1998 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 important opportunity to review the status of public drinking water safety in our state. This is the third annual report and presents compliance data on Oregon public water systems for the calendar year 1998.

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. A full description of the current drinking water standards was published previously (PIPELINE, Fall 1998).

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 efforts 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.

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 1998, there were 2,706 public water systems in Oregon subject to regulation under the federal Safe Drinking Water Act. (Note that an additional 900 very small systems are subject only to the Oregon Act.) Of these, 893 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 2.6 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 343 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 1,470 of these 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.

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 2,706 public water systems in Oregon, 2,428 get their water exclusively from groundwater. 278 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. Almost 87% of the public water systems in Oregon serve 500 or fewer people each.

Compliance Results for 1998

There are now drinking water quality standards for 84 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 Fall, 1998 Special Edition of the PIPELINE newsletter, available from the Division or our web site. The

standards can be grouped into the following general categories:

Microbiological Contaminants - Monthly or quarterly sampling for coliform bacteria.
Surface Water Treatment - treatment technique for continuous disinfection of water from all surface water sources, and for continuous filtration treatment for most surface water sources.
Lead and Copper - Monitoring for levels of lead and copper leached from household plumbing by corrosive water supplies. Systems that exceed “action levels” must install corrosion control treatment systems.
Organic Chemicals - periodic testing for man-made pesticides and solvents, and by-products of chlorine disinfection treatment called “trihalomethanes”.
Inorganic Chemicals - periodic testing for metals and minerals, both naturally occurring and resulting from agricultural and industrial use
Radiologic Contaminants - periodic testing for naturally occurring and man-made radioactive contaminants.

1,217 public water systems achieved full compliance with all standards and sampling requirements during 1998.

Population Size Range	Total Number of Water Systems	Number of Water Systems With No Violations in 1998
25-500	2347	1010
501-3,300	264	146
3,301-10,000	42	22
10,001-100,000	49	35
more than 100,000	4	4
Total	2,706	1,217

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 1998, and the total numbers of violations that occurred. Tables 2 and 3 show this information, including additional data on minor sampling violations, 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.

1,489 of the public water systems generated 8013 violations of maximum levels and major sampling requirements. This means that some water systems violated requirements on multiple occasions or violated requirements for multiple contaminants. Since most Oregon water systems are small, most violations occurred at small water systems. In addition, 94% of violations overall are for failure to sample and report results, while 6% are violations of maximum levels, action levels, or treatment requirements. Violations of maximum levels, action levels, or treatment

requirements mean that there were actual or possible exposures of people to drinking water contaminants. Violations of a sampling requirements mean that water systems did not sample for contaminants or did not report the test results for certain contaminants on time. Major sampling violations mean that no water sample results were reported for a particular reporting period, while minor sampling violations mean that insufficient numbers of samples were reported. Lists of water suppliers that violated maximum levels, action levels, or treatment requirements during 1998 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 2,706 public water systems must sample routinely for coliform bacteria. Coliform bacteria in drinking water are not usually harmful in themselves, but their presence signals 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 64,000 individual coliform bacteria test results in 1998.

158 water systems found and confirmed coliform bacteria in their water and took corrective action. Nineteen 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. 1,100 water systems failed to submit a sufficient number of coliform samples for at least one month or quarter during the year. These systems had 2,089 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 35,000 opportunities to sample and report during each year. This means that in 1998, 95% of the total number of required test results were submitted by Oregon water systems overall.

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 community water systems that do not have filtration treatment and must install it, although this is down from 54 community water 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, 50 failed to meet treatment level requirements on at least one occasion during 1998. The Division worked with

those systems to help them improve their operation, their facilities, or both. 75 water systems failed to report treatment performance data on at least one occasion.

Lead and Copper. At the end of 1998, 80 systems which had exceeded the action levels for lead and/or copper had failed to install corrosion control treatment.

Inorganic Chemicals. Nitrate maximum levels were violated by two water systems in Oregon during 1998. Due to the high degree of hazard to children, these systems were modified or are under order to correct the problem. 542 water systems failed to report nitrate results in 1998. Efforts are underway to better inform water systems of these requirements. Water systems in Oregon rarely violate maximum levels for inorganic contaminants, 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 detections since 1988) are nitrate (992), arsenic (90), cadmium (24), fluoride (35), and nitrate/nitrite (87). Fact sheets on these contaminants are available from the Division and the drinking water web page.

Organic Chemicals. The second round of testing for 51 organic chemicals was completed during 1996-98. 1,235 water systems must conduct this testing. 75 water systems failed to report the required test results. No water systems exceeded MCLs for organics. In 1998, 8 water systems serving more than 10,000 people each failed to report total trihalomethanes as required on at least one occasion.

Again, Oregon water systems rarely violate maximum levels for organic chemicals. The contaminants detected at levels less than maximum levels in past monitoring data (and number of detections since 1988), include tetrachloroethylene (204), trichloroethylene (159), 1,1,1 trichloroethane (57), and toluene (54). Pesticides have been detected much less often - phthalates (10), 2,4-D (8), atrazine (6), and adipates (5). Fact sheets on these contaminants are available from the Division and the drinking water web page. Generally, water suppliers have either abandoned, reconstructed, or replaced contaminated wells or installed treatment to eliminate even low levels of 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

104 water systems completed substantial improvements to meet drinking water standards during 1998. A listing of these systems and the improvement each made appears later in this report.

