

# Nebraska Public Water Supply Program Summary Report 2018

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 2018 Annual Report

January 1 to December 31, 2018

Nebraska's 23<sup>rd</sup> Annual Report



June 28, 2019

Nebraska Department of Health and Human Services  
Drinking Water Program

1200 N Street, Suite 400  
P.O. Box 98922  
Lincoln, NE 68509-8922  
Phone: (402) 471-6435  
Fax: (402) 471-6436  
TDD: (402) 471-9570

<http://deg.ne.gov/NDEQProg.nsf/OnWeb/PWS>

Available in alternate format

## To Obtain a Copy of the 2018 Public Water System Report

As required by the federal Safe Drinking Water Act, the State of Nebraska has made the 2018 Annual Public Water Systems report available to the public. Interested individuals can obtain a copy by accessing the DHHS website at:

<http://deq.ne.gov/NDEQProg.nsf/OnWeb/PWS>

The Office of Drinking Water

Telephone: 402-471-6435

Fax Number: 402-471-6436

E-Mail: [dhhs.drinkingwater@nebraska.gov](mailto:dhhs.drinkingwater@nebraska.gov)

Address: 1200 N Street, Suite 400  
P.O. Box 98922  
Lincoln, NE 68509-8922

## Terms Used In This Report

### *Capacity Development*

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.

### *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 to help understand the report, information on the source water for the PWS, the levels of any detected contaminants, and compliance or noncompliance information with drinking water regulations.

### *DHHS*

Department of Health and Human Services

### *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 DHHS, a monitoring violation occurs.

### *NDEQ*

Nebraska Department of Environmental Quality

### *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.

### *Safe Drinking Water Act*

See Attachment A

### *Safe Drinking Water Standards*

See Attachment B

### *Sanitary Survey*

For this report, 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.

### *Significant Monitoring Violations*

For this 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 DHHS 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.

DHHS 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://deq.ne.gov/NDEQProg.nsf/OnWeb/PWS>

## 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 of Health and Human Services (DHHS) 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.

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 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 2018 is available from the Drinking Water Program, 1200 N Street, Suite 400, P.O. Box 98922, Lincoln, NE 68509-8922, phone: 402-471-6435 or EPA's website at:

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

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

<http://deq.ne.gov/NDEQProg.nsf/OnWeb/PWS>

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

## Nebraska's Public Water Systems

### *Population and Type of System*

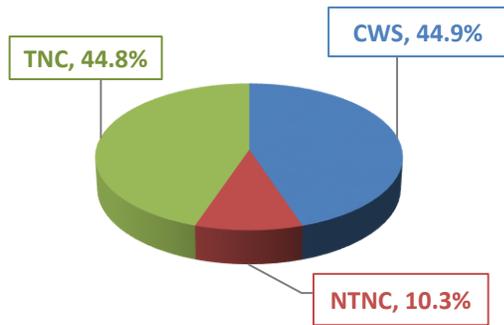
Nebraska public water systems can be broken down into categories based on the size of the population served and/or the type of population served.

Population	CWS	NTNC	TNC	Total Systems	Percentage*
< 101	104	75	513	692	51.3%
101-500	276	46	87	409	30.3%
501-1000	97	8	4	109	8.1%
1001-3300	87	8	0	95	7.0%
3301-10000	28	2	0	30	2.2%
10001-50000	11	0	0	11	0.8%
>50000	3	0	0	3	0.2%
<b>TOTAL</b>	606	139	604	1349	100%

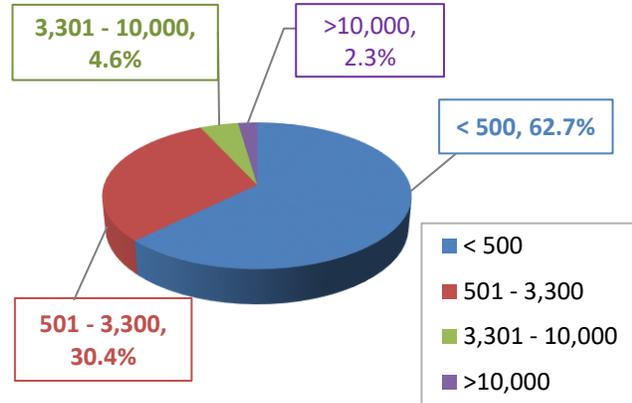
*\*Based on approximate population*

CWS = Community ..... 606 systems  
 NTNC – Non-transient, non-community ..... 139 systems  
 TNC = Transient, non-community ..... 604 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.

