



WISCONSIN STATE LEGISLATURE ... PUBLIC HEARING - COMMITTEE RECORDS

2009-10

(session year)

Senate

(Assembly, Senate or Joint)

Committee on Environment...

COMMITTEE NOTICES ...

- Committee Reports ... **CR**
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INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

- Appointments ... **Appt** (w/Record of Comm. Proceedings)
- Clearinghouse Rules ... **CRule** (w/Record of Comm. Proceedings)
- Hearing Records ... bills and resolutions (w/Record of Comm. Proceedings)
 - (**ab** = Assembly Bill) (**ar** = Assembly Resolution) (**ajr** = Assembly Joint Resolution)
 - (**sb** = Senate Bill) (**sr** = Senate Resolution) (**sjr** = Senate Joint Resolution)
- Miscellaneous ... **Misc**

WABENO SANITARY DISTRICT

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Sen. Mark Miller, Chairman
Senate Environment Committee
Room 317 East
Madison, WI 53707

Dear Senator Miller:

RE: Proposed Rule DG-19-09

We are a small community that is blessed with pristine, good tasting groundwater. Our wells are 155 feet and 95 feet deep. They are protected from potential contamination sources by a Wellhead Protection Plan.

Why would we be opposed to Rule DG-19-09?

1. The EPA rule does not require Mandatory Disinfection.
2. We have not had an opportunity through testing to prove whether disinfection of our water supply is necessary or not. Truly, there is a lack of evidence to prove disinfection is needed in all areas of the State of WI.
3. The cost to bring our wells up to this proposed rule would far exceed the \$10,000 estimated in the Rule. Additional cost would be reflected in higher water bills.
4. Cost:
 - Add a Corrosive Room & Equipment to Well #1 - \$30,000 to \$40,000. (on the very rare occasions we have had to disinfect our water supply, we do have a corrosive room and equipment at Well #2. We can handle any emergency chlorination with this one setup).
 - Chemicals for disinfection.
 - Additional personnel hours and cost of monitoring since this is required 7 days per week.

5. The EPA Fact Sheet on Chlorination advises "some byproducts produced by chlorine and organic materials naturally found in water have been shown to cause cancer or other adverse health effects in animals".

Apparently, the EPA, since they are not making disinfection mandatory (as proposed by the State of WI) feels additional studies are needed.

We are asking that this Rule DG-19-09 not be approved without additional studies on the potential health risks, disinfection methods, the need for all districts to disinfect and a total reevaluation of costs for this Mandatory Disinfection Rule.

Thank you for your consideration of this matter.

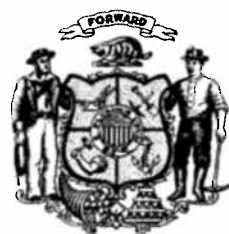
Sincerely,



Scott Schuhart, Chairman
Wabeno Sanitary District



WISCONSIN STATE LEGISLATURE





advanced food products llc

**600 FIRST AVENUE WEST
CLEAR LAKE, WI 54005**

Al Bannink
Village Clerk
Clear Lake, Wisconsin

Dear Mr. Bannink:

You have informed us that the DNR may require the addition of chlorine to the Village of Clear Lake water supply. As you are aware, the Village of Clear Lake is the only source of water to the AFP plant. As an employer of 125 people in the community, I will say we are concerned about the addition of chlorine to our water supply.

We use a great deal of water in our 100 million pound production plant. Water is our primary ingredient. We do not treat the water that is supplied to us. As a matter of fact, we rely greatly on the high quality, non-treated water we currently get from the Village of Clear Lake.

Our concerns center on two points:

1. Our 300 plus product formulas are sensitive. They are a combination of a variety of ingredients including minerals and vitamins. We are producers of smooth homogenous products that are sold throughout the world. When we hear about the addition of chlorine, regardless of strength, we go right to the potential need to do a great deal of formulation work. That work is not easy and takes a great deal of time. Our test run costs run about \$3000 per test run. As you can see, if we need to do a few hundred tests, the costs become extremely high. We are in a competitive business and customer supply is critical. Anything that impedes supply opens the door to our competitors and losing business translates into losing jobs.
2. We currently discharge about 400,000 to 500,000 gallons of non-contact water to Clear Lake on a daily basis. If our permit hinders us from doing that, we will have to look at the installation of cooling towers. The capital to install that equipment as well as additional refrigeration capacity has not been priced but it would easily run into hundreds of thousands of dollars.

As you can see, adding chlorine will cause us a great deal of work and cost. I am stating the obvious, but we would like to avoid both the work and the cost. You have a strong, clear voice, from AFP, to keep chlorine out of the water supply.

Best Regards,

Paul Shafer
Plant Manager
AFP advanced food products, llc

A handwritten signature in cursive script that reads "Paul Shafer".



REPORT TO LEGISLATURE
NR 809, 810 & 811, Wis. Adm. Code

Board Order No. DG-19-09
Clearinghouse Rule No. 09-073

Basis and Purpose of the Proposed Rule:

Federal Rule Changes – Four Federal Rules under the Safe Drinking Water Act have been revised changing drinking water quality standards, monitoring requirements, and public notice requirements. In order for Wisconsin to retain primacy for implementing the Safe Drinking Water Act, the state rules must be as stringent as the federal rules. Retaining primacy affords the state flexibility for implementation and enforcement of the federal rules.

Safer Drinking Water – The federal rules increase the monitoring and improve the level of treatment required for drinking water systems. Disinfection of water provided by municipal systems addresses concerns raised by research indicating viruses are present in wells that were believed to be adequately protected.

Ease of Compliance – Restructuring the rules allows water system owners, operators, and designers to more easily identify the requirements that apply. Incorporating new technology provides more options for achieving compliance with the regulations.

Summary of Public Comments

The Department held five public hearings in Waukesha, Green Bay, Madison, Eau Claire and Spooner in October 2009 to receive comments on the proposed rule changes. In addition, written comments were received by the Department until November 11, 2009. We received comments from: Wisconsin Department of Commerce, Davy Laboratories, Wisconsin Rural Water Association, Village of Kewaskum, City of La Crosse, Municipal Environmental Group, Wisconsin Water Association, Manitowoc Public Utilities, League of Wisconsin Municipalities, City of Brookfield, Watertown Water Department, Marshfield Utilities, Racine Water & Wastewater Utility, Oshkosh Utilities, Madison Water Utility, Margaret Elath, Ductile Iron Pipe Research Association, Milwaukee Water Works, HydroDesigns, Town of Bristol, Barron Light & Water Department, City of Augusta, City of Merrill, City of Janesville, Wausau Water Works, U.S. Pipe and Foundry Co., Darboy Joint Sanitary District, North Shore Water Commission, Fox Point Water Utility, Wauwatosa Water Utility and Jon Standridge.

Specific public comments and summaries of public comments along with DNR responses are provided below:

NR 809

Comment: The proposed rule changes did not make this code revision any easier to understand. NR 809 continues to be a nightmare to read and interpret. The entire code needs to be revisited and changed. There is no reason why the code can't be separated into five sections. Section 1 – General Information that is not specific for any one regulated entity. Then there should be four additional sections: Section 2 – Municipal Community system (MC) Section 3 – Other than Community Systems (OTM), Section 4 – Non-transient Non-Community Systems (MC) and then Section 5 – Transient Non-Community Systems (TN). [Davy Laboratories].

Response: The department consulted with a stakeholder group and individual work groups for each code chapter throughout the revision process and was not asked to proceed in the direction suggested. Within each section of the code, the applicability is clarified as to the types of systems impacted. Dividing the code as suggested would result in significant redundancy.

Comment: The definition of a public water system, or PWS is appropriate to chapter NR 809 however the definition should be clear that it is referring to a "water system". In order to do that, Commerce recommends that the term "water system" be inserted in the definition. [Wisconsin Department of Commerce].

Response: The definition of "public water system" in ch. NR 809 is required by EPA and is adopted from the federal rule. The addition of the word water in front of system in the definition of public water system is not needed when the definition is read in its entirety.

