

## **1999 ANNUAL COMPLIANCE REPORT ON OREGON PUBLIC DRINKING WATER SYSTEMS**

Under the 1996 Safe Drinking Water Act, each state is required to prepare annual reports on violations of national primary drinking water regulations by public water systems in the state. States are required to provide the annual reports to the USEPA, publish and distribute summary reports, and make the full reports available to the public. In addition to satisfying the legal requirement under the Safe Drinking Water Act, the annual compliance report provides an opportunity to review the status of public drinking water safety in Oregon. This is the fourth annual report and presents compliance data on Oregon public water systems for the calendar year 1999.

### **Drinking Water Standards**

A brief overview of the public drinking water regulatory program is useful. In Oregon, public drinking water systems are subject to the Oregon Drinking Water Quality Act (ORS 448 - Water Systems) and the federal Safe Drinking Water Act. The primary purpose of the Oregon Act is to “assure all Oregonians safe drinking water.” According to the Oregon Act, safe drinking water means ‘water which is sufficiently free from biological, chemical, radiological, or physical impurities such that individuals will not be exposed to disease or harmful physiological effects.’ Under the Oregon Act, the Health Division has broad authority to set water quality standards necessary to protect public health through insuring safe drinking water within a public water system. To accomplish this, the Division is directed under the Act to require regular water sampling by water suppliers. These samples must be analyzed in laboratories approved by the Division, and the results of laboratory tests on those samples must be reported by the water supplier to the Division. The Division must investigate water systems that fail to submit samples, or whose sample results indicate levels of contaminants that are above maximum allowable levels. Water suppliers who fail to sample the water or report the results, or whose water contains contaminants in excess of allowable levels must take corrective action and notify water users.

Since 1986, the Division has exercised primary responsibility for administering the federal Safe Drinking Water Act in Oregon, an arrangement called Primacy. The Health Division adopts and enforces standards that are no less stringent than the federal standards, and in return, the US Environmental Protection Agency gives the Division the regulatory responsibility for public drinking water systems and partial financial support for the Oregon program operation.

In practice, the Oregon drinking water standards match the national standards established under the Safe Drinking Water Act by the USEPA. This is because setting maximum levels for drinking water contaminants to protect human health involves considerable development of health effects information and other scientific research that is best carried out at the national level. The Health Division concentrates its available efforts and resources on implementing the national standards at Oregon public water systems.

Drinking water quality standards consist of two parts; a maximum allowable level for each contaminant (called a Maximum Contaminant Level, or MCL) and a sampling and reporting frequency. For contaminants that can not be readily detected or measured in water, the standard may be a treatment technique requirement, which means that in place of regular water sampling and reporting, all water systems at risk of the contaminant are required to provide water treatment processes to remove the contaminant at all times. A full description of the current drinking water standards was published previously (PIPELINE, Spring 2000).

Sampling frequencies vary by the type of drinking water contaminant. Contaminants that are associated with immediate health impacts, like bacteria and nitrates, must be sampled often, such as every month, quarter, or year. Contaminants associated with health effects that could develop from very long-term exposures, like arsenic, are tested less frequently, such as every 3 or 4 years.

### **Oregon Public Water Systems**

In 1999, there were 2,699 public water systems in Oregon subject to regulation under the federal Safe Drinking Water Act. Of these, 890 are community water systems, which means the systems serve at least 15 connections used by year-round residents. These systems perform the most frequent water sampling for the greatest number of contaminants, because the people served have the most ongoing exposure to the drinking water. **Community water systems** in Oregon serve a total of almost 2.7 million people and range in size from 15-home subdivisions and mobile home parks up to and including the City of Portland. **Nontransient noncommunity water systems** serve nonresidential populations consisting of the same people every day, such as a school or workplace with its own independent water supply system. There are 335 of these in Oregon. **Transient noncommunity water systems** serve transient populations. Examples are campgrounds, parks, or restaurants with their own independent water supply systems, and there are 1,474 of these in Oregon.

Oregon public water systems get their water either from wells or springs (called groundwater) or from rivers, lakes, or streams (called surface water). Of the 2,699 total public water systems in Oregon, 2,400 get their water exclusively from groundwater. 281 water systems get their water in whole or in part from surface water supplies. Generally speaking, surface water requires much more treatment and processing to ensure safety for drinking than does groundwater.

There are many small water systems in Oregon. About 90% of the public water systems in Oregon serve 500 or fewer people each.

