

Nebraska Public Water Supply Program Summary Report 2017

NEBRASKA

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DEPT. OF HEALTH AND HUMAN SERVICES

Nebraska Department of Health and Human Services
Division of Public Health
Office of Drinking Water

Nebraska's Public Water System Program 2017 Annual Report

January 1 to December 31, 2017

Nebraska's 22nd annual report
as required by the 1996 Amendments to
the federal Safe Drinking Water Act



June 29, 2018

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Available in alternate format

To Obtain a Copy of the 2017 Public Water System Report

As required by the federal Safe Drinking Water Act, the State of Nebraska has made the 2017 Annual Public Water Systems report available to the public. Interested individuals can obtain a copy by accessing the Department website at:

<http://dhhs.ne.gov/drinkingwater>

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Overview of the Federal Public Water Supervision Program

The United States Environmental Protection Agency (EPA) established the Public Water System Supervision (PWSS) Program under the authority of the 1974 Safe Drinking Water Act (SDWA). Under the SDWA and the 1986 Amendments, EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs). For some regulations, EPA establishes treatment techniques in lieu of an MCL to control unacceptable levels of contaminants in water.

EPA also regulates how often public water systems (PWSs) monitor their water for contaminants and how often they report the monitoring results to the states or EPA. Generally, the larger the population served by a water system, the more frequent the monitoring and reporting requirements. In addition, EPA requires some PWSs to monitor for unregulated contaminants to provide data for future regulatory development. Finally, EPA requires PWSs to notify their consumers when they have violated these regulations. The 1996 Amendments to the SDWA require consumer notification to include a clear and understandable explanation of the nature of the violation, its potential adverse health effects, steps that the PWS is undertaking to correct the violation, and the possibility of using alternative water supplies during the violation.

The federal SDWA applies to the 50 states, the District of Columbia, Indian Lands, Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands.

The SDWA allows states and territories to seek EPA approval to administer their own PWSS program(s). The authority to run a PWSS program is called primacy. For a state to receive primacy, EPA must determine that the state meets certain requirements laid out in the SDWA and the federal regulations, including the adoption of drinking water regulations that are at least as stringent as the federal regulations and a demonstration that they can enforce the program requirements. Of the 56 states and territories, all but Wyoming and the District of Columbia have primacy. The EPA regional offices administer the PWSS programs within these two jurisdictions.

The 1986 SDWA Amendments gave Indian tribes the right to apply for and receive primacy. EPA currently administers PWSS programs on all Indian lands except the Navajo Nation, which was granted primacy in late 2000.

Annual State Public Water System Report

The mission of the Office of Drinking Water is to protect the public health and welfare of Nebraskans by assuring safe, adequate, and reliable drinking water. People expect their water will be safe to drink when they turn on their faucet, program staff across the State work in many areas to assure this.

On July 18, 2017 the Nebraska Department Health and Human Services (DHHS or Department) and the Nebraska Department of Environmental Quality (DEQ) entered into a Memorandum of Agreement (MOA), with the purpose of enhancing the protection of public health and the environment through improved customer service, and increased efficiency. DHHS Drinking Water Program staff continue to administer the Program under the supervision of DEQ. To facilitate communication between programs within the two Agencies who work with utilities, Lincoln-based DHHS Drinking Water Program Staff co-located their offices with those of DEQ on August 1, 2017. To meet the goals of the MOA, both Agencies are concentrating on the following:

- Cross Training of the DHHS & DEQ Engineering Services groups so they can perform both drinking water and wastewater infrastructure plan reviews;
- Cross training of the DHHS & DEQ Field Service Representatives so they can perform both drinking water and wastewater facility inspections; and
- Broaden the approach by both Agencies when dealing with limited community resources.

Each quarter, primacy states submit data to the federal Safe Drinking Water Information System (SDWIS/FED), an automated database maintained by EPA. The data submitted include, but are not limited to, public water system (PWS) inventory information; the incidence of Maximum Contaminant Level, Maximum Residual Disinfectant Level, monitoring, and treatment technique violations and information on enforcement activity related to these violations. Section 1414(c)(3) of the federal Safe Drinking Water Act requires states to provide EPA with an annual report of violations of the primary drinking water standards. This report provides the numbers of violations in each of six categories: MCLs, MRDLs, treatment techniques, variances and exemptions, significant monitoring violations, and significant consumer notification violations.

The following report is a summary of the compliance of Nebraska's public water systems with the Safe Drinking Water Act during 2017, as required by the 1996 Amendments to the federal Safe Drinking Water Act. Other significant program activities that the program staff perform in assuring water is safe for human consumption are also included in this report.

More information about systems with violations that occurred in 2017 is available from the Division of Public Health of the Nebraska Department of Health and Human Services, 1200 N Street, Suite 400, P.O. Box 98922, Lincoln, NE 68509-8922, phone: 402-471-6435 or at EPA's website:

<https://www.epa.gov/enviro/sdwis-search>

This report is also available on the Department's website at:

<http://dhhs.ne.gov/drinkingwater>

Notices of the report's availability will be provided to public libraries and local health departments.

Terms Used In This Report

Consumer Notification

Every community water system is required to deliver to its customers a brief annual water quality report. This report is to include some educational material and will provide information on the source water, the levels of any detected contaminants, and compliance with drinking water regulations.

Maximum Contaminant Level (MCL)

Under the federal Safe Drinking Water Act, EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs).

Maximum Residual Disinfectant Level (MRDL)

EPA sets national limits on residual disinfectant levels in drinking water to reduce the risk of exposure to disinfectant byproducts formed when the public water systems add chemical disinfectant(s) for either primary or residual treatment. These limits are known as Maximum Residual Disinfectant Levels (MRDLs).

Monitoring

A PWS is required to monitor and verify that the levels of contaminants present in the water do not exceed the MCL or MRDL. If a PWS fails to have its water tested as required or fails to report test results correctly to the Department, a monitoring violation occurs.

Public Notice Violations

The Public Notification Rule requires all public water systems to notify their consumers any time a system violates a national primary drinking water regulation or has a situation posing risk to the public.

Public Water System (PWS)

A Public Water System is a system that provides water via piping or other constructed conveyances for human consumption to at least 15 service connections or serves an average of at least 25 people for at least 60 days each year. For this report when the acronym "PWS" is used, it means systems of all types unless specified in greater detail.

There are three types of public water systems:

1. Community water systems (CWS) (a) serve at least 15 service connections used by year-round residents of the area served by the system or (b) regularly serve at

least 25 year-round residents. They include such entities as mobile home parks, rural water districts, and sanitary improvement districts, as well as municipalities.