Comment: NR 809.04 to be consistent with other chapter revisions the definition of a "water system" should be included in chapter NR 809 [sic]. This revision not only creates consistency between the DNR codes, but clarifies that the public water systems do not include the private water mains, water services and water distribution systems under the authority of Commerce. [Wisconsin Department of Commerce].

Response: The definition of distribution system has been added to ch. NR 809 to be consistent with other DNR codes and to help distinguish between the authorities of the DNR and the Department of Commerce.

Comment: NR 809.08(5) – How can the WDNR require a system to comply with a detected concentration below the MCL but above the MCLG? Has this been legally challenged? If I have a detected concentration below the MCL or below some action limit of the MCL but still above the MCLG, why should I have anything further to do? [Davy Laboratories].

Response: MCLs are based both on protection of public health and economic factors related to treatment whereas MCLGs take only public health into account. In s. NR 809.08(5), the system needs to take a confirmation sample if a contaminant is detected above the MCLG but below the MCL. If the contaminant is confirmed, and following a determination by the department on the need for further action, the water supplier would provide public information to its customers concerning the analytical results and the health effects of ingesting the substance at the concentration found. The department may also require that an assessment of the significance of the contamination be done by the public water system. If that assessment indicates the need for installing treatment or finding an alternate water supply, the department would require that. This section of the code is often used in cases where contamination is rising and will probably in the future exceed the MCL and the system needs to begin looking for a new source or determining if treatment is viable. This section has not been legally challenged. The department tries to work with public water systems to anticipate the need for alternate water supplies and treatment since the planning process can take years in some cases. This section is indicative of the purpose of this chapter to protect public health.

Comment: NR 809.113(2) – Are your temperatures for other parameters correct? I believe the EPA raised the preservation temperature to 6° C. [Davy Laboratories].

Response: On March 12, 2007, EPA published "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and

National Secondary Drinking Water Regulations; Analysis and Sampling Procedures; Final Rule" in which EPA did raise the preservation temperature from 4°C to 6°C. In addition, on March 26th, 2007, "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Analytical Methods for Biological Pollutants in Wastewater and Sewage Sludge; Final Rule" was published in which this change to preservation temperature was made. However, a corresponding change has not been made to the preservation table in 40 CFR 141.23(k)(2) for drinking water. Therefore, we are not able to change the preservation holding temperature to 6° C in s. NR 809.113(2), since our rule can be no less stringent than the current federal rule.

Comment: NR 809.113(4) – Compositing sampling. There must be some criteria to be met before you can composite. Don't the wells have to be in the same aquifer and have the same water quality? Unclear what criteria is required to be met before one can composite. If not being done, eliminate it. [Davy Laboratories].

Response: EPA has not provided any specific criteria to determine when compositing can be used. The disinfection by-products Stage 1 portion of the rule uses wells within the same aquifer for determining the number of compliance samples required to be taken in the distribution system. When the Stage 2 compliance monitoring begins in 2012, sample frequency and numbers will be determined by population not by source water characteristics. At this point, the department has tried to maximize monitoring relief for systems using the monitoring waiver program instead of using the compositing of samples on an area basis.

Comment: NR 809.113(4)(e) – I'm not sure what the detection limit means. Is this detection limit a minimum detection limit required by the laboratory to meet [sic]? Why do you have different detection limit [sic] for different techniques? If a required detection limit is based on meeting 1/10 of the MCL, then why the differences? If the detection level is based on technique, then that is outside the scope of NR 809 and not relevant. Detection levels should only be addressed as a function of the laboratory to be below some factor of the MCL for certification. [Davy Laboratories].

Response: The detection limits in s. NR 809.113(4)(e) are the levels that EPA requires laboratories to achieve when analyzing samples to meet requirements under the safe drinking water act. This language is required under our primacy agreement with EPA.

Comment: NR 809.120(2) - Why is total trihalomethanes listed under synthetic organics? Shouldn't this be addressed under volatile organic compounds? [Davy Laboratories].

Response: The total trihalomethanes should not be in this table. They have been removed.

Comment: NR 809.120(4) - Shouldn't 524.3 be added to the list of parameter/method list? [Davy Laboratories].

Response: Yes. We have added 524.3 to the appropriate methods for the covered parameters, since we are unable to refer to methods approved by the EPA under Appendix A to Subpart C of Part 141--Alternative Testing Methods Approved for Analyses Under the Safe Drinking Water Act.

Comment: NR 809.30(1)(b) - "For a system which collects fewer than 40 samples per month, if no more than one sample, including routine and repeat samples collected during a monitoring period is total coliform-positive, the system is in compliance with the MCL for total coliforms". This states that if one sample one per month fails, I'm in compliance. Is this true? [Davy Laboratories].

Response: Yes. A system that takes less than 40 total coliform compliance samples per month must have 2 positive total coliform samples to exceed the MCL.

Comment: NR 809.30(5) - Who is doing heterotrophic bacteria? Why is it here? [Davy Laboratories].

Response: Heterotrophic bacteria plate counts are used for systems with recurring bacteria problems to help determine the severity of the problem and to try to identify the cause. It has been used most often in municipal public water systems with significant biofilm problems.

Comment: NR 809.31 (2)(a) - A system required to sample less than one sample per month is required to sample 4 sites? I thought the groundwater rule changed and required three samples with a fourth coming from the raw water source (i.e. Well)? It is not clear whether it's a distribution system or not[sic]. This entire section is poorly written and needs to be put into a table based on type of community. [Davy Laboratories].

Response: Under the groundwater rule, systems that take 4 repeat samples under the Total Coliform Rule (TCR) may use one repeat sample to fulfill the triggered monitoring sample if that repeat sample is taken from a source/well associated with the positive distribution system sample. Only non-municipal systems that collect one TCR sample or less per month may use this provision.

Comment: NR 809.31 (2)(f) - An additional 5 routine the next month following a violation is excessive. [Davy Laboratories].

Response: This is a requirement of the Safe Drinking Water Act. The Department can be no less stringent than the federal law.

Comment: NR 809.311 (1) - Are you serious? Standard Methods is up to the 23rd edition. Are you sure the 18th edition is still correct? [Davy Laboratories].

Response: The citation has been updated to include the 19th and 20th editions as found in 40 CFR 141.21(f)(3). The federal language only includes those three editions in the citations under the Total Coliform Rule.

Comment: NR 809.323(1)(c) - Table G Note 1. Sample should be required to be below 10°C. [Davy Laboratories].

Response: The footnote has been deleted from Table G.

Comment: NR 809.335(3) - Turbidity measurement shall be made by a party approved by the department? What does this mean? Why not just say a Certified lab? [Davy Laboratories].

Response: The federal code language allows for a number of field parameters to be done by individuals approved by the department. We have approved the water system operators to do these analyses. Since turbidity samples are subject to changes the longer they sit between collection and analysis, these samples are done in the field by the water system operators.

Comment: NR 809.541 (3) - Analyses for all water quality parameters should come from a certified laboratory. This information is critical for developing a corrosion control program and a demonstrated ability to accurately[sic] measure these parameters should not be compromised with an "anybody can do it" mentality. [Davy Laboratories]

Response: The Department requires water quality parameters to be analyzed by the approved methods in s. NR 809.113 Table A.

Comment: NR 809.541 (5)(a)(b) - Why should the levels of lead and copper below the MDL be reported as zero (0) versus "less than" the MDL. [Davy Laboratories].

Response: EPA requires that any results for lead and copper that are below the MDL must be reported as zero (0).

Comment: NR 809.542(2)(a) - I don't think any system that has had to implement corrosion control practices has been required to routinely check their waste system to make sure that corrosion control practices are being maintained. Why not? [Davy Laboratories].

Response: The above referenced section does not pertain to checking wastewater to make sure corrosion practices are maintained. EPA uses water quality parameters to determine if corrosion control practices are maintained. The above section allows us to consider corrosion control optimized if tap samples meet the action levels at the 90th percentile for 2 consecutive 6-month monitoring periods. Lead or copper levels in wastewater are a condition of the wastewater discharge permit.

Comment: NR 809.542(4)(a-g) - What is with these treatment deadlines? Section should be either eliminated or updated. [Davy Laboratories].