Enforcement Activities

During 1998, the Division issued 169 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.

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.

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 need to improve in this area. The benchmark includes the following health-based standards, listed from highest to lowest health risk:

- E. Coli (or fecal coliform) bacteria maximum level
- Surface water treatment performance levels (filtration and disinfection)
- Nitrate/Nitrite maximum levels
- Chemical/Radiological maximum levels
- Lead action level
- Total coliform bacteria maximum level
- Copper action level

Included in the benchmark are about 1,300 public water systems that serve the majority of the state's population, including all community systems, all nontransient noncommunity systems, and the larger transient noncommunity systems (serving over 500 people per day).

The Oregon benchmark goal is to reach 95% by 2005. Results for the last three years are 1994-49%, 1995-50%, 1996-56%, 1997-89%. By the end of 1998 it was 90%.

Listings of water systems that violated maximum levels or treatment requirements in 1998 (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):

< Chemicals
< Coliform Bacteria (Fecal/E coli and Total Coliforms)
< Surface Water Treatment Requirement Violations (Filtered Systems)
< Unfiltered Systems (Required to Filter)
< Lead/Copper Action Level Exceeders
< Corrosion Control Treatment Requirement Violations

Attachments
Table 1 - Water System Improvements during 1998
Table 2 - Oregon Violation Summary - 1998
Table 3 - Oregon Violation Summary by Population for 1998
Table 4 - Oregon Water Systems with Violation by Population for 1998

Table 1

Water Systems Improved in 1998 (other than for lead/copper)			
Water System Name	Population Served	County	Improvement
Beaver Water District	400	Tillamook	Improve filtration and disinfection of surface water
Gates	495	Marion	Improve disinfection of surface water
Lakeshore Trailer Court	34	Lane	Install filtration of surface water
Mattel, Inc.	800	Washington	Abandon TCE contaminated well
Mobilette Ranch	50	Malheur	Abandon high nitrate well, connect to City of Ontario
Prescott	70	Columbia	Develop new well
Riddle/Russell Creek	75	Douglas	Abandon surface water source

Water Systems Adding Corrosion Control Treatment to Control Lead and/or Copper (or served by another supplier who installed treatment) - 1998		
Water System Name	Population Served	County
Albany Trailer Court	60	Linn
Anglers Trailer Village	88	Douglas
Astoria	12300	Clatsop
Bay Hills Water Association	50	Lincoln
Beaverton (Joint Water Commission)	52152	Washington
Bible Temple	200	Multnomah
Brownsville	1250	Linn
Canby Utility Board	12000	Clackamas
Carlton	1570	Yamhill

Carus Elementary School	165	Clackamas
Cave Junction	1150	Josephine
Central Linn High School (Halsey)	1000	Linn
Chehalem Mtn. Sun Ridge	75	Yamhill
Chehalem Valley Water Assn. (Newberg)	150	Yamhill
Clackamas River Water - Clairmont (South Fork Water Board)	15000	Clackamas
Cloverdale Water District	300	Tillamook
Columbia City (St. Helens)	795	Columbia
Coquille	4195	Coos
Corbett Water District	2300	Multnomah
Delight Valley School*	156	Lane
Depoe Bay	850	Lincoln
Dewald Northwest Company*	54	Linn
Evergreen Acres	70	Clatsop
Fairplay School	270	Benton
Fern Ridge School	435	Lane
Fern Valley Estates	170	Jackson
Ferndale School	250	Umatilla
Fernhill Community Water (Astoria)	237	Clatsop
Firs Trailer Park	110	Coos
Garibaldi	1125	Tillamook
Gates	495	Marion
Gilbert Water District (Powell Valley Water District)	4925	Multnomah
Gore Elementary School*	125	Linn
Griffin Creek School*	325	Jackson
Hebo	220	Tillamook
Illahe Golf Club Estates	250	Marion
Inavale School	135	Benton
Inn at Otter Crest	100	Lincoln
James River Corp.-Wauna	1200	Clatsop
Jewell School	150	Clatsop

John Day Water District (Astoria)	225	Clatsop
Lacomb School	320	Linn
Lake Oswego	26985	Clackamas
Latham School*	155	Lane
Lebanon	11000	Linn
Lebanon Middle School*	530	Linn
Merlin School	50	Josephine
Mid Valley Workshop*	70	Yamhill
Mist School*	42	Columbia
Mollala Schools - Maple Grove	29	Clackamas
Myrtle Point	2595	Coos
Neahkanie Water District	600	Tillamook
Nesika Beach Water District	1200	Curry
Netarts Water District	800	Tillamook
Newberg	11300	Yamhill
Northstar Estates	45	Josephine
Northwest Newberg Water Asso. (Newberg)	140	Yamhill
Oregon City (South Fork Water Board)	15900	Clackamas
Oregon Strand Board*	120	Linn
Oxberg Lake Estates	100	Yamhill
Pacific School	150	Curry
Pacific Softwood*	85	Benton
Pleasant Valley Elem School	140	Linn
Port of Tillamook Bay (Tillamook)	250	Tillamook
Powers	732	Coos
Rainbow Water District*	6300	Lane
Reedsport	6000	Douglas
Reynolds Metal Co.*	400	Multnomah
Riverboat Village MHP*	50	Curry
Rockaway Beach	2000	Tillamook
Scappoose	3500	Columbia

