



# City of Danville 2015 Water Quality Report

PWSID # 5590100



Each year, the City of Danville compiles and distributes this report to comply with state and federal requirements. The purpose of this report is to provide you an overview of last year's (2015) drinking water quality. It includes details about where your water comes from and what it contains. We hope this report will provide the facts and perspective you need to make an informed evaluation of your tap water.

In this report, you will find a table showing the City of Danville had no violations of water quality standards during the 2015 calendar year. The substances detected were all well below the levels allowed. This does not happen by chance. Your drinking water is carefully protected from its source, the Dan River, through our treatment plant, and to your tap. Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) is responsible for setting national limits for hundreds of substances in drinking water and for specifying treatment processes to remove them. State-certified water quality labs perform over 4,000 tests of water samples each month. Our treatment and distribution facilities are periodically inspected by the State.

We hold ourselves accountable to the public. Opportunities for increased understanding and involvement in water-related decision and policy making include attendance at the Danville Utility Commission Meetings, held at 4:00 p.m. on the fourth Monday of each month on the fourth floor at City Hall, and the Danville City Council Meetings held at 7:00 p.m. on the first and third Tuesday of each month at City Hall. City Council meetings are also broadcast on River City TV (Comcast cable TV channel 10). If you have questions about this Water Quality Report or want more information about your drinking water, contact the Water Treatment Plant on Monday through Friday between 8:00 a.m. and 5:00 p.m. at 434-799-6473. To report leaks or tank over flows please call 799-5284 at any time, day or night. For customer service, please call 799-5155. If you have billing questions, please call 799-5159. Tours of our facilities are scheduled during business hours.

TREATED WATER CHARACTERISTICS	
PARAMETER	TYPICAL VALUES
pH, standard units <sup>(1)</sup>	6.8-8.3, avg.=7.3
Alkalinity, mg/L	13-41, avg.=26
Calcium, mg/L	12.8
Total Hardness, mg/L <sup>(1)</sup>	52-112, avg.=76
Fluoride, mg/L	0.29-0.74, avg. 0.70
Sodium, mg/L	6.08
Zinc, mg/L	<0.01
Aluminum, mg/L (SMCL <sup>(2)</sup> =0.05-0.2)	<0.05
Iron, mg/L (SMCL <sup>(2)</sup> =0.3)	<0.05
Manganese, mg/L (SMCL <sup>(2)</sup> =0.05)	<0.01
Water temperature, °F Winter	40-71, avg. = 65
Water temperature, °F Summer	57-88, avg. = 75
Annual average daily production: 4 –7 MGD Yearly avg.= 5.13 MGD	
(1) Varies with type of post pH adjustment used.	
(2) SMCL-Secondary Maximum Contaminant Level.	

## Source Water

Danville's drinking water comes from what is classified as a surface water source, the Dan River. The Virginia Department of Health, Office of Drinking Water conducted a source water assessment on the Dan River in 2002. The assessment report consists of maps showing the source water assessment area, an inventory of known land use activities of concern, and documentation of any known contamination within the last five years. The report is available by contacting the Water Treatment Plant. The river was determined to be "highly susceptible" to contamination using the criteria developed by the State in its approved Source Water Assessment Program. The sources of substances in the Dan River come from surface runoff as water travels over the surface of the land and dissolves naturally occurring minerals and substances resulting from the presence of animals and human activity. Contaminants that may be present in source water include: microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife; inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming; pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses; organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities. The presence of these substances in pretreated water does not necessarily indicate that the treated water is unsafe. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Center for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline 1-800-426-4791 or EPA web page: [www.epa.gov/ow](http://www.epa.gov/ow)

## Water Quality Summary

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water produced by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. We constantly monitor for various compounds in the water supply to meet all regulatory requirements. The table on the following page lists only those compounds that had some level of detection. Many other compounds have been analyzed, but were not present or were below the detection limits of the lab equipment.

## Crypto

Cryptosporidium are microscopic organisms that may enter surface waters from runoff containing animal wastes. If ingested, Cryptosporidium may cause diarrhea, fever and other gastrointestinal symptoms. The EPA Long Term 2 Enhanced Surface Water Treatment Rule required the City to test the raw water for Cryptosporidium, beginning February 2008, and continuing through January 2010. We are happy to report the organisms were not detected. During 2016 we have started the second round of this testing, repeating it for 24 consecutive months.

