SERVICE CONNECTION

The Maine CDC Drinking Water Program Newsletter

Working Together for Safe Drinking Water

Fall 2018 ○ Volume 26, Issue 3

Communication is Key

Full-Scale Exercise Highlights the Importance of Communication

Jessie Meeks, Hydrogeologist

In June, Maine and New Hampshire partners held a full-scale exercise on the Salmon Falls River to test emergency response abilities in Somersworth, NH and Berwick, ME. The 85 participants came from both towns' water, fire, and police departments; Maine Rural Water Association; Granite State Rural Water Association; New Hampshire's Department of Environmental Services; and Maine's Department of Environmental Protection and CDC Drinking Water Program. In the mock scenario, a tanker truck, leaking an unknown fluid and containing an unresponsive driver, was found in a park just upriver of both towns' water intakes. The emergency responders had to work through how to identify what and how much material was spilling into the river, how long ago the spill had occurred, and what threats the spill posed to the water supply. The NH and ME water systems then had to determine how to respond to the spill and ensure that public health was not at risk.

The full-scale exercise was a success but highlighted the need for improved communication. One take-away that is transferable state-wide is the need for all water systems to have the ability to communicate with their town and county emergency response agencies in the case of poor cell or land-line service. All community water systems would benefit from having access to a base radio station and/or portable radios for emergency communications, with established frequencies that allow ready and reliable communications between the two water departments and emergency responders. ■

Linking Watershed and Human Health

Sophia Scott, Source Water Protection Coordinator

When it comes to drinking water protection, not all land uses perform the same. A growing body of scientific research suggests that forested lands yield greater water quality benefits when compared to other landscapes. The primary ways that forests and trees improve water quality include filtering runoff and slowing erosion, aiding in groundwater recharge, and regulating streamflow.

In 2011, the United States Department of Agriculture Forest Service (USFS) published Forests to Faucets, an analysis of the role forests play in protecting drinking water sources and the extent to which they are threatened by various factors, such as development, climate, and insects and disease. Now, seven years later, the USFS and its partners are set to

Continued on page 5...

Photo: Rob Schillinger

Contents

Maine CDC Drinking Water Program

Director's Corner

Michael Abbott, Director

I want to first thank everyone for the warm welcome I have received since returning to the Maine CDC Drinking Water Program! I feel very fortunate to have been selected to lead the DWP's talented and dedicated staff in our mission to ensure safe and reliable drinking water for Maine people. I realize that success in the venture will come only through the combined efforts of our program with US EPA, other State agencies and professional organizations, and most importantly, by collaboratively working with YOU – Maine's water suppliers.

As the DWP's vision statement implies, we are all "Working Together for Safe Drinking Water." DWP has the unique role of administering the drinking water rules under the Safe Drinking Water Act, while also being able to offer technical and financial assistance to help public water systems in Maine improve infrastructure and build technical and managerial capacity for more efficient and safe operation. So, is this a "good cop/bad cop" situation? Well, kind of, but not really. Let me explain.

We are tasked with making sure public water systems are delivering safe drinking water, to protect the health of consumers. We do this through periodic inspections known as sanitary surveys and using monitoring data that we require you to collect and report to us. If a water system is out of compliance, we will notify you and hold you accountable to correct the problem – through enforcement, if necessary. This sounds a little harsh, but here's the other side of it: we will use all available resources to help you stay in compliance. This means we offer technical assistance, including water quality specialist visits, financial and capacity development programs, and training on various subjects through partner organizations like Maine Rural Water Association, Maine Water Utilities Association, and Rural Community Assistance Partnership. We also provide funding (over $20 million per year) through the Drinking Water State Revolving Fund to help public water systems replace and repair aging infrastructure, including treatment facilities, storage tanks, and water mains.

Our goal, like yours, is to avoid the need to issue violations and go down the enforcement path. EPA Region 1 developed a new initiative to reduce the number of community systems with health-based violations by 25 percent between 2018 and 2022. This new strategy combines assistance, training, education, outreach, State program oversight, and enforcement assistance to reduce contaminant exposure risks. I see this as being right in line with our current approach in Maine. But, we will all need to work hard to reach that goal. So please keep your system in good operating order, collect your samples on time, and of course – tell us what you need!

