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Division of Environmental Health
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Important Information

For Water and Wastewater System Operators and Owners

Northern Flows

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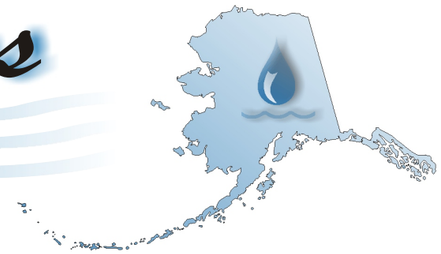


Alaska's Drinking Water and Wastewater Program Newsletter
Issue 16 • Winter 2003

Message from the Manager

Our fall, consisting of unseasonably mild temperatures and localized rains lasted until mid November. Now we have plenty of snow on the ground, the temperatures have dropped in many places to below zero, way below zero in some places, and we are getting prepared for our final rush into the year end holidays. Not Quite!

It is time to rest, and celebrate your accomplishments for another year of making it happen and work according to plan, and for providing safe drinking water to your customers. It is also time for you to make sure you have completed your year end monitoring and for getting reporting requirements for your system caught up.

From mid July 2003 until mid November 2003, the Alaska Department of Environmental Conservation (ADEC), Drinking Water and Wastewater (DW/WW) Program, has had two sets of proposed revisions to the Drinking Water Regulations, 18 AAC 80, out for public comment. The first package of proposed regulation revisions, DW- 2003-1, contained some fee increases and new fees, a new Variance and Exemption section, enhancements to the sanitary survey and sanitary survey inspector section, increased operation, monitoring, and reporting requirements for Class C PWS owners, and minor clarifications to some definitions. The comment period for this package of regulations (DW- 2003-1) was extended from August 12, 2003, until September 16, 2003. The ADEC DW/WW Program received approximately 60 written comments from the public for this proposed regulation package. Staff currently are preparing a responsiveness summary to comments received for this proposed regulation package.

The comment period for the second set of proposed revisions to the Drinking Water Regulations, 18 AAC 80, closed on November 19, 2003. This regulation package (DW- 2003-2) repealed *Article 5. Lead and Copper Requirements* in the current regulations and adopted the original federal Lead and Copper Rule and the Lead and Copper Rule Minor Revisions by reference. Two written public comments were received in response to the proposed adoption of the Lead and Copper Rule Minor Revisions and the Lead and Copper Rule. The state plans to have these rules adopted by mid January 2004. The State of Alaska is required by U.S. EPA, as a primacy condition, to have the Lead and Copper Rule Minor Revisions adopted by January 12, 2004.

Our regulation development process continues. The next proposed regulation revision package for the Drinking Water Regulations, 18 AAC 80, is being planned for release in late December 2003, or mid January 2004. This regulation package will have a 30 day public comment period and will contain the adoption by reference of the Radionuclides Rule and Public Notification Rule and will also include an update of the Analytical Methods section of the regulations. The State of Alaska is required by U.S. EPA to have the Public Notification Rule adopted by May 6, 2004, and the Radionuclides Rule adopted by December 8, 2004.

Public water system security has been an important issue nationwide for the past two years. In Alaska, statewide public water system security training workshops are planned for the first 6 months of calendar year 2004. Check inside this newsletter for additional information about these workshops, as well as, the planned dates and locations. Be proactive and register for a workshop!

One of the consistent themes you hear and read about, with State Government, is "change". One of the most truthful statements someone can make about anything, at anytime, is "that everything changes over time,

continued on page 5

This Issue

Public Water System Security *by Kathy Kastens*

Public Water System (PWS) owners and operators across the country are working hard to protect our nation's drinking water supplies. Safe and secure drinking water is one of our highest public health priorities. PWS owners and operators are looking at their systems' vulnerabilities to man-made and natural disasters and their ability to take action to maintain and improve security along with creating or updating an emergency response plan (ERP) for their system. The Drinking Water and Wastewater (DW/WW) Program staff are working with you, the owners and operators of the public water systems here in Alaska, in this effort.

