THE YORK WATER COMPANY

The York Water Company
Public Comments to the Environmental Quality Board
Regarding **Proposed Rulemaking**
(25 *Pa. Code* **Chapter 109)**
Disinfection Requirements Rule
(46 Pa. B. 857)
April 19, 2016

Respectfully, The York Water Company does not support the Department's efforts to amend Chapter 109 as put forth in the Disinfection Requirements Rule. We agree with the 'ideals' of the Department and with the mission of protecting public health. The York Water Company has taken the mission of protecting our resident's and our customer's health by providing good, high quality, potable water for the past two hundred (200) years. However, The York Water Company respectfully disagrees with the Department's justifications and proposed regulatory actions, as defined in the Disinfection Requirements Rule. Additionally we disagree with the impacts that the proposed changes would have on both the regulated community and those served with public water; including the actual costs associated that add up to nearly two orders of magnitude greater than (100X) the Department's projections.

"***What problem are we trying to solve with this reg. package?***" - Quoted from a colleague in the water industry.

No clear or present public health threat is being addressed by the proposed rule. There are no scientifically defensible benefits of a 0.2-mg/L residual versus that of 0.1-mg/L. Additionally there are very significant costs / detriments associated with meeting the reg. package, as written.

The York Water Company agrees that the current minimum distribution system detectable residual of 0.02 is not valid and believes the minimum residual should be set at 0.1 mg/L. The current regulatory language should only change the 0.02 mg/L to 0.1 mg/L and keep all other existing language – including HPC as the alternative compliance criteria for low chlorine residual situations. The TAC Board (*Small Systems Technical Assistance Center*) has also recommended the same to the Department.

The actual, statewide costs associated with compliance for fifteen suppliers are over seventy five times (75X) higher than the Department's projection of $780,000. According to the Regulatory Analysis Form and Preamble, $780,000 is the projected total, combined capital costs for all of the utilities throughout the state. To contrast the Department's projection, fifteen PA water suppliers responded to requests for projected cost increases associated with compliance at the proposed 0.2-mg/L residual requirement. The combined total CAPEX for these fifteen suppliers is projected to be over $60-million with an annual recurring OPEX of $4.5-million. These fifteen suppliers provide water to 68% of the population in PA that is served by public water. When accounting for the remainder of the medium and large water systems in PA, the costs increase as combined the medium and large water systems supply water to 91% of the population served by CWS within PA.

Source:
http://files.dep.state.pa.us/Water/BSDW/DrinkingWaterManagement/PA_DEP_2014_Annual_Compliance_Report.pdf

PWS Profile

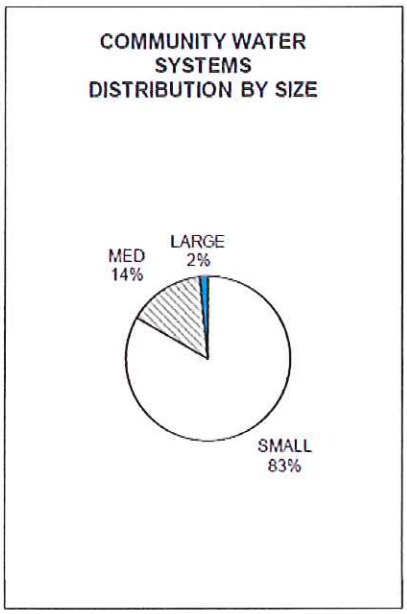
Figure 2. Number of Pennsylvania Systems and Population Served by Size Category

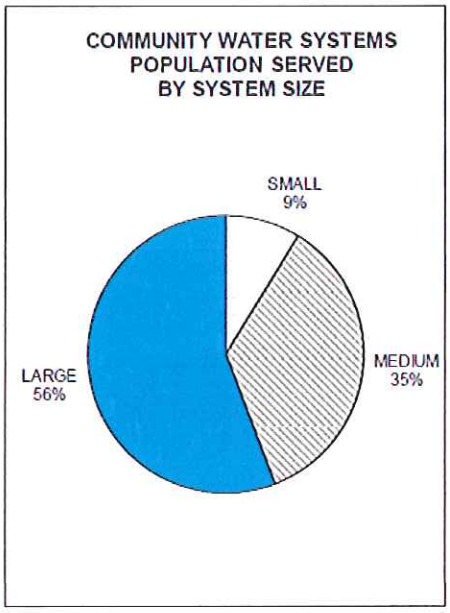
NUMBER OF PWSs

	CWS	NTNC	TNC	BVRB
SMALL	1,647	1,080	5,582	118
MEDIUM	299	13	2	56
LARGE	32	0	0	0
TOTAL	1,978	1,093	5,584	174

POPULATION SERVED

	CWS	NTNC	TNC	BVRB
SMALL	928,797	380,774	705,614	11,649
MEDIUM	3,755,748	73,084	9,000	256,100
LARGE	5,910,809	0	0	0
TOTAL	10,595,354	453,858	714,614	267,749





THE YORK WATER COMPANY

1816 2016 YEAR 200 "THAT GOOD YORK WATER"

Estimated Costs of Compliance With Proposed Disinfection Requirements Rule
All estimates provided after February 15, 2016 and targeted at the 0.2-mg/L Residual Requirement