Scravel Hill Water Co-op	255	Linn
Seaside	5000	Clatsop
Silver Crest school	140	Marion
South Prairie Water Asso. (Tillamook)	350	Tillamook
Springfield Forest Products*	25	Lane
St. Helens	7325	Columbia
Sunny Acres Water District (Newberg)	75	Yamhill
Sunny Hill School	160	Coos
Surf Pines Water Asso.*	300	Clatsop
SW Lincoln County Water District	2613	Lincoln
The Dalles	11800	Wasco
Tillamook	8000	Tillamook
Upper Chetco School*	50	Curry
USFS McKenzie Ranger Station	50	Lane
USFS Timberline Lodge	303	Clackamas
USFS Wolf Creek Job Corps	250	Douglas
Valley View Water Co. (Carlton)	97	Yamhill
Vernonia	1760	Columbia
West Linn (South Fork Water Board)	18891	Clackamas
Western Mennonite School*	115	Polk
Weyerhauser-Turner	40	Marion
Willamette Water Co - Douglas Garden*	327	Lane
Yachats	600	Lincoln
Yoncalla	815	Douglas

*Plumbing relacement, abandoned water source, install auto flushing system, connect to another water supplier, etc.

Table 2 - Oregon Violation Summary, 1998

	Number of violations	Number of water systems In violation
Microbials - Coliform:		
Fecal Coliform/E. coli present	19	19
Total Coliform maximum level	201	158
Significant sampling violations	2,089	1,100
Microbials - Surface water treatment:		
Filtration treatment violations	144	50
Significant sampling violations	184	75
Unfiltered - Required to filter	17	17
Lead and Copper:		
Exceed lead and/or copper action level	80	80
Public Education	4	4
Chemicals:		
Arsenic maximum leve	1	1
Nitrate maximum level	2	2
Tetrachloroethlyene	1	1
Nitrate sampling	542	542
Inorganic chemical sampling (96-98)	1131	128*
Organic chemical sampling (96-98)	3590	87*
Radiological sampling		
Trihalomethane sampling	8	8
Total	8013	1,489**

* Failed to report one or more contaminants in the group
**Number adjusted to eliminate double-counting

Table 3

Number of Violations

	Population Groups					
	Under 500	501 - 3300	3301-10,000	10k to 100k	100,000+	**Totals**
Chemicals						
Arsenic MCL	1					**1**
Nitrate MCL	2					**2**
Tetrachloroethylene MCL	1					**1**
Nitrate Monitoring	498	36	6	2		**542**
TTHM Monitoring				8		**8**
IOC Monitoring	1075	55		1		**1131**
SOC/ VOC Monitoring	3495	94	1			**3590**
Coliform*						
Acute MCL	15	3	1			**19**
Total MCL	182	14	4	1		**201**
No Routines	1883	50	3			**1936**
No Repeats	141	8	2	2		**153**
Surface Water Treatment						
Required to Filter	9	6	2			**17**
Monitoring/Reporting	150	32	1	1		**184**
Treatment Failure	43	84	16	1		**144**
Lead/Copper						
Corrosion Control	64	12	3	1		**80**
Other Violations	4					**4**
Public Water Systems	2347	264	42	49	4	**2706**
Population Served	281,577	357,763	242,580	1,125,470	895,000	**2,902,390**
Systems with No Violations	1010	146	22	35	4	**1217**

* Minor monitoring and reporting violations were excluded.

Table 4

Number of Water Systems With Violations

	Population Groups					
	Under 500	501 - 3300	3301-10,000	10k to 100k	100,000+	**Totals**
Chemicals						
Arsenic MCL	1					**1**
Nitrate MCL	2					**2**
Tetrachloroethylene MCL	1					**1**
Nitrate Monitoring	498	36	6	2		**542**
TTHM Monitoring				8		**8**
IOC Monitoring	117	10		1		**128**
SOC/ VOC Monitoring	81	5	1			**87**
Coliform*						
Acute MCL	15	3	1			**19**
Total MCL	142	12	3	1		**158**
No Routines	938	34	3			**975**
No Repeats	115	6	2	2		**125**
Surface Water Treatment						
Required to Filter	9	6	2			**17**
Monitoring/Reporting	51	23	1	1		**75**
Treatment Failure	23	21	5	1		**50**
Lead/Copper						
Corrosion Control	64	12	3	1		**80**
Other Violations	4					**4**
Public Water Systems	2347	264	42	49	4	**2706**
Population Served	281,577	357,763	242,580	1,125,470	895,000	**2,902,390**
Systems with No Violations	1010	146	22	35	4	**1217**

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