

Nebraska's Public Water System Program 2014 Annual Report

January 1 to December 31, 2014

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



June 30, 2015

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http://dhhs.ne.gov/publichealth/Pages/enh_pwsindex.aspx

Available in alternate formats

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To Obtain a Copy of the 2014 Public Water System Report

As required by the federal Safe Drinking Water Act, the State of Nebraska has made the 2014 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/publichealth/Pages/enh_pwsindex.aspx

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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 programs. 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

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 EPA regional offices report the information for Wyoming, the District of Columbia, and all Indian Lands except the Navaho Nation. EPA regional offices also report federal enforcement actions taken. Data retrieved from SDWIS/FED form the basis of this report.

The following report is a summary of the compliance of Nebraska's public water systems with the Safe Drinking Water Act during 2014, 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.

The mission of the Public Water System Program of the Division of Public Health of the Nebraska Department of Health and Human Services (Department) is to protect the health and welfare of Nebraskans by assuring safe, adequate, and reliable drinking water.

People expect their drinking water will be safe when they turn on the faucet. Program staff work in many arenas to assure safe drinking water.

More information about systems with violations that occurred in 2014 is available from the Division of Public Health of the Nebraska Department of Health and Human Services, 301 Centennial Mall South, P.O. Box 95026, Lincoln, NE 68509, phone 402-471-2541 or at EPA's website:

http://www.epa.gov/enviro/html/sdwis/sdwis_ov.html

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

http://dhhs.ne.gov/publichealth/Pages/enh_pwsindex.aspx

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 public health. Notices must be provided to persons served (not just billing consumers).

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

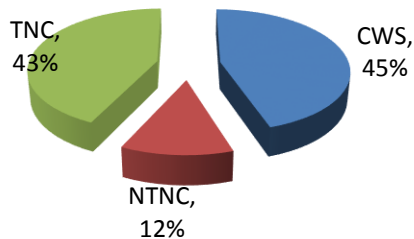
Nebraska public water systems can be broken down into categories based on the size of the population served.

Population	CWS	NTNC	TNC	Total Systems	Percentage*
<100	93	84	484	661	50.4%
101-500	277	51	82	410	31.3%
501-1000	96	4	2	102	7.8%
1001-3300	88	7	0	95	7.2%
3301-10,000	27	4	0	31	2.4%
10,001-50,000	11	0	0	11	0.8%
>50,000	2	0	0	2	0.2%
TOTAL	594	150	568	1312	100%

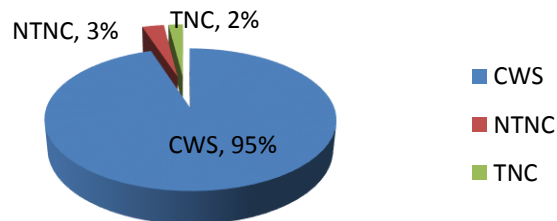
CWS = Community 594 systems
 NTNC – Non-transient, non-community 150 systems
 TNC = Transient, non-community 568 systems

* Percentages have been rounded off.

System Types



Population Served



As you can see, 45% of all public water systems are community water systems that serve 95% of the population. Forty-three percent of the systems are transient systems, but they serve only 2% of the population. And 12% of the systems are non-transient non-community

water systems that serve 3% of the population. It's interesting to note that Nebraska is predominantly a small system state with 96.7% of all of Nebraska's public water systems serving 3,300 or fewer persons.