	Philadelphia Water Department (PWD)	Aqua Pennsylvania	Suez Water	PA-American Water	The York Water Company	Pittsburgh Water and Sewer	North Penn Water	Chester Water Authority	Capital Region Water	Bucks County Water and Sewer	Western Berks Water Authority	Lehigh County Water Authority	City of Lancaster Water Department	Bethlehem Water Dept.	Erie Water	Totals	*"Population Served by Public Water" Represented in this Table by these Suppliers
Source of Cost Estimates	Public Record Submitted to PADEP	Phone Interview	Phone Interview	Phone Interview	Internal Estimates	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview		68%
Population Served	1,700,000	1,400,000	165,000	2,200,000	190,000	500,000	85,000	138,000	60,000	200,000	35,000	118,000	120,000	115,000	220,000	7,256,000	
CAPEX Estimate (total $)	$25,000,000	$7,150,000	$2,000,000	$13,100,000	$3,000,000	$0	$6,000,000	$1,033,000	$25,000	$200,000	$100,000	$25,000	$500,000	$25,000	$1,800,000	$60,158,000	CAPEX Estimate (total $)
OPEX Estimate (increased $/year to comply)	$2,500,000	$200,000	$100,000	$735,000	$600,000	$0	>0	$3,600	$7,000	>0	$20,000	$15,000	$25,000	$210,000	>0	$4,515,600	OPEX Estimate (increased $/year to comply)
Combined Ten Year Cost ($) [CAPEX + (OPEX X 10-yrs)]	$50,000,000	$10,150,000	$3,000,000	$20,450,000	$9,000,000	$0	$6,000,000	$1,069,000	$95,000	$200,000	$500,000	$175,000	$750,000	$2,125,000	$1,800,000	$105,314,000	Combined Ten Year Cost ($) [CAPEX + (OPEX X 10-yrs)]
Number of Waterborne Disease Outbreaks Directly Attributed to Supplier over last 30-years (no private plumbing - suppliers can NOT control O&M of PP)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Number of Waterborne Disease Outbreaks Directly Attributed to Supplier over last 30-years (no private plumbing - suppliers can NOT control O&M of PP)

Combined Costs Summary for Compliance with the Proposed Disinfection Requirements Rule

Presumptions:
-6 Re-Chloramination Stations
-100 Autoflushers
-Manual Flushing 1/3 of Remaining Ends >200' Once Every 3-weeks

100 AutoFlushers Ends over 200' (1,222)	Per 1 Autoflusher	Per 100 Autoflushers
Autoflusher Purchase Cost	$4,000	$400,000
Autoflusher Installation Cost	$5,000	$500,000
Autoflusher Annual O&M Cost	$1,343	$134,250
Flushed Water Costs [$7 / 1,000 gal, 100 flushes, 1 hr/flush, 28 gpm]	$3,066	$306,600
Annual Combined Cost Autoflushers (O&M + Flushed Water)	$4,409	$440,850
Autoflusher CAPEX Costs	$9,000	$900,000
Autoflusher Combined Ten Year Costs	**$53,085**	**$5,308,500**

6 Re-Chloramination Stations	Per 1 Station	Per 6 Stations
Purchase + Installation Costs	$300,000	$1,800,000
Yearly Operating Costs (based on employee salary $45,000 + chemical cost + routine maintenance)	$10,000	$60,000
Ten Year Operating Cost	$100,000	$600,000
Total Cost for Re-Chloramintion Station (installation + 10 year operating cost)	**$400,000**	**$2,400,000**

Manual Flushing - 3 Week Rotation Flushing one-third of Remaining ends over 200' (1,122)	1 year	10 year
Max. # of Ends flushed per day (1 person / 8 hour shift)	20	
Additional employess needed for flushing only (figure 10 working days / 3 week rotation)	12	
Average annual salary of 1 employee (not including benefits, OT, training, fuel, chemicals, mileage, and tools)	$45,000	$450,000
Combined salaries (flushing employees only without benefits)	$56,100	$561,000
Flushed Water Costs [$7 / 1,000 gal, 1112 ends, each end receiving 12 days, 1 hr/flush @ 28 gpm]	$67,452	$674,520
Total Cost for Manual Flushing	**$123,552**	**$1,235,520**

Combined Costs	
Purchase / Installations (totals combined)	**$2,700,000**
1Year Operating Costs (salaries + maintanence + flushed water)	**$624,402**
First Year Combined Costs (CAPEX + OPEX)	**$3,324,402**
10 Year Combined Costs (CAPEX + OPEX)	**$4,761,000**

The Department is proposing to not only increase the required disinfectant residual by ten times (10X) but it is also aiming to remove Heterotrophic Plate Count (HPC) as an alternative compliance criteria (ACC) to low residual situations. HPC used in this capacity has been part of Chapter 109 for many years. In addition to removing this ACC (*making it tougher to both achieve and maintain compliance as well as limiting the operator's toolbox*), the Department is also expanding both the required number and required type of sampling locations required to determine compliance, and is increasing the frequency at which those samples must be drawn. Compliance projections cannot be gauged effectively due to the number of compliance variables being changed at one time. The York Water Company believes HPC should remain as an alternative compliance criteria for a low chlorine residual situation, especially in light of all of the other changes.

The TAC Board has voted 12-to-0 (*1-abstention*) to retain HPC as part of Chapter 109 as an ACC in low chlorine residual situations. The Department seems poised to ignore a near unanimous vote from the TAC Board on this matter.

Additionally, the Department has chosen to retain HPC as an alternative compliance criteria ONLY for bottled, bulk, vended and retail water systems. HPC should remain as an ACC for all water systems, not just for a select few.