2. Non-transient, non-community water systems (NTNC) are not community water systems. They regularly serve at least 25 of the same individuals over six months of the year. Examples include a manufacturing company with its own well and a rural school with over 25 students.
3. Transient non-community water systems (TNC) are non-community systems that do not regularly serve at least 25 of the same persons over six months per year. Examples of transient non-community systems are a café beside the highway which has its own well and the water systems at interstate rest areas and state parks.

Significant Monitoring Violations

For this report, significant monitoring violations are generally defined as any significant monitoring violation that has occurred during the calendar year of the report. A significant monitoring violation, with rare exceptions, occurs when no samples were taken or no results were reported during a compliance period.

Significant Consumer Notification Violations

For this report, a significant public notification violation occurred if a community water system completely failed to provide its customers with the required annual water quality report.

Treatment Techniques

For some regulations, the EPA establishes treatment techniques (TTs) in lieu of an MCL to control unacceptable levels of certain contaminants. For example, treatment techniques have been established for viruses, some bacteria, and turbidity.

Variances and Exemptions

A primacy state can grant a PWS a variance from a primary drinking water regulation if the characteristics of the raw water sources reasonably available to the PWS do not allow the system to meet the MCL. To obtain a variance, the system must agree to install the best available technology, treatment technique(s), or other means of limiting drinking water contamination that EPA finds are available (taking costs into account), and the Department must find that the variance will not result in an unreasonable risk to public health. The variance will be reviewed not less than every 5 years to determine if the system remains eligible for the variance.

The Department can grant an exemption temporarily relieving a PWS of its obligation to comply with an MCL, treatment technique, or both if the system's noncompliance results from compelling factors (which may include economic factors) and the system was in operation on the effective date of the MCL or treatment technique requirement. A new PWS that was not in operation on the effective date of the MCL or treatment technique requirement by that date may

be granted an exemption only if no reasonable alternative source of drinking water is available to the new system. Neither an old nor a new PWS is eligible for an exemption if management or restructuring changes can reasonably be made that will result in compliance with the SDWA or improvement of water quality, or if the exemption will result in an unreasonable risk to public health. The state will require the PWS to comply with the MCL or treatment technique as expeditiously as practicable, but not later than three years after the otherwise applicable compliance date.

In short, a variance or an exemption may be issued, but unreasonable risk to public health is not allowed. For all the details regarding exemptions and variances, see Title 179 NAC 6, Variances and Exemptions http://dhhs.ne.gov/Pages/reg_t179.aspx

Nebraska's Public Water Systems

Population and Type of System

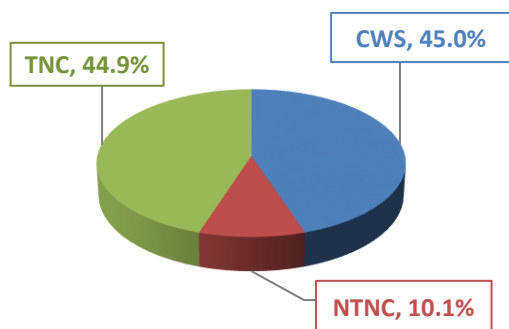
Nebraska public water systems can be broken down into categories based on the size of the population served and/or the type of population served.

Population	CWS	NTNC	TNC	Total Systems	Percentage*
<100	103	73	510	686	51.1%
101-500	273	45	88	406	30.3%
501-1000	101	8	4	113	8.4%
1001-3300	85	8	0	93	7.0%
3301-10,000	28	2	0	30	2.2%
10,001-50,000	11	0	0	11	0.8%
>50,000	3	0	0	3	0.2%
TOTAL	604	136	602	1342	100%

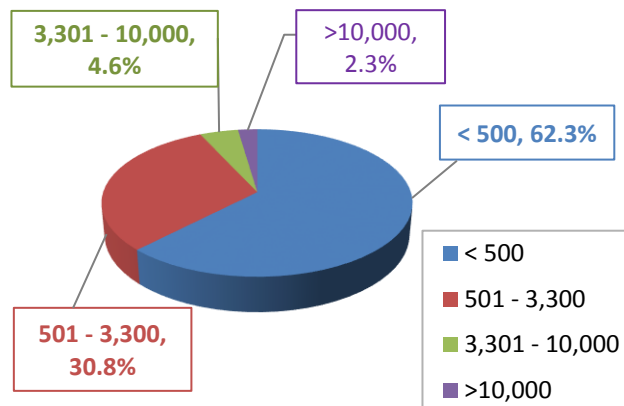
**Based on approximate population*

CWS = Community 604 systems
 NTNC – Non-transient, non-community 136 systems
 TNC = Transient, non-community 602 systems

Public Water System Types



Community Public Water Systems by Size of Population



Approximately 80% of all Nebraskans get their water from a community public water system. Private domestic wells provide water for the remaining 20% of the overall State population.

As you can see, over 60% of Nebraska's community water systems are below 500 people in size. Water systems with populations below 3,300 are considered to be "small systems" by the EPA. This makes Nebraska a predominantly small system state with 93.1% of all of the State's community public water systems serving 3,300 or fewer persons.