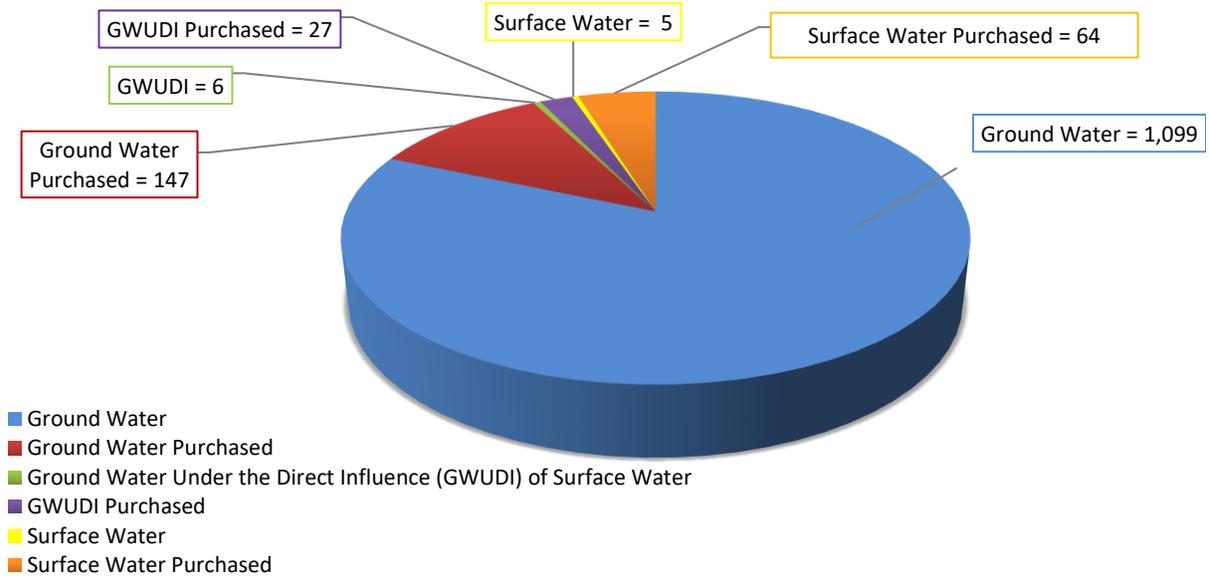
As you can see, over 60% of Nebraska's community water systems are below 500 people in size. Water systems with populations below 3,300 are considered to be "small systems" by the EPA. This makes Nebraska a predominantly small system state with 93.1% of all of the State's community public water systems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

## Public Water in Nebraska

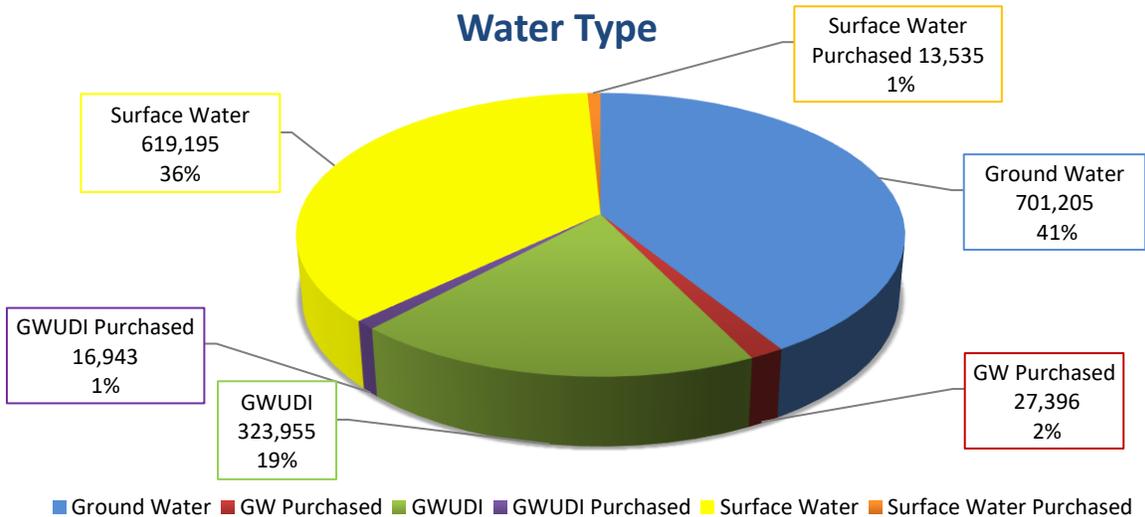
The Drinking Water Program at the Department of Health and Human Services administers the State's regulations governing public water systems (Title 179 NAC 2 through 26), promulgated under the State's SDWA pursuant to and in accordance with the federal SDWA. EPA promulgates rules and sets standards in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

Public water systems provide water to approximately 80% of the people of Nebraska. Private domestic wells provide water for other 20% of Nebraskans. Most of the water Nebraskans drink is ground water and only five public water systems in the state obtain their drinking water from surface water. Another 64 systems purchase water from those five systems. In addition, 6 systems utilize ground water under the influence of surface water (GWUDI), and 27 additional systems purchase water from those six systems. The remaining 1,125 systems use ground water, and an additional 147 systems purchase their water from another ground water system.

### Number of Systems by Source Water Type



### Public Water System Population Served by Source Water Type



\*Percentages rounded to nearest 1%

## What Nebraska's Public Water System Program Does

The Drinking Water Program has 31 full time equivalent positions (FTEs). The Monitoring and Compliance Section has 9, the Engineering Section has 8, the Field Services and Training Section has 12, and two FTEs contribute to the administration of the program.