HPC has been used in conjunction with Total Coliform Sampling and distribution system chlorine residual as part of a 'packaged' set of information or operator's toolbox for many years. Part of this toolbox is used for compliance determination but the other parts are used to glean information about a distribution system's health and to strategically target their personnel and resources. Total coliform sample results are utilized as an indicator of possible contamination in a system, HPC is used to gauge microbiological growth and growth-potential in the system, and Chlorine residual readings are used to gauge the amount of 'suppressant' available to limit bacteriological regrowth and combat potential contaminations. Using these tools together, one is able to view a more complete picture of distribution system health.

The lack of a chlorine residual, while not an ideal situation, is not indicative of any danger nor of the presence of a contaminant. Interestingly, there are situations where a sample has a healthy chlorine residual, there are no coliforms present, but the HPC results indicate that bacteriological growth is present at the sample point. This system needs to do some work in the areas surrounding their sampling location to investigate and address the bacteriological growth before it develops further. Should the situation not be addressed, a coliform positive result may be likely.

If we remove HPC as an ACC in Chapter 109, many utilities will stop paying for HPC analysis. Many authorities and smaller water systems cannot justify paying for an analysis that is not either required nor integral to compliance determination. Thus these utilities and authorities will not be able to utilize HPC as the informative tool that it is.

Additionally, removal of HPC as an ACC will lead to many more unnecessary violations and subsequent public notifications (*low residual*) that have not been linked to any direct or indirect health threat. It has been repeatedly demonstrated that excessive public notification for non-health related violations causes

the populous, at-large, to ignore and disregard the very important public notices such as Boil-Water advisories or Do-Not-Consume notifications. Effectively the public will believe that the water suppliers and the PADEP has "Cried 'Wolf'" too many times. Public notifications must be used judiciously to be effective.

The Department has not provided evidence of a *need* to remove HPC as an alternative compliance criteria. To make a significant change to an existing regulation, the Department should clearly define an overwhelming need and provide evidence that not only is the change merited, but that it is also cost effective. It seems that these factors, specifically in regards to HPC, have not been fully addressed in this package.

Removal of HPC as an ACC will very likely increase the civil liability of water suppliers. Consider that even if a water supplier is meeting the proposed regs everywhere in their system, there will come a time when an individual will look to blame an entity, especially one with "deep pockets" for a sickness or a relative passing. The removal of HPC as an ACC now leaves the reg. with one single compliance criteria, chlorine residual.

Having a single compliance criteria makes water utilities a prime target for frivolous civil lawsuits. The strictures for assessing civil liability are much more elastic than those determining criminal liability. Improper determination of chlorine residual can be done by a customer via a "pool-kit" or test-strips at any faucet inside of a home, building, or facility (*internal treatment devices like softeners and filters remove chlorine from the water)* and should the result be lower than the proposed 0.2-mg/L and there are no alternative compliance criteria, then there is a dramatically increased likelihood of a civil lawsuit being filed and actually making it to court. Claims would be made that since the water did not meet the residual at their particular faucet, then the water supplier is civilly liable for their problems/sickness/loss or other. The HPC test, while still readily available to the populous, acts as a screening tool limiting the number of potentially frivolous lawsuits that would otherwise develop as a result of removing it.

In conclusion, we want our water systems focusing on water treatment, water quality, and proper conveyance; not on defending themselves in court from frivolous lawsuits – especially in cases where the suppliers are truly meeting the regs.

THE YORK WATER COMPANY

Cost vs. Benefit Table	
Costs	**Benefits**
- Approximately 50X to 100X (fifty to one-hundred) times DEP's estimated costs - statewide	- Possible Protection from Waterborne Disease Outbreaks - EXCEPTING those that US CDC focuses on as a direct result of the top deficiencies; this package does not address: 1) Premise Plumbing - 66% 2) Untreated Ground Water - 13% Per the US CDC, Combined these two deficiencies make up 79% of all waterborne disease outbreaks in the USA http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6431a2.htm
- Cost increases to customers, especially to those of Large and Medium sized systems - 91% of PA population served with public water is Med and Large water systems.	
- Simultaneous compliance problems - Lead & Copper and DBPs (*cancer causing*) http://www.cdc.gov/safewater/chlorination-byproducts.html http://www.cdc.gov/nceh/lead/leadinwater/	
- Increased civil liability - removal of HPC as an ACC	- Possible improvement in coliform compliance: The average increase in compliance should be about 1.4%, based on the dataset the Department provided in the Preamble. (*also see tables below*)
- Increased public notification for non-health related violations	
- More customer complaints - high chlorine is already the most common customer complaint	- DBP violations may not be as bad as the science suggests they likely should be.

The ideals of the justifications as proposed in the Preamble are good – to protect the public health. The goals as set forth in the Preamble are:

1) Decrease Waterborne Disease Outbreaks,
2) Improve Coliform Compliance,
3) Zero impact on DBP compliance.
4) No or Minimal Cost impact to the majority of Water Systems

Unfortunately, when we investigate and compare what actions are being proposed to each individual goal, we find that there is no scientific evidence justifying the proposed regulations.

1) **"Decrease Waterborne Disease Outbreaks"**: If we truly want to seriously limit or eliminate Waterborne Disease Outbreaks, according to the US CDC need:
   a. Premise Plumbing issues must be addressed
   b. There needs to be additional focus on any remaining groundwater systems that are not presently disinfecting.

   What's the supporting evidence that the Department should focus on these issues?
   According to the US CDC, Waterborne Disease Outbreaks in the USA (and PA) are related primarily to two known, and specifically identified deficiencies:
   http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6431a2.htm:
   c. 66% = Premise Plumbing – completely separate from the water distribution system as defined multiple times in multiple locations by the US CDC
   d. 13% = Untreated Groundwater

Per the US CDC, "The two most commonly identified deficiencies† leading to drinking water–associated outbreaks were Legionella in building plumbing§ systems (66%) and untreated groundwater (13%).