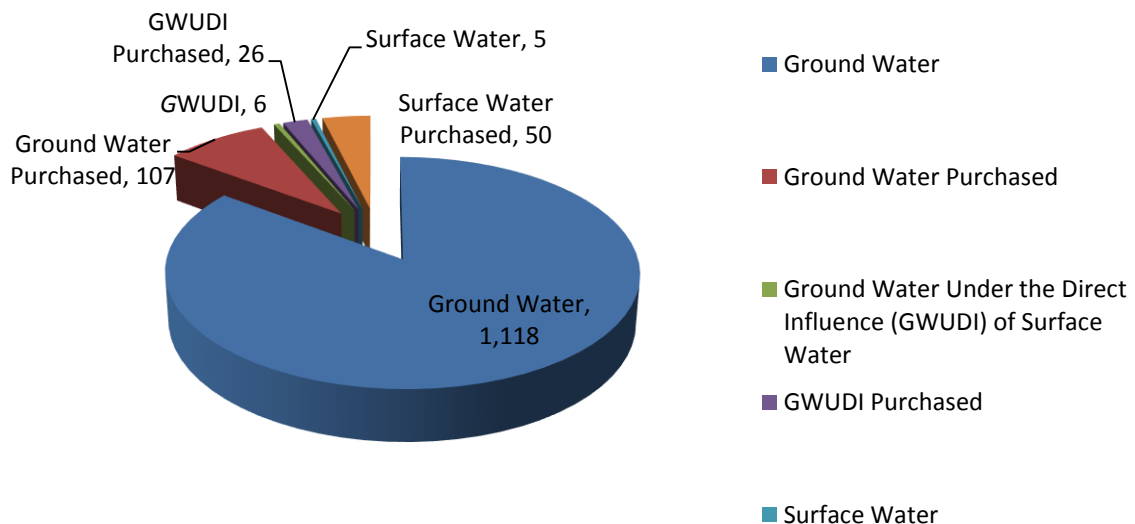
Public Water In Nebraska

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 22), 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.

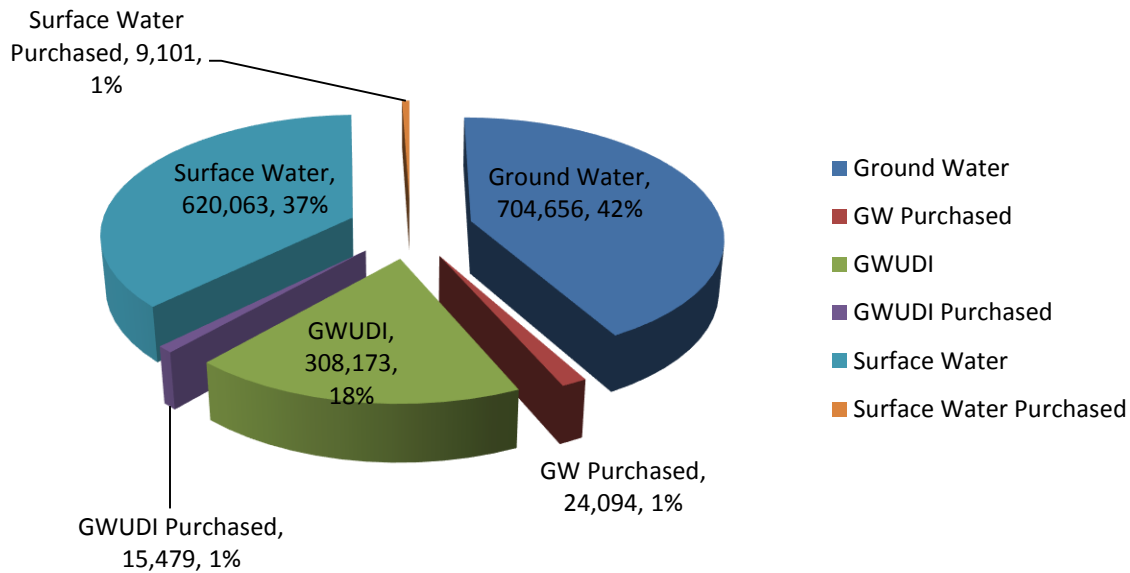
These rules are generated by EPA in accordance with the federal SDWA and its amendments. The SDWA includes water quality standards, and requirements for sampling, treatment and public notification. The Act affects approximately 1,312 public water systems in Nebraska. (The number of public water systems varies as new ones open and existing ones close.) Public water systems provide water to approximately 80 percent of the people of Nebraska. Private domestic wells provide water for other Nebraskans.

