



Regulating Disinfectants and Disinfection Byproducts

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Many water systems add chlorine and other disinfectants to drinking water to kill or inactivate harmful organisms. Disinfectants react with naturally occurring organic matter or inorganic precursors to form disinfection byproducts (DBPs). The Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR) and the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) regulate DBPs.

Regulated water systems include the following, and the rules apply whether the system uses the chemical as a disinfectant or an oxidant.

- ◆ Community and nontransient noncommunity (NTNC) water systems that continuously use chlorine, ozone, chloramines, or chlorine dioxide during any part of the treatment process.
- ◆ Transient noncommunity (TNC) water systems that use chlorine dioxide.
- ◆ Consecutive water systems that receive water treated with chlorine or chloramines from the supplying water system.

Disinfectants

The maximum residual disinfectant level (MRDL) limits the amount of chlorine, chlorine dioxide or chloramine residual that allowed in a distribution system. This represents the maximum average dose a system can use over a year period.

Disinfectant	MRDL (mg/L)	Compliance
Chlorine	4.0 (as Cl ₂)	Running annual average of monthly averages
Chloramine	4.0 (as Cl ₂)	Running annual average of monthly averages
Chlorine dioxide	0.8 (as ClO ₂)	Consecutive daily samples

Disinfection Byproducts

All community and NTNC systems that use any chemical disinfectant (chlorine, chloramines, chlorine dioxide, or ozone) must monitor for total trihalomethanes (TTHM) and five haloacetic acids (HAA5).

Byproducts	MCL (mg/L)	Compliance
TTHM	0.080	Quarterly, locational, running annual average
HAA5	0.060	Quarterly, locational, running annual average

Systems must choose sample sites based on historic water quality data or an evaluation of the distribution system. Larger surface water systems (>3,300 population) must have us approve their monitoring plan locations.

If you use ozone or chlorine dioxide, you must also monitor for bromate or chlorite, respectively, at the entry point to the distribution system for each water treatment plant.

Byproduct	MCL (mg/L)	Compliance
Bromate	0.010	Annual average of monthly averages
Chlorite	1.0	Daily samples and triggered monitoring

Routine Monitoring for TTHM and HAA5

The number of samples and frequency of monitoring depends on the type of source water and water system population.

Source Type	Population Category	Frequency	Sample Sites & Sets
Ground Water	< 500	Annually	1 set
	500 – 9,999	Annually	2 sets
	10,000 – 99,999	Quarterly	4 sets
	100,000 – 499,999	Quarterly	6 sets
	≥ 500,000	Quarterly	8 sets
Surface Water	< 500	Annually	1 set
	500 – 3,300	Quarterly	1 set
	3,301 – 9,999	Quarterly	2 sets
	10,000 – 49,999	Quarterly	4 sets
	50,000 – 249,999	Quarterly	8 sets
	250,000 – 999,999	Quarterly	12 sets

Reduced Monitoring

Systems may qualify for reduced monitoring for TTHM and HAA5 if sample results meet certain criteria. Surface water systems serving fewer than 500 people may not reduce their requirement.

Conventional Surface Water Treatment and Disinfection Byproduct Precursors

Additional monthly monitoring requirements for total organic carbon (TOC) and alkalinity apply to surface water systems that have “conventional” treatment plants (sedimentation with filtration). These systems must meet specific TOC removal levels or alternative criteria for enhanced treatment.

Monitoring Plans

Every affected system must develop a system-specific monitoring plan. We have a template available to help you develop this plan called [Disinfection Byproducts Monitoring Plan Template 331-464 \(PDF\)](#). Surface water systems serving more than 3,300 persons must submit their plans to DOH. All other systems should keep the plan in their system records until DOH specifically requests it.

For more information

Our publications are online at doh.wa.gov/ODWPubs. You may also read the following fact sheets.

[Alternate Disinfectants 331-252 \(PDF\)](#)

[Chlorination of Drinking Water 331-253 \(PDF\)](#)

Contact our nearest regional office from 8 AM to 5 PM, Monday through Friday. If you have an after-hours emergency, call 877-481-4901.

[Eastern Region](#), Spokane Valley 509-329-2100.

[Northwest Region](#), Kent 253-395-6750.

[Southwest Region](#), Tumwater 360-236-3030.

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