Response: The dates are part of the federal regulations. Our state regulations cannot be less stringent than the federal regulations, so the dates must remain in the code.

Comment: NR 809.543(3)(c) - How often should this be done? Who is requiring this and how is it tracked? Are compliance schedules sent out with report forms? NR 809.548(5)(e) - The frequency of monitoring for water quality parameters is not being enforced at the frequency stated. I know of several communities that have not checked their water quality parameters since implementing corrosion control. Why hasn't this been enforced? [Davy Laboratories].

Response: The section above refers to water quality parameters collected as part of a corrosion control study at a large water system, or when required by the department. In this context, the samples should be collected at locations and frequencies that would demonstrate the effectiveness of the corrosion control treatment being evaluated. There are typical procedures for performing pipe loop and coupon corrosion studies. Other water quality parameters are required for large systems, and for medium or small systems that exceed a lead or copper action level. The number and frequency of these samples is specified in s. NR 809.548. The department tracks requirements and compliance with these schedules in drinking water system (DWS) database. Compliance for water quality parameters is tracked on a 6-month basis.

Comment: NR 809.543(8) - How often should this be done? Who is requiring this and how is it tracked? Are compliance schedules sent out with report forms? [Davy Laboratories].

Response: Compliance for water quality parameters is tracked on a 6-month basis. The data is reported to the department on the system's monthly operating reports, along with other operational data.

Comment: NR 809.546(1) - Put this in the appendix as an example. Not in a good place and should be in a letter format. [Davy Laboratories].

Response: We allow the system to determine its preferred format for distributing the information. The specific language is required by EPA.

Comment: NR 809.547(1)(c) - The tier sampling site information is a joke. Few communities have neither [sic] actually looked at their building records nor is anyone from the department going to take the time to check the records. NO attempt to verify these records have b[sic] portably [sic] been done, [sic] Furthermore, when submitting data to the laboratories, the systems don't check the tier site. Additionally, the web based data entry system doesn't request this information so why is it here? If it is not being verified for compliance then eliminate this section. [Davy Laboratories].

Response: The tier structure was established to identify sites at highest risk for finding lead. It has been the department's experience in dealing with utilities that many have access to accurate building records, plumbing records, street repair records, etc, and reviewed these records when identifying their high risk sites. This initially occurred in 1991 and 1992. Since the same sites are used for lead and copper testing, it is not necessary to do this evaluation every time samples are collected. The information only needs to be updated if it is necessary to change a sample location. EPA protocol requires systems to provide tier information for each site every time samples are collected. The department was not capturing tier information after changing to the electronic data submittal format, so we developed monitoring site forms for all systems to fill out. This form captures tier information for lead and copper sample locations.

Comment: NR 809.547(4)(a) - Initial tap sampling? Eliminate. Dates are old and therefore section not needed. [Davy Laboratories].

Response: The dates are part of the federal regulations. Our state regulations cannot be less stringent than the federal regulations, so the dates must remain in the code. Water quality parameter monitoring requirements are established, and compliance is tracked in the drinking water system. Medium and small systems are required to collect water quality parameter samples only in the monitoring period during which they exceed a lead or copper action level. Large systems (serving >50,000) have been required to collect water quality parameter samples since optimizing corrosion control, and are on a reduced monitoring frequency.

Comment: The bromate monitoring reduction requirements in proposed NR 809.565(3)(b)2. do not seem to reflect the changes made in the Federal Rule on disinfection by-products. The bromate reduction should be as reflected in 40 CFR 141.132(b)(3)(ii)(B). [Margaret Elath].

Response: The change has been made to s. NR 809.565(3)(b) to allow for the old and new requirements for bromate monitoring reductions, as required by the federal law.

NR 810

Comment: It was requested that the definitions of "distribution system" in s. NR 810.02(18) [now s. NR 810.02(17)] and "Waterworks" or "water system" in s. NR 810.02(46) be modified to include the terminology "water distribution systems" as defined in ch. Comm 81 instead of "piping and fixtures inside buildings served". [Wisconsin Department of Commerce].

Response: The intent of the commenter was to clarify jurisdiction issues between DNR and Commerce. However, we feel that using the term "water distribution system as defined in ch. Comm 81" within a definition for "distribution system" or "water system" would only lead to confusion by the general public. Minor modifications have been made to both definitions for clarity and consistency.

Comment: It was requested that the definition of a non-community water system in s. NR 810.02(28)

[now s. NR 810.02(29)] include examples. [Davy Laboratories].

Response: The definitions for the two subcategories of non-community water systems, transient and non-transient, already include examples of each type of system. A sentence has been added to the definition that refers to the two types of non-community water systems.

Comment: It was requested that language be added to s. NR 810.04 that only certified operators be allowed to take water samples at other than municipal community systems and non-transient non-community water systems. [Davy Laboratories].

Response: Water system owners are the ones ultimately responsible for collecting water samples from their systems. The requested language would preclude owners from taking samples at their own system, which the Department cannot do.

Comment: It was requested that s. NR 810.08 be modified so that drinking water standards only apply to finished "drinking" water supplied to consumers. The reasoning being that in the future, public water systems may supply water that is not for human consumption. [Wisconsin Department of Commerce].

Response: The phrase "by public water supply systems" was inserted as clarification. By definition the water supplied by public water systems is for human consumption.

Comment: Several comments were received on s. NR 810.09, which will require all municipal water systems using groundwater to continuously disinfect the water prior to the water entering the distribution system. Some commenters concurred with the public health benefits of mandatory disinfection and stated that viruses have been found even in wells drawing from deep confined aquifers. A few commenters were opposed to mandatory disinfection due to costs to small systems or questioned the need, identified taste and environmental concerns and felt that it should be a local decision. [Jon Standridge, Wisconsin Rural Water Association, Village of Kewaskum, League of Wisconsin Municipalities, Madison Water Utility and Barron Light & Water Department].

Response: The requirement for mandatory disinfection will remain. Approximately 12% of the 614 municipal water systems in the state do not supply water that has been disinfected. A recent study led by Dr. Mark Borchardt of the Marshfield Clinic Research Foundation shows that illness attributable to viruses is occurring at municipal systems served by groundwater and has connected the detection of viruses in the drinking water to illness from consuming the drinking water. During some periods of the study, illness rates associated with drinking water were as high as 44/100 in children and 24/100 in adults. The target illness rate identified by USEPA for microbial risk is 1/10000. The study found that disinfection reduces the rate of illness attributable to viruses at municipal water systems served by groundwater.

The 71 municipal systems not supplying water that has received disinfection are subject to the current administrative rule requirement that systems have the equipment in place to disinfect. For these systems, the only additional cost will be for chemicals and monitoring and are expected to be \$2000 annually. For systems without equipment, and with no pre-existing unaddressed water quality concerns, the one-time cost is expected to be \$10,000 per well. In order to allow systems additional time for planning and to secure financing, the rule has been modified to allow a delayed effective date for this requirement of 3 years after the effective date for the remainder of the rule. The original delayed effective date was proposed to be 1 year after the effective date for the remainder of the rule.

Comment: It was requested that a note be added to s. NR 810.09(1)(c) that states the Department of Commerce requires plan submittal and approval of all treatment systems installed to service private and non-community water systems that are designed to reduce health-related contaminants. [Wisconsin Department of Commerce].

Response: The note has been added.

Comment: It was stated that s. NR 810.09(2)(b) references additional requirements in s. NR 809.705(2) and that this section does not exist. [City of La Crosse].

Response: The reference has been corrected to read s. NR 809.74(2).

Comment: It was requested that s. NR 810.13 include language which would allow a water system owner to receive permission from the Department for an alternative schedule for valve and hydrant exercising. [Milwaukee Water Works].

Response: The change has been made.

Comment: Two comments were received that s. NR 810.14 should include a provision that would allow a water system to receive permission from the Department for an alternate schedule for draining down their water storage tanks every 10 years for inspection. [City of La Crosse & North Shore Water Commission].

Response: Language has been added that will allow alternative schedules to be approved by the Department.