M. Abbott

WE VALUE OUR READERS

We are interested in your opinion. What do you like about the *Service Connection*? Where do you see room for improvement? What would you like to see more of? Are there particular topics about which you'd like to learn more that we haven't covered?

Let us know what you think!

Visit our Facebook page to take a short survey or get in touch with Sophia Scott via email, sophia.scott@maine.gov, or phone, 485-4058.

www.facebook.com/MaineCDCDWP

DWP staff (from L-R: Nate Saunders, Mike Abbott, Sophie Scott, Jen Jamison, Maia Ferris, Christina Trufant) tour the Poland Spring bottling plant at the annual summer staff meeting.

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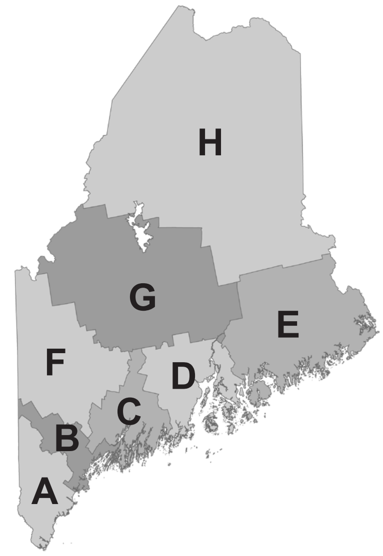

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Fall is All About Preparedness

Sara Flanagan, Capacity Development and Security Coordinator and Sophia Scott, SWP Coordinator

National Preparedness Month (September) and National Cybersecurity Month (October) remind us of the importance of emergency preparedness. The best time to prepare for an emergency is before it happens. Visit the Drinking Water Program's Security and Emergency Preparedness website (www.medwp.com/pws/securityEmergencyPreparedness.shtml) for emergency response plan templates, factsheets, and other useful emergency preparedness and response information.

Tools to aid in emergency preparedness:

EPA's Tabletop Exercise Tool for Water Systems: Emergency Preparedness, Response, and Climate Resiliency.

- This tool contains 15 scenarios with fully customizable situation manuals, discussion questions, and PowerPoint presentations. You can modify the material to meet your specific needs.
- Find it here: bit.ly/ttxtool

EPA's Water Utility Response On-the-Go Mobile Website.

- This tool allows users to track severe weather, create customized contact lists for response partners, respond to incidents, take notes and record damage, inform incident command, and provides access to additional planning information.
- Find it here: watersgeo.epa.gov/responseotg/

Water Information Sharing Analysis Center's Cyber Security Top Ten List.

- Top ten list of cybersecurity recommendations for minimizing your water system's vulnerability to a cyber breach or attack.
- Find more information here: bit.ly/cybersecuritytop10

Are you a water system that has been impacted by a cybersecurity threat?

What are your lessoned learned? What would you do differently if it were to happen again? We can all benefit from learning from each other's experiences. Email Sophia Scott (sophia.scott@maine.gov) if you would like to share your story.

Water System Partnerships

Sara Flanagan, Capacity Development and Security Coordinator

Small and mid-sized public water systems often face unique challenges in providing safe, reliable, and affordable drinking water to their customers. Limited resources, including rural areas that contain few qualified operators with adequate technical expertise, lack of full-time managerial oversight, aging infrastructure, or dwindling financial capacity due to a shrinking customer base, are all barriers to successfully operating a public water system.

A water system partnership can build technical, managerial, or financial capacity, and foster invaluable relationships with other water systems who share similar challenges. Available water system partnerships are described below:

- **Informal Cooperation:** Work with other systems, but without contractual obligations. For example, sharing equipment, sharing bulk supply purchases, mutual aid agreements.
- **Contractual Assistance:** Requires a contract, but the contract is under system's control. For example, operations and maintenance, engineering, purchasing water.
- **Joint Powers Agency:** Creation of a new entity by several systems that continue to exist as independent entities. For example, shared system management, shared operators, shared source water.
- **Ownership Transfer:** Takeover by existing or newly created entity. For example, acquisition and physical interconnection, acquisition and satellite management, transfer of privately-owned system to new or existing public entity.