The DW/WW Program has contracted with NANA Training Systems to conduct a 2-day workshop for PWS owners and operators on conducting a vulnerability assessment (VA) and preparing an ERP for their system. This training will also help with how to set up a network of first responders to an emergency, and how to conduct emergency drills for your water system. An invitation has also gone out to first responders to join us at this training to help in setting up your systems network. The classroom training will take place in 10 different locations throughout the state over the next 4 months. See the insert in this issue of *Northern Flows* for information and a registration form.

We are also working with the Alaska Rural Water Association (ARWA) to modify the current National Rural Water Association interactive CD for Alaskan utilities. The CD walks the user through the process of creating a VA and an ERP. The CD will be available to help PWS owners and operators develop their VA and ERP very soon and will be used during the statewide training. The ARWA is also making on-site assistance available to your community. They can assist you in fine tuning your emergency response plans and even practice them. Once you have familiarized yourself with this process give Brad Ault with ARWA a call at (907) 694-6792.

Another possibility the DW/WW Program will be looking at is establishing a communications system that can contact all of the PWSs rapidly by either fax, e-mail or telephone. To do this we need your help in getting correct contact information for your system. We recently sent out a letter and a PWS FACT sheet for you to review and update. We have hired a temporary administrative staff member to update this information in our PWS database. Her name is Angel Waalkes and she can be contacted at (907) 269-7630. Please send Angel your systems contact information updates, her fax number is (907) 269-7655.

Knowing that each PWS is unique but share basic similarities and needs, we recently asked if you have ideas that you believe would assist other PWS owners and operators. One of the best reminders we've received so far is:

- If someone wants to come on to your property ask them to let you know ahead of time, in writing if possible, to make sure your letting a real company on to your premises. This also lets you know who to expect and when. This might not be possible all the time but it is a good idea to practice whenever possible.

- When they get to your system ask for identification. Is this the same individual mentioned in the letter? Do they have company identification with a picture? You need to know if they really do work for the company. Be proactive, and check it out.

If anyone has more ideas or suggestions, send them to me, we will post them on our website and add them to the next issue of *Northern Flows* for all to share. Thanks for your help!! And we wish you a safe and happy holiday season!~

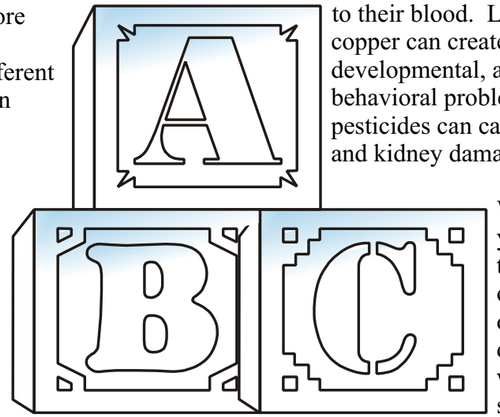
Question: A sanitary survey inspector approved by the department is required by the Alaska Drinking Water Regulations, 18 AAC 80, to submit his sanitary survey report to the Department and the PWS owner within _____ days after the sanitary survey is complete.

A) 10
B) 45
C) 30
D) Whenever

(Answer on Page 7)

Children and Drinking Water *by Heather Newman*

Children are more susceptible to drinking water contaminants than adults. Their immune systems are not fully developed yet, they are still growing, and in relation to their size they drink more water than adults. Children have different nutrient needs than adults and their metabolic and gastrointestinal systems are working and developing to meet those needs. Absorption rates are higher in children and their ability to get rid of toxins is typically not as good as adults. All of these factors mean that children drinking contaminated water may be impacted by harmful contaminants more than adults would be. What contaminants in drinking water could adversely affect children and what can you do to help?



Contaminants that can be harmful to children include bacteria and viruses, nitrates, lead and copper, and pesticides. These could all potentially be found in drinking water. Bacteria and viruses can cause illnesses including diarrhea and upset stomachs. Nitrates can create a situation where it is hard for children to get the required oxygen to their blood. Lead and copper can create learning, developmental, and behavioral problems; and pesticides can cause liver and kidney damage.