Comment: Many comments were received on s. NR 810.15 regarding cross connection control programs. [Darboy Sanitary District, Wisconsin Department of Commerce, City of Brookfield, Manitowoc Public Utilities, Watertown Water Department, Wisconsin Water Association, Marshfield Utilities, Municipal Environmental Group, Oshkosh Water Utility, Madison Water Utility, Milwaukee Water Works, HydroDesigns, Town of Bristol, City of Barron, City of Augusta, City of Merrill, City of Janesville, Wausau Water Works, Village of Fox Point & Wauwatosa Water Utility].

The comments fall into four general categories:

1. Opposition to the language requiring protection from cross connections "to the last flowing tap or end-use device." The concern is that the language increases the liability of a public utility. A commenter felt that a utility should not be responsible for inspecting a property owners' internal plumbing when that plumbing does not result in a significant risk to the public water system.
2. Concerns about intrusion into the private areas of customers' homes during residential inspections and the time and costs associated with doing such inspections. Many comments were received which opposed inspecting bathrooms and kitchens with normal fixtures as these are low hazard areas for cross connections and these pose a low risk to the public water system. Furthermore, it was felt that inspecting these areas is an unwise use of utility time and money and is intrusive to the privacy of the utility customer. The comments did endorse regular inspections of high hazard residential situations such as laundry tubs and outside hose faucets.
3. Opposition to conducting surveys at all commercial properties every two years due to manpower requirements and the resulting costs. Many commenters requested that the frequency for surveys at commercial properties be based on level of risk and not on classification. Most of the comments requested a more targeted approach to commercial properties as many commercial

properties contain nothing more than a simple restroom and are of similar or lesser risk than residential properties.

4. Several comments were received on licensing and certification requirements for those conducting cross connection inspections.

Response: Several changes were made to address the concerns of the commenters and to provide clarity. Responding to the four general comments:

1. The language requiring protection from cross connections "to the last flowing tap or end-use device" was retained. This same concern was raised during the work group process. The language "In order to protect the public water system" was inserted as a preface to the requirement, which satisfied the work group. This makes it clear that the intent of the proposed requirement is to protect the public water system from potential cross connections within the buildings being served.

2. DNR now includes language that allows a utility to provide educational materials to its customers in lieu of doing inspections of the low hazard portions of residential buildings. Low hazard areas include normal kitchen and bathroom fixtures. The educational materials would need to be distributed every 3 years and with every cross connection inspection and should provide basic information identifying and eliminating commonly found cross connections. The Wisconsin Water Association, Wisconsin Rural Water Association and the Municipal Environmental Group-Water Division have offered to help develop the educational materials.

3. DNR now includes language that allows commercial properties of similar or lesser risk to residential properties to follow the same inspection frequency as residential properties. This calls for an inspection every 10 years or on a schedule matching meter replacement. The language that will allow distributing educational materials to customers in lieu of doing inspections of the low hazard portions of residential buildings will also apply to the low hazard portions of commercial buildings.

4. The proposed rule contains no requirements for certification or licensing. The Department of Commerce is in the process of developing licensing requirements for industrial and commercial properties but would not require licensing for residential inspectors.

Comment: It was suggested that a minor modification be made to the language in s. NR 810.17 to avoid any confusion over the use of the term "service." [Wisconsin Department of Commerce].

Response: The change has been made as proposed.

Comment: It was requested that the last sentence in s. NR 810.19 be removed, as it seemed inconsistent with provisions in the WPDES General Permit, which this section refers to. [Municipal Environmental Group]

Response: The sentence has been deleted as requested.

Comment: It was requested that the reference to ch. NR 809 in s. NR 810.26(6) for required sampling plans have more detail or list examples. [Davy Laboratories].

Response: The ch. NR 809 code citation for each required sampling or monitoring plan has been included.

NR 811

Comment: It was requested that changes be made to the wording in s. NR 811.06, modifying the existing language from prohibiting cross-connections to more correctly prohibiting unprotected cross-connections, since cross-connections are sometimes necessary. [Wisconsin Department of Commerce].

Response: Department staff worked with the commenter and the section language was modified to reflect mutually agreed upon language. This included inserting replacement language stating that "unprotected cross-connections are prohibited."

Comment: It was requested that changes be made to the wording in s. NR 811.25 (1)(h)1 and 2 which would delete department language on building floor drain requirements and in its place refer to s. Comm. 82.38. [Wisconsin Department of Commerce].

Response: Department staff worked with the commenter and the section language was left in place with only a few format changes. The Department of Natural Resources has design criteria in ch. NR 811 that currently go beyond the design criteria provided in Department of Commerce codes for the purpose of providing enhanced well head and water supply protection. It was agreed that if the Department of Commerce modifies its code language in the future to incorporate the Department of Natural Resources' design criteria that the language in ch. NR 811 would then be changed to refer to the ch. Comm. requirements.

Comment: It was requested that changes be made to the wording in s. NR 811.25 (1) (h) 2. d. that would delete the prohibition on building drain piping discharging to a French drain and replace it with language referring to the Clearwater infiltration requirements listed in Chapters Comm. 81 to 87. [Wisconsin Department of Commerce].

Response: Department staff worked with the commenter and the section language was left in place and revised for clarity. The Department of Natural Resources has design criteria in ch. NR 811 that currently go beyond the design criteria provided in Department of Commerce codes for the purpose of providing enhanced well head and water supply protection.

Comment: It was requested that changes be made to the wording in s. NR 811.25 (1)(h)3 and 4 that would delete some department language on building trench drains and building floor drain piping requirements and in its place refer to Chapters Comm. 81-87. [Wisconsin Department of Commerce].

Response: Department staff worked with the commenter and the section language was left in place with only one format change. The Department of Natural Resources has design criteria in ch. NR 811 that currently go beyond the design criteria provided in Department of Commerce codes for the purpose of providing enhanced well head and water supply protection. In addition, s. NR 811.25 (8) was revised to include a requirement that all plumbing, including fixtures, backflow protection, floor drains, hub drains, piping and their installation, testing, and maintenance shall conform to the applicable ch. Comm. requirements. It was agreed that if the Department of Commerce modifies its code language in the future to incorporate the Department of Natural Resources' design criteria, that the language in ch. NR 811 would then be changed to refer to the ch. Comm. requirements.

Comment: It was suggested that a portion of the existing language in s. NR 811.25 (8) be deleted and that references to Department of Commerce plumbing requirements for water system buildings be moved from a note to a requirement in the body of the section language. [Wisconsin Department of Commerce].

Response: The suggested revisions were accepted.

Comment: It was requested that the requirement given in s. NR 811.39 (2) (c), for peristaltic chemical feed pumps to be operated at a minimum of 10 per cent of the maximum feeder output be modified to take into consideration the feed tube diameter for meeting the minimum 10 percent requirement. [Racine Water Utility].

Response: The change has been made.

Comment: It was questioned whether a reference in s. NR 811.42 (5) to s. NR 809.705 was valid. [City of La Crosse].

Response: The incorrect code reference was deleted and replaced with the correct reference to s. NR 809.74 (2).

Comment: It was requested that a note be added to s. NR 811.44 that plan review and inspection by the Department of Commerce may be required for water treatment pilot plant testing installations. [Wisconsin Department of Commerce].

Response: This comment was not accepted by the department. Normally, these installations are temporary, do not serve water to the public, and go through the department plan review and approval process. The department contacts the Department of Commerce as necessary if any cross-connection or backflow issues arise that need clarification.

Comment: It was requested that the requirement found in s. NR 811.66 (1) (b) to take corrective action when pressures exceed 100 psi be tied to documented problems such as excessive water main and service line leaks or breaks. [City of La Crosse].

Response: The change has been made. Identical revised language was included in s. NR 810.10.

Comment: It was requested that the "C" value (the coefficient of friction) assigned to cement lined ductile iron pipe in s. NR 811.70 (10) be increased from 120 to 140. [US Pipe and Foundry Company Ductile Iron Pipe Research Association].

Response: The change has been made. Additional language modifications were made to clarify that the "C" values assigned in ch. NR 811 are the maximum values to be used in the design of new water mains (unless other "C" values are justified) and that in addition to other considerations currently listed in the code, "C" values for existing water mains with a diameter of 12 inches or less may be less than the maximum "C" value for new pipe.

