ug/L	EPA 524.2
Pentachlorophenol	< 0.04 ug/L	1 ug/L	EPA 515.4
Picloram	< 0.1 ug/L	500 ug/L	EPA 515.4
Radium 228	0.4 pCi/L	5 pCi/L	EPA 904.0
Selenium	< 0.002 mg/L	0.05 mg/L	EPA 200.8
Simazine	< 0.05 ug/L	4 ug/L	EPA 525.2
Styrene	< 0.5 ug/L	100 ug/L	EPA 524.2
TC, Total Coliform Compliance	1.28 %	5% /mo.	Calculated
Tetrachloroethylene	< 0.5 ug/L	5 ug/L	EPA 524.2
Thallium	< 0.002 mg/L	0.002 mg/L	EPA 200.8
Toluene	< 0.5 ug/L	1,000 ug/L	EPA 524.2
Toxaphene	< 0.5 ug/L	3 ug/L	EPA 505
trans-1,2-Dichloroethylene	< 0.5 ug/L	100 ug/L	EPA 524.2
Trichloroethylene	< 0.5 ug/L	5 ug/L	EPA 524.2
TTHM, Compliance Average	47 ug/L	80 ug/L	Calculated
Turbidity, Filter Compliance	100 %	TT	TT
Vinyl Chloride	< 0.3 ug/L	2 ug/L	EPA 524.2
Xylenes, Total	< 1 ug/L	10,000 ug/L	EPA 524.2

### Secondary Regulated Compounds

These compounds have no health significance, but can cause tastes or odors in your water. For this reason, secondary limits called Secondary Maximum Contaminant Levels (SMCLs) have been established. Exceeding these standards does not mean that the water is unhealthy, only that it might taste or smell unusual.

Compound	Result	SMCL	Method
Aggressive Index	10.05	Noncorrosive	Calculated
Aluminum	0.022 mg/L	0.05-0.2 mg/L	EPA 200.8
Chloride	24 mg/L	250 mg/l	EPA 235.3
Color	0 CUs	15 CUs	SM 2120 B

## Moores Bridges Plant

Foaming Agents	0.011 mg/L	0.5 mg/L	Hach Crystal Violet
Iron	0.057 mg/L	0.3 mg/L	EPA 200.8
Langelier Index	-1.69	Noncorrosive	Calculated
Manganese	< 0.005 mg/L	0.05 mg/L	EPA 200.8
pH	7 units	6.5-8.5	EPA 150.1
Silver	< 0.002 mg/L	0.1 mg/L	EPA 200.8
Solids, Total Dissolved	130 mg/L	500 mg/L	SM 2540 C
Sulfate	27.6 mg/L	250mg/L	EPA 300.0
TO, Threshold Odor, Quarterly Averag	< 3 units	3	SM 2150 B
Zinc	0.134 mg/L	5 mg/l	EPA 200.8

### Monitored Unregulated Compounds

These compounds are not regulated by the EPA and have no established limits. Mandatory monitoring for these compounds helps EPA determine where certain compounds occur and whether those compounds need to be regulated.

Compound	Result	Method
1,1,1,2-Tetrachloroethane	< 0.5 ug/L	EPA 524.2
1,1,2,2-Tetrachloroethane	< 0.5 ug/L	EPA 524.2
1,1-Dichloroethane	< 0.5 ug/L	EPA 524.2
1,1-Dichloropropene	< 0.5 ug/L	EPA 524.2
1,2,3-Trichlorobenzene	< 0.5 ug/L	EPA 524.2
1,2,3-Trichloropropane	< 0.5 ug/L	EPA 524.2
1,2,4-Trimethylbenzene	< 0.5 ug/L	EPA 524.2
1,3,5-Trimethylbenzene	< 0.5 ug/L	EPA 524.2
1,3-Dichloropropane	< 0.5 ug/L	EPA 524.2
2,2-Dichloropropane	< 0.5 ug/L	EPA 524.2
3-Hydroxycarbofuran	< 0.5 ug/L	EPA 531.2
Aldrin	< 0.01 ug/L	EPA 505
Bromobenzene	< 0.5 ug/L	EPA 524.2
Bromochloromethane	< 0.5 ug/L	EPA 524.2
Bromomethane	< 0.5 ug/L	EPA 524.2
Butachlor	< 0.05 ug/L	EPA 525.2
Carbaryl	< 0.5 ug/L	EPA 531.2
Chloroethane	< 0.5 ug/L	EPA 524.2
Chloromethane	< 0.5 ug/L	EPA 524.2
cis-1,3-Dichloropropene	< 0.5 ug/L	EPA 524.2
DCPA, Total Mono & Diacid Degradate	< 0.1 ug/L	EPA 515.4
Dibromomethane	< 0.5 ug/L	EPA 524.2
Dicamba	< 0.1 ug/L	EPA 515.4
Dichlorodifluoromethane	< 0.5 ug/L	EPA 524.2
Dieldrin	< 0.01 ug/L	EPA 505
HAA, Dibromoacetic acid	< 1 ug/L	SM 6251B
HAA, Dichloroacetic acid	25 ug/L	SM 6251B
HAA, Monobromoacetic acid	< 1 ug/L	SM 6251B
HAA, Monochloroacetic acid	4.1 ug/L	SM 6251B
HAA, Trichloroacetic acid	28 ug/L	SM 6251B
HAA5, Total	57 ug/L	SM 6251B
Hexachlorobutadiene	< 0.5 ug/L	EPA 524.2
Isopropylbenzene	< 0.5 ug/L	EPA 524.2
m-Dichlorobenzene	< 0.5 ug/L	EPA 524.2
Methomyl	< 0.5 ug/L	EPA 531.2
Metolachlor	< 0.05 ug/L	EPA 525.2

