

Small Water System
Compliance
Monitoring, Compliance
Determination & Waivers

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Outline

- Legal Obligations of Public Water Systems
- Water Supply Permits
- Emergency Notification Plans
- Operator Certification

Outline Continued

- Water Quality Monitoring Requirements:
 - Bacteriological
 - Inorganic Chemical Monitoring
 - Nitrate and Nitrite Monitoring
 - Organic Chemical Monitoring
 - Secondary Standards
 - Radionuclide Monitoring
 - Unregulated Chemicals
 - EDT Regulations
 - Distribution System Water Quality Monitoring
 - CA SWTR and LT1ESWTR
 - Consumer Confidence Report
- Questions ???

California Safe Drinking Water Act

- California's legal authority to carry out the federal Safe Drinking Water Act is defined in the California Health and Safety Code (CHSC), Chapter 4, "California Safe Drinking Water Act", Sections 116270-116751.
- Authority for additional programs is included in CHSC, Chapter 4.5, "Safe Drinking Water State Revolving Fund Law of 1997."
- The regulations to carry out the SDWA are defined in the California Code of Regulations, Title 17 and Title 22.

Definition of a Public Water System

California Health and Safety Code (CHSC)
Section 116275:

- “Public Water System” means a system for the provision of water for human consumption through pipes or other conveyances that has 15 or more service connections or regularly serves 25 individuals daily at least 60 days out of the year.

Types of Public Water Systems

Community Water Systems

- A public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents of the area served by the system.
- Typically includes cities, residential areas, mobile home parks, etc.

Types of Public Water Systems (cont.)

Noncommunity Water Systems

- **Nontransient** – a public water system that is not a community water system and that regularly serve at least 25 of the same persons over 6 months per year.
 - Includes facilities that serve a generally stable population: schools, places of business, etc.
- **Transient** – a noncommunity water system that does not regularly serve at least 25 of the same persons over six months per year.
 - Includes facilities that serve a generally transient population: campgrounds, restaurants, stores, wineries, etc.

Regulatory Responsibility in California

- EPA has delegated primacy to enforce the Safe Drinking Water Act to DHS
- DHS has delegated primacy to 34 of the 58 counties (known as LPA counties) for small water systems
 - Community water systems < 200 service connections
 - Non-community water systems (transient and non-transient)

Key Legal Obligations of Public Water Systems (1)

Most of these will be discussed further in this presentation.

- Provide a reliable and adequate supply of pure, wholesome, healthful, and potable water.
- Obtain a Water Supply Permit and comply with all conditions.
- Use only approved drinking water sources.
- All new public water systems and those that change ownership must comply with Technical, Managerial, and Financial (TMF) requirements.
- Prepare and maintain an Emergency Notification Plan.

Key Legal Obligations of Public Water Systems (2)

- Employ or utilize only water treatment plant operators that have been certified by the Department of Health Services at the appropriate grade.
- Comply with operator certification requirements.
- Conduct water quality monitoring and submit results as required.
- Comply with bacteriological quality requirements.
- Comply with primary and secondary drinking water standards.
- Provide treatment as necessary to comply with requirements.

Key Legal Obligations of Public Water Systems (3)

- Comply with waterworks standards.
- Ensure that the water system will not be subject to backflow under normal conditions.
- Prepare and distribute an annual Consumer Confidence Report as required.
- Submit an annual report to the Department.
- Maintain records and submit reports as required.
- Pay all required fees.
- Use only NSF approved additives.
- Comply with Department orders and directives.

Reliable Supply

Section 116555 of the CHSC requires each public water system (PWS) to:

“Provide a reliable and adequate supply of pure, wholesome, healthful, and potable water.”

- The system must have adequate source capacity and storage to meet average and peak demands.
- The system must be properly operated, maintained, and protected from damage and contamination.
- Water must always be delivered at proper pressure (20 psi).*

* *Currently under review*

Water Supply Permit Permit Requirements

- No person shall operate a public water system without applying for and receiving a valid permit.
- The Department may renew, reissue, revise or amend any domestic water supply permit when deemed necessary, whether or not an application has been filed.
- An application for an amended permit is required for changes in source, treatment or distribution system. Changes to the distribution system do not require an amendment if they comply with waterworks standards.
- Water systems may only use sources that are approved in the water supply permit.