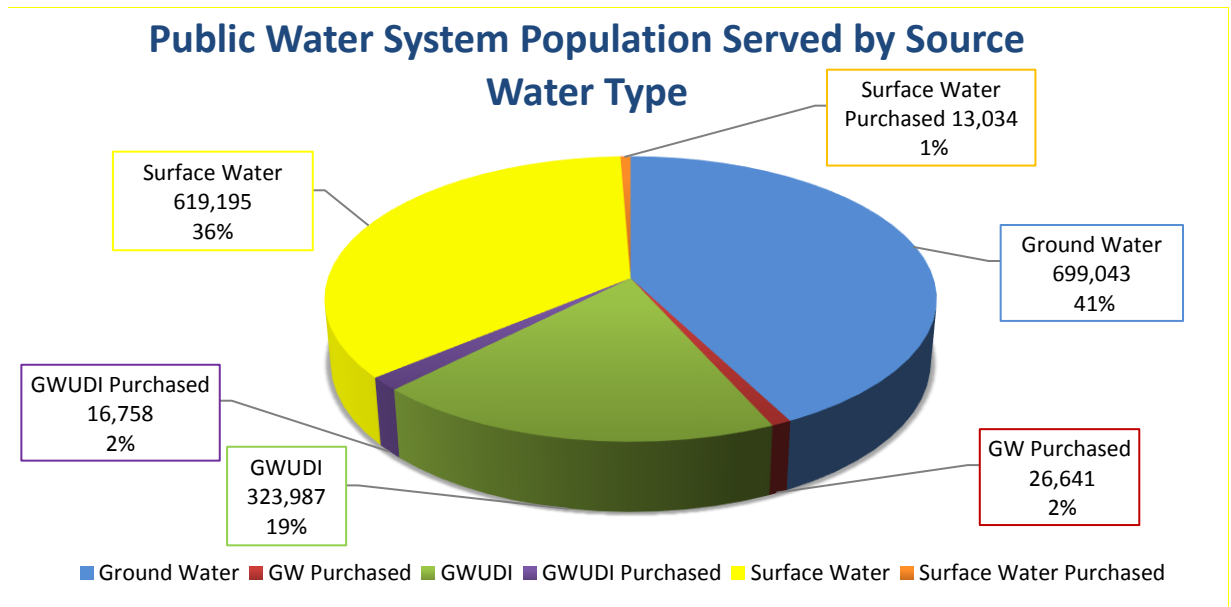
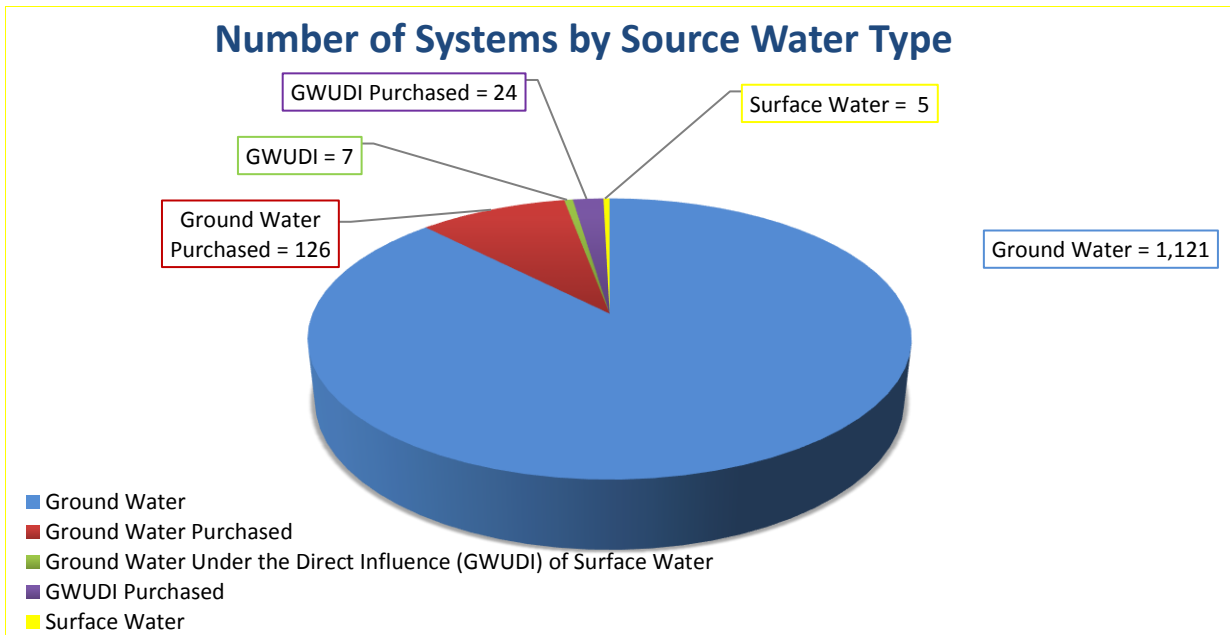
Public Water in Nebraska

The Division of Public Health of the Department of Health and Human Services, through its Public Water System Program, administers the state's regulations governing public water systems (Title 179 NAC 2 through 26), promulgated under the state's SDWA pursuant to and in accordance with the federal SDWA. EPA promulgates rules and sets standards in accordance with the federal SDWA, which was originally passed in 1974 and later amended in 1986 and 1996.

These rules are generated by EPA in accordance with the federal SDWA and its amendments. The SDWA includes water quality standards, and requirements for sampling, treatment and public notification. The Act affects approximately 1,338 public water systems in Nebraska. (The number of public water systems varies as new ones open and existing ones close.) Public water systems provide water to approximately 80% of the people of Nebraska. Private domestic wells provide water for other Nebraskans.

Most of the water Nebraskans drink is ground water. Only 5 public water systems in the state obtain their drinking water from surface water. Another 55 systems purchase water from those five systems. In addition, 7 systems utilize ground water under the influence of surface water (GWUDI), and 25 additional systems purchase water from those seven systems. The remaining

1,125 systems use ground water, and an additional 121 systems purchase their water from another ground water system.



**Percentages rounded to nearest 1%*

The 1996 Amendments to the Safe Drinking Water Act require each state to publish a report each year that includes the violations that occurred in the state. Specific information about the systems that had violations is available from the Office of Drinking Water, Division of Public Health, Nebraska Department of Health and Human Services, 1200 N Street, Suite 400, P.O. Box 98922, Lincoln, NE 68509-8922, phone 402-471-6435.

What Nebraska's Public Water System Program Does



The Public Water System Program has 33 full time equivalent positions (FTEs). The Monitoring and Compliance Section has 11, the Engineering Section has 8, the Field Services and Training Section has 12, and two FTEs contribute to the administration of the program.

Field Services and Training Section

The Public Water System Field Services and Training (FS&T) Section encompasses four separate but related areas of responsibility: 1) field services (inspections, operator assistance, etc.), 2) training, 3) capacity development, and 4) water system security. FS&T staff include a supervisor, eight field representatives, a training coordinator, a capacity development coordinator, and a staff assistant. FS&T staff conduct sanitary surveys, train public water system operators, attend and present information at continuing education programs for water operators, assist public water systems (PWSs) during emergency situations and help public water systems to achieve or maintain adequate technical, financial, and managerial capacity. There are eight field areas with locations in North Platte, Grand Island, Norfolk, Blair, Nelson, Chadron and Lincoln to provide close contact and timely assistance to Nebraska's public water systems. The Norfolk office serves two field areas.

The July, 2017 MOA between DHHS and DEQ has added an additional facet to the PWS Field Services' activities. To provide a more effective and efficient level of customer service, PWS Field Representatives have been coordinating with DEQ Wastewater Inspectors in a cross-training effort, enabling DHHS and DEQ to perform both drinking water and wastewater facility inspections.

Routine sanitary surveys are conducted once every three years for community water systems (CWS) and non-transient non-community (NTNC) public water systems and once every five years for transient non-community (TNC) PWSs. A sanitary survey is an on-site review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the system's adequacy and ability to reliably produce and distribute safe drinking water within the confines of regulatory requirements. A few of the items for which field personnel check are the presence of a properly licensed water operator in responsible charge, an emergency plan, and a cross-connection control program. When deficiencies are found, the system is notified of the needed improvements.