For more information about water system partnerships and case studies, visit EPA's website at:www.epa.gov/dwcapacity/water-system-partnerships

(Source of the above descriptions: Gaining Operational and Managerial Efficiencies Through Water System Partnerships, EPA 816-R-09-005, October 2009)

Watershed and Human Health

Continued from Page 1...

release Forest to Faucets 2.0, also known as the acronym F2F2. The updated version improves upon the previous analysis and aims to strengthen the understanding between landscapes and water quality.

Forests to Faucets 2.0 focuses on surface water sources of drinking water, which account for 77% of the drinking water in the United States. In our State, approximately one-third of Mainers are supplied water from a surface water source. The focus on surface water stems from the fact that lakes, ponds, rivers, and streams have a larger contributing watershed and are more easily polluted, when compared to a groundwater source.

Using a combination of biophysical and demographic data at the watershed scale, the analysis looks at the ability of a landscape to produce clean water. The study focuses on: 1) the ability of a watershed to produce clean drinking water based on land use; 2) the importance of the watershed for drinking water based on population served; and 3) the various threats to both drinking water watersheds and drinking water sources. The analysis will also provide information that can be used to forecast future impacts on drinking water.

Forests to Faucets 2.0 aims to help watershed managers, drinking water professionals, policy makers, and others make informed decisions about drinking water. Forests help to keep our sources of drinking water clean and play a role in protecting public health. Cleaner sources of drinking water ultimately mean lower treatment costs and safer drinking water.

For more information on Forests to Faucets 2.0 visit the USFS website: bit.ly/usfs-f2f2 or check out the Source Water Collaborative's informative webinar: bit.ly/f2f2webinar ■

Water Operator News

Jim Jacobsen, Project Manager

The Board of Licensure of Water System Operators (Board) reviewed and approved 29 applications for water operator training courses from May through September. During this same time, 63 people passed water operator exams and 38 received new or upgraded operator licenses. As of September, a total of 107 individuals have passed the 2018 water operator exam.

The Board met October 19 at the Public Utilities Commission. The next Board meeting will be held at 9:00 am on December 7. There are presently two vacancies on the Board: Class III Operator representative and Very Small Water System representative. The Board is researching training options for very small water system operators and part-time operators.

The New England Water Works Association, Operator Certification Committee is working on a guidance document for licensing agencies' constituents to ensure uninterrupted operations. The Committee's goal is to provide this guidance document to systems to help in planning for unexpected staff shortages, such as resignation or termination, illness, and vacations. ■

Sanitary Surveys Enter the Digital Age

Nate Saunders, Senior Environmental Engineer

Sanitary surveys are intended to help water systems comply with the Safe Drinking Water Act and, in doing so, serve safe water to consumers. The current sanitary survey process involves collecting responses in the field on a paper form and then inputting data and information onto the Drinking Water Program's electronic database.

In recent years, drinking water programs across the country have switched to electronically recording sanitary survey data. This method allows information to be automatically uploaded to an electronic database and eliminates the extra step of manually inputting data. It also results in a better quality-control check on the data being uploaded. In 2017, the Drinking Water Program started exploring the use of electronic sanitary survey technology, which would enable increased efficiency. This effort is ongoing. When complete, the new system will allow public water system inspectors to input sanitary survey information on an iPad in the field. Sanitary survey findings will be summarized in a letter and could potentially include time-bound requirements and recommendations. If you have questions about the upcoming electronic sanitary survey process, contact your public water system inspector. ■

Tiny Plastic Everywhere?

Sophia Scott, Source Water Protection Coordinator

Plastics provide many conveniences to people across the globe. We use and rely on plastics every day. However, unsustainable use and improper waste management have created pollution worldwide. One infamous example of plastic pollution is the Great Pacific Garbage Patch. This floating mass of plastic debris is roughly the size of Texas.