Continued vigilance by public health, regulatory, and industry professionals to identify and **correct** deficiencies associated with building plumbing systems and groundwater systems could prevent most reported outbreaks and illnesses associated with drinking water systems."

"† Outbreaks are assigned one or more deficiency classifications based on available data. (http://www.cdc.gov/healthywater/surveillance/deficiency-classification.html).

§ "Plumbing" refers to the pipes that are within a building or within a service line leading into a building, distinguished from the distribution system of pipes that compose the water supply."

Quoted Text Copied From:
The US-CDC Morbidity and Mortality Report Weekly, Titled: Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2011–2012, Weekly
August 14, 2015 / 64(31);842-848
Karlyn D. Beer, PhD1,2; Julia W. Gargano, PhD2; Virginia A. Roberts, MSPH2; Vincent R. Hill, PhD2; Laurel E. Garrison, MPH3; Preeta K. Kutty, MD3; Elizabeth D. Hilborn, DVM4; Timothy J. Wade, PhD4; Kathleen E. Fullerton, MPH2; Jonathan S. Yoder, MPH, MSW2
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6431a2.htm

The US CDC further clarifies the differences between "Building Plumbing / Premise Plumbing" and Distribution Systems. The following section is copied from the US CDC page linked immediately following.
(http://www.cdc.gov/healthywater/surveillance/deficiency-classification.html).

"**For a community water system, the distribution system refers to the pipes and storage infrastructure under the jurisdiction of the water utility prior to the water meter or property line (if the system is not metered). For noncommunity and nonpublic individual water systems, the distribution system refers to the pipes and storage infrastructure before entry into a building or house."*

"† Contamination of drinking water and deficiencies occurring in plumbing and pipes that are not part of the distribution system as defined previously. For community systems, this means occurring after the water meter or outside the jurisdiction of a water utility; for noncommunity and nonpublic systems, this means occurring within the building or house (e.g., in a service line leading to a house or building, in the plumbing inside a house or building, during shipping or hauling, during storage other than in the distribution system, or at point of use)."

http://www.cdc.gov/healthywater/burden/need-for-estimate.html
Below is another example of the CDC having defined Premise Plumbing as jurisdictionally separate from that of the Public Water System. (*Link above and screenshot below*)

THE YORK WATER COMPANY

1816 2016 YEAR 200 "THAT GOOD YORK WATER"

The ideal waterborne disease burden estimate will provide a cohesive umbrella estimate that covers

All water uses, including:

- Drinking and household uses
- Recreation and leisure
- Industry
- Agriculture and food production
- Medical and healthcare uses

All water venues, including:

- Drinking water systems (public, private)
- Natural swimming waters (beaches, fresh water)
- Chlorinated swimming venues (pools, hot tubs/spas, water parks, foot spas)
- Premise plumbing and building distribution systems
- Irrigation and food processing water systems
- Reclaimed water, graywater

Premise Plumbing

Premise plumbing is the drinking water system that is inside housing, schools, and other buildings. It connects to the main drinking water distribution system, but the water utility does not monitor its safety. A large proportion of drinking water outbreaks are linked to pathogens that grow in premise plumbing and building water system parts—like hot water tanks, cooling towers, decorative fountains, shower heads, and water taps—and are inhaled through steam or aerosol [1-5].

References

1. Haupt TE, Heffernan RT, Kazmierczak JJ, Nehls-Lowe H, Rheineck B, Powell C, Leonhardt KK, Chitnis AS, Davis JP. An outbreak of Legionnaires' disease associated with a decorative water wall fountain in a hospital. Infect Control Hosp Epidemiol. 2012; 33(2):185-91.
2. Falkinham JO 3rd. Nontuberculous mycobacteria from household plumbing of patients with nontuberculous mycobacteria disease. Emerg Infect Dis. 2011; 17(3):419-24.
3. Falkinham JO 3rd. Hospital water filters as a source of *Mycobacterium avium* complex. J Med Microbiol. 2010; 59(Pt 10):1198-202.
4. Tobin-D'Angelo MJ, Blass MA, del Rio C, Halvosa JS, Blumberg HM, Horsburgh CR. Hospital water as a source of *Mycobacterium avium* complex isolates in respiratory specimens. J Infect Dis. 2004;189(1):98-104.
5. Fields BS, Benson RF, Besser RE. *Legionella* and Legionnaires' disease: 25 years of investigation. Clin Microbiol Rev. 2002;15(3):506-26.

(http://www.cdc.gov/healthywater/surveillance/deficiency-classification.html). Screen-shot below from US CDC webpage (link immediately preceding)

Deficiency Classification for Drinking Water and Other, Non-recreational Waterborne Disease Outbreaks

Waterborne disease outbreaks are assigned one or more deficiency categories based on available data. The deficiencies provide information about how the water became contaminated, water system characteristics, and factors leading to waterborne disease outbreaks.