## Drinking Water 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) with Level 1 and Level 2 assessments, 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.

### Field Services

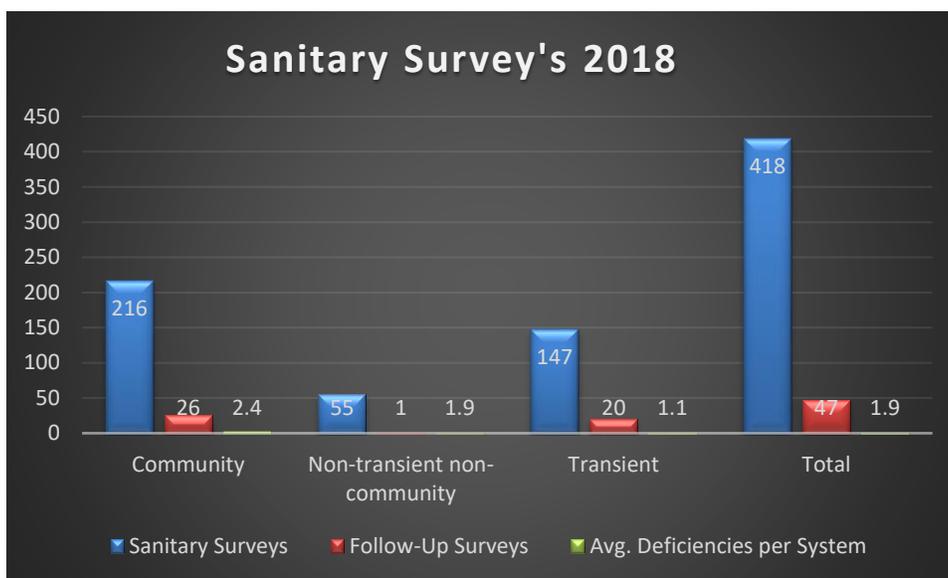
#### ***Sanitary Survey's***

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 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 2018, field personnel conducted 418 sanitary surveys (216 community, 55 non-transient non-community, and 147 transient public water systems) and 47 follow-up surveys (26 community, 1 non-transient non-community, and 20 transient public water systems). A total of 791 deficiencies were found in 2018. This reflects an overall deficiency rate of 1.9 deficiencies per sanitary survey in 2018. There was an average of 2.4 deficiencies found in community systems, an average of 1.9 deficiencies found in non-transient non-community water systems, and an average of 1.1 deficiencies in transient water systems. No deficiencies were found in 173 (41%) sanitary surveys done in 2018. The number of deficiencies found in Nebraska's public water systems declined by 14% from 2017 to 2018.

Outside of sanitary surveys, 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.



### Level 1 & Level 2 Assessments

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 a Level 1 assessment. Then field staff are responsible for completing the review of a Level 1 assessment.

A Level 2 assessment is triggered by either multiple Level 1 assessments within a running twelve-month period, or by the confirmed presence of *E. coli* in the system. The Level 2 assessment is conducted by field staff and provides a much more detailed evaluation of the public water system.

### Hypochlorinators

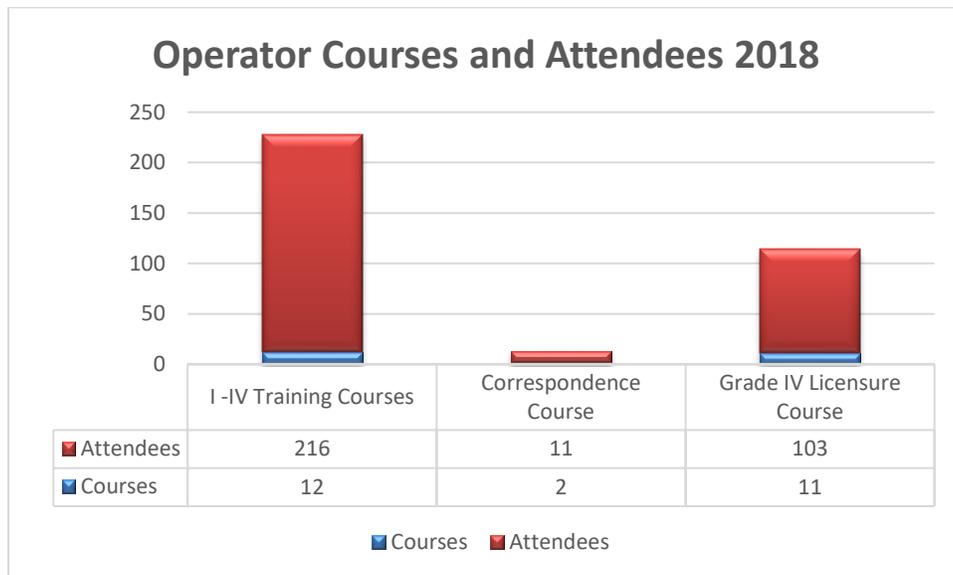
The Drinking Water Program maintains a number of hypochlorinators for temporary loan to public water systems when bacterial contamination is a source of concern. This assistance to communities in need of temporary chlorination of their water supplies has been very helpful in ensuring the safety of drinking 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.

