BURGESS & NIPLE

5085 Reed Road | Columbus, OH 43220 | 614.459.2050

Mr. Michael B. Nixon
Superintendent
City of Lancaster, Ohio
Water/Water Pollution Control
800 Lawrence Street
Lancaster, OH 43130-9401

Re: Background Groundwater Quality In the Vicinity of the City of Lancaster Miller Park Potable Water Supply Well Field

February 22, 2016

Dear Mr. Nixon:

Burgess & Niple, Inc. (B&N) has prepared this letter for the City of Lancaster, Ohio (City) to provide additional information regarding groundwater quality in the vicinity of the City's Miller Park potable water supply well field. In an email dated February 10, 2016 from Mr. Robert Hedges, City Council President, to Mr. Brian Kuhn, Mayor of the City of Lancaster, Mr. Hedges identifies that contamination has been identified in monitoring wells MW-9S and MW-9D. Mr. Hedges indicates that arsenic concentrations reported for samples collected from MW-9S and MW-9D on January 20, 2016 exceeded the U.S. Environmental Protection Agency (EPA) Primary Drinking Water Standard (DWS). In a February 9, 2016 Facebook post, Mr. Hedges indicates that the elevated arsenic concentrations are likely a contaminant plume originating in the central portion of the jail site (referring to the new County Jail site at 342 W. Wheeling Street in Lancaster, Ohio). He indicates, "The contaminant plume is likely the result of hydraulic migration of arsenic (and other toxic metals) from the contaminated fill material, through the confining clay (which now has been perforated by the foundation pilings being installed on the site), and into the underlying sand and gravel aquifer." Mr. Hedges goes further in his February 10, 2016 email stating, "I am presuming that we are going to abide by the requirements of the Ground water Monitoring Plan and we are not going to try to dance around the definition of 'contamination'."

Due to the recent correspondence associated with the City's Miller Park Water Supply Wellfield, it is imperative that regulatory requirements be understood with regard to the definition of "contamination" and how it relates to background concentrations. As documented in the B&N letter dated December 8, 2015 to the City, arsenic concentrations within the Miller Park water supply well PW-28 have been as high as 18 micrograms per liter (µg/l), with an average concentration of 12 µg/l. The average detected arsenic concentrations reported for monitoring wells MW-3 (18.7 µg/l), MW-4S (18.5 µg/l), MW-7 (17.7 µg/l), MW-1D (11.3 µg/l), MW-5D (33.0 µg/l), and MW-6D (11.8 µg/l) within the Miller Park Wellhead Protection Program (WHPP) monitoring network have also been documented to exceed the U.S. EPA Primary DWS of 10 µg/l since the WHPP monitoring began in October of 1995. The highest arsenic concentrations have been observed upgradient of MW-9S and MW-9D and the new County Jail site at monitoring wells MW-4S (maximum concentration of 57.0 µg/l) and could also be contributing to the concentrations reported in MW-9S and MW-9D.

The definition of groundwater "contamination" is not restricted to an identification of chemicals of concern as being above a Primary DWS. We present the following to support the inclusion of background groundwater quality when considering the identification of "contaminated groundwater".

Regulatory Requirements Associated with Background Concentrations

There are Ohio regulations that acknowledge that concentrations of select constituents are naturally occurring and do not need to be remediated unless a region-wide remedial action is taking place. Ohio Administrative Code (OAC) 3745-27-10(F)(7) details the procedures for establishing groundwater remediation standards for waste-derived constituents that have been determined to be released from a municipal solid waste disposal facility:

7. Ground water remediation standards. The corrective measures plan shall propose a concentration level for each waste-derived constituent which has been detected in the ground water at a statistically significant level. These shall be established as follows:

a. The proposed concentration levels in the ground water shall be protective of human health and safety and the environment.

b. Unless an alternate level is deemed necessary to protect environment receptors, then the following apply:

i. For constituents for which a maximum contaminant level has been promulgated under section Chapter 3745-81 of the Administrative Code, the maximum contaminant level for that constituent.

ii. For constituents for which maximum contaminant levels have not been promulgated, the background concentration for the constituent from wells in accordance paragraphs (C)(4) and (C)(5) of this rule.

iii. If the owner or operator can demonstrate to the director that a waste-derived constituent is already present in the ground water at a background level, then the proposed concentration levels shall not be set below background levels unless the director determines that cleanup to levels below background levels is necessary to protect human health and the environment and such cleanup is in connection with an area-wide remedial action under other authorities.