Most of the water Nebraskans drink is groundwater. Only five public water systems in the state obtain their drinking water from surface water. Another 50 systems purchase water from those five systems. In addition, six systems utilize groundwater under the influence of surface water (GWUDI), and 26 additional systems purchase water from those six systems. The remaining systems use ground water, including 107 systems that purchase their water from another system.

Number of Systems by Source Water Type



Population Served by Source Water Type



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 Division of Public Health of the Nebraska Department of Health and Human Services, 301 Centennial Mall South, P.O. Box 95026, Lincoln, NE 68509, phone 402-471-2541.

What Nebraska's Public Water System Program Does



The Public Water System Program has 35 full time equivalent positions (FTEs). The Monitoring and Compliance Section has 13, the Engineering Section has eight, the Field Services and Training Section has 13, and portions of two other 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, a water system security 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 and Lincoln to provide close contact and timely assistance to Nebraska's public water systems. The North Platte and Norfolk offices each serve two field areas.

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.

In 2014, field personnel conducted 368 sanitary surveys (191 community, 45 non-transient non-community, and 132 transient public water systems) and 43 follow-up surveys (29 community, 6 non-transient non-community, and 8 transient public water systems). When deficiencies are found, the system is notified of the needed improvements. A total of 1,000 deficiencies were found in 2014 (20 fewer deficiencies than the previous year, with 42 fewer

sanitary surveys having been done). This reflects an overall deficiency rate of 2.7 deficiencies per sanitary survey in 2014. There was an average of 3.0 deficiencies found in community systems, an average of 4.1 deficiencies found in non-transient non-community water systems, and an average of 1.9 deficiencies in transient water systems. Overall, there was a 2% decrease in deficiency numbers from 2013 to 2014.

No deficiencies were found in 134 (36.4%) sanitary surveys done in 2014 (55 CWS, 16 NTNC and 63 TNC). If we adjust for these surveys where there were no deficiencies, the systems that had deficiencies averaged 4.3 per survey.

Nebraska's public water systems continue to be relatively stable regarding the average number of deficiencies found during sanitary surveys.

Field personnel 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.

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 2014 no fines were issued to individuals for "Practice (Operating) Without a License."



In 2014, FS&T program personnel conducted ten water operator training courses Grade I through IV, with a total of 156 attendees. An additional ten persons completed the correspondence course that is also offered to prepare for Grade IV licensure examination. For Grade VI licensure (backflow preventer testing and repair), nine courses were offered with a total of 86 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 at each grade level.

Number of Water Operator Licenses Issued In 2014

Grade	Examinations	Passing	Number of Licenses Issued
I	4	2	2
II	10	7	7
III	31	22	26
IV	147	122	104
V	44	37	30
VI	103	95	70

FS&T program personnel joined other professionals in educating children on the value of groundwater at the annual Children's Groundwater Festival in May.

The Drinking Water Program and other training providers offered continuing education opportunities for water operators in 2014. Coordinated by the program, a group informally known as the Water Operator Training Coalition convened periodically in 2014 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 2014, 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 175 workshops/seminars/conferences were offered in Nebraska in 2014 for the purpose of water operator continuing education. Of these, 43 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 Loan Fund.

To provide a measurement for financial and managerial capacity for a project that has been funded by the State Revolving Loan Program, assessments are 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 year, a follow-up assessment is done to show the improvement that has been accomplished with the funding that was provided. In 2014 there were five initial assessments completed.

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 21

sessions for operators, which included two conference presentations 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.

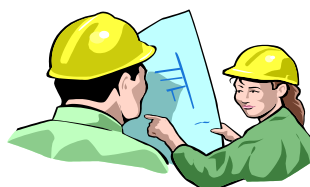
These training sessions involved 325 attendees representing 171 systems.