## Lead Levels

Elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Danville is responsible for providing high quality drinking water, but cannot control the variety of materials used in the plumbing components inside your home or business. You can minimize the potential for lead exposure by flushing your tap for 15 to 30 seconds or until it becomes cold or reaches a steady temperature before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

## Trihalomethane Levels

The levels of total trihalomethanes (TTHMs) in some samples collected during 2015 were greater than the PMCL of 80 micrograms per liter (ug/L or ppb) but were not a violation of the drinking water standard. Compliance with the PMCL is based on a running annual average (4 quarters) of the quarterly samples collected and you will note the water supply did not exceed the drinking water limits on this basis. TTHMs are formed when trace amounts of naturally occurring organic compounds in the raw water source combine with chlorine that is used to disinfect the treated water. All locations do not have the same levels of TTHMs. Higher levels are expected in the areas with highest residence time (generally the furthest points in the system) and during the warmer months of the year. Some people who drink water containing TTHMs in excess of the PMCL over many years could experience problems with their liver, kidneys or central nervous system and may have increased risk of getting cancer. This water system will continue to be monitored for TTHMs. We intend to maintain compliance with the drinking water contaminants.

## Trihalomethane (THM) Removal Project

For some time now the city has been testing water samples from four sites within the distribution system for TTHMs. Compliance has been based on averaging quarterly samples from the four sites. The City has always been in compliance with the limit for THMs of 80 ppb. However, the criteria has changed to require each site to meet the limit of 80 ug/L based on the averaging of the consecutive four quarterly samples from that site and not averaging all samples together. Meeting the new compliance limit at all sample sites would not likely be possible as new sites were included with the revised compliance limit. Therefore, the city hired Hazen and Sawyer to evaluate alternatives for reduction of the THMs. Hazen and Sawyer recommended mixing and aeration in the Ballou Park 8 million gallon storage reservoir as the best alternative for removing the THMs. Construction of this equipment was completed on April 15, 2015. Due to the construction time requirements of this project, the Virginia Department of Health, Office of Drinking Water (ODW) gave the city a two year extension to meet the new requirements. The HAA5 concentrations in the city water have always been below the MCL level and no problems are anticipated with the new compliance criteria.

### The following two tables list many of the contaminants of concern for drinking water Unregulated Contaminant Monitoring Rule (UCMR3 – sampling started in July 2014 and completed April 2015)

Contaminant & Unit of Measurement	MCLG	MCL	Level Detected And / or Range	Violation	Requires 4 consecutive quarters	Sources of Substance or Compound
Chromium, ppb	N/A	N/A	Max 0.3 Range: <0.2-0.3	No	2014 July & Oct. 2015 Jan. & April	Chromium can be found in low levels in water supplies either as the result of industrial activities or from naturally occurring sources.
Strontium, ppb	N/A	N/A	Max 63 Range: 49-63	No	2014 July & Oct. 2015 Jan. & April	High levels of strontium can occur in water drawn from bedrock aquifers that are rich in strontium minerals. Strontium occurrence is also linked to other sources such as air contamination from milling processes, coal burning, and phosphate fertilizers
Vanadium, ppb	N/A	N/A	Max 1.0 Range: 0.2-1.0	No	2014 July & Oct. 2015 Jan. & April	Vanadium is a metal that naturally occurs in many different minerals and in fossil fuel deposits. The primary industrial use of vanadium is in the strengthening of steel.
Hexavalent Chromium, ppb	N/A	N/A	Max 0.34 Range: 0.07-0.34	No	2014 July & Oct. 2015 Jan. & April	Same definition as Chromium above, but the natural chromium element has been altered to the +6 oxidation state.

### REGULATED COMPOUNDS

Contaminant & Unit of Measurement <sup>(1)</sup>	MCLG	MCL	Level Detected And / or Range	Violation	Date of Sample	Sources of Substance or Compound
Gross Alpha <sup>(2)</sup> pCi/L	0	15	<0.6	NO	May 2014 Every 6 Yrs.	Erosion of natural deposits
Combined Radium <sup>(2)</sup> pCi/L	0	5	<0.6	NO	May 2014 Every 6 Yrs.	Erosion of natural deposits
Beta Emitters <sup>(2)</sup> pCi/L	0	50	1.8	NO	May 2014 Every 6 Yrs.	Decay of natural and man-made deposits
Total Coliform	0	Presence of coliform bacteria in no more than 5% samples per month <sup>(4)</sup>	Maximum monthly detection level 1.45% for May 2015. 1 of 69 samples	NO	Typically tested daily; rotating through a minimum of 50 locations per month	Naturally present in the environment