During 2018 no fines were issued to individuals for "Practice (Operating) Without a License."

## Training

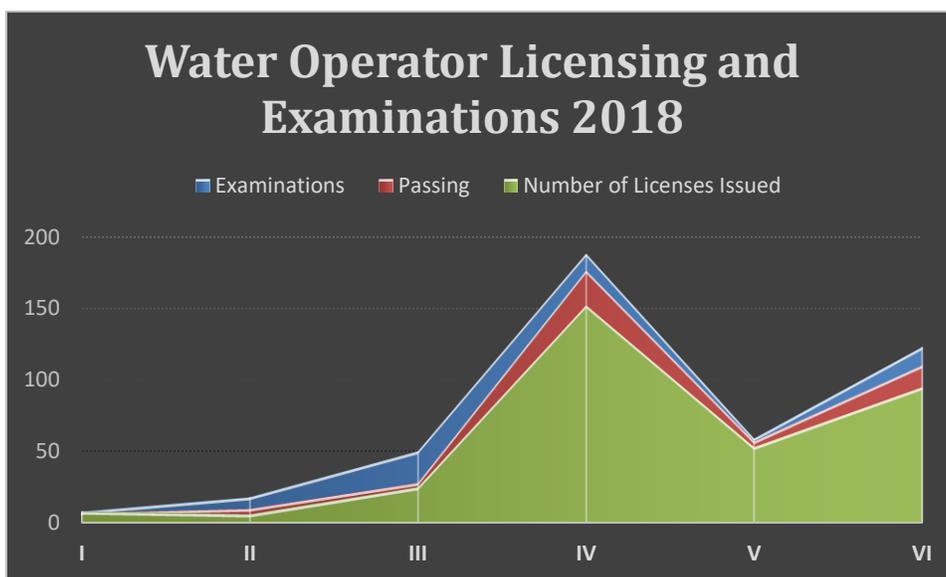
DHHS conducts emergency response training sessions around the state. This training focuses on the necessity of keeping a good working emergency response plan up-to-date and training all individuals who have a role in the plan.

In 2018, FS&T program personnel conducted 12 water operator training courses, Grades I through IV, with a total of 216 attendees. An additional 11 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), 11 courses were offered with a total of 103 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 2018:

Grade	Examinations	Passing	Number of Licenses Issued
I	8	7	8
II	18	10	6
III	50	28	25
IV	188	176	152
V	59	57	53
VI	123	110	95



The Drinking Water Program and other training providers offered continuing education opportunities for water operators in 2018. Coordinated by the program, a group informally known as the Water Operator Training Coalition convened periodically in 2018 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 2018, 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 126 workshops/seminars/conferences were offered in Nebraska in 2018 for the purpose of water operator continuing education. Of these, 42 focused primarily on backflow prevention continuing education for Grade VI operators.

### ***Capacity Development***

The Capacity Development Coordinator has been overseeing DHHS'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.

### ***DWSRF 2% Set-Aside Funds***

The Program's Capacity Development Coordinator, along with the 2% Team, assistance with applications for funding, and provide capacity development training, manuals, and mentorship to assist water systems. Team members include DHHS, 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. Two hundred seventy-seven contacts were made in 2018.

### ***2% Fund Utilization***

To ensure proper use of the funds for drinking water system maintenance or new construction, assessments are made by DHHS on water systems prior to beginning a project and then following startup and operation. There was one (1) initial assessment, and two (2) follow-up assessments completed by DHHS in 2018. The Department has found capacity development to be a proactive approach to help ensure adequate capacity and delivery of safe water to Nebraskans.

A concerted effort has been made to educate water system operators regarding their role in developing and maintaining adequate capacity for their water systems. The Capacity Development Coordinator coordinates with DHHS's Water Operator Training Coalition partners to provide training to water operators. Due to unforeseen staffing issues, DHHS was not able to provide this training in 2018.

### ***Education and Outreach***

The Capacity Development Coordinator held ten board/council information sessions were held to advise members about the legal and fiduciary responsibilities necessary to maintain adequate, safe water to their customers. A total of 62 board/council members attended, representing 10 community water systems. Coordination was also made with water Operator Training Coalition partners to provide capacity development training for water operators. Members include DHHS, 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 2018, as in past years, the Coalition produced a calendar identifying dates and locations of continuing education opportunities for distribution to licensed water operators.

## Drinking Water Engineering Section

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.

### ***Plan Reviews and Inspections***

The Drinking Water Engineering Section provides engineering plan review; issuance of construction permits; inspection of newly constructed projects for issuance of approvals for placement into service; 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.

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.

In 2018, DHHS received 178 sets of plans and specifications for the construction of water projects for review and approval. In addition, engineering staff conducted 170 inspections of constructed water projects.

### ***Annual Audits***

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 construct water distribution main projects without having to submit plans and specifications to DHHS 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 2018, 22 annual audits were completed and as of December 31, 2018, a total of 23 public water systems had entered into a 3-year agreement with the DHHS.