In 2017, field personnel conducted 372 sanitary surveys (195 community, 45 non-transient non-community, and 181 transient public water systems) and 67 follow-up surveys (30 community, 4 non-transient non-community, and 33 transient public water systems). A total of 863

deficiencies were found in 2017. This reflects an overall deficiency rate of 2.3 deficiencies per sanitary survey in 2017. There was an average of 2.8 deficiencies found in community systems, an average of 1.6 deficiencies found in non-transient non-community water systems, and an average of 1.9 deficiencies in transient water systems. No deficiencies were found in 130 (35%) sanitary surveys done in 2017. The number of deficiencies found in Nebraska's public water systems continues to be relatively stable with a 3.1% increase in average deficiency numbers from 2016 to 2017.

Field staff conduct site inspections for the location of new wells, in addition to assisting engineering services personnel in conducting construction inspections of public water system projects (such as the drilling of wells, the construction of treatment plants, and the erection of water towers) during construction and upon completion. When needed, field services staff provide public health advice concerning emergency situations associated with natural disasters or contamination of a public water system. As needed or upon request, they go out to communities to help public water system personnel identify potential causes of problems in their systems.

When public water systems have a confirmed presence of coliform bacteria, the Revised Total Coliform Rule (RTCR) requires that either a Level 1 or Level 2 assessment of the system be conducted. An assessment is an evaluation to identify the possible presence of sanitary defects, defects in coliform monitoring practices, and (when possible) the likely reason for the presence of coliform bacteria in the system. Any identified defects are required to be corrected.

A Level 1 assessment is triggered by the confirmed presence of only total coliform in the public water system. The public water system is responsible for completing the Level 1 assessment, and submitting its findings to the Department for review. Field staff are responsible for completing the review of Level 1 assessments.

Level 2 assessments are triggered by either multiple Level 1 triggers within a running twelve-month period, or by the confirmed presence of *E. coli* in the system. The Level 2 assessment provides a much more detailed evaluation of the public water system. Similar in many aspects to a sanitary survey, Level 2 assessments are conducted by Field Staff.

The Public Water System Program, in-house as well as through technical assistance providers, maintains a number of hypochlorinators for loan to public water systems when bacterial contamination is a source of concern. This assistance to communities in need of temporary chlorination of their water supplies has been very helpful in ensuring the safety of drinking water. When a power outage or source failure is involved, program staff also help systems locate equipment and supplies which may be needed. In general, the program's response to emergencies is limited to consultation and advice regarding actions to be carried out by the owners of public water systems.

In addition to the tasks mentioned above, the FS&T program has been actively enforcing water operator licensing standards through the issuance of fines against operators who are in responsible charge of their respective public water systems who allow their licenses to expire. Without a valid license, they are not allowed by regulation to be in responsible charge of or operate a public water system, and the Department has the ability to issue administrative penalties (fines) against such persons when they continue to be in responsible charge or operate without a valid water operator license. During 2017 no fines were issued to individuals for "Practice (Operating) Without a License."

The Department conducts emergency response training sessions around the state. This training focuses on the necessity of keeping a good working emergency response plan up-to-date and training all individuals who have a role in the plan.

The Department received 31 emergency calls in 2017. The circumstances prompting these calls included positive coliform samples and pressure losses due to main breaks. Other emergency calls not related to public water include swimming pool accidents, fuel spills, fertilizer spills, wastewater releases, etc.

In 2017, FS&T program personnel conducted 11 water operator training courses, Grades I through IV, with a total of 185 attendees. An additional 14 persons completed the correspondence course that is also offered to prepare for the Grade IV licensure examination. For Grade VI licensure (backflow preventer testing and repair), 9 courses were offered with a total of 90 attendees. For Grade V operators (transient systems only), there are no classroom courses. Training is obtained through a self-study process. Water operators are licensed only after successfully passing an exam. Examinations are offered following each training course and can also be scheduled individually.



The following table breaks down the number of licenses issued following examination at each grade level during 2017:

Grade	Examinations	Passing	Number of Licenses Issued
I	3	3	2
II	29	17	11
III	41	27	23
IV	171	141	118
V	51	49	41
VI	102	91	64

The Drinking Water Program and other training providers offered continuing education opportunities for water operators in 2017. Coordinated by the program, a group informally known as the Water Operator Training Coalition convened periodically in 2017 to identify training needs and to avoid conflicts in the scheduling of training opportunities. Members include the Nebraska Rural Water Association, the League of Nebraska Municipalities, the Midwest Assistance Program, Central Community College, and the Nebraska Section of the American Water Works Association. In 2017, as in past years, the Coalition produced a calendar identifying dates and locations of continuing education opportunities for distribution to licensed water operators.

A total of 134 workshops/seminars/conferences were offered in Nebraska in 2017 for the purpose of water operator continuing education. Of these, 55 focused primarily on backflow prevention continuing education for Grade VI operators.

The Capacity Development Coordinator has been overseeing the Department's 2% contracts with the various technical assistance providers – the 2% Team -- which consist of the same members as the Water Operator Training Coalition. The name comes from the 2% set-aside from the Drinking Water State Revolving Fund.

To provide a measurement for financial and managerial capacity for a project that has been funded by the State Revolving Fund Program, assessments need to be made on water systems prior to beginning any new construction. These initial assessments provide a basis whereby a determination can be made as to the financial and managerial capacity of the system, before work begins on the new project. Once the project has been completed and the system has been in operation for approximately one to two years, a follow-up assessment is done to show the improvement that has been accomplished with the funding that was provided. There were fifteen (15) Initial Assessments done in 2017.

A concerted effort has been made to educate water system operators regarding their role in developing and maintaining adequate capacity for their water systems. There were thirty-three (33) sessions for operators, which included one conference presentation with the Nebraska Section of the American Water Works Association and two conference presentations with the Nebraska Rural Water Association. Capacity development is the process through which water systems acquire and maintain adequate technical, managerial, and financial capabilities to enable them to consistently provide safe drinking water.

These training sessions involved Seven Hundred Five (705) attendees representing Four Hundred thirty-Eight (438) systems.

Eleven (11) board/council information sessions were held to advise members about the legal and fiduciary responsibilities that they have to assure adequate, safe water to their customers. A total of One Hundred Eleven (111) board/council members attended, representing twenty (20) community water systems.

The 2% Team provides continuing education for water operators, and also assists the Department by providing technical, managerial and financial assistance to public water systems. The 2% Team made Two Hundred Fifty Four (254) contacts in 2017. This includes assistance with the applications for funding from various sources, training manuals, and mentors from large systems to assist small systems, as well as several other activities. The Department has found capacity development to be a proactive approach to helping systems.