Water Supply Permit

When is an Application Required?

- New water system
- Change of ownership
- Changes in source – new sources, change in status (from standby to active, etc.), change in method of collection, removal of sources
- Changes in treatment – chlorination, filtration, new treatment process
- Addition of a storage reservoir
- Major expansion of service area
- Consolidation of water systems
- Change in regulatory jurisdiction (i.e., from DHS to LPA)
- Change in water system classification

Water Supply Permit Application

- Permit Application consists of:
 - Application form
 - Technical report
 - Permit application fees
 - Other information as required by the Department.
- Department will review information and inform applicant within 30 days if application is complete.
- If not complete, applicant must submit information within specified time frame.
- Once application is complete, Department has 90 days to approve or reject application.

Water Supply Permit Technical Report

- Technical Report
 - General information
 - Technical, Managerial and Financial information (TMF)
 - Source information
 - Water quality monitoring
 - Drinking Water Source Assessment (to be discussed later)
 - Treatment information
 - Distribution system information
 - Engineering and design information
 - Plans and specifications
 - Operations/Maintenance plans
 - Additional information as required.

Emergency Notification Plan

- The ENP identifies procedures for the immediate notification of customers of any significant rise in bacterial count or other failure of a primary drinking water standard.
- The ENP must include:
 - Names and phone numbers (day and evening) of water system contact and alternates
 - Names and phone numbers (day and evening) of DHS or LPA contact and alternate.
 - Methods to be used to notify customers and detailed procedures (i.e., door-to-door, telephone, etc.)

Operator Certification

- New regulations effective January 2001
- **Treatment:** In 1971, laws and regulations governing the certification of the potable water treatment facility operation were enacted. These regulations established at what level water treatment facilities should be staffed, established minimum qualifications for testing at each of the five grade levels, and established criteria for the renewal and revocation of certificates. These regulations govern a program consisting of ~13,000 certified water treatment operators.

Operator Certification

- **Treatment and Distribution:** In 1998, the US EPA released Guidelines for the Certification and Recertification of Operators of Community and Nontransient Noncommunity Public Water Systems. Based on these guidelines, state regulations governing the certification of potable water treatment operators were revised to include distribution operators. **These regulations became effective on January 2001.** The new distribution grades are designated D1 through D5.
- <http://www.dhs.ca.gov/ps/ddwem/publications/opcert/index.htm>

Water Quality Monitoring Requirements



| Constituent(s) | Source or System? | Type of System |
|---|-------------------|--|
| Bacteriological | System | All |
| Primary Standards – Inorganic | Source | All (with exceptions) |
| Primary Standards – Organic | Source | Comm. & Nontransient |
| Secondary Standards | Source | Community |
| Unregulated Chemicals | Source | Comm. & Nontransient |
| Trihalomethanes and Haloacetic acids, MRDLs | System | Comm. & Nontransient |
| Radioactivity | Source | Community |
| Lead and Copper | System | Comm. & Nontransient |
| Surface Water Treatment | Source & System | All (with surface water) |
| Treated Water | System | All (if treatment req'd) ₂₀ |

Bacteriological Quality

Each water supplier shall:

- Develop a sample siting plan that identifies routine and repeat sampling locations
- Collect routine, repeat, and replacement samples as required
- Have all samples analyzed by approved laboratories
- Notify the Department when there is an increase in the coliform bacteria in samples
- Comply with the bacteriological MCL

Bacteriological Quality Routine Sample Siting Plan

- Required for all water systems
- Sample sites shall be representative of the water throughout the distribution system
 - All pressure zones
 - Areas supplied by each source
 - Areas served by each distribution reservoir
- Water supplier may rotate among sample sites if number of sites exceeds number required to be tested each month
- Use certified operators or trained personnel
- Keep the plan current

Bacteriological Quality

Routine Sample Siting Plan

- Plan must identify:
 - Routine sample sites
 - Repeat sample sites
 - Laboratory analyzing samples
 - Personnel to be notified by laboratory of positive samples
 - Contact name and phone numbers (day and evening) for DHS or LPA