### ***Drinking Water State Revolving Fund***

The engineering staff also participates in the common pre-application review process for federal and state agencies' loan; grant programs for water and wastewater projects; and the Drinking Water State Revolving Fund (DWSRF) program activities

The annual DWSRF needs survey was sent out to all public water systems in 2017 to assess infrastructure needs for 2018. The surveys indicated 326 eligible projects with just over \$970.5 million in infrastructure needs. A ranking system developed by DHHS was used to prioritize and establish the funding order for DWSRF projects. The DWSRF closed 10 loans in 2018 for

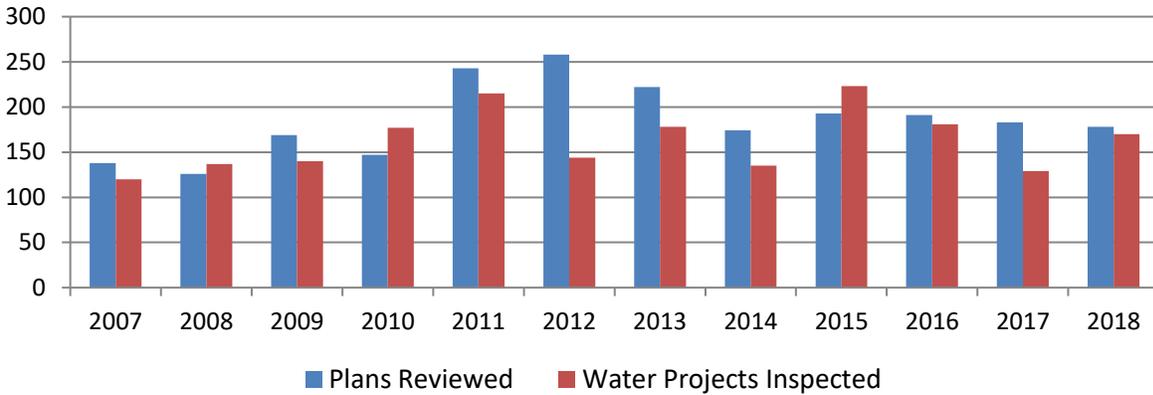
\$16,276,316, with \$2,919,864 of that provided in forgiveness assistance. In the fall of 2018, the Engineering Services staff drafted the next Intended Use Plan (IUP). In the fall of 2018, the Engineering Services staff began drafting the next Intended Use Plan (IUP). Each year the CWSRF and DWSRF publish an Intended Use Plan (IUP), which explains how the SRF programs will use capitalization grants received annually from the federal government, annual state matching funds, and current program funds to meet Nebraska's community needs and funding requirements for the State Fiscal Year (SFY), which runs from July 1<sup>st</sup> of a year to June 30<sup>th</sup>. IUPs also include a priority funding list for CWSRF and DWSRF projects, listing and prioritizing projects that are submitted by the communities to the program. Every year, IUPs undergo a public hearing and comment period and are presented to the Environmental Quality Council (EQC) for review and approval. Nebraska SFY 2020's IUP was reviewed and approved by the EQC on June 20, 2019 and will go into effect on July 1<sup>st</sup>, 2019.

The Drinking Water Engineering Section staff also reviewed and evaluated justifications provided by professional engineers for any new well site that does not meet the setback distances identified in Title 179 NAC 7. In 2018, a total of 9 new well site justifications were reviewed and approved. In addition, the engineering staff worked with NDEQ and city officials to evaluate encroachment issues that may be of concern to existing public drinking water wells. One encroachment issue was evaluated and resolved.

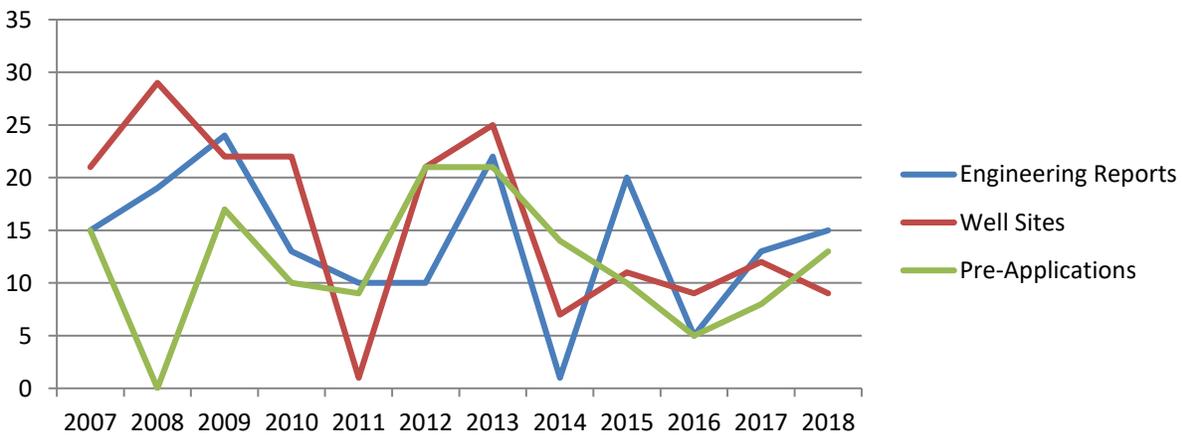
**SUMMARY OF THE DRINKING WATER ENGINEERING SECTION ACTIVITIES**  
*January 1, 2018 to December 31, 2018*