OAC 3745-300-07(F)(5) details the procedures for establishing the applicable standards for all complete exposure pathways for properties that have implemented a site investigation under the Ohio Environmental Protection Agency (EPA) Voluntary Action Program (VAP):

5. Determination of applicable standards. Applicable standards must be determined for all chemicals of concern with respect to all exposure pathways determined to be complete under paragraph (F)(1) of this rule for which the volunteer intends to demonstrate compliance with applicable standards in accordance with paragraph (I) of this rule. The volunteer must determine and derive the applicable standards for each complete exposure pathway in accordance with the requirements specified in this chapter. When an engineering control is implemented under an operation and maintenance plan in accordance with rule 3745-300-11 of the Administrative Code that renders an exposure pathway incomplete the volunteer does not need to derive the applicable standards.

a. The volunteer must determine the applicability of generic numerical standards at the property in accordance with paragraph (A)(1)(a) of rule 3745-300-08 of the Administrative Code. If generic direct-contact soil standards for restricted land uses are used to meet applicable standards, institutional controls must be used to limit the property's land use as described in paragraphs (B)(2)(d) and (C)(2)(c) of rule 3745-300-08 of the Administrative Code. The institutional controls must be implemented in accordance with rule 3745-300-11 of the Administrative Code.

b. When a property-specific risk assessment is performed at the property, the volunteer must determine the applicability of standards derived through a property-specific risk assessment conducted in accordance with paragraph (A) of rule 3745-300-09 of the Administrative Code.

c. The volunteer must determine the applicability of any other standards contained in this rule or in rule 3745-300-08, 3745-300-09, 3745-300-10, or 3745-300-11 of the Administrative Code.

d. The volunteer must consider the performance of a remedy employed at the property when its use is intended to meet or maintain applicable standards. The remedy must be implemented in accordance with rule 3745-300-11 of the Administrative Code.

e. The volunteer does not need to determine applicable standards in accordance with rule 3745-300-08 or 3745-300-09 of the Administrative Code for chemicals of concern when the concentrations of the chemicals of concern from the property are at or below background levels determined in accordance with paragraph (H) of this rule.

OAC 3745-54-94 details the procedures for establishing concentrations limits in groundwater for hazardous constituents determined to be released by a hazardous waste disposal facility:

A. The facility permit will specify the concentration limits in the ground water for hazardous constituents established under rule 3745-54-93 of the Administrative Code. The concentration of a hazardous constituent:

*1. **Must not exceed the background level of that constituent in the ground water at the time that limit is specified in the permit**; or*

*2. For any of the constituents listed in the table in this rule must not exceed the respective value given in the table **if the background level of the constituent is below the value given in the table**; or*

3. Must not exceed an alternate limit established in the permit under paragraph (B) of this rule.

To date, there has been no known or published regional cleanup effort for reducing naturally occurring arsenic concentrations within a sand and gravel aquifer in Ohio. There are no similar regulations promulgated within the Ohio drinking water regulations that address background concentrations. This is due to the fact that the drinking water regulations apply to finished water distributed to customers. The regulations do not apply to raw water prior to entering a water treatment/distribution facility. However, we believe that Ohio EPA's interpretation and overall approach has remained consistent with regard to background water quality and regulatory compliance. Therefore, arsenic concentrations observed in MW-9S and MW-9D to be above the Ohio EPA Primary DWS can be considered to be at or below background concentrations that have been observed in groundwater in and around the monitoring wells and water supply wells of the Miller Park Well Field, as well as similar sand and gravel aquifers in buried valley deposits across the Midwest.

Treatment of Elevated Arsenic Concentrations

Arsenic concentrations have been documented to be above the U.S. EPA Primary DWS in and around the Miller Park Well Field since October 1995. The City's water treatment facility (WTF) has been treating groundwater collected by the Miller Park water supply wells since 1932. To date, arsenic concentrations reported to Ohio EPA and in the Consumer Confidence Reports (CCRs) in accordance with Ohio EPA drinking water regulations have not exceeded the U.S. EPA Primary DWS. Therefore, there is definitive evidence that the WTF effectively reduces concentrations of arsenic prior to distribution to the community.