Deficiencies Assigned to Outbreaks Associated with Drinking Water, Other Water, and Unknown Water Exposures

Contamination of drinking water (i.e., public, individual, or bottled water systems) at/in the water source, treatment facility, or distribution system*

- **1:** Untreated surface water
- **2:** Untreated ground water
- **3:** Treatment deficiency (e.g., temporary interruption of disinfection, chronically inadequate disinfection, or inadequate or no filtration)
- **4:** Distribution system deficiency, including storage (e.g., cross-connection, backflow, contamination of water mains during construction or repair)
- **13:** Current treatment processes not expected to remove a chemical contaminant (e.g.,pesticide contamination of ground water treated with disinfection only)
  - **A:** Surface water
  - **B:** Ground water

Contamination of water at points not under the jurisdiction of a water utility or at the point of use†

- **5:** *Legionella* spp. in water system
  - **A:** Drinking water (i.e., public, individual, or bottled water systems)
  - **B:** Other non-recreational water (e.g., cooling/industrial, water reuse, irrigation, occupational, decorative/display, includes water consumed from sources such as back-country streams)
  - **C:** Unknown water use (i.e., the intended purpose or use of the water is unknown or the water exposure category could not be determined)
- **6:** Plumbing system deficiency after the water meter or property line (e.g., cross-connection, backflow, or corrosion products)
- **7:** Deficiency in building/home-specific water treatment after the water meter or property line
- **8:** Deficiency or contamination of equipment using or distributing water (e.g., drink-mix machines)
- **9:** Contamination or treatment deficiency during commercial bottling
- **10:** Contamination during shipping, hauling, or storage
  - **A:** Drinking water – tap water
  - **B:** Drinking – commercially-bottled water
- **11:** Contamination at point of use
  - **A:** Tap
  - **B:** Hose
  - **C:** Commercially-bottled water
  - **D:** Container, bottle, or pitcher
  - **E:** Unknown
- **12:** Drinking or contact with other non-recreational water

Unknown/Insufficient Information

- **99:** Unknown/Insufficient information
  - **A:** Drinking water – tap water
  - **B:** Drinking water – commercially-bottled water
  - **C:** Other non-recreational water
  - **D:** Unknown water use

*For a community water system, the distribution system refers to the pipes and storage infrastructure under the jurisdiction of the water utility prior to the water meter or property line (if the system is not metered). For noncommunity and nonpublic individual water systems, the distribution system refers to the pipes and storage infrastructure before entry into a building or house.

† Contamination of drinking water and deficiencies occurring in plumbing and pipes that are not part of the distribution system as defined previously. For community systems, this means occurring after the water meter or outside the jurisdiction of a water utility; for noncommunity and nonpublic systems, this means occurring within the building or house (e.g., in a service line leading to a house or building, in the plumbing inside a house or building, during shipping or hauling, during storage other than in the distribution system, or at point of use).

Additionally, the Department continues to insist that Premise Plumbing is somehow under the jurisdiction of the Water Supplier and is considered a part of the Distribution System. Per the US-CDC, *Premise Plumbing is NOT part of the Distribution System*. In fact he US-CDC goes to great lengths and puts forth obvious effort to distinguish and clarify the differences between "The Distribution System" and "Premise Plumbing" to mitigate confusion. The US-CDC has specifically identified the jurisdictional dividing line(s) as the meter, the property line, or piping before entry into a building or house.

Additionally, The York Water Company is not authorized to enter local schools, hospitals, industrial campuses, or other premise plumbing networks to operate valves in their plumbing systems. We cannot legally flush their piping, we cannot legally confirm or investigate internal cross-connections or plumbing failures (*unless a failure impacts the public water system's distribution system directly*), we cannot aid with moving water through lesser used areas, and we cannot maintain their plumbing network for them. Similarly, premise plumbing owners cannot operate or maintain a PWS' distribution system.

Should the two leading causes of Waterborne Disease Outbreaks as identified by the US-CDC not be addressed as part of this package, then how can the claim of preventing the same be made by the Department in item #17 in the Regulatory Analysis Form? Neither Premise Plumbing nor untreated groundwater have been addressed in this reg. package.

2) **"Improved Coliform Compliance":** We, as an industry, have just made significant changes to improve coliform compliance. As part of the Revised Total Coliform Rule, overhauls to operations, compliance sampling, and determination of compliance criteria went into effect eighteen (18) days ago, April 1, 2016. The Department is still working to publish its own version of the RTCR. However, the Federal RTCR was vetted via the FACA process and was created to protect public health from deficiencies in the distribution system, specifically relating to coliforms. Additionally, the Federal RTCR specifically avoided identifying a mandatory chlorine residual for distribution systems.

   Presently, federal advisory committees (FACA) are meeting and investigating whether a specific residual should be included in a future reg package and if so, how it might be implemented.

   According to the Pennsylvania Public Water System Compliance Report – 2014 table immediately following, if Total Coliform compliance improvement is truly our goal, then targeting education and compliance aid for the small water systems of PA seems a fairly good starting point, not increasing chlorine residual requirements for all water systems.

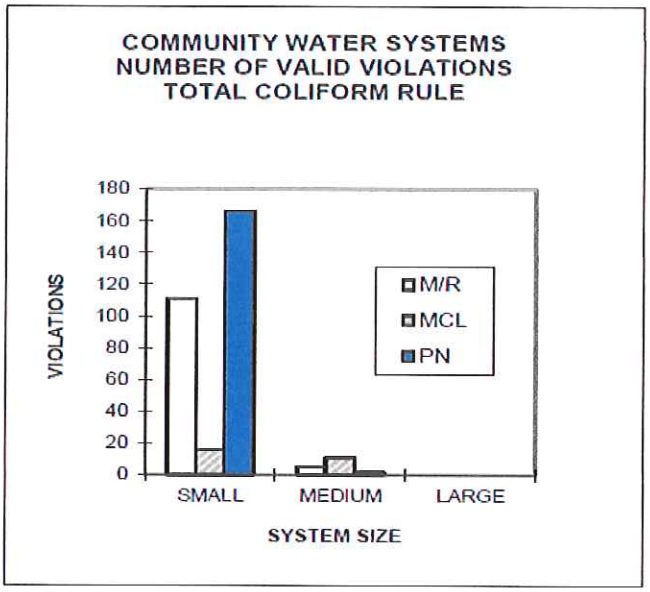
Pennsylvania Public Water System Compliance Report – 2014

Violations Summary by Violation Type and PWS Type and Size

Figure 8.

COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
TOTAL COLIFORM RULE

	M/R	MCL	PN
SMALL	111	16	166
MEDIUM	5	11	2
LARGE	0	0	0
TOTAL	116	27	168



Graphs were provided by The Department as part of the Preamble and claimed that these graphs demonstrated that states with mandatory distribution system residuals >0.2-mg/L had higher TCR (total coliform rule) compliance rates than PA – and they rightfully suggest that the statistics might be able to be applied to PA. Unfortunately, the statistical interpretations of the dataset do not match the conclusions that the Department has drawn. Typically any result falling within two standard deviations can be considered an "insignificant difference" and those falling within one standard deviation are typically considered as the same result, or indifferent from "noise".

Our assessment of the dataset is different from that which the Department provided following its graphs in the Preamble. The evaluation below suggests that PA can expect no statistically significant increase in coliform compliance rates (0.5% - 1.3% improvements). Please see the table below summarizing the data set that the Department provided in the Preamble. We can identify three states that performed better than PA (average of 1.3% better), four states performed effectively the same as PA (averaging 0.5% better), and one state performed worse than PA.

The tables below were constructed from the data contained in the graphs located in item #28 of the Regulatory Analysis Form, as provided by the Department.

Total Coliform Rule (TCR) Violation Summary Utilizing Data from Bar Charts Presented in the Preamble (pages 863 - 866)

Percentage of Community Water Systems with TCR Violations During the Years: FY2011 through FY2014

Comparing PA violations vs. that of states with mandatory residuals >0.2-mg/L

Summary:
PA should be able to expect 0 - 1.3% better TCR compliance rates with elevated distribution system residual.

3-states slightly better than PA
(avg 1.3% better compliance rates)

3-states effectively the same as PA

1-state worse than PA
(1% worse)

State	Pennsylvania	Alabama	Tennessee	West Virginia	Illinois	Kentucky	Kansas	North Carolina	Ohio
Required Residual (Total/Free in mg/L)	*0.02/0.02*	*0.5/0.2*	*0.2(free)*	*0.2(total)*	*0.5/0.2*	*0.5/0.2*	*1.0/0.2*	*1.0/0.2*	*1.0/0.2*
FY 2011	2.9	0.9	2.5	0.6	1.5	4.3	2.8	1.3	1.2
FY 2012	2.6	2.4	1.9	0.4	1.9	4.1	3.2	1.1	1.0
FY 2013	2.0	2.3	1.0	1.8	1.5	2.8	3.1	1.1	1.1
FY 2014	2.1	1.7	1.5	1.7	1.5	3.8	3.4	0.8	1.5
Average Percent Violations Reported	2.4	1.8	1.7	1.1	1.6	3.8	3.1	1.1	1.2
Std Deviation of Violations	0.94								
Average Difference from PA		0.6 Same as PA	0.7 Same as PA	1.3 Better than PA	0.8 Same as PA	1.4 Worse than PA	0.7 Same as PA	1.3 Better than PA	1.2 Better than PA

Disinfection Byproduct (DBP) Violation Summary Utilizing Data from Bar Charts Presented in the Preamble (pages 863 - 866)

Percentage of Community Water Systems with DBP Violations During the Years: FY2011 through FY2014

Comparing PA violations vs. that of states with mandatory residuals >0.2-mg/L

Summary:
PA should be able to expect 0.4 - 4.1% Worse DBP compliance rates with elevated distribution system residual.

0-states better than PA

4-states effectively the same as PA

4-state worse than PA
(0.8 - 4.1% worse)

State	Pennsylvania	Alabama	Tennessee	West Virginia	Illinois	Kentucky	Kansas	North Carolina	Ohio
Required Residual (Total/Free in mg/L)	*0.02/0.02*	*0.5/0.2*	*0.2(free)*	*0.2(total)*	*0.5/0.2*	*0.5/0.2*	*1.0/0.2*	*1.0/0.2*	*1.0/0.2*
FY 2011	2.2	0.9	3.8	2.2	0.5	6.6	1.9	2.0	2.1
FY 2012	1.2	0.2	2.7	1.2	0.3	2.8	1.4	1.8	1.5
FY 2013	0.9	3.8	1.7	1.0	0.4	2.0	1.2	1.6	1.4
FY 2014	0.7	1.7	4.2	4.2	1.0	10.0	2.4	1.8	3.2
Average Percent Violations	1.3	1.7	3.1	2.2	0.6	5.4	1.7	1.8	2.1
Std Deviation of Violations *Excluding Kentucky as an Outlier*	0.73								
Average Difference from PA		0.40 Same as PA	1.85 Worse than PA	0.90 Worse than PA	0.70 Same as PA	4.10 Worse than PA	0.48 Same as PA	0.55 Same as PA	0.80 Worse than PA

3) "Zero impact on DBPs."