Comment: It was requested that the language in s. NR 811.71 (8) be modified to allow distribution system sampling faucets that are not specifically designated as sampling locations to be used for water sample collection as necessary. [Milwaukee Water Works].

Response: The word "dedicated" was removed.

Comment: It was requested that properly restrained ductile iron pipe be allowed in pipe bursting installations in addition to the plastic water main pipe currently allowed in s. NR 811.73 (3) (c). [Ductile Iron Pipe Research Association].

Response: Language to allow properly restrained ductile iron pipe has been added.

Modifications Made Based on Public Comments

NR 809.04. Added a definition for distribution system.

NR 809.120(2). Removed total trihalomethanes from the table.

NR 809.120(4). Added 524.3 to the list of parameter methods.

NR 809.323(1)(c). Deleted footnote from table G.

NR 809.565(3)(b). Revised to allow both old and new methods for bromate monitoring reductions as allowed by federal law.

NR 810.02(28). Added a sentence referring to the two types of non-community water systems.

NR 810.08. Added the phrase "by public water systems".

NR 810.09. Revised the delayed effective date from 1 year to 36 months.

NR 810.09(1)(c). Added a note referring to Department of Commerce plan approval.

NR 810.09(2)(b). Corrected the reference to read s. NR809.74(2).

NR 810.14. Revised to allow for an alternate schedule for draining tanks for inspection with department approval.

NR 810.15. Revised to allow a utility to provide public education materials in lieu of inspections of low hazard portions of residential buildings.

NR 810.15. Revised to allow commercial properties of similar risk to residential properties to be inspected at the same frequency as residential buildings.

NR 810.17. Modified to clarify use of the term "service".

NR 810.19. Deleted the last sentence.

NR 810.26(6). Modified to include references to required monitoring plans.

NR 811.06. Revised to reflect "Unprotected cross-connections are prohibited"

NR 811.25(8). Modified to include references to the Department of Commerce plumbing requirements.

NR 811.39(2)(c). Revised to take into consideration feed tube diameter.

NR 811.42(5). Revised to reflect correct reference of s. NR 809.74(2).

NR 811.66(1)(b). Revised to link the corrective action requirement to documented problems.

NR 811.70(10). Revised to increase "C value" for ductile iron pipe to 140.

NR 811.71(8). Modified by deleting the word "dedicated".

NR 811.73(3)(c). Revised to allow the use of properly restrained ductile iron pipe.

Appearances at the Public Hearings

10/14/09

Keith Haas, General Manager, Racine Water utility
Robert Kaplan, Inspector, Racine Water Utility
Eric Kiefer, Plant Manager, North Shore Water Commission
Paul Haugen, Water Foreman, Fox Point Water
Jim Wojcehowicz, Water Superintendent, Wauwatosa Water Utility

10/21/09

Lisa Roskom, Green Bay, WDATCP-DFS Lab Evaluation Officer
Russ Hardwick, Green Bay Water Utility
Nilaksh Kothari, Manitowoc Public Utilities

10/22/09

Jon Standridge, Madison
Theresa Peters, Madison Water Utility Cross Connection Inspector
Mark Mayes, Madison – student UW Madison Nelson institute and CHANGE-IGERT Program at the Center for Sustainability and the Global Environment (SAGE).
Edwin Ganser, City of Beloit
Steve Plachinski, Madison

10/27/09

Mike Stoffel, Eau Claire, Ayres Associates, Inc
Casey Werner, Eau Claire, Ayres Associates, Inc

10/28/10

Susan Wojtkiewicz, Rice Lake

Changes to Rule Analysis and Fiscal Estimate

See previous section and section on Legislative Council comments below.
No changes to Fiscal Estimate.

Response to Legislative Council Rules Clearinghouse Report

All of the Clearinghouse comments were incorporated except for the following:

2. Form, Style and Placement in Administrative Code

k. In s. NR 809.115 (1)(b), and in other places in the rule, the phrase "herein called the sampling point" is used. The term "sampling point" should be defined in s. NR 809.04.

Response: "Sampling point" has been removed from ch. NR 809 and replaced by references to specific sampling locations.

dd. The rule makes excessive use of acronyms, generally without sufficient definition. Note that using a term in the text of a rule and following it with a parenthetical indication of the acronym for the term does not constitute a definition of the acronym. In some subchapters, an appendix listing acronyms is provided, which is helpful but, too, does not constitute definition of the terms.

Response: The acronyms are used as shorthand. Terms are defined as necessary. The appendix listing acronyms is a requirement of EPA and is not meant to define terms.

ee. Test methods and other technical procedures referenced in the rule must be incorporated into the rule by reference, with the permission of the Attorney General. [See s. 2.08, Manual]. Each reference to the method should include information on how and where to find documentation on the method, or a cross-reference to this information. For one model of how to do this, see ch. NR 484.

Response: The reference in the rule to methods approved by the EPA under Appendix A to Subpart C of Part 141--Alternative Testing Methods Approved for Analyses Under the Safe Drinking Water Act has been removed. The department will follow the ch. NR 484 model in the future.

kkk. In s. NR 811.35 (4) (c), the first occurrence of the term "per" should be replaced by the word "under". The second occurrence of the term should be replaced by the phrase "as required under."

Response: The first change was made. In the second occurrence, the word "per" was replaced with the phrase "as allowed under" because metal pipe is normally required by the department when the piping is exposed inside buildings but PVC pipe is sometimes "allowed" if the situation meets the requirements of s. NR 811.28 (5) (b).

4. Adequacy of References to Related Statutes, Rules and Forms

f. In s. NR 811.25 (3) note, it would be helpful if the rule provided specific citations to state codes that may apply. This problem also occurs in subs. (4) and (5).

Response: The references to other codes were removed from s. NR 811.25 (3) and (4). The reference in s. NR 811.25 (5) was changed from "applicable local and state codes" to "applicable building codes". A similar note was also removed from s. NR 811.49 (1) (d) 14.

h. The department should review the entire rule to ensure that references to requirements in other rules, statutes, or technical standards are specific as possible. Examples of vague references in the rule include the references to the following:

(5) Storage structure construction requirements including applicable portions of ch. Comm. 32 and safety requirements in federal OSHA codes in s. NR 811.64 (11) (e).

Response: This was reviewed. Many sections of ch. Comm. 32 could apply so the reference in ch. NR 811 was left as is.

(6) Pipes, joints, fittings, valves, and fire hydrants manufactured in conformity with the latest standards issued by the AWWA in s. NR 811.69 (2).

Response: This was reviewed. Due to the voluminous number of AWWA standard

numbers that would have to be inserted into ch. NR 811, the ch. NR 811 language was left as is.

(9) Installation of mains in accordance with AWWA standards in s. NR 811.73 (1).

Response: This was reviewed. Due to the voluminous number of AWWA standard numbers that would have to be inserted into ch. NR 811, the ch. NR 811 language was left as is.

(10) Testing of installed water mains to meet at a minimum the applicable pressure and leakage testing requirements as specified in s. NR 811.73 (3) (b).

Response: This was reviewed. Due to the voluminous number of AWWA standard numbers that would have to be inserted into ch. NR 811, the ch. NR 811 language was left as is.

(11) Monitoring well construction requirements in ch. NR 141, as specified in s. NR 811.89 (3).

Response: This was reviewed. Due to the voluminous number of applicable ch. NR 141 code sections that would have to be inserted into ch. NR 811, the ch. NR 811 language was left as is.

5. Clarity, Grammar, Punctuation and Use of Plain Language

I. In s. NR 809.566 (3) (b) 1. what constitutes an "acute" violation?

Response: This is language required by EPA. What constitutes an acute violation is explained in the sentence. The standard definition of acute as an adjective also explains that this is a critical violation that may have a severe health risk. By comparison, s. NR 809.566(3)(b)2 contains a corresponding explanation of a non-acute violation.

o. The table following s. NR 809.70 (1) lacks a standard for methylene-blue active substances. If this is intended as a heading, rather than a table entry, this needs to be made clear and headings for the other substances in the table should be provided.