Plastic pollution can come in many sizes. We have all seen plastic litter: a plastic bottle, cellophane wrappers, cigarette butts. These items are examples of macroplastic pollution. Microplastic pollution is less obvious but just as prevalent. Microplastics are defined as plastic debris under 5 millimeters in size, which includes plastics the size of a pencil eraser to particles that can only be seen under a microscope. These tiny plastic pieces have been found virtually everywhere: air, soil, salt water, brackish water, fresh water, bottled water, and tap water. Tiny plastic particles have been found in Arctic sea ice, a remote Mongolian lake, and the Gulf of Maine.

These contaminants enter the environment as primary or secondary microplastics. Primary microplastics are manufactured plastic particles. Secondary microplastics are created when larger pieces of plastic waste break down into smaller particles. Microplastics do not biodegrade and they remain in the environment for centuries. Some microplastics can release harmful chemicals into the environment. Others attract chemicals and act as vectors for pollutants. Despite their wide distribution, very little is known about the human health implications of microplastic pollution.

Microplastics, shown here on a penny, are microscopic plastic particles. Photo credit: Carolyn Box/AP/Courtesy 5gyres.org

From a drinking water standpoint, microplastics have been found in both bottled and tap water across the globe. In the first study of its kind, researchers in the Czech Republic looked at how three water treatment plants performed in microplastic removal. Systems removed between 70% and 85% of microplastic particles. The details of the study are in the table below.

Does this mean we'll see regulation for microplastics in the future? As we say here in Maine, "Hard tellin', not knowin'." Despite this uncertainty, it is a safe bet to say that we're a ways off from any microplastic regulations in drinking water. Microplastics are not listed on the most recent Contaminant Candidate List and research on the implications of microplastic pollution in drinking water is only just beginning. ■

Table 1. In the 2018 study, researchers looked at three treatment plants with different sources, treatment, demand, and population served. Microplastics in the raw water source varied significantly across treatment plants. Though all three treatment systems were able to remove the majority of microplastics, no plant was able to remove 100% of the plastics.

Treatment plant	Usual/maximum capacity (gallons/ minute*)	Population Served	Source	Treatment	Average raw water microplastics	Average treated microplastics	Average percent microplastics removed
1	59,000/110,000	1.5 million	Large valley reservoir	Coagulation/ flocculation, sand filtration	1473	443	70
2	1,600/3,200	60 thousand	Smaller reservoir	Coagulation, flocculation, sedimentation, sand and granular activated carbon filtration	1812	338	81
3	1,400/2,400	130 thousand	River	Coagulation, flocculation, flotation, sand filtration, granular activated carbon filtration	3605	628	83

*Approximate value calculated from the original liters/second. Data from Pivokonsky, M., et al., Occurrence of microplastics in raw and treated drinking water. Science of the Total Environment (2018) htpps://doi.org/10.1016/j.scitotenv.2018.08.102

What *Is* Spring Water?

Jessie Meeks, Hydrogeologist

As a hydrogeologist, I am frequently asked if the water bottled in Maine is really, truly spring water. Spring water is defined by the Federal Food and Drug Administration in 21 CFR 165.110(a)(vi):

> *The name of water derived from an underground formation from which water flows naturally to the surface of the earth may be "spring water." Spring water shall be collected only at the spring or through a bore hole tapping the underground formation feeding the spring. There shall be a natural force causing the water to flow to the surface through a natural orifice. The location of the spring shall be identified. Spring water collected with the use of an external force shall be from the same underground stratum as the spring, as shown by a measurable hydraulic connection using a hydrogeologically valid method between the bore hole and the natural spring, and shall have all the physical properties, before treatment, and be of the same composition and quality, as the water that flows naturally to the surface of the earth. If spring water is collected with the use of an external force, water must continue to flow naturally to the surface of the earth through the spring's natural orifice. Plants shall demonstrate, on request, to appropriate regulatory officials, using a hydrogeologically valid method, that an appropriate hydraulic connection exists between the natural orifice of the spring and the bore hole.*