Drinking Water Engineering Section



The Drinking Water Engineering Section provides engineering plan review; issuance of construction permits; inspection of newly constructed projects for issuance of approval for placement into service; and technical assistance and advisory contacts with owners/operators of public water systems, consulting engineers, state, federal and local officials, organizations, and the general public in matters relating to siting, design, construction, maintenance, and operation of public water systems.

The Nebraska Safe Drinking Water Act and regulations adopted thereunder require that plans and specifications for all major construction related to public water systems be prepared by a registered professional engineer and be approved by the Department before construction begins. The law defines major construction as structural changes that affect the source of supply, treatment processes, or transmission of water to

service areas, but it does not include the extension of service mains within an established service area.

Water system plan review was incorporated into state law to increase assurance that water source development, treatment, storage, and distribution facilities would be constructed or expanded in a manner contributing to the ability of the system to deliver safe drinking water. Emphasis is placed on encouraging long-term benefits from capital investment as opposed to temporary actions designed to eliminate an emergency situation. Engineering services are a significant factor in preventing the occurrence of contamination in the delivery of safe drinking water.

In 2017, the Department received 183 sets of plans and specifications for the construction of water projects for review and approval. In addition, engineering staff conducted 129 inspections of constructed water projects.

The section's engineering personnel provide technical assistance to owners/operators of public water systems in complying with the federal and state laws and regulations. They also assist state and federal agencies in eliminating environmental health hazards.

On April 4, 2010, state regulations – Title 179 NAC 7, *Siting, Design and Construction of Public Water Systems* -- became effective. As a result, public water systems can enter into a 3-year agreement to do water distribution main projects without having to submit plans and specifications to the Department for review and approval. These systems are subject to an annual audit by the Drinking Water Engineering Section as a condition of the agreement. In 2017, 21 annual audits were completed. As of December 31, 2017, a total of 22 public water systems had entered into a 3-year agreement with the Department.

Some of the additional major activities that staff members are currently participating in are the common pre-application review process for federal and state agencies' loan and grant programs for water and wastewater projects and Drinking Water State Revolving Fund (DWSRF) program activities. The DWSRF program is administered jointly by the Department and the Nebraska Department of Environmental Quality (NDEQ).

Safe Drinking Water Information System

The Safe Drinking Water Information System (SDWIS) is available to all field personnel in their offices and in the field, as well as to those who work in the drinking water program in the Lincoln office. This system was developed by EPA for states to report water quality data. It provides information on all public water system facilities, test results, violations, compliance assistance, enforcement, compliance schedules, water operator licensure, and PWS operating permits. SDWIS is used in over 40 states. It receives electronic sample data from the Department Laboratory and all laboratories that perform analyses for the Department.

Monitoring and MCL Violations, and Assessments

There were no waterborne diseases or deaths reported due to Nebraska public water systems in 2017.

A public water system is required to monitor and verify the presence or absence of contaminants. If a contaminant is present in the water, the system must monitor and verify that it does not exceed the maximum contaminant level (MCL). An MCL is the amount of a substance that is allowed to be in the water before the system must take corrective action to lower the level. Levels of substances below the MCL are not considered to be harmful to health. In 2017, only 6 of 87 contaminants for which community public water systems monitor were found in quantities above the MCL. That means 81 contaminants for which monitoring was conducted were not found above the MCL in *any* community water system in Nebraska.

A major monitoring violation occurs when no valid samples are obtained. Significant monitoring violations are defined as any major monitoring violation that has occurred during a specified reporting period, which differs for each contaminant.

The following tables summarize the types of violations issued in calendar year 2017 and the number of public water systems that received violations. There were a total of 530 violations from 326 public water systems for MCLs and monitoring. There were no treatment technique violations and there were no public notice violations in Nebraska in 2017.

Revised Total Coliform Rule (RTCR)

The objective of the RTCR is to increase public health protection through the reduction of potential pathways of entry for fecal contamination into distribution systems. The new rule is based on a “find and fix” approach and has established a MCL for *E. coli*. As with the prior Total Coliform Rule, all public water systems are required to monitor for the presence of coliform bacteria and routine monitoring is based on the system type and size. RTCR assessments and corrective actions are required based on these monitoring results. A system is required to do

Public Notice (PN) for failure to complete an assessment or corrective action, and for an Acute *E. coli* violation.

With this “find and fix” approach, Level 1 and Level 2 Assessments of the public water system are conducted in accordance with the RTCR. The assessments are meant to evaluate a system and try to find the reasons for the Total Coliform or *E. coli* detects.

A Level 1 Assessment is triggered when total coliform is found in the system. The public water system is responsible for conducting the Level 1 Assessment and for returning the completed Level 1 paperwork to their Field Area Representative who reviews and accepts it or returns it for further information. Identified defects noted in the Assessment are required to be corrected in a timely manner.

A Level 2 Assessment is triggered when a system incurs multiple Level 1 Assessments in a running 12-month period, or if a system has a confirmed *E. coli* presence within their system. The Level 2 Assessment is a more detailed analysis of the public water system, with many similarities to a sanitary survey. A Department Field Area Representative conducts Level 2 Assessments with a representative of the public water system. Level 2 paperwork is completed and identified defects are noted. The system is sent a letter and copy of the paperwork, and is responsible for responding to the letter in a timely manner with a timeline of when the defects found will be corrected.

RTCR Assessments

(All public water systems must monitor for total coliform bacteria.)

Type of RTCR Assessment	Number of Assessments Triggered	Number of Systems	% of Systems with Assessments
Level 1, Multiple TC +	134	134	10.0%
Level 2, 2 nd Level 1 triggered	106	83	6.2%
Level 2, <i>E. coli</i> MCL triggered	7	7	0.5%

RTCR Violations

Type of RTCR Violation	Number of Violations Issued	Number of Systems	% of Systems with Violations
Treatment Technique, Level 1 requirements not met	5	5	0.4%
Treatment Technique, Level 2 requirements not met	8	3	0.2%
MCL – <i>E. coli</i> +	8	7	0.5%
Monitoring, Additional Routine, Major Routine	81	73	5.4%