Response: The term "methylene-blue active substances" has been removed from the table, since in the federal rule there is no reference to this type of foaming agent. The table headings have been clarified.

r. In s. NR 810.02 (7), the definition of "community water system" makes a distinction between a public water system that "serves" and one that "regularly serves." If there is a difference in meaning between these two terms, the department should clarify this in the rule. In sub. (33) 20(intro), the meaning of "regularly serves" is also unclear. In sub. (33) (a), "Include" should be changed to "Includes."

Response: The wording of the definition is the exact federal wording from US EPA. Changing it would create a difference between state and federal language and could cause primacy issues and confusion.

x. In s. NR 810.16 (1), "currently used" should be deleted and replaced with "in use as of the effective date of the section [LRB inserts date]." A similar problem also occurs in s. NR 811.12 (15) (a).

Response: The term "currently used" has been replaced with "routinely used." The requirement needs to apply to all wells, including those that are currently used and may become inactive at some time after the effective date of the rule. In s. NR 811.12 (15)(a) the term "currently used" has been replaced with, "in effect at the time of well construction." Similar wording changes were made in ss. NR 811.64 (1) (b), (15) (b) and (17) (a), and NR 811.73 (1) and (2) (c) and (d). The effective dates of AWWA standards routinely change over time as the standards are revised and updated.

y. In s. NR 810.21 (intro.), the term "water treatment plant" is used but is not defined. This term should be defined in the rule.

Response: The last sentence of the introduction preceding the requirements of the section reads "Unattended plants treating for acute contaminants shall be provided with:" which in itself defines water treatment plant for this section. Any further definition would be redundant.

z. In s. NR 810.22 (intro.), the meaning of the phrases "routinely used" and "normally unused" are unclear and should be clarified if possible.

Response: It is very difficult to provide any more clarity to these terms as individual cases can be somewhat variable. The ch. NR 810 workgroup concurred with the wording.

jj. In s. NR 810.45 (1) (d), it is not clear why "1x" is included in the formula. It seems that multiplying the other two items by one will have no effect.

Response: The formula is federal language from US EPA and is denoted in scientific notation and is consistent with other formulas.

qq. In s. NR 811.09 (1) (b) 2. , is it possible to clarify what significant drawdown means? In sub. (3), the material in the note appears to be substantive and should be moved to the text of the rule.

Response: Significant drawdown is determined on a case-by-case basis. Therefore, it is not possible to clarify it further in the code. In s. NR 811.09(3) the note on energy efficiency and any analysis thereof are not meant to be regulated in ch. NR 811 and therefore it is appropriate to keep it as a recommendation in the note.

tt. The department should review the entire rule to ensure that all abbreviations are defined. Examples of abbreviations that are not defined include:

(1) "SCADA" in s. NR 811.39 (4) (e).

Response: A definition for SCADA was inserted into s. NR 811.02.

(2) "TFE" in s. NR 811.48 (5) (g).

Response: Use of the term TFE was deleted.

(3) "NTUs" in s. NR 811.49(1) (j) 5 and (2) (a).

Response: A definition for Nephelometric turbidity units or NTUs was inserted into s. NR 811.02.

(4) "SPADNS" in s. NR 811.51 (7).

Response: Use of the term SPADNS was deleted.

uu. The department should review the following undefined terms and, as appropriate, define them to improve the clarity and ensure the consistent application of the rule:

(1) "Jar testing" in s. NR 811.47 (7) (b) 1.

Response: It is unnecessary to define jar testing as the term is well-known in the regulated community.

vv. The department should review the following ambiguous or unclear phrases and modify them, as appropriate, to improve the clarity and ensure consistent application of the rule:

(3) "...resistant to the aggressiveness of the water and dissolved gasses" in s. NR 811.45 (1) (f) and (2) (f).

Response: The intent and meaning of the existing language is adequate.

(4) "Generators shall be sized to have sufficient reserve capacity so that the system does not operate at peak capacity for extended periods of time" in s. NR 811.54 (3). What is an extended period of time in this context?

Response: The intent and meaning of the existing language is adequate. Also, the language is identical to the language in the Ten States Standards. Ten States Standards are recommended standards for water works construction set by a group of ten states, including Wisconsin, along with the province of Ontario. The group meets once a year and periodically revises and updates the standards. Some states use the standards in their entirety as their administrative code. Chapter NR 811 is in part based upon the standards.

Final Regulatory Flexibility Analysis:

Typically, the Department has little flexibility with drinking water regulations since state rules can be no less stringent than the federal regulation. Flexibility in the rule will be used to reduce monitoring costs and complexity wherever possible. These rules should not have a significant impact on small business since the water systems operated by small businesses such as taverns and restaurants are already subject to the inspection and deficiency correction requirements included in the rule modifications. Therefore, under s. 227.19(3m), Stats., a final regulatory analysis is not required.



PWS_ID	PWS_NAME	POPULATION
11100980	FALL RIVER WATERWORKS	1,363
11100991	FRIESLAND WATERWORKS	311
11302203	DANE WATERWORKS	954
12200474	STITZER SANITARY DIST 1	150
12200859	BLOOMINGTON WATERWORKS	682
12201057	MARYVILLE SD 2	100
12500818	HOLLANDALE WATERWORKS	283
12500840	MINERAL POINT WATERWORKS	2,706
15300615	LONE ROCK WATERWORKS	895
15700971	BLUFFVIEW SANITARY DISTRICT	450
15701092	SPRING GREEN WATERWORKS	1,552
25201814	NORTH CAPE SAN DIST	170
25202023	WATERFORD WATERWORKS	4,848
26501464	TROY SANITARY DISTRICT 1	170
26501563	EAST TROY S D 3	40
26701125	KEWASKUM WATERWORKS	4,209
26801984	EAGLE WATERWORKS	1,728
43604330	ST NAZIANZ WATERWORKS	750
60301252	BARRON LIGHT & WATER DEPT	3,307
60301274	CAMERON WATERWORKS	1,683
60301296	CHETEK WATERWORKS	1,931
60301329	CUMBERLAND WATERWORKS	2,311
60301351	DALLAS WATERWORKS	365
60301384	RICE LAKE WATERWORKS	8,300
60904613	NEW AUBURN WATERWORKS	570
60908496	LAKE HALLIE WATERWORKS, VILLAGE OF	3,500
61702619	COLFAX WATERWORKS	1,155
61702740	WHEELER WATERWORKS ASSOC	317
61802961	FALL CREEK WATERWORKS	1,322
64802397	ELLSWORTH WATERWORKS	2,844
64802430	PRESCOTT WATERWORKS	4,046
64903300	BALSAM LAKE WATERWORKS	1,031
64903355	CLEAR LAKE WATERWORKS	1,061
64903366	DRESSER WATERWORKS	875
64903377	FREDERIC WATERWORKS	1,241
64903388	LUCK WATERWORKS	1,280
64903399	MILLTOWN WATERWORKS	915
64903421	AMANI VILLAGE SANITARY DIST	100
65601195	BALDWIN WATERWORKS	3,301
65601217	HAMMOND WATERWORKS	1,614
65601349	ROBERTS WATERWORKS	1,323
65601371	SOMERSET WATERWORKS	1,736
65601382	WOODVILLE WATERWORKS	1,318
65601415	STAR PRAIRIE WATERWORKS	644
70101075	ADAMS WATERWORKS	1,847
70101108	FRIENDSHIP WATERWORKS	781
72101073	CRANDON WATERWORKS	1,958
72101106	WABENO SANITARY DIST 1	750
73401185	WHITE LAKE WATERWORKS	351
73501274	TOMAHAWK WATERWORKS	3,770
74401162	LAKELAND SANITARY DIST 1	2,381

74401294 THREE LAKES SANITARY DISTRICT	600
80400947 PORT WING WATERWORKS	400
80401266 BAYFIELD WATERWORKS	627
80401299 DRUMMOND SANITARY DISTRICT	250
80401310 IRON RIVER SANITARY DISTRICT	600
80401321 WASHBURN WATERWORKS	2,280
80703117 SIREN WATERWORKS	988
80703128 WEBSTER WATERWORKS	685
85501273 BRUCE WATERWORKS	766
85501317 LADYSMITH WATERWORKS	3,618
85502780 SHELDON WATER UTILITY	260
85504540 GLEN FLORA WATERWORKS	92
85504595 TONY WATERWORKS	105
85805027 STONE LAKE SANITARY DISTRICT	175
85805335 RADISSON WATERWORKS	224
85810153 EXELAND WATERWORKS	260
86103468 WESTBORO SAN DIST 1	150
86603022 BIRCHWOOD WATERWORKS	562
86603044 SHELL LAKE WATERWORKS	1,368

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Revised: 12/05/2012



Chlorination Assessment

**Municipal Water System
Cumberland, Wisconsin**



Prepared for:

**City of Cumberland,
Wisconsin**

June 2010

Chlorination Assessment

**Municipal Water System
Cumberland, Wisconsin**



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Introduction

Cumberland Municipal Utilities retained Ayres Associates to perform an assessment of the work that would need to be completed at each well station to comply with proposed changes to NR811. This assessment will address existing deficiencies with each well station, capital costs of installation of chemical feed equipment, and operation and maintenance costs related to chemical feed.