*An additional 969 very small systems are subject only to the Oregon Act, and are too small to fall under federal drinking water regulations. These water systems supply 4-14 connections or 10-24 people each. These water systems serve a total of about 18,000 people in Oregon. By comparison, about 400,000 Oregonians get their drinking water from individual home wells, which are not subject to public water system standards or rules.*

## Compliance Results for 1999

There are now drinking water quality standards for 96 different contaminants. Most have established maximum levels and sampling requirements. Others have treatment technique requirements. A complete description of the drinking water standards is given in the Spring, 2000 Special Edition of the PIPELINE newsletter, available from the Division or our web site. Drinking water contaminants can be grouped into the following general categories:

- ! Microbial Contaminants - such as viruses, bacteria, and parasites which can come from sewage treatment plants, septic systems, agricultural and livestock operations, and wildlife.
- ! Disinfectants and Disinfection By-Products - chemical disinfectants used in water treatment to kill harmful microbes, and the chemical by-products formed from the reaction of disinfection treatment chemicals with natural substances in the water.
- ! Inorganic Chemicals - such as salts or metals, which can be naturally-occurring or can result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. Includes lead and copper leached into the water from household plumbing and fixtures.
- ! Organic Chemicals - Pesticides and herbicides which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses. Also includes synthetic and volatile chemicals which are used in industrial processes and petroleum production and can come from gas stations, urban stormwater runoff, and septic systems.
- ! Radiologic Contaminants - Naturally occurring or resulting from oil and gas production or mining operations.

*Compliance statistics cited here DO NOT include the very small public water systems not subject to EPA standards, or individual home wells.*

1,109 public water systems achieved full compliance with all standards and sampling requirements during 1999, as shown in the table below:

Population Size Range	Total Number of Water Systems	Number of Water Systems With No Violations in 1998
25-500	2,344	923
501-3,300	259	134
3,301-10,000	41	16
10,001-100,000	51	32
more than 100,000	4	4
Total	2,699	1,109

The attached tables present summaries of the violations of both maximum levels, treatment

requirements, and sampling and reporting requirements for categories of contaminants. Table 1 shows the number of public water systems that experienced significant violations of requirements during 1999, and the total numbers of violations that occurred. Tables 2 and 3 show this information, organized by size ranges of populations served. Note that totals presented on Table 2 have been adjusted to avoid double-counting water systems that violate multiple requirements.

1,590 of the public water systems generated 3,502 violations of maximum levels and sampling requirements. This means that some water systems violated requirements on multiple occasions or violated requirements for multiple contaminants. 11% of the violations are for maximum levels, action levels, or treatment requirements, and 89% of violations overall are for failure to sample and report results. Violation of maximum levels, action levels, or treatment requirements mean that there were actual or possible exposures of people to drinking water contaminants. Violation of sampling requirements means that a water system did not sample for contaminants or did not report the test results for certain contaminants on time. A significant sampling violation means that no water sample results were reported for a particular reporting period. Since most Oregon water systems are small, most violations occurred at small water systems. Lists of water suppliers that violated maximum levels, action levels, or treatment requirements during 1999 are available from the Division, and can be viewed on our drinking water web page.

The groups of contaminants are discussed individually below.

**Microbials (Coliform Bacteria).** All 2,699 public water systems must sample routinely for coliform bacteria. Coliform bacteria in drinking water are not usually harmful in themselves, but they signal the possible presence of harmful microorganisms. Small systems sample at least once per month or quarter, while very large water systems must collect up to a hundred or more samples per month. The Division received almost 62,000 individual coliform bacteria test results in 1999.

120 water systems found and confirmed coliform bacteria in their water and took corrective action. 14 of these water systems found fecal coliform in the drinking water and people were advised to boil their drinking water until the cause of the contamination could be found and corrected. The Division expends considerable effort working with systems to prevent and correct these types of water problems because they represent a significant and immediate potential risk to health.

Most of the microbial violations were for failure to monitor and report results. 914 water systems failed to submit coliform samples for at least one month or quarter during the year. These systems had 1,731 routine monitoring violations, so some systems failed to submit sample results more than once during the year. While this is a substantial amount of nonreporting, Oregon public water systems have a total of almost 22,000 opportunities to sample and report during each year. This means that in 1999, 92% of the total number of required test results were submitted on-time by Oregon water systems overall.

98 water systems failed to report the results of repeat samples required following positive routine

samples. 90 of these systems are very small, serving less than 500 people.

**Microbials (Surface Water Treatment).** Standards require that most water systems that draw water from lakes, rivers, and streams continually treat the water by filtration and disinfection to remove or kill microorganisms like bacteria, viruses, and protozoans that can cause waterborne disease outbreaks. The last recognized waterborne disease outbreak in a community water system in Oregon occurred in the City of Talent in 1992 (cryptosporidiosis). Surface water treatment standards are established to assure that the proper level of treatment is practiced at all times. In Oregon, there are still 17 water systems that do not have filtration treatment and must install it, although this is down from 165 systems in 1992. These remaining unfiltered systems are on administrative orders from the Health Division to install treatment, and work is continuing on those systems. Of the systems with filtration treatment, 36 failed to meet treatment level requirements on at least one occasion during 1999. The Division worked with those systems to help them improve their operation, their facilities, or both. 66 water systems failed to report treatment performance data on at least one occasion.