Attachment 1 includes the analytical tables from the CCRs for 2009 through 2014 (those required to be made available to the community). As displayed in the tables, arsenic has not been detected in the North Plant finished water samples. Therefore, arsenic concentrations in the City's treated public water supply meet the regulatory requirements.

Confining Layer within the Sand and Gravel Aquifer

In his latest correspondence, Mr. Hedges references a confining clay layer that he believes has been perforated by the foundation pilings being installed on the new County Jail site. As detailed in the Bennett & Williams letter dated January 29, 2016 to Mr. Dennis Keller, Facilities Manager for the Fairfield County Board of Commissioners, as well as in the B&N letter dated February 9, 2016, based upon review of the boring logs for MW-9S and MW-9D, there is no distinct low-permeability unit (i.e. clay) that could be classified as a separating aquitard of the upper and lower sand and gravel deposits in the area. Therefore, it appears that the shallow wells monitor the upper portion of the regional sand and gravel aquifer and the deep wells monitor the lower portion of the regional sand and gravel aquifer.

Reiteration of the Proposed Enhancement to the WHPP

The B&N letter dated February 9, 2016 included several recommendations for enhancing the City's Miller Park WHPP, including statistical analysis of the groundwater quality data reported for the WHPP monitoring wells, sampling of the water supply wells, addition of a combined raw water sampling location to the monitoring program, and completion of a study of the capabilities of the WTF to remove heavy metals prior to distribution based upon additional data collected. These enhancements will provide a better understanding of the existing geochemistry of the sand and gravel aquifer as well as the overall treatment capabilities of the WTF.

If you have any questions or comments, please do not hesitate to call.

Sincerely,

Michael E. Leone, CPG
Project Director

Thomas J. Mignery, CPG, VAP CP
Principal in Charge

MEL/TJM:cmc
Attachments

ATTACHMENT 1

CONSUMER CONFIDENCE REPORTS

What's in My Water?

CONTAMINANTS	Units	MCLG (1)	MCL (2)	Amount Detected	Range of Detection	Violation	Sample Year	Typical Source of Contamination
Inorganic Contaminants								
* 1) Lead	ppb	0	AL=15	2.7**	< 2 to 12	NO	2008	Corrosion of household plumbing
* 2) Copper	ppm	1.3	AL=1.3	0.820**	.088 to 1.040	NO	2008	Corrosion of household plumbing
* 0 out of 30 distribution samples were found to have levels that exceeded the action level of 15 ppb lead and 1.3 ppm copper								
NORTH PLANT								
Barium	ppm	2	2	0.0335	N/A	NO	2008	Erosion of natural deposits
Fluoride	ppm	4	4	0.23	N/A	NO	2008	Erosion of natural deposits
Nitrate	ppm	10	10	0.150	N/A	NO	2009	Erosion of natural deposits
SOUTH PLANT								
Barium	ppm	2	2	.0969	N/A	NO	2008	Erosion of natural deposits
Fluoride	ppm	4	4	BDL	N/A	NO	2008	Erosion of natural deposits
Nitrate	ppm	10	10	BDL	N/A	NO	2009	Erosion of natural deposits
Volatile Organic Compounds Distribution System								
* TTHM	ppb	N/A	80	31.14	29.05 to 31.14	NO	2008-2009	By-product of drinking water chlorination
* HAA5	ppb	N/A	60	12.80	1.313 to 12.80	NO	2008-2009	By-product of drinking water chlorination
* Compliance of TTHM's and HAA5 are based on a running annual average, not individual sample values								
Volatile Organic Compounds - North Plant								
Bromoform	ppb	N/A	N/A	1.4	N/A	No	2008	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	1.9	N/A	No	2008	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	0.64	N/A	No	2008	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	2.6	N/A	No	2008	By-product of drinking water chlorination
Volatile Organic Compounds - South Plant								
Bromoform	ppb	N/A	N/A	1.0	N/A	No	2008	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	0.68	N/A	No	2008	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	BDL	N/A	No	2008	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	0.73	N/A	No	2008	By-product of drinking water chlorination
Residual Disinfectants								
CONTAMINANT	**Units**	**MRDLG(3)**	**MRDL(4)**	**Amount Det.**	**Range Det.**	**Violation**	**Sample Yr.**	**Typical Source of Contamination**
Total Chlorine	ppm	4	4	0.98	0.87 to 1.08	NO	2009	By-product of drinking water chlorination.

Table Definitions

(1) Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a safety margin.