<b>ACTIVITIES</b>	<b>NUMBER</b>
Water Projects Received for Review and Approval	178
Water Projects Inspected	170
Engineering Reports for Water System Improvements Evaluated	15
New Water Well Sites Evaluated	9
Common Pre-Applications for Water/Wastewater Projects for Federal and State Financial Assistance Reviewed	13
Operation and Maintenance Manuals for Drinking Water State Revolving Loan Funded Projects Reviewed	3
Three-Year Agreements for Distribution Main Projects—Annual Audits Completed	22
Encroachment Issues	1

**Engineering Plans Reviewed/  
Water Projects Inspected**



**Engineering Evaluations**



**Monitoring and Compliance Section**

The Monitoring and Compliance (M&C) Section of the Drinking Water Program establishes monitoring schedules and reviews analytical results for contaminants in drinking water. In this review of analytical results, M&C personnel determine compliance with MCLs and issue appropriate enforcement actions, when necessary, to help a PWS return to compliance.

**Safe Drinking Water Information System**

The Safe Drinking Water Information System (SDWIS) was developed by EPA for States to report water quality data and provide information on all public water system facilities, test results, violations, compliance assistance, enforcement, compliance schedules, water operator

licensure, and PWS operating permits. It receives electronic sample data from the State of Nebraska Environmental Health Laboratory and the 4 contract laboratories (Midwest Lab, Hall County, American Ag, and Enviro Services) that perform analyses for DHHS.

DHHS is preparing for transition to cloud-based software called SDWIS PRIME. This transition includes staff training, implementing routine quality assurance and quality control measures and implementing standard data entry and reporting methods.

### ***Monitoring and MCL Violations, and Assessments***

A public water system is required to monitor for the presence of 83 different contaminants. If a contaminant is present in the water, the system must verify that it does not exceed the maximum contaminant level (MCL).

In 2018, only 6 of 83 contaminants for which community public water systems monitor were found in quantities above the MCL. That means 77 contaminants for which monitoring was conducted were not found above the MCL in *any* community water system in Nebraska.

Monitoring & Compliance is divided up into 9 different rules. Within each of the rules there are multiple contaminants, each having its own MCL. Below is a list of the rules:

- 1- RTCR
- 2- Disinfections Byproducts
- 3- Groundwater
- 4- Lead & Copper
- 5- IOC
- 6- Radionuclides
- 7- SOC
- 8- Surface Water Treatment
- 9- VOC

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

There were a total of 258 violations from 145 public water systems for MCLs and monitoring. There were no waterborne diseases or deaths reported due to drinking water contamination in public water systems. More detailed information on each of the monitoring rules follow the summary table below.

### ***Revised Total Coliform Rule (RTCR)***

The objective of the Revised Total Coliform Rule (RTCR) is to increase public health protection through the reduction of potential pathways of entry for fecal contamination into distribution systems. The rule established a MCL for *E. coli*, a type of pathogenic coliform bacteria that can be associated with drinking water contamination. 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 issue a Public Notice (PN) if they fail to monitor for bacteria, if *E.coli* bacteria are found, or for failure to complete an assessment or corrective action.

Assessments of the public water system are conducted in accordance with the RTCR. The assessments are meant to evaluate a system and try to determine the reasons for the presence of bacteria.

A Level 1 Assessment is triggered when total coliform is found in the system. The public water system conducts the Level 1 Assessment and it is reviewed by the Drinking Water Program. Identified deficiencies noted in the Assessment are required to be corrected in a timely manner.

A Level 2 Assessment is triggered when a system incurs more than one Level 1 Assessments in a running 12-month period, or if a system has a confirmed *E. coli* bacteria presence within their system. The Level 2 Assessment is conducted by the Drinking Water Program with a representative of the public water system. Level 2 paperwork is completed and identified deficiencies are noted and the system is responsible for correcting deficiencies in a timely manner.

\*Significant deficiencies must be corrected within 120 days and minor deficiencies must be corrected within 12 months

***RTCR Assessments 2018***

<b>Type of RTCR Assessment</b>	<b>Number of Assessments Triggered</b>	<b>Number of Systems</b>	<b>% of Systems with Assessments</b>
Level 1, Multiple TC +	114	114	8.4%
Level 2, 2 <sup>nd</sup> Level 1 triggered	97	66	4.9%
Level 2, <i>E. coli</i> MCL triggered	10	10	0.7%

***RTCR Violations 2018***

<b>Type of RTCR Violation</b>	<b>Number of Violations Issued</b>	<b>Number of Systems</b>	<b>% of Systems with Violations</b>
Treatment Technique, Level 1 requirements not met	0	0	0%
Treatment Technique, Level 2 requirements not met	0	0	0%
MCL – <i>E. coli</i> +	10	10	0.7%
Monitoring, Additional Routine, Major Routine	116	102	7.6%