Nitrate-Nitrite Violations

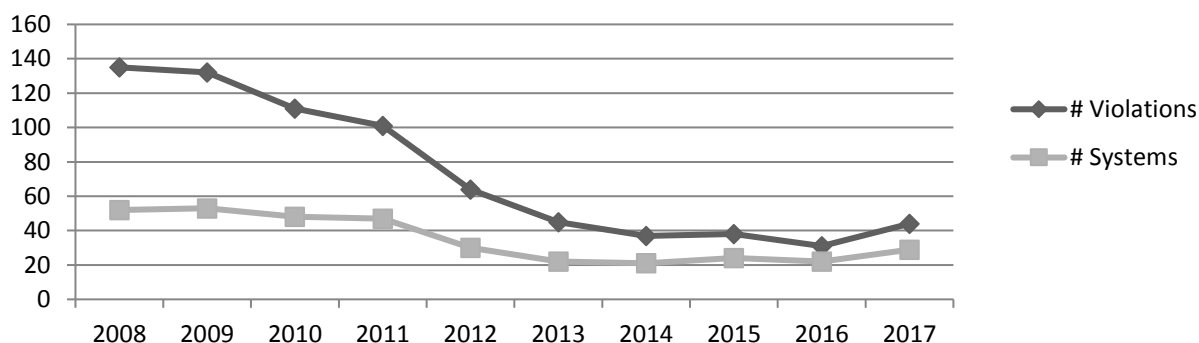
This listing is separate from other Inorganic Contaminants because only Community and Non-transient, non-community systems monitor for other inorganic contaminants, while ALL public water systems monitor for Nitrate-Nitrite.

The number of nitrate-nitrite MCL violations increased by one and the number of monitoring violations decreased from the previous year.

Violation	Number of Violations	Number of Systems	% of Systems with Violations
MCL – 10 mg/l	44	29	2.2%
Monitoring	13	12	0.9%

Nitrate-nitrite violations are considered acute violations. Immediate adverse health effects can be experienced when nitrate is consumed by the vulnerable population of pregnant women, infants under six months of age, and nursing mothers. The system is significantly out of compliance when it receives one violation. A system is issued an Administrative Order to correct a nitrate contamination problem if two acute nitrate-nitrite violations are issued within a consecutive three quarter period.

Acute Nitrate MCL Violations



Looking at the past 10 years, the number of nitrate MCL violations has decreased significantly in the past seven years.

Public Notification

Rule	Number of Violations	Number of Systems
Consumer Confidence Rule	11	3

Volatile Organic Chemical (VOC) Violations

(Only Community and Non-transient, non-community systems monitor for VOCs.)

VOC Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with Violations
1,1-Dichloroethylene	0	0	0	0.0%
1,1,1-Trichloroethane	0	0	0	0.0%
1,1,2-Trichloroethane	0	0	0	0.0%
1,2-Dichloroethane	0	0	0	0.0%
1,2-Dichloropropane	0	0	0	0.0%
1,2,4-Trichlorobenzene	0	0	0	0.0%
Aldrin	0	2	2	0.15%
Benzene	0	0	0	0.0%
Carbon tetrachloride	0	0	0	0.0%
cis-1,2-Dichloroethylene	0	0	0	0.0%
Dicamba	0	1	1	0.07%

Volatile Organic Chemical (VOC) Violations Continued

VOC Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with Violations
Dichloromethane	0	0	0	0.0%
Metribuzin	0	2	2	0.15%
Monochlorobenzene	0	0	0	0.0%
o-Dichlorobenzene	0	0	0	0.0%
para-Dichlorobenzene	0	0	0	0.0%
Styrene	0	0	0	0.0%
Tetrachloro-ethylene	0	0	0	0.0%
Toluene	0	0	0	0.0%
trans-1,2-Dichloroethylene	0	0	0	0.0%
Trichloroethylene	0	0	0	0.0%
Vinyl chloride	0	0	0	0.0%
Xylenes (total)	0	0	0	0.0%

Inorganic Chemical (IOC) Contaminant Violations

(Only Community and Non-transient, non-community systems monitor for Inorganic Chemicals.)

Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with MCL Violations
Antimony	0	0	0	0%
Asbestos	0	0	0	0%
Arsenic	16	0	7	0.5%
Barium	0	0	0	0%
Beryllium	0	0	0	0%
Cadmium	0	0	0	0%
Chromium total	0	0	0	0%
Cyanide (as free cyanide)	0	0	0	0%
Fluoride	0	0	0	0%
Mercury	0	0	0	0%
Nickel	0	0	0	0%
Selenium	0	0	0	0%
Sodium	0	0	0	0%
Thallium	0	0	0	0%

Non-Volatile Synthetic Organic Chemical (SOC) Contaminants

(Only Community and Non-transient, non-community systems monitor for Non-Volatile Synthetic Organic Chemicals.)

Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with Violations
2,3,7,8-TCDD (Dioxin)	0	0	0	0%
2,4-D	0	1	1	0%
2,4,5-TP	0	1	1	0%
Alachlor (Lasso)	0	2	2	0.15%
Atrazine	0	2	2	0.15%
Benzo[a]pyrene	0	2	2	0.15%
Butachlor	0	2	2	0.15%
Carbaryl	0	1	1	0%
Carbofuran	0	1	1	0%

Non-Volatile Synthetic Organic Chemical (SOC) Contaminants Continued

Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with Violations
Chlordane	0	0	0	0%
Dalapon	0	1	1	0%
Di(2-ethylhexyl)adipate	0	2	2	0.15%
Di(2-ethylhexyl)phthalate	0	2	2	0.15%
Dibromochloropropane	0	1	1	0.07%
Dieldrin	0	2	2	0.15%
Dinoseb	0	1	1	0.07%
Diquat	0	1	1	0.07%
Endothall	0	0	0	0%
Endrin	0	2	2	0.15%
Ethylene dibromide	0	1	1	0.07%
Glyphosate	0	0	0	0%
Heptachlor	0	2	2	0.15%
Heptachlor epoxide	0	2	2	0.15%
Hexachlorobenzene	0	2	2	0.15%
Hexachlorocyclopentadiene	0	2	2	0.15%
Lindane	0	0	0	0%
Methomyl	0	1	1	0.07%
Methoxychlor	0	2	2	0.15%
Oxamyl (Vydate)	0	1	1	0.07%
Pentachlorophenol	0	1	1	0.07%
Picloram	0	1	1	0.07%
Polychlorinated biphenyls	0	0	0	0%
Propachlor	0	1	1	0.07%
Simazine	0	2	2	0.15%
Toxaphene	0	0	0	0%

Radionuclides

(Only Community water systems monitor for Radionuclides.)

Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with Violations
Gross Alpha Including Radon and Uranium	0	0	0	0.0%
Uranium Mass	3	1	1	0.7%
Combined Radium (Radium - 226 and Radium -228)	0	0	0	0.0%

Disinfection Byproducts

(Only water systems that disinfect their water, monitor for Disinfection Byproducts and Disinfectant Residuals.)

Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems
Total Trihalomethanes	5	0	3
Total Haloacetic Acids	0	0	0

Disinfection Byproducts Stage 1 Monitoring

Violation	# Violations	# Systems
Qualified Operator Failure	1	1

Disinfection Byproducts Monitoring Plan

	# Violations	# Systems
Failure to have a plan	0	0

Disinfectant Residual

MRDL	Treatment Technique # Violations	Treatment Technique # Systems	Monitoring # Violations	Monitoring # Systems
0	0	0	1	1

Lead and Copper Rules

(Only Community and Non-transient, non-community water systems monitor for Lead and Copper.)

Contaminant	Number of Monitoring Violations	Number of Systems	Systems with Violations
Lead and Copper	0	0	0.0%

Surface Water Treatment Rules

Type of Violation	Number of Violations	Number of Systems
Treatment Technique	2	1
Monitoring	2	1
Record Keeping	0	0

Ground Water Rule

(All water systems who use ground water as their source water have to monitor for the Ground Water Rule.)

Type of Violation	Number of Violations	Number of Systems
Sanitary Survey – Failure to Address Deficiency	15	3
Sanitary Survey – Failure to Consult	1	1
Treatment Technique	0	0
Monitoring/Reporting/Recordkeeping	0	0

Administrative Orders Issued

The Public Water System Program issues an administrative order when a public water system is significantly out of compliance. (Each contaminant has different parameters that indicate what constitutes “significantly out of compliance.”) Once an administrative order is issued, MCL violations continue to be issued, but no other formal enforcement is initiated while the administrative order for violating that particular maximum contaminant level is in effect. Failure to comply with the terms of an administrative order can result in action by the Department to revoke the system’s permit to operate.

	Total Coliform Monitoring	Nitrate	Arsenic	DBP
Number of Orders	1	7	2	1
Population Affected	35	642	724	2494

The number of administrative orders for Total Coliform Monitoring violations decreased by 1 in 2017. Seven administrative orders were issued for nitrates, two more than 2016.

Variations and Exemptions

No variations or exemptions were issued in 2017. When they are issued, they require the approval of the Advisory Council on Public Water Supply.

MCL Violations other than Total Coliform/RTCR and Nitrate

All maximum contaminant level violations other than total coliform and nitrate are considered to be chronic in nature, i.e., the adverse health effects are evident only after exposure over a long period of time. These contaminants are listed at the end of this report. When a contaminant other than total coliform and nitrate is present in a water system, the public water system must monitor quarterly for that contaminant. If the level decreases, the monitoring frequency may be

reduced. A public water system is issued an administrative order to correct a chronic contamination problem after a specified number of MCL violations are issued. If the contaminant is measured above the “unreasonable risk to health” level, an administrative order is issued immediately.

Population Affected by Various Contaminants

Contaminant	Population
Arsenic	2,535
Uranium Mass	87
Nitrate/Nitrite	35,609

Nebraska Public Health Environmental Laboratory (NPHEL)



The DHHS Public Health Environmental Laboratory tested more than 67,500 samples in CY2017, which was about an 8% decrease from last year. Approximately 63% of the laboratory’s tests are for public water systems across the state which reflects a decline of 5%. Around 26.5% of the lab’s testing was performed for the Nebraska Department of Environmental Quality, primarily in their Water Quality Division. About 1.4% was directly for the Nebraska Drinking Water program. Private customers accounted for about 7.5% of the samples. Total coliform still accounts for about 36% of the laboratory

tests. Total coliform testing has a very short holding time of 30 hours from collection to incubation, so ongoing US Postal Service issues continue to cause a struggle for clients to get their samples to the lab on time.

Of the Colilert presence/absence tests, 3.34% were positive for Total Coliform and 0.05% of those were positive for *E. coli*. Of the Colilert Quantitray tests, 30.0% were positive for Total Coliform and 0.8% of those were positive for *E. coli*. One percent of the PWS routine bacti samples were rejected due to excessive age upon receipt.

The following table shows a comparison of the larger volume test numbers for the last few years:

Number of Tests Done

Test Type	2017	% Change from CY2016	2016	2015	2014
Total Coliform/E.coli	24,109	-3.56	25,000	24,143	23,839
Nitrate	8,069	0.0	8,070	7,753	7,806
Lead/Copper	4,809	-16.4	5,753	4,086	4,224
VOCs (Volatile Organic Compounds)	1,079	-1.1	1,091	1,073	1,018
Pesticides	498	-34.6	761	693	551
Uranium (mass)	566	2.4	553	703	819
Arsenic	1,414	-2.8	1,454	1,491	1,148
Blood Alcohol	692	-49.6	1,373	2,091	2,165

Test Type	2017	%Change from CY2016	2016	2015	2014
Chloride	2,558	-14.8	3,001	2,479	2,571
Total Suspended Solids	2,725	-12.0	3,095	2,650	2,590

Number of Tests by Analytical Area

Analytical Area	Test Count	% of Total	Change from 2016
Organics and Radon	3,625	5.7	-7.7%
Inorganics	24,313	36.0	-8.8%
Metals/Minerals	12,990	19.2	-11.1%
Bacteriological	24,422	36.2	-3.39%
Air	445	0.66	-7.1%
Alcohols	692	1.03	-49.6%
Routine Contract Lab	1,009	1.49	-1.1%

The laboratory purchased some minor ancillary equipment in 2017, but no new major pieces of equipment were put into service. The lab is hoping to do so in 2018 as several instruments are nearing obsolescence.

Lab fees remained the same in CY 2017 and will hold throughout 2018. Paying lab invoices by credit card, debit card and electronic check continues to be popular with clients.

The Drinking Water Laboratory Certification Office currently certifies five labs for coliform and two labs for nitrate testing.

For more information call Nebraska Public Health Environmental Laboratory at (402) 471-2122.

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ATTACHMENT A

Definition of a Public Water System in the Safe Drinking Water Act:

Public water system means a system for providing the public with water for human consumption through pipes, or after August 5, 1998, other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least sixty days per year.

Public water system includes:

- any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Public water system does not include a special irrigation district. A public water system is either a community water system or a non-community water system.

Service connection does not include a connection to a system that delivers water by a constructed conveyance other than a pipe if:

- (i) the water is used exclusively for purposes other than residential uses, consisting of drinking, bathing, cooking, and other similar uses,
- (ii) the department determines that alternative water to achieve the equivalent level of public health protection provided by the Nebraska Safe Drinking Water Act and rules and regulations under the act is provided for residential or similar uses for drinking and cooking, or
- (iii) the department determines that the water provided for residential or similar uses for drinking, cooking and bathing is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the Nebraska Safe Drinking Water Act and the rules and regulations under the Act.