(2) Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best treatment technology.

Parts Per Million (PPM) - One part per million (or milligrams per liter) corresponds to one penny in $10,000.

Parts Per Billion (PPB) - One part per billion (or micrograms per liter) corresponds to one penny in $10,000,000.

Action Level (AL) - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a system must follow.

(3) Maximum Residual Disinfectant Level Goal (MRDLG) - The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(4) Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Center for Disease Control (CDC), Million Gallons (MG), Not Regulated (NR), Not Applicable (NA), Below Detectable Limit (BDL)

**90th Percentile - The 90th percentile value is calculated by placing all sample results in order from the lowest to the highest concentration. Number each sample starting with 1 for the lowest up to the highest concentration. Then multiply the total number of samples collected by 0.9, the number corresponding to the calculated value is the 90th percentile.

What's in My Water?

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Inorganic Contaminants								
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* 2) Copper	ppm	1.3	AL=1.3	0.820**	.088 to 1.040	NO	2008	Corrosion of household plumbing
* 0 out of 30 distribution samples were found to have levels that exceeded the action level of 15 ppb lead and 1.3 ppm copper								
NORTH PLANT								
Barium	ppm	2	2	0.0335	N/A	NO	2008	Erosion of natural deposits
Fluoride	ppm	4	4	0.23	N/A	NO	2008	Erosion of natural deposits
Nitrate	ppm	10	10	0.221	N/A	NO	2010	Erosion of natural deposits
SOUTH PLANT								
Barium	ppm	2	2	.0969	N/A	NO	2008	Erosion of natural deposits
Fluoride	ppm	4	4	BDL	N/A	NO	2008	Erosion of natural deposits
Nitrate	ppm	10	10	BDL	N/A	NO	2010	Erosion of natural deposits
Volatile Organic Compounds Distribution System								
* TTHM	ppb	N/A	80	31.14	29.05 to 31.14	NO	2008-2009	By-product of drinking water chlorination
* HAA5	ppb	N/A	60	12.80	1.313 to 12.80	NO	2008-2009	By-product of drinking water chlorination
* Compliance of TTHM's and HAA5 are based on a running annual average, not individual sample values								
Volatile Organic Compounds - North Plant								
Bromoform	ppb	N/A	N/A	1.4	N/A	No	2008	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	1.9	N/A	No	2008	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	0.64	N/A	No	2008	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	2.6	N/A	No	2008	By-product of drinking water chlorination
Volatile Organic Compounds - South Plant								
Bromoform	ppb	N/A	N/A	1.0	N/A	No	2008	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	0.68	N/A	No	2008	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	BDL	N/A	No	2008	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	0.73	N/A	No	2008	By-product of drinking water chlorination
Residual Disinfectants								
CONTAMINANT	**Units**	**MRDLG(3)**	**MRDL(4)**	**Amount Det.**	**Range Det.**	**Violation**	**Sample Yr.**	**Typical Source of Contamination**
Total Chlorine	ppm	4	4	1.00	0.87 to 1.05	NO	2010	By-product of drinking water chlorination.

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* 1) Lead	ppb	0	AL=15	2.2	< 2 to 8.83	NO	2011	Corrosion of household plumbing
* 2) Copper	ppm	1.3	AL=1.3	0.634	.041 to.751	NO	2011	Corrosion of household plumbing
* 0 out of 30 distribution samples were found to have levels that exceeded the action level of 15 ppb lead and 1.3 ppm copper								
NORTH PLANT								
Barium	ppm	2	2	0.0603	N/A	NO	2011	Erosion of natural deposits
Fluoride	ppm	4	4	0.26	N/A	NO	2011	Erosion of natural deposits
Nitrate	ppm	10	10	0.26	N/A	NO	2011	Erosion of natural deposits
SOUTH PLANT								
Arsenic	ppb	0.0	10	5.32	BDL - 5.32	NO	2011	Erosion of natural deposits
Barium	ppm	2	2	0.0246	N/A	NO	2011	Erosion of natural deposits
Fluoride	ppm	4	4	BDL	N/A	NO	2011	Erosion of natural deposits
Volatile Organic Compounds Distribution System								
* TTHM	ppb	N/A	80	41.33	38.33 to 41.33	NO	2010-2011	By-product of drinking water chlorination
* HAA5	ppb	N/A	60	9.27	0 to 9.27	NO	2010-2011	By-product of drinking water chlorination
* Compliance of TTHM's and HAA5 are based on a running annual average, not individual sample values								
Volatile Organic Compounds - North Plant								
Bromoform	ppb	N/A	N/A	0.710	N/A	No	2011	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	2.22	N/A	No	2011	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	0.980	N/A	No	2011	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	2.97	N/A	No	2011	By-product of drinking water chlorination
Residual Disinfectants								
CONTAMINANT	**Units**	**MRDLG(3)**	**MRDL(4)**	**Amount Det.**	**Range Det.**	**Violation**	**Sample Yr.**	**Typical Source of Contamination**
Total Chlorine	ppm	4	4	1.05	0.96 to 1.19	NO	2011	By-product of drinking water chlorination.