Sixteen 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 101 board/council members attended, representing 16 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. 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.

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 10 emergency calls in 2014. 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.



Engineering Services Section

The Engineering Services 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.

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. These engineering services

are a significant factor in preventing the occurrence of contamination in the delivery of safe drinking water.

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. In 2014, the Department received 174 sets of plans and specifications for the construction of water projects for review and approval. During this year, engineering staff conducted 135 inspections of constructed water projects.

The program'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. 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).

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 Engineering Services Section as a condition of the agreement. In 2014, 15 annual audits were completed and one additional public water system entered into such an agreement with the Department. As of December 31, 2014, a total of 21 public water systems had entered into a 3-year agreement with the Department. (If a system has no water main projects in a year, the system is not audited that year.)

At the beginning of the 2014 calendar year, the Engineering Services Section reviewed the responses from the annual DWSRF needs survey sent out to all public water systems the preceding fall. The returned surveys indicated 329 eligible projects with approximately \$594 million in infrastructure needs. The ranking system developed by the Department was used to prioritize and establish the funding order for DWSRF projects. In addition to public health, the prioritization was also based on readiness-to-proceed criteria. As a primary result, the DWSRF closed 10 loans in 2014 that totaled \$16.7 million. High priority status projects, which are those that address water quality issues, accounted for 5 of the 10 loans that were closed.

In the fall of 2014, the Engineering Services staff started drafting the next Intended Use Plan (IUP). A revised public water system needs survey form was mailed to all public water supply systems. A total of 344 projects with infrastructure needs of \$927 million were identified for inclusion in the draft SFY 2016 IUP.

An informational meeting for professional engineers who submit plans and specifications for drinking water projects to the Department was held in Lincoln on September 11, 2014. Topics presented included new and future regulations, an update on the Annular Seal Task

research, borehole geophysics and horizontal collector wells in Nebraska. Attendees at this meeting were provided with four continuing education units.

The Engineering Services staff reviews and evaluates justifications provided by professional engineers for any well site encroaching on the state's setback distance for new wells. A total of seven new wells with encroachment issues were evaluated and approved. In addition, the engineering staff also works with NDEQ in evaluating encroachment issues that may be of concern to existing public drinking water wells. One encroachment issue on an existing well was evaluated.

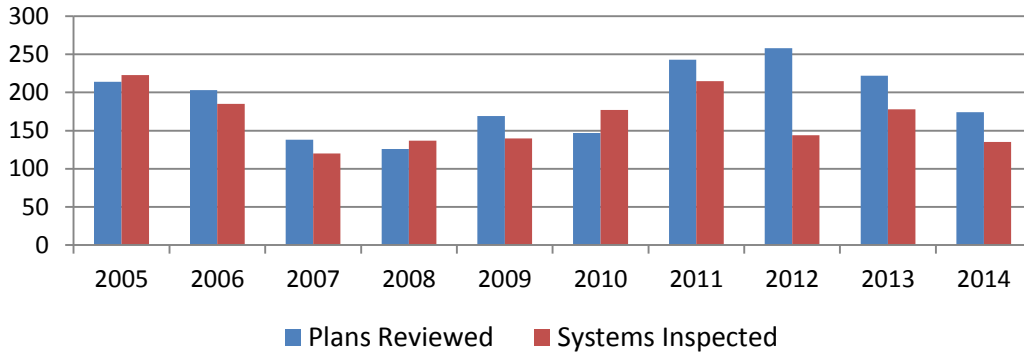
In summary, the Engineering Services Section activities play a significant role in ensuring that public water systems in Nebraska provide safe drinking water to the public.