Note: *Storage tanks, wells, blow offs, and fire hydrants are not acceptable sampling locations*

Bacteriological Quality

Number of Samples

| Routine Samples (CCR Table 64423-A) | |
|---|---|
| Type/Size of System | Minimum # Samples |
| Community Water Systems 25 - 1000 population > 1000 population | 1 sample per month See Table 64423-A |
| Nontransient Noncommunity 25 - 1000 population > 1000 population | 1 sample per month See Table 64423-A |
| Transient Noncommunity - GW 25 - 1000 population > 1000 population | 1 sample per quarter See Table 64423-A |
| Transient Noncommunity - SW 25 - 1000 population > 1000 population | 1 sample per month See Table 64423-A |

Bacteriological Quality

Sample Collection and Analysis

- Sample Collection – make sure that
 - Sampler is adequately trained
 - Samples are correctly taken
 - Samples are labeled correctly: routine, repeat, special, replacement
- Sample Analysis
 - Use an approved laboratory
 - Have sample analyzed for total coliform (T.C.)
 - If T.C. present, lab must sample for fecal coliform or E. coli
 - Lab must notify water supplier within 24 hours of presence of T.C., fecal coliform, or E. coli

Bacteriological Quality Reporting Results

- Analytical results for a month must be submitted to DHS or LPA by the 10th of the following month.
- For systems serving a population < 10,000, laboratories are required to submit results directly to DHS or LPA
- Water supplier must keep results for at least 5 years

Bacteriological Quality

Repeat Sampling

- If a routine sample is T.C. positive, the water supplier shall collect a repeat sample set within 24 hours of being notified
- Repeat sample set (for systems that collect one or fewer routine samples per month) = 4 samples:
 - 1 at original site
 - 1 within 5 connections upstream
 - 1 within 5 connections downstream
 - 1 at another location (DHS Guidance Memo 2003-03)
- If any of the repeat samples is T.C. positive, the water system has violated the Total Coliform MCL
- In the month following any T.C. positive sample, the water system shall take 5 routine samples

Bacteriological Quality

Repeat Sampling

Number of Repeat Samples

| <u># Routine Samples/Month</u> | <u># Repeat Samples</u> | <u># Routine Samples Next Month</u> |
|--------------------------------|-------------------------|-------------------------------------|
| 1 or Fewer | 4 | 5 |
| 2, 3 or 4 | 3 | 5 |
| 5 or More | 3 | Per Routine Requirements |

See additional comments in June 18, 2003 DHS Guidance Memo 2003-03: TCR Sample Siting Plan and SWS Repeat Sample Collection Sites

Bacteriological Quality

Repeat Sampling – Additional Repeats

- If any repeat sample is Total Coliform-Positive, the system must collect another set of repeat samples, as before...
- Until either:
 - Total coliforms are not detected in one complete set of repeat samples, or
 - The MCL has been violated and the system has notified the DHA or LPA

Note: If analysis or collection of samples cannot meet 24hr requirement, the system must notify DHS or LPA, who will determine how much more time will be allowed

Bacteriological Quality

Significant Rise in Bacterial Count

- DHS or LPA must be contacted if there is a violation of the Total Coliform MCL or any detection of fecal coliform or E. Coli
 - By end of day, or
 - Within 24 hours if DHS or LPA office closed
- When notifying DHS or LPA, include information on the current status of the system and activities that may have contributed to the results
- If DHS or LPA determines there is a Significant Rise in Bacterial Count, the water system shall implement its Emergency Notification Plan

Bacteriological Quality

Sample Invalidation

- DHS or LPA may invalidate a positive sample when there is evidence of a sampling site (non-distribution system) plumbing problem causing contamination.
 - Based on repeat sample results
 - Routine sample and repeat sample at original location are the only positive samples
 - Not if all repeats are negative
 - Not if system has only 1 service connection
- DHS or LPA may invalidate a positive sample if the laboratory, at the Purveyor's request, is willing to document laboratory error.
 - Replacement sample required from original sample site within 24 hours of notification

Bacteriological Quality

Sample Invalidation

Case 1.