This is not accurate. Under the same conditions, the higher the concentration of chlorine (free or combined) for a given water, typically, the higher the DBPs (Disinfection By-Products are regulated and some are health hazards). The table immediately above bears this out. This is the summary of the series of graphs the Department provided in the Preamble summarizing DBP compliance in PA as compared to those states that have a mandatory distribution system residual >0.2-mg/L of chlorine. This analysis shows that no state is better than PA at DBP compliance, four states are effectively the same as PA, and four are worse than PA, including one that is dramatically worse than PA (Kentucky). So, by both scientific and statistic projections, we can agree that DBPs will increase in PA should the minimum distribution system residual increase by ten-times (10X) as put forth in this proposed package.

The statistics and the science directly refute box number 13 of the Regulatory Analysis Form. DBPs and the Disinfection By-Product Rule will be directly impacted as a result of this regulatory package.

Additionally, compliance with the Lead and Copper Rule will likely be negatively impacted. Elevated levels of residual disinfectant as necessary to comply with this proposed package will

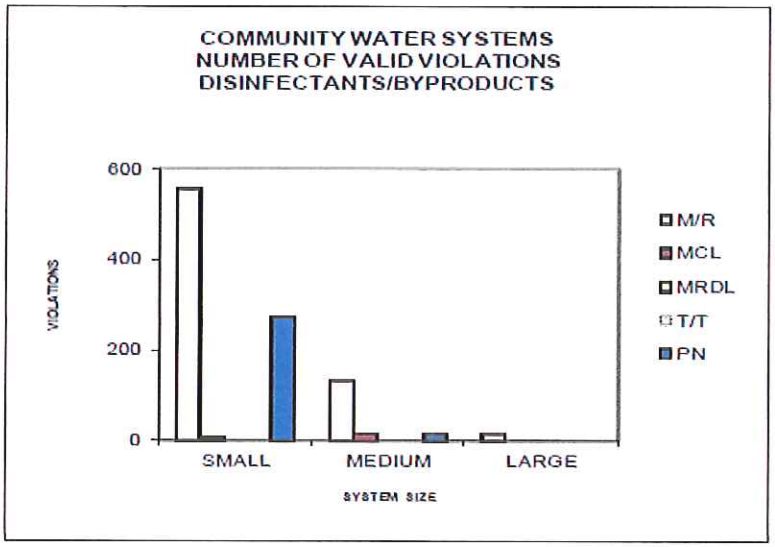
change the corrosivity of the water and thus to the leaching and corrosion of lead, specifically for those homes and schools closest to the Point of Entry into the Distribution System where that residual will be highest.

Pennsylvania Public Water System Compliance Report – 2014

Figure 13.

COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
DISINFECTANTS/BYPRODUCTS

	M/R	MCL	MRDL	T/T	PN
SMALL	556	6	0	2	272
MEDIUM	133	14	0	3	14
LARGE	13	0	0	3	0
TOTAL	702	20	0	8	286



4) **"No Significant Cost Impacts to the majority of Water Systems"**

Cost information for many utilities and suppliers was provided to the Department as part of the TAC Board testimony. Unfortunately, the Department has ignored those numbers and has made no notation in the Preamble nor updated its cost projections in the Regulatory Analysis Form.

Estimates indicate that the capital expenditures will exceed the Department's projections by over fifty-million dollars (> $50-million) and may actually be much more than that.

Recurring annual operating costs were not accounted for in the Department's projections. These annual operating costs also exceed the Department's projections for capital investment by over three million dollars (> $3-million).

THE YORK WATER COMPANY

Estimated Costs of Compliance With Proposed Disinfection Requirements Rule
All estimates provided after February 15, 2016 and targeted at the 0.2-mg/L Residual Requirement

	Philadelphia Water Department (PWD)	Aqua Pennsylvania	Suez Water	PA American Water	The York Water Company	Pittsburgh Water and Sewer	North Penn Water	Chester Water Authority	Capital Region Water	Bucks County Water and Sewer	Western Berks Water Authority	Lehigh County Water Authority	City of Lancaster Water Department	Bethlehem Water Dept.	Erie Water	Totals	Percent of Pennsylvania's *Population Served by Public Water * Represented in this Table by these Suppliers
Source of Cost Estimates	Public Record Submitted to PADEP	Phone Interview	Phone Interview	Phone Interview	Internal Estimations	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview	Phone Interview		68%
Population Served	1,700,000	1,400,000	165,000	2,200,000	190,000	500,000	85,000	138,000	60,000	200,000	35,000	118,000	130,000	115,000	220,000	7,256,000	
CAPEX Estimate (total $)	$25,000,000	$7,150,000	$2,000,000	$13,100,000	$3,000,000	$0	$6,000,000	$1,033,000	$25,000	$200,000	$300,000	$25,000	$500,000	$25,000	$1,800,000	$60,158,000	CAPEX Estimate (total $)
OPEX Estimate (increased $/year to comply)	$2,500,000	$300,000	$100,000	$735,000	$600,000	$0	>0	$3,600	$7,000	> 0	$20,000	$15,000	$25,000	$212,000	> 0	$4,515,600	OPEX Estimate (increased $/year to comply)
Combined Ten Year Cost ($) (CAPEX + (OPEX X 10 yrs))	$50,000,000	$10,150,000	$3,000,000	$20,450,000	$9,000,000	$0	$6,000,000	$1,069,000	$95,000	$200,000	$500,000	$175,000	$750,000	$2,125,000	$1,800,000	$105,314,000	Combined Ten Year Cost ($) (CAPEX + (OPEX X 10 yrs))
Number of Waterborne Disease Outbreaks Directly Attributed to Supplier over last 30-years (no premise plumbing - suppliers can NOT control O&M of PP)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Number of Waterborne Disease Outbreaks Directly Attributed to Supplier over last 30-years (no premise plumbing - suppliers can NOT control O&M of PP)

Item #19 in the Regulatory Analysis Form is inaccurate because the math cannot be applied in this fashion. These inaccuracies have been identified and have been repeatedly brought to the attention of The Department. This is already a part of the public record on multiple occasions, including TAC meetings, testimony provided before the TAC Board, and as part of the "Stakeholder Workgroup Meetings". Qualifiers have NOT been included, as part of the Preamble, yet, detailing that the costs of compliance estimates and the mathematical processes used to reach them, have been repeatedly challenged.