Special irrigation district means an irrigation district in existence prior to May 18, 1994, that provides primarily agricultural service through a piped water system with only incidental residential or similar users if the system or the residential or similar users of the system comply with exclusion provisions of subdivision (ii) or (iii) of this subdivision.

ATTACHMENT B

Safe Drinking Water Standards

The purpose of setting drinking water standards is to limit the level of contaminants that can be in water which the citizens of Nebraska consume so that they are protected from harm.

Contaminants which might be found in water are grouped into three categories:

1. **Natural pathogens:** These are disease-causing microorganisms that can occur in source water or in the distribution system. They can be bacteria, protozoans, or viruses. These organisms can be transmitted by humans, and in many cases by animals. Exposure to them in even small amounts in drinking water can cause illness rapidly. Examples include *Cryptosporidium* and *giardia lamblia*.
2. **Organic, inorganic and radioactive chemicals:** These can be man-made, or they may occur naturally. Examples include carbon tetrachloride (organic – carbon-based), arsenic (inorganic -- compounds which are not carbon-based), and radon (radioactive). Health effects from most of these substances occur after long-term exposure to low concentrations. These substances may come from a variety of sources, such as contamination of the aquifer or from naturally occurring elements.
3. **Treatment Process Chemicals and Byproducts:** Disinfectants and coagulants are chemicals used in treatment plants to purify drinking water. Some of the chemicals have health effects themselves and must be used carefully. With other substances, the treatment, such as chlorine, may produce chemical byproducts, such as trihalomethanes, which may be harmful to health.

Between 1975 and 1980, EPA established standards for 23 different contaminants. With the passage of the Safe Drinking Water Act in 1974, EPA specified a maximum contaminant level (MCL) and a monitoring or sampling frequency for each contaminant. Minimum treatment requirements were established for contaminants that could not be monitored in a practical way.

In the 1980s, reports of drinking water contamination by substances such as industrial solvents and pathogenic organisms aroused concern about the adequacy of the program. The 1986 Amendments to the Safe Drinking Water Act required EPA to address 87 new contaminants within three years, to be followed by regulation of 25 more contaminants every three years thereafter. To date, all but seven of the 1986 regulations have been finalized. Public water systems must test for the following contaminants.

Inorganic Chemicals

All the following maximum contaminant levels (MCLs) for inorganic chemical contaminants apply to community water systems. All the following MCLs for inorganic chemicals, except the MCL for fluoride, apply to Non-transient, non-community water systems. Only the MCLs for nitrate, nitrite, and total nitrate and nitrite apply to transient, non-community systems.

Inorganic Contaminants

	<u>MCL (mg/l)</u>
Antimony	0.006
Asbestos (fibers >10 μ m)	7 million fibers/liter
Arsenic	0.05
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium total	0.10
Cyanide (as free cyanide)	0.2
Fluoride*	4.0
Mercury	0.002
Nickel	0.1
Nitrate (as Nitrogen)	10
Nitrite (as Nitrogen)	1
Total Nitrate and Nitrite (as Nitrogen)	10
Selenium	0.05
Sodium	500.0
Thallium	0.002

*Community water systems experiencing fluoride levels above 2.0 milligrams per liter must notify the public.

Synthetic Organic Chemicals

The following maximum contaminant levels for organic chemical contaminants apply to community and non-transient, non-community water systems.

Volatile Organic Chemical Contaminants

	<u>MCL (mg/l)</u>
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,2,4-Trichlorobenzene	0.07
Benzene	0.005
Carbon tetrachloride	0.005
cis-1,2-Dichloroethylene	0.07
Dichloromethane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002

Xylenes (total)	10
<u>Non-Volatile Synthetic Organic Chemical Contaminants</u>	<u>MCL (mg/l)</u>
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4-D	0.07
2,4,5-TP	0.05
Alachlor	0.002
Atrazine	0.003
Benzo[a]pyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Di(2-ethylhexyl)adipate	0.4(22)
Di(2-ethylhexyl)phthalate	0.006
Dibromochloropropane	0.0002
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls	0.0005
Simazine	0.004
Toxaphene	0.003

Microbiological

The maximum contaminant levels for coliform bacteria, applicable to all public water systems, are as follows:

The MCL is zero, based on the presence or absence of total coliforms and/or *E. coli* in a sample, rather than coliform density.

Radionuclides

Combined radium-226 and radium-228 - 5 pCi per liter.

Gross alpha particle activity including radium-226 but excluding radon and uranium - 15 pCi per liter.

Uranium – 30 µg/L

Disinfection Byproducts

Byproduct	MCL (mg/L)
Total Trihalomethanes (TTHMs)	0.080
Haloacetic acids (five) HAA5	0.060
Bromate	0.010
Chlorite	1.0

Maximum Residual Disinfectant Levels (MRDLs)

DISINFECTANT RESIDUAL	MRDL (MG/L)
Chlorine	4.0 (as Cl ₂)
Chloramines	4.0 (as Cl ₂)
Chlorine dioxide	0.8 (as ClO ₂)

Lead and Copper

Before and after a PWS evaluates corrosion control treatment, it must test for:

- pH
- conductivity
- calcium
- alkalinity
- water temperature
- orthophosphate (when an inhibitor containing an orthophosphate compound is used)
- silicate (when an inhibitor containing a silicate compound is used)

Contaminants which public water systems test for, but which are not regulated, include:

Inorganic Chemical

Sulfate

Volatile Organic Chemicals

Chloromethane	Bromomethane
Chlorodibromomethane	1,2,3-Trichloropropane
1,1,1,2-Tetrachloroethane	Chlorobenzene
Chloroethane	m-Dichlorobenzene
2,2-Dichloropropane	1,1-Dichloropropene
o-Chlorotoluene	1,1-Dichloroethane
p-Chlorotoluene	1,1,2,2-Tetrachloroethane
Bromobenzene	1,3-Dichloropropane
1,3-Dichloropropene	

Pesticides and Other Synthetic Organic Chemicals

Aldrin	3-Hydroxycarbofuran
Butachlor	Methomyl
Carbaryl	Metolachlor
Dicamba	Metribuzin
Dieldrin	Propachlor

ATTACHMENT C

Advisory Council on Public Water Supply

Members as of December 31, 2017.

Glen Dostal (engineer), Omaha

Vacant (physician)

Ivan Van Dyke, (consumer), Norfolk

Robert Johnson, (consumer), Hastings

Paul Markowski (licensed operator of system serving 5,000 or fewer persons), Ord

Christopher Fox (licensed operator of a system serving over 5,000 persons), Omaha

Steven Kelley (member of a governing board of a public water system), Beatrice

Members of the Advisory Council are appointed by the Governor for three-year terms. They can be reappointed until they have served three consecutive three-year terms. In 2017, the Council met once.