| | | | |
|----------------|----|-------------|----|
| Routine Sample | | + | |
| Repeat Set | -- | + | -- |
| Repeat Set | -- | + | -- |
| | | <u>Flow</u> | > |

Case 1 - Sample invalidated due to site contamination

Case 2.

| | | | |
|----------------|----|-------------|----|
| Routine Sample | | + | |
| Repeat Set | -- | - | -- |
| | | <u>Flow</u> | > |

Case 2 - Sample is not invalidated

Bacteriological Quality

TCR Violations

- Monthly MCL compliance is determined for each month in which the system is required to monitor for total coliforms
 - Calendar month - Not a 30-day period
- Acute MCL compliance is determined by sample results of routine and repeat samples
 - May span more than one month

Bacteriological Quality

Monthly MCL Violation (Requires Tier 2 Public Notice)

| | |
|--|--|
| Number of Samples <u>Analyzed/Month</u> | System in Compliance <u>with the MCL if...</u> |
| Fewer than 40 | No more than 1/month be total coliform-positive |

Acute MCL Violation (Requires Tier 1 Public Notice)

| | <u>Total Coliform</u> | <u><i>E.coli</i>/Fecal Coliform</u> |
|---------|-----------------------|-------------------------------------|
| Routine | + | - |
| Repeat | + | + |
| <hr/> | | |
| Routine | + | + |
| Repeat | + | - |

Bacteriological Quality Compliance Scenarios



PWS Takes 1 routine sample per month

Routine Sample **TC+** EC-

A set of 4 repeats are required.

If all 4 repeats are analyzed as TC-, is there any violation?

Repeat Samples:

Original Site TC-

Upstream TC-

Downstream TC-

Other Site TC-

No violation, BUT the system must take a minimum of 5 routine samples in the following month

Bacteriological Quality Compliance Scenarios

PWS Takes 1 routine sample per month

Routine Sample

TC+ EC-

A set of 4 repeats are required.

Case 1 - One of the repeat samples was total coliform positive but E.coli negative.

Case 2 – PWS took NONE of the required 4 repeat samples

CASE 1

Repeat Samples:

| | |
|---------------|---------|
| Original Site | TC+ EC- |
| Upstream | TC- |
| Downstream | TC- |
| Other Site | TC- |

CASE 2

Repeat Samples:

| | |
|---------------|-----------|
| Original Site | NOT TAKEN |
| Upstream | NOT TAKEN |
| Downstream | NOT TAKEN |
| Other Site | NOT TAKEN |

Case 1. That's a Monthly MCL violation (Requires Tier 2 Public Notice)

Case 2. That's is a Monitoring & Reporting (M&R) Violation (Requires Tier 3 Public Notice)

Bacteriological Quality Compliance Scenarios

PWS Takes 1 routine sample per month

CASE 1

Routine Sample

TC+ EC-

CASE 2

Routine Sample

TC+ EC+

A set of 4 repeats are required.

CASE 1

Repeat Samples:

Original Site

TC+ EC+

Upstream

TC-

Downstream

TC-

Other Site

TC-

CASE 2

Repeat Samples:

Original Site

TC+ EC-

Upstream

TC+ EC-

Downstream

TC-

Other Site

TC-

Cases 1 & 2 - ACUTE MCL violation (Require Tier 1 Public Notice)

Approved Coliform Test Methods

100 mL of sample must be used

- Total Coliforms:
 - Quantitative estimation (MTF)
 - Multiple Tube Fermentation
 - Membrane Filtration (MF)
 - Single vessel Presence-Absence (P/A) Methods (Colilert-Colisure, E*Colite, Colitag , Clark's)
- Fecal Coliforms:
 - MTF
 - MF
 - P/A confirmation with EC medium
- *E.coli*:
 - Colilert
 - Colisure
 - E*Colite
 - MF with nutrient agar + MUG
 -

CONFIRMATION: Fecal coliforms or *E.coli* must be determined for every TC positive sample