What can you do as the owner or operator of a drinking water system? First, make sure you are current on all of your drinking water system sampling requirements. This will ensure that you know the quality of the drinking water your consumers are drinking. Second, complete your Consumer Confidence Report (CCR) annually, if required, and distribute the CCR to your consumers to make sure you have made an effort to inform them of the quality of their drinking water and the levels of any detected contaminants in the water. If there is a maximum contaminant level (MCL) exceedence, post any required public notice and public education information appropriately letting your consumers know the contaminant present, the health effects the contaminant may have, and what they can do to reduce their exposure to the contaminant.

In addition, you can help consumers know what to do to reduce their children's exposure to contaminants in their drinking water by making them aware of some simple treatment and mitigation techniques. For bacterial or microbial contamination, water can be boiled to help rid the water of the contaminant; however, boiling water will only increase the concentration of the other contaminants mentioned earlier. Lead and copper exposure can be lessened by flushing the water lines in the home prior to obtaining drinking water and using cold water. Nitrate levels can be reduced by finding an alternate drinking water source, such as bottled water, for young children. By being aware and keeping your consumers informed of the quality of their drinking water and of any contaminants detected in their drinking water, you can help keep our children safe and healthy.~

Special Notice to Sanitary Survey Inspectors!!

The DW/WW Program is now posting all Public Water Systems that are overdue in their sanitary survey AND is listing those systems that will need a survey within the next year on our website... Check it out!

PWS owners and operators, you may want to check it out too, to see if your system is listed!

Answer: C) 30 days - the inspector has 30 from the completion of the sanitary survey to submit the report to the Department of Environmental Conservation, Drinking Water and Wastewater Program and to the owner of the public water system.

Staff Profile - Environmental Specialist III- Juneau *by Cindy Christian*

Carrie McMullen is an Environmental Specialist III for the Mat-Su and Southeast Drinking Water and Wastewater Program area in the Juneau office. She is responsible for a wide range of activities, including compliance assistance and enforcement for all of the Class A Community and Non-transient non-community and Class B Transient non-community public water systems (PWS's) in the Prince William Sound and Southeast Alaska areas. Carrie helps to review all of the laboratory data received for those public water systems to check the accuracy of the data and to determine compliance with various rules. She works with system owners and operators to make sure that they remain in compliance and are serving safe drinking water to their communities. Carrie is very active in providing technical assistance to the public water systems in her area. She is the statewide technical expert on the Interim Enhanced Surface Water Treatment Rule and the Disinfectant/Disinfection By-Products Rule and provides assistance to PWS owners and operators as well as, to other DW/WW Program staff on the interpretation and implementation of these rules. Carrie also conducts sanitary survey inspections for public water systems, as well as, on-site septic system inspections throughout the entire Southeast Alaska and Prince William Sound areas.

Carrie graduated from the University of Idaho with a bachelor's degree in Natural Resource Ecology and Conservation in 1999. She came to Alaska in the summer of 1999 to work for the US Forest Service. She fell in love with the area and since she had some family in Juneau, she decided to make it her home. Prior to coming to the ADEC Drinking Water and Wastewater Program, Carrie worked as a tour operator for Grayline of Alaska and for the City of Juneau in the Engineering Department. Carrie came to work for the Drinking Water and Wastewater Program in April of 2001. She was interested in using her knowledge of environmental and conservation issues to assist public water systems in delivering safe drinking water to their customers. Over the past two years, Carrie has been dedicated to seeing that the public water systems in her area are delivering safe drinking water to their consumers. She really enjoys being able to have daily contact with the owners and operators of public water systems and building the relationships necessary for the consistent long-term protection of public health.

Carrie is actively involved in many activities outside of ADEC. She is currently serving as the Vice President for the Southeast Region of the Alaska Water and Wastewater Management Association and is very active on the Young Professionals Committee development for the association. Carrie and her partner, John, are both very active in the Juneau hockey league. Carrie plays defense on a women's league team. They also enjoy hunting and fishing throughout Southeast Alaska and reading when they have a few moments of spare time. Carrie is a very important member of the ADEC team, working to require the protection of public health by offering compliance and enforcement assistance to public water system owners and operators in the Mat-Su and Southeast areas of the state. ~

Coming Soon:
The Alaska Department of Environmental Conservation's website is in the process of being updated with a new look. Keep checking in to see whats new!