***Nitrate-Nitrite Rule***

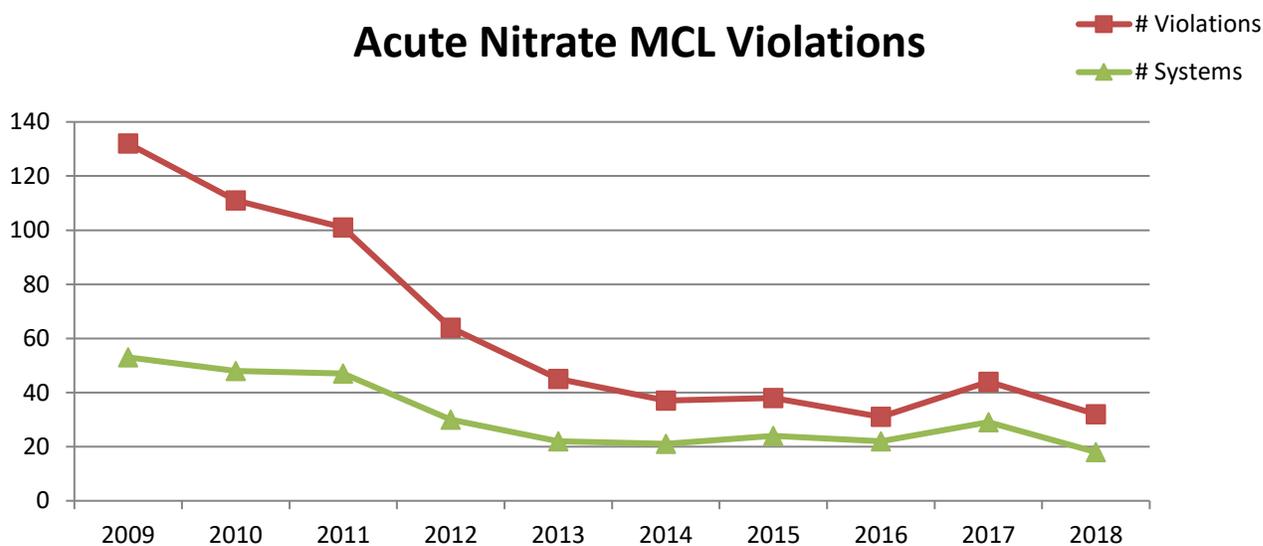
All public water systems monitor for nitrate-nitrite. Immediate adverse health effects can be experienced when high levels of nitrate or nitrite, above their respective MCLs, are consumed by pregnant women, infants under six months of age, and nursing mothers. A system is out of compliance when it receives one monitoring or MCL violation. A system is issued an Administrative Order to correct a nitrate contamination problem if two nitrate-nitrite violations are issued within a consecutive three quarter period.

A summary of the 2018 nitrate-nitrite violations is presented below along with historic data. Nitrate MCL violations have decreased significantly in Nebraska since 2009.

**Nitrate-Nitrite Violations 2018**

Violation	Number of Violations	Number of Systems	% of Systems with Violations
MCL – 10 mg/l	32	18	1.3%
Monitoring	11	10	0.9%

**Acute Nitrate MCL Violations**



**Public Notification Rule 2018**

Public Notification is required if a PWS receives a MCL, Monitoring, or acute violation. There were no systems in violation of the PN Rule.

Rule	Number of Violations	Number of Systems
Public Notification Rule	0	0

**Consumer Confidence Rule 2018**

The CCR Rule requires all community water systems to prepare and distribute a brief annual water quality report summarizing information regarding source water, detected contaminants, compliance, and educational information. There were no systems in violation of the CCR Rule.

Rule	Number of Violations	Number of Systems
Consumer Confidence Rule	0	0

**MCL Violations for Chronic Contaminants**

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 chronic contaminant is present in monitoring results of a water system, the PWS must monitor quarterly for that contaminant. And if the level decreases, the monitoring frequency may be reduced. A public water system is issued an AO to correct a chronic contamination issue after 3 quarterly MCL violations are issued in a rolling 12 month period. If the contaminant is measured above the “unreasonable risk to health” level, an AO is issued immediately.

Below are a list of tables that outline the type of contaminants and the number of violations issued for each.

**Volatile Organic Chemical (VOC) Violations 2018**

(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	3	3	0.2%
Benzene	0	0	0	0.0%
Carbon tetrachloride	0	0	0	0.0%
cis-1,2-Dichloroethylene	0	0	0	0.0%
Dicamba	0	0	0	0.0%

**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	3	3	0.2%
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 2018**

(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	5	0	3	0.2%
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 2018**

(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	0	0	0%
2,4,5-TP	0	0	0	0%
Alachlor (Lasso)	0	3	3	0.2%
Atrazine	0	3	3	0.2%
Benzo[a]pyrene	0	3	3	0.2%
Butachlor	0	3	3	0.2%
Carbaryl	0	0	0	0%
Carbofuran	0	0	0	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	0.0%
Dalapon	0	0	0	0.0%
Di(2-ethylhexyl)adipate	0	3	3	0.2%
Di(2-ethylhexyl)phthalate	0	3	3	0.2%
Dibromochloropropane	0	0	0	0.0%
Dieldrin	0	3	3	0.2%
Dinoseb	0	0	0	0.0%
Diquat	0	0	0	0.0%
Endothall	0	0	0	0.0%
Endrin	0	3	3	0.2%
Ethylene dibromide	0	0	0	0.0%
Glyphosate	0	0	0	0.0%