**Disinfectants and Disinfection By-products.** In 1999, 9 water systems serving more than 10,000 people each failed to report total trihalomethanes as required on at least one occasion.

**Inorganic Chemicals.** Nitrate maximum levels were violated by 4 water systems in Oregon during 1999. Due to the high degree of hazard to children, these systems were modified or are under order to correct the problem. 655 water systems failed to report nitrate results in 1999. Efforts are underway to better inform water systems of these requirements. One community water system and one noncommunity water system violated the maximum level for arsenic in 1999. At the end of 1999, 81 systems which had exceeded the action levels for lead and/or copper at plumbing taps had not yet installed corrosion control treatment. 93 systems had not yet completed initial lead/copper monitoring.

Water systems in Oregon rarely violate maximum levels for inorganic contaminants from source waters, but these contaminants are routinely detected in drinking water systems at levels more than one-half the maximum level. The most-detected inorganics (and number of water systems with detections since 1988) are nitrate (244), arsenic (40), nitrate/nitrite (31), cadmium (25), and mercury (25). Fact sheets for many of these contaminants are available either from the Division, the drinking water web page, or through web page links with other agencies or organizations.

**Organic Chemicals.** The second round of testing for 53 organic chemicals was completed during 1996-98. 1,235 water systems must conduct this testing. 74 water systems failed to report the required test results. No water systems exceeded MCLs for organics.

Again, Oregon water systems rarely violate maximum levels for organic chemicals. The contaminants detected in past monitoring data (and number of water systems with detections since 1988), include tetrachloroethylene (52), toluene (48), 1,1,1 trichloroethane (28), xylenes (24), methylene chloride (24), and trichloroethylene (22). Pesticides have been detected much less often - 2,4-D (6), atrazine

(5), and ethylene dibromide (4). Again, the vast majority of detections are at levels well below maximum allowable levels. In practice, many water suppliers that confirm the presence of even low levels of organic chemicals either abandon, reconstruct, or replace contaminated wells or install treatment to eliminate these contaminants from the water supply.

**Radiological Contaminants.** No violations of standards occurred during the report period. Naturally occurring radiological contaminants are detected in Oregon water systems, but at very low natural background levels.

### **Water System Improvements**

Fourteen water systems completed substantial improvements to meet drinking water standards during 1999 (See Table 4).

### **Enforcement Activities**

During 1999, the Division issued 61 formal enforcement actions for high-priority violations of standards, primarily for coliform and nitrate maximum level violations, surface water treatment violations, and repeated failures to sample and report sample results.

### **Measuring Progress**

The Oregon Safe Drinking Water Benchmark, stated below, is intended to measure progress of public water suppliers toward meeting safe drinking water standards in Oregon:

**“The percentage of Oregonians served by public drinking water systems that meet all health-based standards continuously during the year”**

Meeting all health-based standards at all times during the year is an important indicator of drinking water safety. The benchmark presumes that required monitoring of water supplies is carried out, and as shown above, Oregon water suppliers do need to improve in this area. The Oregon benchmark goal is to reach 95% by 2005, and to maintain this benchmark level during the process of implementing new drinking water standards from 2005 through 2010. At the end of 1999, the Benchmark was 90%.

USEPA established a similar performance-based measure for drinking water under the Government Performance and Results Act (GPRA) of 1993. This goal is:

**By 2005, protect human health so that 95% of the population served by community water systems receive water that meets health-based drinking water standards...**

In 1994, the GPRA baseline for the U.S. was 83%. In 1999, the measure for the U.S. improved to

91%. Oregon achieved 93% in 1999.

## **Conclusions**

Oregon water suppliers and the Health Division drinking water program must continue to focus efforts on responding to coliform bacteria contamination, getting filtration treatment installed at unfiltered supplies that must filter, improving filtration treatment facilities and their operation, installing treatment to control lead and copper at the tap, and improving monitoring for coliform bacteria and nitrates. Additional work is needed to better inform smaller water systems of regulatory requirements, particularly in the area of sampling.