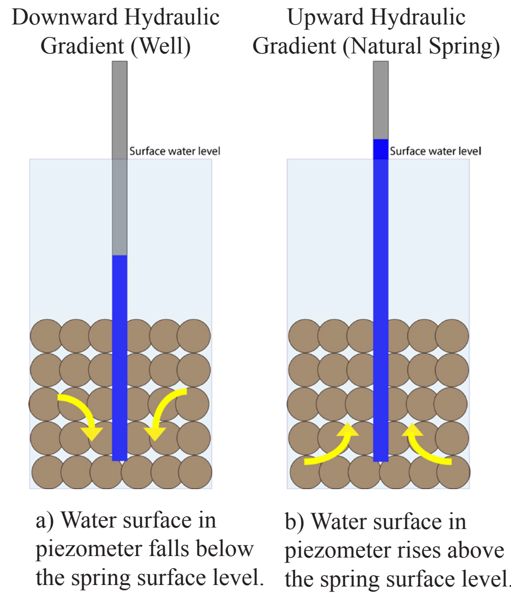

Figure 1. Piezometer showing well and spring conditions.

For water to be marketed as spring water, it must meet this FDA definition.

A spring must have water naturally flowing to the surface. To test this, a small well, called a piezometer, is used to determine if water is naturally following to the surface. If the water in the piezometer rises above the elevation of the spring, then the spring is naturally flowing (Figure 1b) Spring water is typically not harvested from the spring. Instead, an extraction well close to the spring is used. To be classified as spring water, the water harvested from the extraction well must have the same chemical makeup as the water flowing at the spring. It must also be hydraulically connected to the spring. Hydraulic connection is shown with a pump-test. If the well is hydraulically connected to the spring, the water level in the spring's piezometer will decrease shortly after the pumping starts at the extraction well. When the pumps are turned off, the water table and the water level in the spring's piezometer, should return to their pre-test levels. (Figure 2). If pumping at the extraction well does not cause lower water levels at the spring's piezometer, then the spring and the well are not connected and the water is not classified as spring water.

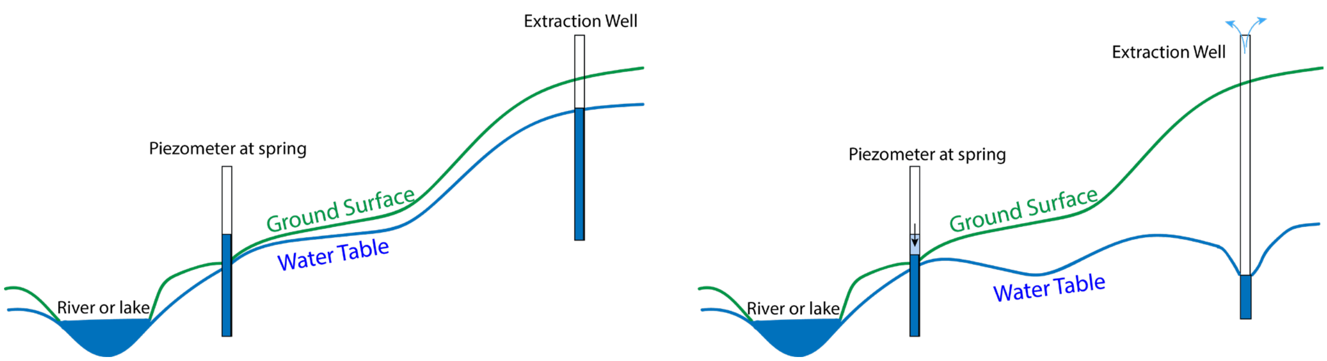

Figure 2. Conditions before the pump test (left): ground water is at normal levels and the spring is flowing. During the pump test (right) water is pumped from the extraction well. If the spring is hydraulically connected to the extraction well, pumping lowers the water table around the well and lowers the height of the piezometer in the spring.

Finally, the person or group selling spring water, must show though models and water balance calculations, that the planned pumping rate will not stop the springs from flowing. Flow condition must be confirmed through continuous monitoring under pumping conditions.

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