Resources Corner: Rural Community Assistance Corp. *by Jamie Stazel*

The Rural Community Assistance Corporation (RCAC) was founded 25 years ago, in Sacramento California, to help community-based organizations and governments in rural areas implement housing and community development programs. RCAC has grown to become a resource to rural areas in thirteen Western States in the U.S., including Alaska. RCAC is a part of the larger non-profit organization of Rural Community Assistance Programs (RCAPs). Program areas include affordable housing development, environmental infrastructure development, and community development and finance. Most of RCACs services are available to communities with populations under 50,000 persons.

With an annual operating budget of 14 million dollars and more than 54 million dollars in lending capital, RCAC is a major financial resource for communities in the rural Western United States. In 1996, the U.S. Treasury certified RCAC as a Community Development Financial Institution. Financing is available to nonprofit organizations and public entities for affordable housing, community facilities, and water and wastewater systems.

RCAC also provides a wide range of community development services that improve water, wastewater, and solid waste management through technical assistance. Other RCAC programs provide housing services.

With field offices in Anchorage and Fairbanks, RCAC assists rural public water systems achieve Safe Drinking Water Act (SDWA) compliance by writing Consumer Confidence Reports (CCRs) for water system owners, developing site sampling plans, emergency response plans, and helps public water system owners and operators obtain training.

Additionally, RCAC provides on-site technical assistance and helps locate funding for rural development projects. RCAC receives rural development grant money to provide technical assistance for rural development projects and they are able to tailor their services specifically for the unique needs of public water systems in Alaska.

Currently, RCAC is working with the Alaska Native Tribal Health Consortium (ANTHC) on regulatory compliance with water system operators in the communities of Grayling, Holy Cross, and Tuksook Bay. RCAC has also provided their assistance to a subdivision located in the Matanuska-Susitna Valley.

For further information about RCAC services in Alaska contact Roland Shanks, a Rural Development Specialist in Anchorage by phone: (907) 279-1126, fax: (907) 276-1130, or e-mail: rshanks@RCAC.org ~

Message from the Manager cont'd. *by James Weise*

and most often for the better." Well, the ADEC is scheduled for some restructure, "changes," and the DW/WW Program will be part of this restructure. First, the DW/WW Program's Mat-Su office will be taken out from under the umbrella of the South-central Program Area and will become part of the new Mat-Su and Southeast Program Area along with the Juneau office. The supervisor for this program area will be located in the Mat-Su, Wasilla office. As for the Department overall, to better prepare for, and help the ADEC manage risks across all the water-related programs and obtain primacy from U.S. EPA for the National Pollution Discharge Elimination System (NPDES) Program, the wastewater component of the DW/WW Program is planned to be transferred to a new "Water Division" that will include the current Division of Facility Construction Operation and the water components of the Division of Air and Water Quality. A management team from the respective Divisions at ADEC is reviewing this planned restructure and will finalize a reorganization plan and budget by February 1, 2004 for submittal to the Governor's Office and legislature. I will provide details of the ADEC reorganization as they occur in later issues of the *Northern Flows* newsletter.

Continue the good work and have a happy and fulfilling holiday season. ~

James Weise

James R. Weise

Manager
DW/WW Program

Disinfectant/Disinfection By Products Rule cont'd. *by Carrie McMullen*

MRDLs

Another effort to reduce disinfectant levels is the new Maximum Residual Disinfectant Levels (MRDLs) set forth in the Stage 1 D/DBPR. Currently, disinfecting systems are required to report the disinfection residual at the same time and place that each monthly coliform water sample is taken. The new Rule requires that the average of these distribution system residuals not exceed 4 mg/L (parts per million - ppm) during the year for chlorine and chloramines, and 0.8 mg/L (ppm) for chlorine dioxide. The public outcry from finished water with a chlorine residual greater than about 2 mg/L (ppm) is probably enough to keep any system from violating this portion of the rule! Keep in mind that unique situations, such a super chlorination for maintenance purposes or for cleaning a new line are exempt for the purposes of the MRDLs. It is also important to remember that currently, if a system fails to report the chlorine residual taken with the monthly coliform sample, a monitoring and reporting violation is accrued by the system. With the new MRDL, systems will accrue **two** monitoring violations if no residual reading is reported.