The Wisconsin Department of Natural Resources has proposed changes to NR811 which will require that that "all municipal water systems shall provide continuous disinfection of the water prior to entry to the distribution system". Communities will have 36 months after the new code goes into effect to comply with this requirement. The City of Cumberland does not currently continually chlorinate, but rather has standby chemical feed equipment available in case of an emergency.

Types of Chlorination

Gas Chlorination

General Overview

In a gas chlorination system, chlorine gas is delivered to the municipality in 150 pound cylinders. These cylinders are placed on a scale to determine the amount of chemical to be utilized. Water is taken from the well discharge, injected with chlorine gas, and then returned to the well discharge piping as solution water. This solution water then mixes with the raw water in the pipe to attain chlorine residual. A rotameter, or flow meter for gases, is used to measure the amount of chlorine gas entering the chlorine feed line at any given time. This system also requires a booster pump to increase the pressure of the solution line to be able to inject it back into the raw water line.

Code Requirements

The following proposed NR811 code sections specifically apply to the injection of gas chlorine. Additional code sections exist that govern the installation, but either will not significantly change the costs between types of chlorination or will not pose design concerns for the City of Cumberland:

- NR811.39 (4) (b) - "The operation of the chemical feed pumps shall be interlocked with the operation of the appropriate well or service pump. Any controlled electrical outlet used for any chemical feed pump shall be clearly marked."
- NR811.39 (6) (a, d) - "Weighing scales shall meet the following requirements: Be provided with weighing cylinders at all plants utilizing chlorine gas. Be accurate enough to measure increments of 0.5% of load."
- NR811.39 (7) (e) - "Feed lines shall meet the following requirements: not carry chlorine gas under pressure beyond the chlorine feeder room."
- NR811.40 (2)(c1)- "The following equipment shall be provided for each installation where chemicals are handled: Where the eyes and body of any person may be exposed to

injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided as required in s. Comm. 32.15"

- NR811.48 (1) (b) - "The chlorinator capacity shall be such that a free chlorine residual of at least 2 mg/L can be attained in the water after a contact time of at least 30 minutes when maximum flow rates coincide with anticipated maximum chlorine demands....Solution-feed-gas-type chlorination chemical feed equipment shall be designed to operate between 30% and 70% of the rotameter capacity. This may require that 2 rotameters be provided, one for normal feed rates and one for emergency feed rates."
- NR811.48 (5)(a-h)- "Chlorine gas feed and storage installations shall meet the following requirements: chlorine gas feed and storage installations shall be separated from other operating areas by gas-tight rooms or enclosures in order to prevent injury to personnel and damage to equipment. Chlorine gas rooms shall be provided with a safety glass inspection window installed in an interior wall or exterior door to permit viewing of the interior of the room and equipment. Chlorine gas rooms shall be provided with a minimum of one door having emergency or panic hardware opening outward to the building exterior. Rooms may have additional doors to the building exterior. Chlorine gas rooms shall be heated to prevent freezing and insure proper operation of the equipment. Chlorine gas feeders shall be provided with restraints to prevent movement of the cylinders. Full and empty cylinders of chlorine gas shall be isolated from operating areas, restrained in position to prevent movement of the cylinders, stored in rooms separate from ammonia storage, stored in areas not in direct sunlight or exposed to excessive heat. Pressurized chlorine feed lines may not carry chlorine gas beyond the chlorine room. Vacuum chlorine feed lines may carry gas beyond the chlorine room if the chlorine lines are either schedule 40 polyethylene tubing or schedule 80 PVC pipe. Polyethylene tubing shall be enclosed in a protective conduit running from the chlorine room to a point near the ejector. The end of the conduit in the chlorine room shall be sealed. Polyethylene tubing connections shall be made using tube adaptors especially designed for this purpose. PVC pipe joints may be socket welded using PVC cement or threaded using polytetrafluoroethylene pipe joint tape. Pre-manufactured chlorine cabinets may be used for retrofit situations only. These cabinets shall have an observation window, fan, air intake, and light as (required above) for normal chlorine gas rooms. It is recommended that these cabinets not be placed in the sunny side of the building.
- NR811.48 (6) (a-f) - "Ventilation for chlorine gas rooms shall meet the following requirements: one complete air change per minute shall be provided when the room is occupied. The exhaust fan suction shall be near the floor as far as practical from the door and air inlet, with the point of discharge located to avoid contamination of the air inlets to other rooms and structures, and to avoid being blocked by snow or other obstructions. Air inlets shall be located near the ceiling and controlled to prevent adverse temperature variations. Louvers for the chlorine room air intake and exhaust shall be corrosion resistant and shall facilitate airtight closure. The exhaust fan switch shall be located outside the entrance to the chlorine room with a signal light indicating fan operation when the fan is controlled from more than one point. Outside switches shall be protected from vandalism. As an alternative, the fan may be controlled by an automatic door switch with manual shut-off. Vent lines from feeders and storage shall discharge to the outside atmosphere, above grade, in a downward direction, be

screened, and be located as required (above). In addition, vent lines shall conform with the manufacturer's installation recommendations. "

- NR811.48 (7) (a-c) - "The following safety equipment shall be provided when chlorine gas is used: Respiratory protection equipment, known as gas masks, meeting the requirements of the National Institute for Occupational Safety and Health (NIOSH) shall be available when chlorine gas is handled, and shall be stored at a convenient heated location but not inside any room where chlorine is used or stored. The gas masks shall be compressed air, have at least 30 minute capacity, and be compatible with or exactly the same as the gas masks used by the fire department responsible for the plant. The gas masks shall be available at all installations where chlorine gas is handled and shall be placed outside every room where chlorine gas is used or stored. At installations utilizing 100 or 150 pound cylinders, an agreement with the local fire department which has an approved type of gas mask for the fire department to handle water system chlorine gas leaks may be approved by the Department. Instructions for using, testing, and replacing gas mask part shall be posted. Other protective clothing shall be provided as necessary. A bottle of concentrated ammonium hydroxide, 56 percent ammonia solution, shall be provided for chlorine leak detection. If pressurized chlorine gas is present, continuous chlorine leak detection equipment shall be installed and equipped with both an audible alarm and a warning light. Automatic emergency chlorine cylinder shutdown valves shall also be provided."

Sodium Hypochlorite Chlorination

General Overview

In a sodium hypochlorite system, sodium hypochlorite is delivered to the municipality in tanks or bulk. The municipality will have a tank located on a scale, called the day tank. This tank is used for daily chlorine usage. A separate storage tank will also be available to ensure adequate capacity for 30 days usage. A small dosage pump pumps sodium hypochlorite solution from the day tank into the discharge piping. When the day tank comes low, additional sodium hypochlorite is pumped from the storage tank into the day tank using a transfer pump.

Code Requirements

The following proposed NR811 code sections specifically apply to the use of sodium hypochlorite. Additional code sections exist that govern the installation, but either will not significantly differ the costs between types of chlorination or will not pose design concerns for the City of Cumberland.