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Metribuzin	< 0.05 ug/L	EPA 525.2
Molinate	< 0.1 ug/L	EPA 525.2
MTBE	< 0.5 ug/L	EPA 524.2
n-Butylbenzene	< 0.5 ug/L	EPA 524.2
n-Propylbenzene	< 0.5 ug/L	EPA 524.2
Naphthalene	< 0.3 ug/L	EPA 525.2
o-Chlorotoluene	< 0.5 ug/L	EPA 524.2
p-Chlorotoluene	< 0.5 ug/L	EPA 524.2
p-Isopropyltoluene	< 0.5 ug/L	EPA 524.2
Perchlorate	< 4 ug/L	EPA 314
Propachlor	< 0.05 ug/L	EPA 525.2
sec-Butylbenzene	< 0.5 ug/L	EPA 524.2
Terbacil	< 0.1 ug/L	EPA 525.2
tert-Butylbenzene	< 0.5 ug/L	EPA 524.2
THM, Bromodichloromethane	10.9 ug/L	EPA 502.2
THM, Bromoform	< 1 ug/L	EPA 502.2
THM, Chloroform	46.8 ug/L	EPA 502.2
THM, Dibromochloromethane	1.7 ug/L	EPA 502.2
TTHM, Total trihalomethanes	59.4 ug/L	EPA 502.2

### Compounds and Physical Characteristics of Interest

These water quality parameters are not regulated, but are frequently requested by customers.

Compound	Result	Method
Alkalinity	27 mg/L	SM 2320B
Ammonia, Quarterly Average	0.087 mg/L	Calculated
Calcium	16.8 mg/L	SM 3500-Ca D
Calcium Hardness	42 mg/L	SM 3500-Ca A
Chlorine, Free	0 mg/L	SM 4500-CI F
Chlorine, Total	3.5 mg/L	SM 4500-CI F
Conductivity	199 umho/cm	SM 2510 B
Fluoride	0.75 mg/L	SM 4500-F C
Hardness	3.16 gr/Gal	Calculated
Hardness	54 mg/L	SM 2340 C
Magnesium	2.9 mg/L	SM 3500-Mg E
Potassium	2.73 mg/L	EPA 200.8
Silica	5.9 mg/L	EPA 200.7
Sodium	14.2 mg/L	EPA 200.8
Solids, Total	122 mg/L	SM 2540 B
Temperature, C	27.8 C	Calculated
Temperature, F	82 F	SM 2550
Temperature, F, Annual Average	68 F	Calculated
Temperature, F, Annual Maximum	86 F	Calculated
Temperature, F, Annual Minimum	49 F	Calculated
Turbidity	0.13 ntu	SM 2130 B

### Additional Unregulated Compounds

Although we are not required to monitor for the following compounds, we include them in order to evaluate compliance with future regulations.

Compound	Result	Method
2,4,5-T	< 0.2 ug/L	EPA 515.4
2,4-DB	< 2 ug/L	EPA 515.4
2,4-Dinitrotoluene	< 0.1 ug/L	EPA 525.2