*SUMMARY REPORT FOR ENGINEERING SERVICES REVIEW AND
INSPECTION ACTIVITIES*

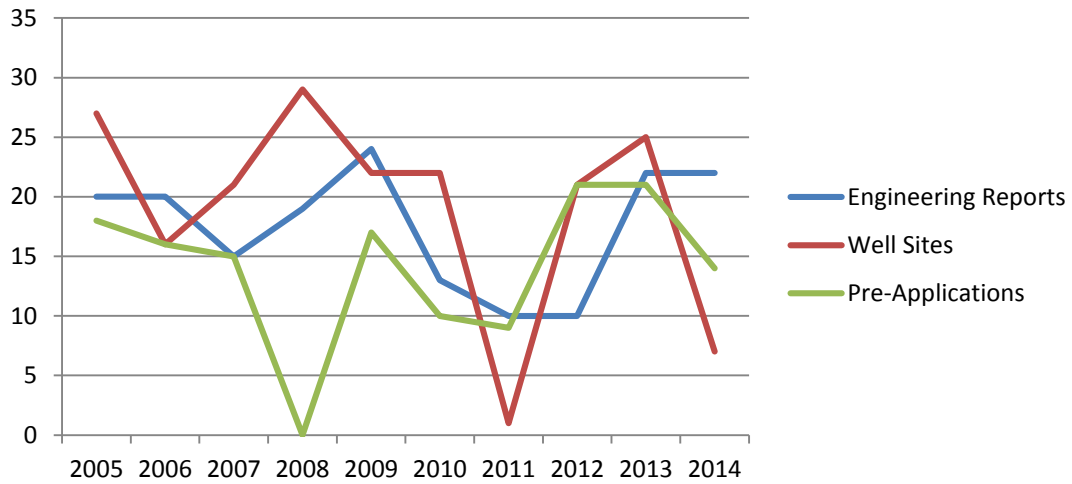
January 1, 2014, to December 31, 2014

ACTIVITIES	NUMBER
Water Projects Received for Review and Approval	174
Water Projects Inspected	135
Major Engineering Reports for Water System Improvements Evaluated	26
Special Reports/Pilot Studies	1
New Water Well Sites Evaluated	7
Common Pre-Applications for Water/Wastewater Projects for Federal and State Financial Assistance Reviewed	14
Operation and Maintenance Manuals for Drinking Water State Revolving Loan Funded Projects Reviewed	15
Three-Year Agreements for Distribution Main Projects—Annual Audits Completed	5

Engineering Plans Reviewed/Systems Inspected



Engineering Evaluations





Monitoring and Compliance Section

The Monitoring and Compliance (M&C) Section of the Public Water System Program reviews the analytical results of public water systems' monitoring for contaminants in their drinking water. In this review of analytical results, M&C personnel determine compliance with Maximum Contaminant Levels and issue appropriate enforcement actions when necessary. They determine PWS sample schedules and arrange for the appropriate sampling kits to be sent from the Division of Public Health's Environmental Laboratory.

Safe Drinking Water Information System

The Safe Drinking Water Information System (SDWIS) is now 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 in 2014

There were no waterborne diseases or deaths reported due to Nebraska public water systems in 2014.

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. If a public water system fails to take the required water samples, a monitoring violation occurs.

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.

In 2014, only 7 of 87 contaminants for which community public water systems monitor were found in quantities above the MCL. That means 80 contaminants for which monitoring was conducted were not found above the MCL in *any* community water system in Nebraska.