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NORTH PLANT								
Barium	ppm	2	2	0.0603	N/A	NO	2011	Erosion of natural deposits
Fluoride	ppm	4	4	0.26	N/A	NO	2011	Erosion of natural deposits
Nitrate	ppm	10	10	0.279	N/A	NO	2012	Erosion of natural deposits
SOUTH PLANT								
Arsenic	ppb	0.0	10	5.32	BDL - 5.32	NO	2011	Erosion of natural deposits
Barium	ppm	2	2	0.0246	N/A	NO	2011	Erosion of natural deposits
Fluoride	ppm	4	4	BDL	N/A	NO	2011	Erosion of natural deposits
Volatile Organic Compounds Distribution System								
* TTHM	ppb	N/A	80	41.92	41.33 to 41.92	NO	2011-2012	By-product of drinking water chlorination
* HAA5	ppb	N/A	60	11.53	0 to 11.53	NO	2011-2012	By-product of drinking water chlorination
* Compliance of TTHM's and HAA5 are based on a running annual average, not individual sample values								
Volatile Organic Compounds - North Plant								
Bromoform	ppb	N/A	N/A	0.710	N/A	No	2011	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	2.22	N/A	No	2011	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	0.980	N/A	No	2011	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	2.97	N/A	No	2011	By-product of drinking water chlorination
Residual Disinfectants								
CONTAMINANT	**Units**	**MRDLG(3)**	**MRDL(4)**	**Amount Det.**	**Range Det.**	**Violation**	**Sample Yr.**	**Typical Source of Contamination**
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* 0 out of 30 distribution samples were found to have levels that exceeded the action level of 15 ppb lead and 1.3 ppm copper								
NORTH PLANT								
Barium	ppm	2	2	0.0603	N/A	NO	2011	Erosion of natural deposits
Fluoride	ppm	4	4	0.26	N/A	NO	2011	Erosion of natural deposits
Nitrate	ppm	10	10	0.111	N/A	NO	2013	Erosion of natural deposits
SOUTH PLANT								
Arsenic	ppb	0.0	10	5.32	BDL - 5.32	NO	2011	Erosion of natural deposits
Barium	ppm	2	2	0.0246	N/A	NO	2011	Erosion of natural deposits
Fluoride	ppm	4	4	BDL	N/A	NO	2011	Erosion of natural deposits
Volatile Organic Compounds Distribution System								
* TTHM	ppb	N/A	80	23.215	4.96 to 41.53	NO	2013	By-product of drinking water chlorination
* HAA5	ppb	N/A	60	5.333	0 to 10.78	NO	2013	By-product of drinking water chlorination
* Compliance of TTHM's and HAA5 are based on a running annual average, not individual sample values								
Volatile Organic Compounds - North Plant								
Bromoform	ppb	N/A	N/A	0.710	N/A	No	2011	By-product of drinking water chlorination
Bromodichloromethane	ppb	N/A	N/A	2.22	N/A	No	2011	By-product of drinking water chlorination
Chloroform	ppb	N/A	N/A	0.980	N/A	No	2011	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	2.97	N/A	No	2011	By-product of drinking water chlorination
Residual Disinfectants								
CONTAMINANT	**Units**	**MRDLG(3)**	**MRDL(4)**	**Amount Det.**	**Range Det.**	**Violation**	**Sample Yr.**	**Typical Source of Contamination**
Total Chlorine	ppm	4	4	1.05	0.94 to 1.12	NO	2012-2013	By-product of drinking water chlorination.

Table Definitions

(1) Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a safety margin.

(2) Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best treatment technology.

Parts Per Million (PPM) - One part per million (or milligrams per liter) corresponds to one penny in $10,000.