One cannot utilize monthly average chlorine residuals from a water system to project 'ease of compliance' nor accurately projected expenditures. Especially since compliance, as proposed by the Department is on a single sample basis (not a monthly average).

1) Monthly Average chlorine residuals cannot mathematically aid in the prediction of potential compliance
   i. Proposed Regs determine compliance based upon individual results
   ii. *Theoretical Example (Extreme)*: **120-monthly samples required**
      - **60-of those samples = 2.00-mg/L and**
      - **60-of those samples = 0.10-mg/L**
      - **Monthly average = 1.05-mg/L – this is reported to the Dept. under present regs** and is also the number used to make their projections for cost and ease of compliance
   2. Based on the new reg., the PWS would be out of compliance 60 times in the first month (*below 0.2-mg/L, but still meets present regs*)
   3. Based on the Dept's choice of math for projections, this system expects no capital expenditures (*no flushers & no chemical booster necessary*) and thus has no concerns as its ***average*** residual is well over the proposed 0.2-mg/L – excepting the fact that the utility would be in "violation" 720-times in the first year.
   4. Overall ease of compliance projections are severely overestimated by the Dept.

2) Actual costs to achieve compliance are much higher than the Dept.'s predictions
   i. Automated Flusher capital cost estimated at **$2,000** each, by the Dept.
   ii. The Philadelphia Water Dept. has published estimates for their system, their cost for purchasing, installing, and securing each flusher is **$45,000**
      1. This is greater than an order of magnitude difference
      2. **Even if** the actual costs worked out to be halfway between (*$23,500*) – the Dept.'s estimated costs are ***dramatically*** understated – still "off" by an order of magnitude.
      3. The number of flushers needed, statewide is dramatically underestimated.
         a. More than three systems need flushers
         b. Much more than the Dept's estimated $30,000 will be spent by the medium and large water systems on flushers to achieve the 0.2-mg/L minimum residual.
   iii. Operating costs are NOT accounted for in the Dept.'s cost projections.
      1. Nearly all medium and large water systems operating costs will increase
      2. *The York Water Company* projects annual operating cost increases, just to comply with the 0.2-mg/L proposed residual at **$600,000/yr**.
      3. *The Philadelphia Water Dept.* projects its operating costs to increase by **$2,500,000/yr. ($2.5-million/yr.)** to comply with the proposed residual of 0.2-mg/L.
      4. The Dept. estimates a total combined cost, statewide at **$780,000**

Based on the above, we need to consider what problem is it that we are actually solving with this regulatory package? Additionally, what problems are we creating?

There is no scientific, obvious, or overwhelming *need* for this very expensive reg. package.
What is the actual driver for this proposed reg. package?

1) 5-pages of the Preamble focus on Legionella and Legionnaires Disease (LD)
   a. Elevated residuals in a distribution system will not completely remove or destroy Legionella
   b. Legionella must amplify in order to cause harm
   c. Legionella amplification is a premise plumbing problem and is NOT a distribution system issue – per the CDC
   d. I cannot identify a single waterborne disease outbreak within the past 20-years, in PA, that has been directly attributed to a medium or large PWS that has been disinfecting AND meeting the present regs. (91% of PA's population served)\
2) 5-pages of the Preamble are dedicated to Total Coliform Rule (TCR) and Disinfection Byproduct Rule (DBP) compliance. (*see Tables #1 and #2 below*)
   a. Based on the dataset, PA cannot expect a significant increase in TCR compliance – 0 – 1.3% better is possible
   b. Based on dataset, PA can expect DBP violations to increase by 0.4 to 4.1%.

3) 1-page is dedicated to costs and compliance estimates
    a. Estimates are dramatically skewed
    b. Cost estimates are too low per item
    c. Cost estimates are too low statewide
    d. Ease of Compliance projections is dramatically overestimated
4) Cost / benefit? Especially for Large and Medium PWS (91% of PA population served)
    a. No science based nor statistical 'guarantee' of any benefits
    b. Capital and Operating Costs go up dramatically
    c. Customer Costs increase
    d. DBPs increase (*cancer and other health effects*)
    e. Complaints go up
    f. Violations go up

What problem are we trying to solve with this reg. package?

In summary, The York Water Company recommends that due to the statewide CAPEX for compliance at > $60-million, annual OPEX for compliance at > $4-million, and the Department's stated goal of resolving the numeric value for what a "detectable" chlorine residual is, that we maintain the current rule with the exception of replacing 0.02-mg/L with 0.1-mg/L which retains HPC as an ACC, will provide a reliable, verifiable residual that is five times (5X) higher than the current residual, at a reasonable cost, and has already been approved by the TAC Board. This change will clearly solve the Department's stated goal without backsliding and without the unintended consequences.

Sincerely,

Douglas J. Crawshaw
Water Quality Manager
The York Water Company