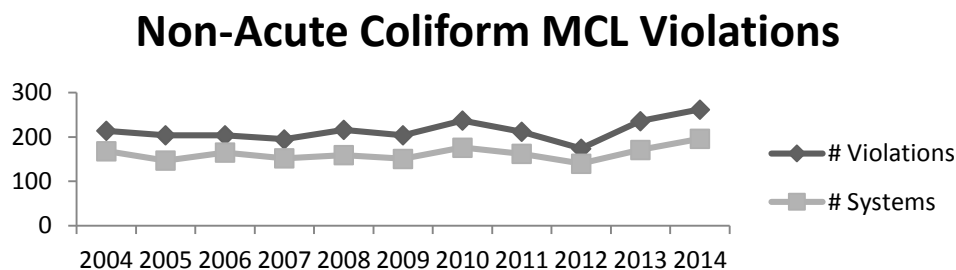
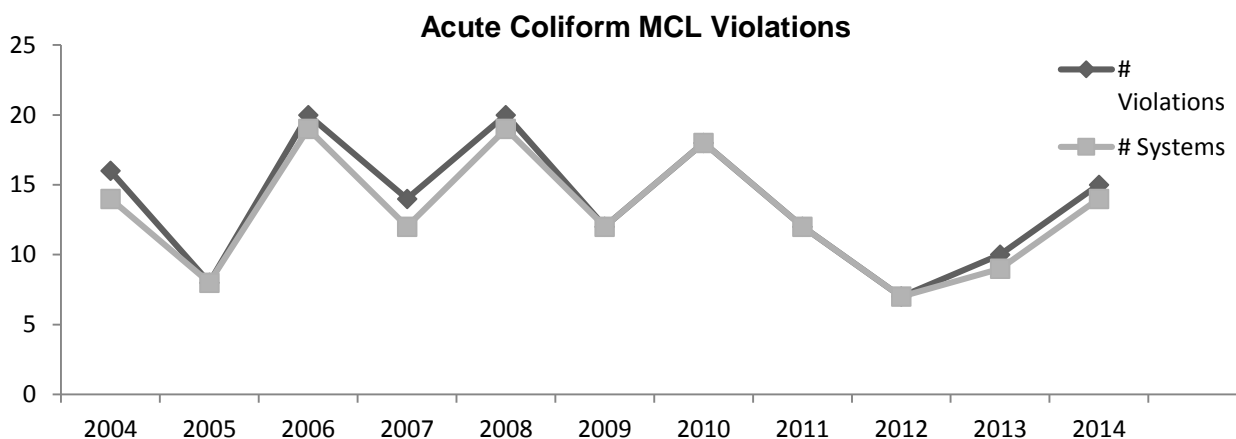
The following tables summarize the types of violations issued in calendar year 2014 and the number of public water systems that received violations. There were a total of 480 violations

from 309 public water systems for MCL and monitoring. There was one treatment technique violation and there were no public notice violations in Nebraska in 2014.

Total Coliform Violations

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

Violation Type	Number of Violations	Number of Systems	Systems With Violations
Acute MCL	15	14	1.1%
Non-Acute MCL	262	196	14.9%
Major Monitoring	97	90	6.9%



Several types of coliform bacteria are found in the environment and in the intestinal tract of humans and warm blooded animals. Coliform bacteria do not necessarily produce disease, but when they are present, other pathogens may also be present. Because of that association, EPA has used total coliform bacteria as an indicator organism for potential contamination. Testing for total coliform is inexpensive and results can be obtained in 24 hours.

Total coliform violations occur when the Maximum Contaminant Level has been exceeded. A non-acute violation occurs when only total coliform is involved. Public water supply systems must notify the public about the potential adverse health effects and take corrective action. An acute violation occurs when one or more samples indicate total coliform and *E. coli*, a fecal coliform bacteria. The water system must notify the public and issue a boil water advisory until

the system has done additional testing and has found that the system again meets safe drinking water standards.