Heptachlor	0	3	3	0.2%
Heptachlor epoxide	0	3	3	0.2%
Hexachlorobenzene	0	3	3	0.2%
Hexachlorocyclopentadiene	0	3	3	0.2%
Lindane	0	3	3	0.2%
Methomyl	0	0	0	0.0%
Methoxychlor	0	3	3	0.2%
Oxamyl (Vydate)	0	0	0	0.0%
Pentachlorophenol	0	0	0	0.0%
Picloram	0	0	0	0.0%
Polychlorinated biphenyls	0	0	0	0.0%
Propachlor	0	3	3	0.2%
Simazine	0	3	3	0.2%
Toxaphene	0	0	0	0.0%

***Radionuclide Violations 2018***

(Only Community water systems monitor for Radionuclides.)

<b>Contaminant</b>	<b>Number of MCL Violations</b>	<b>Number of Monitoring Violations</b>	<b>Number of Systems</b>	<b>Systems with Violations</b>
Gross Alpha Including Radon and Uranium	1	0	1	0.0%
Uranium Mass	5	0	1	0%
Combined Radium (Radium - 226 and Radium -228)	0	0	0	0.0%

***Disinfection Byproduct Violations 2018***

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

<b>Contaminant</b>	<b>Number of MCL Violations</b>	<b>Number of Monitoring Violations</b>	<b>Number of Systems</b>
Total Trihalomethanes	0	0	0
Total Haloacetic Acids	0	0	0

***Disinfection Byproducts Stage 1 Monitoring***

Violation	# Violations	# Systems
Qualified Operator Failure	0	0

**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	0	0

**Lead and Copper Rule 2018**

(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 Rule 2018**

Type of Violation	Number of Violations	Number of Systems
Treatment Technique	3	2
Monitoring	3	2
Record Keeping	0	0

**Ground Water Rule 2018**

(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	7	2
Sanitary Survey – Failure to Consult	1	1
Treatment Technique	1	1
Monitoring/Reporting/Recordkeeping	0	0

**Administrative Orders 2018**

The Drinking Water Program issues an Administrative Order (AO) 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 AO is issued, MCL violations continue to be issued until the System returns to compliance. Failure to comply with the terms of an AO can result in administrative action or revoking the system's permit to operate.

	<b>Total Coliform Monitoring</b>	<b>Nitrate</b>	<b>Arsenic</b>	<b>DBP</b>
Number of Orders	2	2	1	0
Population Affected	196	1271	150	0

**Variations and Exemptions**

No variations or exemptions were issued in 2018.

**Population Affected by Various Contaminants**

<b>Contaminant</b>	<b>Population</b>
Arsenic	1,294
Uranium Mass	94
Nitrate/Nitrite	32,693

**Nebraska Public Health Environmental Laboratory (NPHEL)**

Approximately 61% of the Nebraska Public Health Environmental Laboratory tests in 2018 were for public water systems. 1.5% of the water samples tested were for the DHHS Drinking Water Program. Private customers accounted for about 8.25% water samples analyzed. Water samples analyzed for coliform bacteria accounted for about 36% of the laboratory tests. These samples have a very short holding time, 30 hours from collection to incubation. Delivery issues have resulted in delays for some systems/individuals in getting their samples to the lab within that time.

The following table shows the number of water samples analyzed over the last four years.

**Number of Water Samples Analyzed**

<b>Test Type</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
Total Coliform/E.coli	22,579	24,109	25,000	24,143
Nitrate	7824	8,069	8,070	7,753
Lead/Copper	4536	4,809	5,753	4,086
VOCs (Volatile Organic Compounds)	977	1,079	1,091	1,073
Pesticides	713	498	761	693
Uranium (mass)	646	566	553	703
Arsenic	1089	1,414	1,454	1,491
Blood Alcohol	827	692	1,373	2,091
Chloride	2439	2,558	3,001	2,479
Total Suspended Solids	2446	2,725	3,095	2,650

The laboratory laid the groundwork in 2018 for the necessary upgrades to lab instrumentation which will occur in 2019.

Lab fees will remain the same through 2019.

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

For more information call NPHEL 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 DHHS 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 DHHS 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**

	<b><u>MCL (mg/l)</u></b>
Antimony	0.006
Asbestos (fibers >10 µm)	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**

	<b><u>MCL (mg/l)</u></b>
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)	$3 \times 10^{-8}$
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 <sub>2</sub> )
Chloramines	4.0 (as Cl <sub>2</sub> )
Chlorine dioxide	0.8 (as ClO <sub>2</sub> )

**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, 2018.

Glenn Dostal (engineer), Omaha  
James Persson (physician), Omaha  
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  
Mike Stanzel (member of a governing board of a public water system), Valley

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 2018, the Council met once.