- NR811.39 (3) (c-d) - "Chemical feed equipment shall meet the following requirements: Be located and have protective containment curbs so that chemicals from equipment failure, spillage, or accidental drainage may not enter the water in conduits, treatment, or storage basins. Be located within a containment basin capable of receiving accidental spills, drainage, or overflows without an uncontrolled discharge outside of the containment basin. A common containment basin may be provided for each group of compatible chemicals. At a minimum, the containment basin shall be sized to contain the volume of the largest tank that could fail. Chemical containment basins shall not be provided with floor drains. Trapped and vented floor drains discharging to sanitary sewers, holding tanks, or the ground surface in accordance with s. NR811.25 (1) (h) may be installed for chemical rooms outside of containment basins. Chemical feed pumps

shall be located within the containment basin. Piping shall be designed to minimize or contain chemical spills in the event of pipe ruptures.”

- NR811.39 (4) (b) - “The operation of the chemical feed pumps shall be interlocked with the operation of the appropriate well or service pump. Any controlled electrical outlet used for any chemical feed pump shall be clearly marked.”
- NR811.39 (6) (b, d) - “Weighing scales shall meet the following requirements: be required for other solution feed unless comparable means for determining usage is approved by the department. Be accurate enough to measure increments of 0.5% of load.”
- NR811.40 (1) (d) - “Solution storage or day tanks supplying feeders directly shall have a maximum capacity such that daily chemical solution usage is a minimum of 5% of the tank capacity. The department may approve chemical container storage volumes that will allow daily chemical solution usage less than 5% of the tank capacity if supporting information is provided to the department and the chemical storage container is placed on a scale or other department approved method is installed, to accurately determine daily chemical usage. Graduated lines shall not be used to determine daily chemical usage in cases where the daily use is less than 5% of the tank capacity. In any case, the maximum storage volume shall not exceed 45 days for sodium hypochlorite and 60 days for all other chemicals.
- NR811.40 (1) (g) - “Means shall be provided to accurately determine the amount of chemical applied either by measurement of the solution level in the tank or by weighing scales. Graduation lines shall be in increments of approximately 2%-3% of tank capacity...”
- NR811.40 (1) (i) - “Adequate means of draining tanks shall be provided, but there may be not direct connection between any drain piping and a sanitary sewer. Chemicals shall not be discharged directly to a storm sewer. Drain piping shall terminate at least 2 pipe diameters, but not less than 3 inches, above the overflow rim of a receiving pump, conduit, or waste receptacle.
- NR811.40 (2)(c1) - “The following equipment shall be provided for each installation where chemicals are handled: Where the eyes and body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided as required in s. Comm. 32.15”

Tablet Chlorination

General Overview

In a tablet chlorination system, tablets of calcium hypochlorite are placed in contact with water to create a solution. This is accomplished in a chlorinator. Tablets are stored above the water level and dropped on an as-needed basis so that the bottom of the in-use tablets are located in the water. Water is taken from the well discharge piping, piped through the chlorinator, and then pumped back into the well discharge piping using a chemical feed pump. Extra tablets are stored in the pails that they are delivered in.

Code Requirements

The following proposed NR811 code sections specifically apply to the use of tablet chlorinators. Additional code sections exist that govern the installation, but either will not significantly differ the costs between types of chlorination or will not pose design concerns for the City of Cumberland.

- NR811.39 (4) (b) - "The operation of the chemical feed pumps shall be interlocked with the operation of the appropriate well or service pump. Any controlled electrical outlet used for any chemical feed pump shall be clearly marked."
- NR811.48 (9) (a-f)- "Calcium hypochlorite tablet chlorinators shall meet the following design requirements: The calcium hypochlorite solution shall be produced by dissolving tablets with a department approved feed water source using an erosion chamber or an upward directed spray system... The calcium hypochlorite tablets used in the chlorinator shall be supplied by the manufacturer of the tablet chlorinator equipment. The supplier of the calcium hypochlorite shall have obtained NSF/ANSI Standard 60 certification for the tablets in accordance with NR810.09. The tablet hopper shall be sized to provide a minimum of two days of supply assuming average day consumption of the tablets. Load cells shall be provided on the hopper so that the weight of the tablets consumed in a 24 hour period can be determined. The design shall allow for collection of the data necessary to determine the theoretical daily chlorine usage. The design shall allow any solution to be drained out of the hopper before weighing the tablets. The load cell equipment shall be capable of providing an alarm when the weight of the tablets approaches a one day supply based upon an average day use. The alarm signal shall be automatically annunciated by the water system controls. A local alarm shall be sounded or signaled by an exterior red light at the pump station if the operation of the pump station is not remotely controlled. The tablet hopper shall include a screened air-vacuum relief device if the possibility of a vacuum condition could develop during the operation of the tablet chlorinator. The open area for any pipe penetration through the walls of the solution tank shall be sealed sanitarly so that insects and foreign material cannot contaminate the chlorine solution. This on and off operation of the process to produce chlorine solution from the tablets shall be controlled by float switches or sensors located in the solution tank. Float switches or sensors shall be installed and wired to provide automatic shut-off and operator alarms for low and high solution level conditions. The shut-off and alarm signals shall be automatically annunciated by the water system controls. A local alarm shall be sounded or signaled by an exterior red light at the pump station if the operation of the pump station is not remotely controlled. The tank shall be capable of being drained for maintenance purposes. The solution tank shall be sized to keep an adequate supply of calcium hypochlorite in the tank at all times based upon the capabilities of the tablet chlorinator to produce solution and the chemical feed pump withdrawal rates necessary to achieve the required dosages. The flow rate and pressure of the feed water piping shall be regulated so as to meet the design flow requirements provided by the supplier of the equipment. A shutoff valve, flow meter, and pressure gauge shall be installed on the feed water piping. Pre-treatment devices shall be installed as necessary if the feed water does not meet the water quality requirements for the designated tablet chlorinator. Any pre-treatment device shall be compatible for use in a potable water system and shall not be used unless approved by the department. A strainer-filter shall be installed on the feed water piping, if necessary. A check valve shall be installed on the feed water piping upstream of any treatment equipment, control valve, or solenoid valve. A solenoid valve shall be installed on the feed water piping to

control the flow of water into the tablet chlorinator. The operation of the solenoid valve shall be controlled based upon float switches or sensors located in the solution tank. Erosion type tablet chlorinators shall be provided with a control valve capable of regulating the flow of water through the erosion cell... The chemical feed pump shall be wired to operate in association with the well or service pump in compliance with s. NR811.39 (4). A tablet chlorinator producing calcium hypochlorite solution shall use a chemical feed pump installed in compliance with s. NR811.39 (2) or a centrifugal pump. Centrifugal pumps shall be sized to match or exceed the maximum head conditions at the point of injection”

Recommended Alternative

After discussions with the Cumberland Municipal Utilities staff, it was determined that the best, most feasible type of chlorination for the City to utilize would be sodium hypochlorite. This was based on the fact that a chlorine gas system would require a separate room and additional HVAC requirements, thus increasing the cost. Gas also possesses additional health concerns that the other two treatment alternatives do not pose. Sodium hypochlorite could be splashed on the operator during transfers. However, sodium hypochlorite chlorination requires the least amount of equipment of any of the treatment options. If equipment were to break, a single component of the system can be replaced, thus minimizing operation and maintenance costs. Tablet chlorinators, on the other hand, do not pose a splash hazard but require additional piping and equipment associated with the use of feed water.

Water System Characteristics

Water System Composition

The City of Cumberland’s municipal water supply system is composed of four municipal wells and one water tower. In 2009, the wells pumped approximately 179,500,000 gallons of water. The average daily pumping during winter (November through May) was 255,800 gallons while during summer (June through October) was 984,400 gallons. This fluctuation is not only caused by season fluctuations in water usage, but the majority of the increased water usage is from Seneca Foods Corporation which has a green bean canning factory within the City.

Water Quality

When chemical treatment of a water source is proposed, the water quality must be examined to determine any potential impacts. The water quality at each of Cumberland’s well stations is shown below.