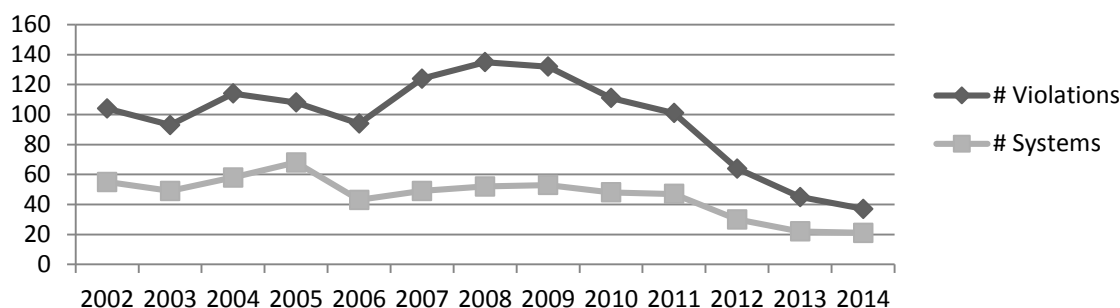
If a community water system is issued four total coliform violations in a twelve-month period, or a non-community water system is issued three violations in a twelve-month period, the system will be issued an Administrative Order requiring a minimum of six months disinfection.

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.)

Violation	Number of Violations	Number of Systems	Systems With Violations
MCL – 10 mg/l	37	21	1.6%
Monitoring	9	9	0.7%

Acute Nitrate MCL Violations



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. A system is issued an Administrative Order to correct a nitrate contamination problem if two nitrate-nitrite violations are issued in a nine-month period. The system is significantly not in compliance when it receives one violation.

The number of nitrate-nitrite MCL and monitoring violations both decreased from the previous year. Looking at the past 11 years, the number of nitrate violations has decreased significantly from a high of 135 in 2008 to 37 in 2014.

Public Notification

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

Volatile Organic Chemical Violations

(Community and non-transient non-community systems monitor for VOCs)

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%
Benzene	0	0	0	0.0%
Carbon tetrachloride	0	0	0	0.0%
cis-1,2-Dichloroethylene	0	0	0	0.0%
Dichloromethane	0	0	0	0.0%
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%
Tetrachloroethylene	1	0	1	0.1%
Toluene	0	0	0	0.0%
trans-1,2-Dichloroethylene	0	0	0	0.0%
Trichloroethylene	4	0	1	0.1%
Vinyl chloride	0	0	0	0.0%
Xylenes (total)	0	0	0	0.0%

Inorganic Chemical Violations

(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	34	3	13	1.7%
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	8	1	3	0.4%
Sodium	0	0	0	0%
Thallium	0	0	0	0%

Non-Volatile Synthetic Organic Chemical Contaminants

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	0	0	0	0%
Atrazine	0	0	0	0%
Benzo[a]pyrene	0	0	0	0%
Carbofuran	0	0	0	0%
Chlordane	0	0	0	0%
Dalapon	0	0	0	0%
Di(2-ethylhexyl)adipate	0	0	0	0%
Di(2-ethylhexyl)phthalate	0	0	0	0%
Dibromochloropropane	0	0	0	0%
Dinoseb	0	0	0	0%
Diquat	0	0	0	0%
Endothall	0	0	0	0%
Endrin	0	0	0	0%
Ethylene dibromide	0	0	0	0%
Glyphosate	0	0	0	0%

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Contaminant	Number of MCL Violations	Number of Monitoring Violations	Number of Systems	Systems with Violations
Heptachlor	0	0	0	0%
Heptachlor epoxide	0	0	0	0%
Hexachlorobenzene	0	0	0	0%
Hexachlorocyclopentadiene	0	0	0	0%
Lindane	0	0	0	0%
Methoxychlor	0	0	0	0%
Oxamyl (Vydate)	0	0	0	0%
Pentachlorophenol	0	0	0	0%
Picloram	0	0	0	0%
Polychlorinated biphenyls	0	0	0	0%
Simazine	0	0	0	0%
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%
Combined Uranium	4	0	1	0.2%
Combined Radium (Radium -226 and Radium -228)	1	0	1	0.2%

Disinfection Byproducts

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

Lead and Copper Violations

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

Violations of Surface Water Treatment Rules

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

Ground Water Rule

Type of Violation	Number of Violations	Number of Systems
Treatment Technique	0	0
Monitoring/Reporting/Recordkeeping	1	1

Administrative Orders Issued in 2014

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.