Contaminant & Unit of Measurement (1)	MCLG	MCL	Level Detected And / or Range	Violation	Date of Sample	Sources of Substance or Compound
Barium ppm	2	2	0.022	NO	August 2015 Annually	Discharge of drilling waste; Discharge from metal refineries; Erosion of natural deposits
Turbidity NTU In Finished Water	N/A	TT = 1 NTU max	Max = 0.410 Range: 0.013 – 0.410	NO	Tested continuously at plant	Soil runoff
		TT = at least 95% of the monthly samples <0.3 NTU	100%		N/A	
Stage 1 First three quarters of 2015						
Total Trihalomethanes TTHM ppb	N/A	80	Max of the first 3 qtrs. Avg. = 61 Range: 27-100	NO	Tested quarterly at four locations in our service area	By-product of drinking water chlorination
Stage 2 Fourth quarter of 2015						
TTHM Site 1 ppb Stokesland Tank	N/A	80	4th qtr. LRAA = 45 Range: 31-76	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
TTHM Site 2 ppb Lombardy Court	N/A	80	4 <sup>th</sup> qtr. LRAA = 67 Range: 30-96	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
TTHM Site 3 ppb Holland Road	N/A	80	4th qtr. LRAA= 70 Range: 46-100	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
TTHM Site 4 ppb Piney Forest Tank	N/A	80	4th qtr. LRAA = 39 Range: 27-66	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
Fluoride ppm	4	4	Avg. 0.70 ppm Range: 0.29-0.74	NO	Tested continuously at plant	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories; desired level 0.7
Nitrate ppm	10	10	0.19	NO	August 2015 Annually	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Lead <sup>3</sup> ppb	0	AL = 15	90 <sup>th</sup> % = 1.2 ND –3.4	NO	July/August 2015 Every 3 Yrs.	Corrosion of household plumbing systems; erosion of natural deposits
Copper <sup>3</sup> ppm	1.3	AL = 1.3	90 <sup>th</sup> % = 0.099 0.002–0.140	NO	July/August 2015 Every 3 Yrs.	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Chlorine ppm	MRDL G = 4	MRDL = 4	Highest Qtrly Avg.0.84 Range: ND-2.54	NO	Tested daily along with Coliform samples collected in our service area	Water additive used to control microbes.
Total Organic Carbon - TOC ppm	N/A	TT – Based on the percentage of TOC removed during the treatment process; ratio must be greater than or equal to 1.00	TOC removal Ratio Lowest Running Avg. 1.11 Range: 1.00-1.89	NO	Tested monthly at raw and treated water.	Naturally present in the environment.
Stage 1 First three quarters of 2015						
Haloacetic Acids - HAA ppb	N/A	60	Max for the first 3 qtrs. 2015 Avg. = 20 Range 11-39	NO	Tested quarterly at four locations in our service area	By-product of drinking water disinfection
Stage 2 Fourth quarter of 2015						
HAA Site 1 ppb Stokesland Tank	N/A	60	LRAA = 23 Range: 16-28	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
HAA Site 2 ppb Lombardy Court	N/A	60	LRAA = 29 Range: 24-39	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
HAA Site 3 ppb Holland Road	N/A	60	LRAA= 13 Range: 11-15	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
HAA Site 4 ppb Piney Forest Tank	N/A	60	LRAA = 21 Range: 16-28	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination

## See helpful table Definitions & Table Key below

### Notes:

- (1) Detected Compounds - Listed are 14 parameters detected in Danville's drinking water, ten parameters during calendar year 2015. The State allows us to monitor for some compounds less than once per year because the concentrations of these compounds do not change frequently.
- (2) This data is the latest available. The SDWA requires that the highest value/lowest removal ratio detected during the calendar year be provided in this report. Not listed are the hundreds of other compounds for which we tested that were not detected.
- (3) Compliance based on 90% of samples being below action level (AL).
- (4) Compliance based on the number of Total Coliform positive samples being divided by the number of samples collected with the monthly % being below 5%.