Optimizing Treatment

Conventional filtration plants (those that use coagulation, flocculation, sedimentation, and filtration) have to meet additional treatment techniques laid out in the Stage 1 D/DBPR. The intention of the treatment techniques is for systems to optimize the use of coagulants, polymers, and softening agents for removal of organics which will lead to decreased disinfection by-products, and not just turbidity. Many conventional plants in Alaska are already working at optimum or nearly optimum conditions, but some will be required to perform jar tests to determine optimum conditions and reach that level. The basic idea of the treatment technique requirements is for the treatment plant to remove a certain percentage of organics, in the form of Total Organic Carbon (TOC), based on raw water TOC and alkalinity. Conventional systems will be required to sample raw water alkalinity and TOC, and treated water TOC, once per month and evaluate the TOC removal. Reduced monitoring for the water system is possible after one year of documented low TOC concentrations.

Monitoring Plans

To ensure that systems are prepared for the requirements of the D/DBPR, each system is required to complete a Monitoring Plan. This plan outlines the system's treatment practices, and identifies sampling requirements, procedures, and reporting requirements. Electronic and hard copy templates of the Monitoring Plan, as well as other reporting forms for the Rule, can be obtained from your local DW/WW Program Environmental Specialist. Monitoring Plans are due to the State by January 31, 2004, for all systems serving greater than 3,300 persons and must be available on-site for a sanitary survey inspector for all other systems.

Potential Solutions and Problems

Looking back at our equation for disinfection by-products, *Disinfectant + Organic Matter = Disinfection By-Products*, you can see every system will have to find a unique way to meet the new regulations. Changing disinfectants may reduce certain by-product levels; for example, chloramines tend to produce fewer TTHMs than chlorination. To reduce disinfection by-product formation, some systems may be able to reduce the residence time in parts of the distribution system by instituting a regular dead-end flushing program, while other systems may find that they are adding excessive amounts of disinfectant and are able to lower the dosage. In systems using pre-chlorination to introduce disinfectants to raw water containing higher organics that filtered water, changing the point of chlorination may reduce disinfection by-products.

Regardless of the changes a system makes, we must all keep in mind that meeting the regulations for keeping our drinking water safe is an increasingly difficult challenge. Changes to a water systems treatment process should be made slowly and gradually to ensure that the public health is always protected. Drastic reductions in disinfectant residuals could allow for bacterial growth or disease outbreak, which is an immediate and significant health risk. Also, treatment process changes made to meet the D/DBPR may impact a system's compliance with other rules. For example, altering pH or alkalinity to optimize TOC removal may also change the corrosivity of finished water, thus interfering with compliance of the Lead and Copper Rule. Optimization for desired drinking water quality and public health must be balanced carefully. The best plan of action is to begin sampling as soon as possible, make small changes, document the effects and contact your local DW/WW Program Environmental Specialist for more information and before making any changes to your system's disinfection practices. ~

Northern Flows

Disinfectant/Disinfection By Products Rule *by Carrie McMullen*

In the United States, continuous disinfection was first employed in New Jersey in 1908, although chlorine disinfection had been used as early as 1850 during a cholera outbreak in London. As various disinfection practices spread, waterborne diseases such as cholera, typhoid, dysentery and hepatitis A were nearly eliminated from the United States. In 1974, it was discovered that disinfection by-products are created by the reaction of disinfectants and naturally occurring organic matter in water. These by-products include trihalomethanes (THMs), such as bromoform, chloroform, bromodichloromethane and dibromochlormethane. These four compounds are collectively referred to as Total Trihalomethanes (TTHMs) and two of the four TTHMs have been classified as possible human carcinogens. This discovery led to the 1979 TTHM Rule, which set a maximum contaminant level (MCL) for TTHMs at 100 ug/L (parts per billion - ppb) for Community Water Systems (CWS) serving greater than 10,000 persons.