Primary Standards

Inorganic Chemicals

Note: As of January 2006 MCL for Arsenic is 0.01 mg/L

Table 64431-A

Maximum Contaminant Levels
Inorganic Chemicals

| <i>Chemical</i> | <i>Maximum Contaminant Level, mg/L</i> |
|-------------------------------------|--|
| Aluminum | 1. |
| Antimony | 0.006 |
| Arsenic | 0.05 |
| Asbestos | 7 MFL* |
| Barium | 1. |
| Beryllium | 0.004 |
| Cadmium | 0.005 |
| Chromium | 0.05 |
| Cyanide | 0.2 |
| Fluoride | 2. |
| Mercury | 0.002 |
| Nickel | 0.1 |
| Nitrate (as NO ₃) | 45. |
| Nitrate + Nitrite (sum as nitrogen) | 10. |
| Nitrite (as nitrogen) | 1. |
| Selenium | 0.05 |
| Thallium | 0.002 |

*MFL = million fibers per liter; MCL for fibers exceeding 10 um in length.

Primary Standards

Inorganic Chemicals

- These are inorganic chemicals that represent a health risk to the consumer
- All community and nontransient water systems, and transient systems >1000 population, shall monitor for the chemicals in CCR, Title 22 Table 64431-A
- Monitoring frequency (except Nitrate)
 - Ground water sources – once every 3 years
 - Surface water sources – annually
- Detections above MCL (except Nitrate)
 - Inform DHS or LPA within 48 hrs and begin quarterly monitoring, or
 - Inform DHS or LPA within 7 days and collect second sample within 14 days. If average of 2 samples > MCL, begin quarterly monitoring
- **Waivers possible that may reduce monitoring frequency**

Primary Standards

Nitrate and Nitrite

- All systems shall monitor for Nitrate and Nitrite
- Nitrate monitoring frequency:
 - Transient systems – annually
 - Community and Nontransient systems:
 - Ground water sources – annually
 - Surface water sources – quarterly
- Nitrite monitoring frequency:
 - All systems – once every 3 years
- Detections above MCL
 - Laboratory must notify water system within 24 hrs
 - Second sample required
 - If average of samples $>$ MCL contact DHS within 24 hours
 - If average of samples $<$ MCL contact DHS within 7 days
- Detections $>$ 50% of MCL
 - Conduct quarterly monitoring

Primary Standards

Fluoride and Asbestos

- Fluoride
 - All transient systems shall monitor once
 - Additional monitoring requirements if system fluoridates
- Asbestos
 - Community and Nontransient systems only
 - Source sampling same as for other inorganic chemicals
 - Distribution system sampling required if system has AC pipe
 - **Waivers possible for systems not vulnerable to asbestos contamination in its source OR to leaching of AC pipes**

Primary Standards

Arsenic

- In January 2006 EPA has adopted a MCLG for arsenic of 0 and a MCL of 0.010 mg/L
- All water systems must comply with new MCL of 0.010 mg/L
- Department is accepting pre-applications for SRF monies for projects dealing with arsenic problems

Primary Standards

Organic Chemicals

- These are organic chemicals that represent a health risk to the consumer. These include Volatile Organic Chemicals (VOCs) and Synthetic Organic Chemicals (SOCs)
- Monitoring required for Community and Nontransient systems
- Initial monitoring = four quarterly samples
- Repeat monitoring based on results; if no detections:
 - VOCs
 - GW = 3 annual samples, then once every 3 years
 - SW = annual sampling
 - SOCs
 - > 3,300 population = 2 quarterly samples once every three years
 - < 3,300 population = once every three years
- **Waivers possible that may reduce repeat monitoring frequency**

Primary Standards – Organic Chemicals

- If VOC or SOC detected:
 - Within 7 days, collect 1 or 2 *confirmation samples*
 - If no detection in 2 additional samples – disregard
 - If detected in an additional sample, detected level = average of original and additional sample
 - Additional requirements:
 - Additional monitoring required for certain chemicals
 - Repeat monitoring frequency increased. Title 22, Section 64445.1(c)(5)(B) Repeat sampling, outlines requirements for systems serving $\leq 3,300$ persons
 - If concentration $> 10 \times$ MCL, immediately discontinue use of source, notify DHS within 48 hrs, and take a confirmation sample within 48 hrs