### Definitions & Table Key:

< - Less than. **AL** - Action Level, the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. **LRAA** - Locational Running Annual Average - Average amount detected is the highest locational running annual average of the 4 stage two compliance sample sites. **MCL** - Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goals as feasible using the best available treatment technology. **MCLG** - Maximum Contaminant Level Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. **MRDL** - Maximum Residual Disinfectant Level - 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. **MRDLG** - Maximum Residual Disinfectant Level Goal - Level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect benefits of use of disinfectants to control microbial contaminants. **NA** - Not Applicable. **ND** - Non Detect. **NTU** - Nephelometric Turbidity Unit, a measure of very small particulate matter in drinking water. **ppb** - one part per billion; the equivalent of 1¢ in \$10,000,000. **ppm** - one part per million, the equivalent of 1¢ in \$10,000. **Sources** - The major sources of the compounds detected in the finished water. **TOC** - Total Organic Carbon has no health effects. However, it provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes and haloacetic acids. Compliance with the treatment technique (TT) reduces the formation of these disinfection by-products. **TT** - Treatment Technique, a required process intended to reduce the level of a contaminant in drinking water. **pCi/L** - Picocuries per Liter, a measure of radioactivity. **UCMR** - Unregulated Contaminant Monitoring Rule - Purpose is to assist the EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. The results detected during our UCMR monitoring are noted in a separate table elsewhere in this report. Unregulated contaminants are those for which EPA has not established drinking water standards. **Variations and exemptions** - State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

### **Taste and Odor Issue**

The City had a taste and odor problem in February through June and again in October through December 2015, the source of which was not determined. In February there was an algal bloom that passed through the city which obviously caused some and maybe all of the issues with taste and odor. A Dan River Water Quality Coalition has been established to determine what actions are necessary to deal with the taste and odor issue. This Coalition is currently working with researchers at Virginia Tech and others to apply for a grant to determine what has occurred to change the water quality in the Dan River. It is hoped that this grant from the Virginia Department of Environmental Quality will be approved so information on the water quality can be obtained to address what changes have taken place in the river. The taste and odor detected was described as muddy, earthy, moldy, musty, woody, etc. Samples of the water were collected to determine if there was a chemical contamination of the water. The results received the next day (02/12/15) indicated no chemical contamination. The Virginia Department of Health - Office of Drinking Water (ODW) and the Department of Environmental Quality were notified of the issue. Microscopic examination of the water was performed by the City's Water Chemist with pictures of the work sent to ODW. It was determined that the unacceptable taste and odor were due to algae in the water. Powdered activated carbon (PAC) was added to the raw water pumped from the Dan River. Later the feed rate was increased as the initial dose was not sufficient to remove the taste and odor. PAC was added to the raw water from February 13th through June. Until all of the water that had been produced during February and March had been used, the taste and odor would continue with the hot water lasting even longer due to the trapping and heating of the water. Carbon feed was stopped on Wednesday, March 11<sup>th</sup> as no odor was detected in the raw water and no taste and odor had been noticed in the treated water for some time. However complaints were received the next week and the carbon feed was started back and continued through July. The original carbon feeder had been installed in 1990 and was sized to feed a dosage of 5 to 15 mg/L. The staff has determined that a dosage of about 25 mg/L was needed to address the taste and odor at its maximum level. An additional drip feed system to make up the needed additional dosage was used until a larger feeder could be purchased. Therefore the City staff purchased a new PAC feeder, removed the old feeder and installed the new feeder by the first of September 2015.

This is a rare event for an algal bloom to occur in a free flowing stream in the winter time. The bloom was seen on Sunday, February 22nd, behind the Schoolfield Dam. The bloom was brilliant green in color and covered the entire width of the Dan River. Samples of the river water were collected by the city and DEQ staffs on Tuesday, February 24th and analyzed by Dr. Todd Egerton at Old Dominion University. Their results identified some algae, but most likely the heaviest algae population had already passed by with the bloom the Sunday and Monday before sampling.

Throughout the period of the taste and odor problem, the water was tested, and based on the analysis; the water was safe to drink.

A Dan River Water Quality Coalition has been established to set up a regional organization to determine what has caused the taste and odor problems in the Dan River. From this Coalition, Dr. Greg Boardman and others from Virginia Tech submitted a grant proposal to evaluate the water quality of the Dan and Smith Rivers to DEQ for review and approval. This study will be a year-long effort to look at the parameters of concern in the water column, sediments and surface area (microorganisms).