Administrative Orders

	Total Coliform MCL	Total Coliform Monitoring	Nitrate	Arsenic
Number of Orders	16	1	6	1
Population Affected	2,467	40	480	741

The number of administrative orders for total coliform MCL violations increased by three in 2014. Six administrative orders were issued for nitrates, four more than the previous year.

Variations and Exemptions

No variations or exemptions were issued in 2014. When they are issued, they require the approval of the Advisory Council on Public Water Supply.

MCL Violations Other Than Total Coliform 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	4,483
Chlorine	997
Combined Uranium	953
Nitrate/Nitrite	13,283
Selenium	2,447
Tetrachloroethylene	4,479
Trichloroethylene	235

Laboratory Services



The DHHS Public Health Environmental Laboratory tested a total of 64,749 samples in 2014, an increase of about 2,200 samples or 3.5%. Approximately 60% of the laboratory’s tests are for public water systems across the state. Around 26% of the lab’s testing was performed for the Nebraska Department of Environmental Quality, about 1% directly for the Nebraska Drinking Water program, and 8-10% for private walk-in customers. About 37% of the laboratory tests in 2014 were for total coliform testing. The total coliform testing has a very short holding time of 30 hours from collection to incubation, so changes by the US Postal Service have necessitated our clients paying for Priority Express or using some courier service for guaranteed overnight delivery.

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

Number of Tests Done

Test Type	2014	2013	2012	2011	2010	2009
Total Coliform/ <i>E.coli</i>	23,839	23,121	23,311	23,489	23,952	24,428
Nitrate	7,806	7,724	7,949	8,013	7,337	7,817
Lead/Copper	4,224	4,774	4,076	3,721	3,072	5,789
VOCs (Volatile Organic Compounds)	1,018	989	989	931	969	1,200
Pesticides	551	944	782	531	921	915
Uranium (mass)	819	600	661	334	285	306
Arsenic	1,148	1,273	1,349	1,278	933	1,165

Number of Tests by Analytical Area

	Test Count	% of Total
Organics and Radon	3,356	5.2
Inorganics	21,232	32.8
Metals/Minerals	12,326	19.0
<i>Total Coliform/E.coli</i>	24,088	37.2
Contract Lab	1,044	1.6
Other (non-drinking water)	2,643	4.1

The laboratory purchased two replacement Lachat systems in early 2014. These flow injection analysis systems are used for analyzing nutrients. The three Lachats analyzed a total of about 16,800 tests or 5,600 per instrument. In the fall of 2014, a new ICP/MS was purchased to replace a 16 year-old instrument. The ICP/MS does around 10,000 samples/year. Two more instruments are slated for replacement in 2015.

Laboratory fees have not increased since July 2013. The laboratory continually looks at supply costs and streamlining measures which can be used to keep the cost per test low.

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

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 By-products:** 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 by-products, 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 nontransient noncommunity water systems. Only the MCLs for nitrate, nitrite, and total nitrate and nitrite apply to transient, noncommunity systems.

Inorganic Contaminants

MCL (mg/l)

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 nontransient, noncommunity water systems.

<u>Volatile Organic Chemical Contaminants</u>	<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 x 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
1,1,1,2-Tetrachloroethane
Chloroethane
2,2-Dichloropropane
o-Chlorotoluene
p-Chlorotoluene
Bromobenzene
1,3-Dichloropropene

1,2,3-Trichloropropane
Chlorobenzene
m-Dichlorobenzene
1,1-Dichloropropene
1,1-Dichloroethane
1,1,2,2-Tetrachloroethane
1,3-Dichloropropane

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, 2014.

Reed Miller (engineer), Kearney

Walter Gardner, M.D., (physician), Lincoln

Ivan Van Dyke, (consumer), Norfolk

Robert Johnson, (consumer), Hastings

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

Jerome Obrist (licensed operator of a system serving over 5,000 persons), Lincoln

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 2014, the Council met 2 times.