The New Rules

In an effort to balance the risks to public health from waterborne disease outbreaks and long term health effects resulting from disinfection by-products, the United States Environmental Protection Agency (USEPA) has promulgated the Enhanced Surface Water Treatment Rules (ESWTRs) and the Disinfectant/Disinfection By-Products Rules (D/DBPRs). The Stage 1 D/DBPR, which applies to all Class A public water systems that disinfect, sets new maximum contaminant levels (MCLs) for TTHMs and a group of haloacetic acids (Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Bromoacetic acid, and Dibromoacetic acid) collectively referred to as HAA5s. Effective January 1, 2002, for systems serving greater than 10,000 persons, and January 1, 2004 for smaller systems, these MCLs are 80 ug/L (ppb) for TTHMs and 60 ug/L (ppb) for HAA5s.

Disinfection by-product formation tends to increase the longer organic matter is in contact with disinfectants and when water temperatures increase. Because of this, systems are required to sample at the point in the distribution system with the longest residence time, such as a dead end, and during the month of warmest water temperature. Systems that sample more than once per year will be able to average all of the samples to allow for peaks during long retention times and warm water months.

In the presence of bromide, ozone creates the disinfection by-product bromate. Systems using ozone, either as a disinfectant or an oxidizing agent, must meet the MCL of 10 ug/L (ppb) for bromate. Similarly, systems using chlorine dioxide as a disinfectant must meet a new MCL of 100 ug/L (ppb) for the disinfection by-product, chlorite.

See the chart (above) to determine what TTHM and HAA5 sampling requirements apply for your water system, based on source type and population. Other requirements may apply depending on the treatment.

System Type	Sampling Frequency	Location	Reduced Sampling Frequency	Conditions for Reducing	Additional Sampling
Surface Water or GWUDISW ≥ 10,000	4 per plant per quarter	1 at point of max. residence time, 3 other locations	1 per plant per quarter at point of max. residence time	TTHMs & HAA5s ≤50% of the MCLs, raw TOC ≤ 4/0 mg/L	Monthly TOC and Alkalinity
Surface Water or GWUDISW ≥ 500-9,999	1 per plant per quarter	Point of max. residence time	1 per plant per year at point of max. residence time and month of warmest water temp.	TTHMs & HAA5s ≤50% of the MCLs, raw TOC ≤ 4/0 mg/L	Monthly TOC and Alkalinity
Surface Water or GWUDISW < 500	1 per plant per year	Point of max. residence time, in the month of warmest water temp.	No Reduced Monitoring	NA	NA
Ground Water ≥ 10,000	1 per plant per quarter	Point of max. residence time	1 per plant per year at point of max. residence time and month of warmest water temp.	TTHMs & HAA5s ≤50% of the MCLs	NA
Ground Water < 10,000	1 per plant per year	Point of max. residence time, in the month of warmest water temp.	1 per plant per 3 years, at point of max. residence time and month of warmest water temp.	TTHMs & HAA5s ≤50% of the MCLs for 2 years, or ≤25% of the MCLs for 2 years	NA

Organic mater + Disinfectant = Disinfection By-Products

Using the basic equation above, you can see that there are two ways to reduce disinfection by-products: reduce organic matter or reduce disinfectant levels. Lets look at how to achieve this.

Disinfection Profiling

Portions of the ESWTRs require systems to produce a disinfection profile, which is a graphical representation of inactivation of *Giardia* and viruses from disinfection, over time. This valuable tool allows water system owners and operators to visualize if, and when, their system is achieving inactivation above and beyond the system's requirements, and where adjustments in disinfection may be possible. The profile only requires weekly monitoring of flow, volume, temperature, chlorine concentration, and pH and may result in significant savings for systems that are currently using excessive amounts of disinfectant.

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