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2,6-Dinitrotoluene	< 0.1 ug/L	EPA 525.2
2-Butanone	< 5 ug/L	EPA 524.2
3,5-Dichlorobenzoic acid	< 0.5 ug/L	EPA 515.4
4,4'-DDD	< 0.1 ug/L	EPA 525.2
4,4'-DDE	< 0.1 ug/L	EPA 525.2
4,4'-DDT	< 0.1 ug/L	EPA 525.2
4-Methyl-2-Pentanone	< 5 ug/L	EPA 524.2
Acenaphthene	< 0.1 ug/L	EPA 525.2
Acenaphthylene	< 0.1 ug/L	EPA 525.2
Acetochlor	< 0.1 ug/L	EPA 525.2
Acifluorfen	< 0.2 ug/L	EPA 515.4
alpha-BHC	< 0.1 ug/L	EPA 525.2
alpha-Chlordane	< 0.05 ug/L	EPA 525.2
Anthracene	< 0.02 ug/L	EPA 525.2
Baygon	< 0.5 ug/L	EPA 531.2
Bentazon	< 0.5 ug/L	EPA 515.4
Benz(a)anthracene	< 0.05 ug/L	EPA 525.2
Benzo(b)fluoranthene	< 0.02 ug/L	EPA 525.2
Benzo(g,h,i)perylene	< 0.05 ug/L	EPA 525.2
Benzo(k)fluoranthene	< 0.02 ug/L	EPA 525.2
beta-BHC	< 0.1 ug/L	EPA 525.2
Boron	< 0.05 mg/L	EPA 200.7
Bromacil	< 0.2 ug/L	EPA 525.2
Bromoethane	< 0.5 ug/L	EPA 524.2
Butylbenzylphthalate	< 0.5 ug/L	EPA 525.2
Caffeine	< 0.05 ug/L	EPA 525.2
Chlorothalonil	< 0.1 ug/L	EPA 525.2
Chrysene	< 0.02 ug/L	EPA 525.2
delta-BHC	< 0.1 ug/L	EPA 525.2
Di-isopropyl ether	< 3 ug/L	EPA 524.2
Di-n-Butylphthalate	< 1 ug/L	EPA 525.2
Di-n-Octylphthalate	< 0.1 ug/L	EPA 525.2
Diazinon	< 0.1 ug/L	EPA 525.2
Dibenz(a,h)anthracene	< 0.05 ug/L	EPA 525.2
Dichlorprop	< 0.5 ug/L	EPA 515.4
Diethylphthalate	< 0.5 ug/L	EPA 525.2
Dimethoate	< 0.1 ug/L	EPA 525.2
Dimethylphthalate	< 0.5 ug/L	EPA 525.2
Endosulfan I	< 0.1 ug/L	EPA 525.2
Endosulfan II	< 0.1 ug/L	EPA 525.2
Endosulfan sulfate	< 0.1 ug/L	EPA 525.2
EPTC	< 0.1 ug/L	EPA 525.2
Fluoranthene	< 0.1 ug/L	EPA 525.2
Fluorene	< 0.05 ug/L	EPA 525.2
gamma-Chlordane	< 0.05 ug/L	EPA 525.2
HAA, Bromochloroacetic acid	4.8 ug/L	SM 6251B
Indeno(1,2,3-cd)pyrene	< 0.05 ug/L	EPA 525.2
Isophorone	< 0.5 ug/L	EPA 525.2
m,p-Xylenes	< 0.5 ug/L	EPA 524.2
Methiocarb	< 0.5 ug/L	EPA 531.2
Molybdenum	0.008 mg/L	EPA 200.8
Nickel	< 0.002 mg/L	EPA 200.8
o-Xylene	< 0.5 ug/L	EPA 524.2

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Orthophosphate	0.27 mg/L	EPA 365.3
Paraquat	< 2 ug/L	EPA 549.2
Pendimethalin	< 0.1 ug/L	EPA 525.2
Phenanthrene	< 0.04 ug/L	EPA 525.2
Pyrene	< 0.05 ug/L	EPA 525.2
Terbutylazine	< 0.1 ug/L	EPA 525.2
tert-Amyl Methyl Ether	< 3 ug/L	EPA 524.2
tert-Butyl Ethyl Ether	< 3 ug/L	EPA 524.2
Thiobencarb	< 0.2 ug/L	EPA 525.2
trans-1,3-Dichloropropene	< 0.5 ug/L	EPA 524.2
trans-Nonachlor	< 0.05 ug/L	EPA 525.2
Trichlorofluoromethane	< 0.5 ug/L	EPA 524.2
Trichlorotrifluoroethane	< 0.5 ug/L	EPA 524.2
Trifluralin	< 0.1 ug/L	EPA 525.2

Samples collected on: 7/14/2009 , 7/14/2009

Location: Moores Bridges Water Treatment Plant Effluent

### Notes of Interest:

1. The MCLs for Lead and Copper, the "action levels," are measured at the 90th percentile of all samples collected.
2. THMs and HAAs are based on a four quarter running average of eight locations throughout Norfolk.
3. Total coliform positive samples must not exceed 5% of total samples per month. Highest month of quarter is listed.
4. Under "Primary Regulated Compounds," turbidity compliance is based on the percentage of filtered water samples below 0.3 NTU. Highest month of the quarter is listed. "TT" stands for Treatment Technique, a required process intended to reduce the level of a contaminant in drinking water. The turbidity value listed under "Compounds and Physical Characteristics of Interest" is the finished water turbidity leaving the plant on the day of sampling.

For questions concerning this report, please call the Division of Water Quality's Laboratory at 441-5678, Monday thru Friday 8:00am to 4:00pm.

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Vernon R. Land  
Water Quality Manager    <http://www.city.norfolk.va.us/utilities/quality/index.html>    <http://www.epa.gov/safewater/mcl.html>