## **More Information**

Listings of water systems that violated maximum levels or treatment requirements in 1999 (and fact sheets on specific contaminants) are available on request or from the Oregon Drinking Water web page (<http://www.ohd.hr.state.or.us/cehs/dwp>):

Attachments:

Table 1 - Oregon Violation Summary - 1999

Table 2 - Number of Public Water Systems in Violation by Population Category - 1999

Table 3 - Number of Violations by Population Category - 1999

Table 4 - Water systems completing construction/installation projects in 1999

Table 1 - Oregon Violation Summary, 1999

	Number of violations	Number of water systems In violation	
Microbials - Coliform:			
Fecal Coliform/E. coli present	14	14	
Total Coliform maximum level	151	120	
Significant sampling violations	1,845	1,012	
Microbials - Surface water treatment:			
Filtration treatment violations	122	36	
Significant sampling violations	200	66	
Unfiltered - Required to filter	17	17	
Lead and Copper:			
Failed to conduct initial sampling	121	93	Failed
to install treatment	81	81	
Failed to conduct public education	33	33	
Chemicals:			
Arsenic maximum level	2	2	
Nitrate maximum level	4	4	
Nitrate sampling	655	655	
Inorganic chemical sampling (99-01)*	N.A.	N.A.	
Organic chemical sampling (99-01)*	N.A.	N.A.	
Radiological sampling (96-99)**	78	78	
Trihalomethane sampling	12	9	
Consumer Confidence Reports:			
Failed to submit report	167	167	
Total	3,502	1,590***	

\* Sampling is required once during each 3-year period, tests are due by the end of 2001

\*\* Sampling is required once during each 4-year period, tests were due by the end of 1999

\*\*\* Number adjusted to avoid double-counting water systems with violations of multiple contaminant and monitoring standards

**Table 2**  
**Number of Water Systems With Violations**

	Population Groups					Totals
	Under 500	501 - 3300	3301-10,000	10k to 100k	100,000+	
Chemicals						
Arsenic MCL	2					2
Nitrate MCL	3	1				4
Nitrate Monitoring	624	28	2	1		655
Radiological Monitoring	64	10	2	2		78
TTHM Monitoring				9		9
Coliform*						
Acute MCL	12	1		1		14
Total MCL	106	11	1	2		120
No Routines	887	26	1			914
No Repeats	90	4	3	1		98
Surface Water Treatment						
Required to Filter	10	5	2			17
Monitoring/Reporting	47	16	2	1		66
Treatment Failure	15	16	5			36
Lead/Copper						
Corrosion Control	61	15	4	1		81
Initial Tap Sampling	86	7				93
Public Education	29	4				33
Consumer Confidence						
No Report	161	5	1			167
Public Water Systems	2344	259	41	51	4	2699
Population Served	281950	352239	237551	1215903	934000	3021643
Systems with No Violations	923	134	16	32	4	1109

\*Minor monitoring and reporting violations were excluded

**Table 3**  
**Number of Violations**

	Population Groups					Totals
	Under 500	501 - 3300	3301-10,000	10k to 100k	100,000+	
Chemicals						
Arsenic MCL	2					2
Nitrate MCL	2	2				4
Nitrate Monitoring	624	28	2	1		655
Radiological Monitoring	64	10	2	2		78
TTHM Monitoring				12		12
Coliform*						
Acute MCL	12	1		1		14
Total MCL	136	12	1	2		151
No Routines	1,698	32	1			1,731
No Repeats	104	4	5	1		114
Surface Water Treatment						
Required to Filter	10	5	2			17
Monitoring/Reporting	169	28	2	1		200
Treatment Failure	30	76	16			122
Lead/Copper						
Corrosion Control	61	15	4	1		81
Initial Tap Sampling	113	8				121
Public Education	29	4				33
Consumer Confidence						
No Report	161	5	1			167
Public Water Systems	2,344	259	41	51	4	2,699
Population Served	281,950	352,239	237,551	1,215,903	934,000	3,021,643
Systems with No Violations	923	134	16	32	4	1,109

\*Minor monitoring and reporting violations were excluded

Table 4 - Water systems completing construction/installation projects in 1999

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Water System Name	Population Served	County	Improvement
Bear Creek Hideout	125	Lincoln	Develop wells, abandon surface water supply
Camas Valley School	160	Douglas	Corrosion control treatment - soda ash
Carus Elementary School	365	Clackamas	Corrosion control treatment - soda ash
Deerhorn Community Water System	300	Lane	Corrosion control treatment - caustic soda
Environmental Container Systems	130	Josephine	Corrosion control treatment - aeration
Heceta Water District	3,000	Lane	Corrosion control treatment - soda ash
Mapleton Water District	800	Lane	Corrosion control treatment - soda ash
Marshland Water District	90	Columbia	Develop well, abandon surface water supply
Nehalem (City)	1,400	Tillamook	Install filtration treatment on surface water supply
Seven Oak School	190	Linn	Corrosion control treatment - soda ash
Shangri-La Water District	225	Lane	Corrosion control treatment - soda ash
Talent (City)	3,000	Jackson	Corrosion control treatment - soda ash
Triangle Lake School	210	Lane	Corrosion control treatment - soda ash
Wilson River Water District	350	Tillamook	Corrosion control treatment - blending of existing wells