Parts Per Billion (PPB) - One part per billion (or micrograms per liter) corresponds to one penny in $10,000,000.

Action Level (AL) - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a system must follow.

(3) Maximum Residual Disinfectant Level Goal (MRDLG) - The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(4) Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Center for Disease Control (CDC), Million Gallons (MG), Not Regulated (NR), Not Applicable (NA), Below Detectable Limit (BDL)

**90th Percentile - The 90th percentile value is calculated by placing all sample results in order from the lowest to the highest concentration. Number each sample starting with 1 for the lowest up to the highest concentration. Then multiply the total number of samples collected by 0.9, the number corresponding to the calculated value is the 90th percentile.

What's in My Water?

CONTAMINANTS	Units	MCLG (1)	MCL (2)	Amount Detected	Range of Detection	Violation	Sample Year	Typical Source of Contamination
Inorganic Contaminants								
* Lead	ppb	0	AL=15	2.13	< 2 to 16.3	NO	2014	Corrosion of household plumbing
* Copper	ppm	1.3	AL=1.3	0.663	.15 to.84	NO	2014	Corrosion of household plumbing
* 1 out of 30 distribution samples were found to have levels that exceeded the action level of 15 ppb lead								
NORTH PLANT								
Barium	ppm	2	2	0.0453	N/A	NO	2014	Erosion of natural deposits
Fluoride	ppm	4	4	0.28	N/A	NO	2014	Erosion of natural deposits
Nitrate	ppm	10	10	0.165	N/A	NO	2014	Run off from fertilizer use, erosion of natural deposits
SOUTH PLANT								
Arsenic	ppb	0	10	6.08	N/A	NO	2014	Erosion of natural deposits
Barium	ppm	2	2	0.119	N/A	NO	2014	Erosion of natural deposits
Fluoride	ppm	4	4	BDL	N/A	NO	2014	Erosion of natural deposits
Volatile Organic Compounds Distribution System								
* TTHM	ppb	N/A	80	16.04	4.68 to 41.53	NO	2014	By-product of drinking water chlorination
* HAA5	ppb	N/A	60	3.44	0.00 to 10.78	NO	2014	By-product of drinking water chlorination
* Compliance of TTHM's and HAA5 are based on a running annual average, not individual sample values								
Volatile Organic Compounds - North Plant								
Bromodichloromethane	ppb	N/A	N/A	1.41	N/A	No	2014	By-product of drinking water chlorination
Bromoform	ppb	N/A	N/A	1.03	N/A	No	2014	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	2.49	N/A	No	2014	By-product of drinking water chlorination
Volatile Organic Compounds - South Plant								
Bromodichloromethane	ppb	N/A	N/A	0.79	N/A	No	2014	By-product of drinking water chlorination
Dibromochloromethane	ppb	N/A	N/A	0.77	N/A	No	2014	By-product of drinking water chlorination
Residual Disinfectants								
CONTAMINANT	**Units**	**MRDLG(3)**	**MRDL(4)**	**Amount Det.**	**Range Det.**	**Violation**	**Sample Yr.**	Typical Source of Contamination
Total Chlorine	ppm	4	4	1.04	0.95 to 1.10	NO	2013-2014	By-product of drinking water chlorination
Unregulated Contaminants (UCMR3) (5)								
CONTAMINANT	**Units**	**MCLG(1)**	**MCL(2)**	**Amount Det.**	**Range Det.**	**Violation**	**Year**	Typical Source of Contamination
NORTH PLANT								
Molybdenum	ppb	N/R	N/R	8.6	N/A	NO	2014	Erosion of natural deposits
Strontium	ppb	N/R	N/R	175	N/A	NO	2014	Erosion of natural deposits
SOUTH PLANT								
Molybdenum	ppb	N/R	N/R	1.8	N/A	NO	2014	Erosion of natural deposits
Strontium	ppb	N/R	N/R	88.5	N/A	NO	2014	Erosion of natural deposits
1,4-Dioxane	ppb	N/R	N/R	0.04	N/A	NO	2014	Run off from industry, landfills or septic systems
DISTRIBUTION								
Molybdenum	ppb	N/R	N/R	9.65	N/A	NO	2014	Erosion of natural deposits
Strontium	ppb	N/R	N/R	200	N/A	NO	2014	Erosion of natural deposits

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(4) Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(5) Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist the EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

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