Secondary Standards

Table 64449-A
Secondary Maximum Contaminant Levels
Consumer Acceptance Limits

| <i>Constituents</i> | <i>Maximum Contaminant Levels/Units</i> |
|--|---|
| Aluminum | 0.2 mg/L |
| Color | 15 Units |
| Copper | 1.0 mg/L |
| Corrosivity | Non-corrosive |
| Foaming Agents (MBAS) | 0.5 mg/L |
| Iron | 0.3 mg/L |
| Manganese | 0.05 mg/L |
| Methyl-<i>tert</i>-butyl ether (MTBE) | 0.005 mg/L |
| Odor—Threshold | 3 Units |
| Silver | 0.1 mg/L |
| Thiobencarb | 0.001 mg/L |
| Turbidity | 5 Units |
| Zinc | 5.0 mg/L |

Table 64449-B
Secondary Maximum Contaminant Levels - Ranges

| <i>Constituent, Units</i> | <i>Maximum Contaminant Level Ranges</i> | | |
|--|---|--------------|-------------------|
| | <i>Recommended</i> | <i>Upper</i> | <i>Short Term</i> |
| Total Dissolved Solids, mg/L | 500 | 1,000 | 1,500 |
| or | | | |
| Specific Conductance, micromhos | 900 | 1,600 | 2,200 |
| Chloride, mg/L | 250 | 500 | 600 |
| Sulfate, mg/L | 250 | 500 | 600 |

Secondary Standards

- These are chemicals and constituents that affect the consumer acceptability of the water.
- Community water systems must monitor for those in Tables 64449-A and 64449-B, and these:
 - Bicarbonate
 - Carbonate
 - Hydroxide alkalinity
 - Calcium
 - Magnesium
 - Sodium
 - Total hardness
- Monitoring frequency:
 - Ground water = once every 3 years
 - Surface water = annually
- **Waivers possible that may reduce monitoring frequency, per Title 22, Section 64449(e) and (h). Must renew every 9 years.**

Radionuclide Monitoring

- Radioactivity
 - Community water systems must monitor source for naturally occurring gross alpha and uranium once every 4 years
 - Community water systems > 30,000 service conn. and system using surface water must monitor for man-made radioactivity once every 4 years

The federal [radionuclides rule](#) became effective December 2003.

Four quarters of initial monitoring are required by 01/31/07.

- CA proposed regulation available at:
<http://www.dhs.ca.gov/ps/ddwem/publications/Regulations/proposedregulations.htm>

Proposed Radionuclides Reg.

- Applies to community and non-transient, non-community water systems
- Initial Monitoring
 - Each system needs to collect one sample from each source and monitor for gross alpha particle activity and Radium-228
 - Monitoring for Radium-226 can be waived if the gross alpha particle activity is < 5 pCi/L
 - Monitoring for Uranium can be waived if the gross alpha particle activity is < 15 pCi/L
 - Frequency of monitoring is determined by initial round of monitoring results

Unregulated Chemicals

- These are chemicals for which no drinking water standard has been set, but monitoring is required.
- Monitoring is required by community and nontransient water systems
- Initial monitoring for 9 chemicals due by 12/31/2003
- Systems serving < 150 service connections may be eligible for an exemption based on existing data, per Title 22, Section 64450 (d)

Waivers (1)

- **Overview:**
 - Contaminant specific
 - Can apply to one, some, or all sources
 - Individual systems or area-wide
 - Requested by the system (except area-wide)
- **Types:**
 - Use waivers [chemicals used, manufactured, or stored in zone of influence]
 - Susceptibility waiver based on analytical results & vulnerability assessment
- **Waiver Implementation: IOCs**
 - NO WAIVERS for NITRATE & NITRITE !**
 - Based on 3 rounds of monitoring:
 - SW 3 annual samples
 - GW 3 rounds of monitoring
 - At each entry point
 - All analytical results below the MCL

Waivers (2)

- Waiver Criteria: IOCs
 - Reported concentrations from all previous monitoring
 - Variations in monitoring results
 - Changes in:
 - GW pumping rates
 - System configuration
 - Operating procedures
 - Source characteristics
 - Asbestos:
 - Potential source contamination
 - Use of asbestos-cement pipe
 - No monitoring required for asbestos under a waiver
 - Waiver duration = 3 years
 - Cyanide
 - Not vulnerable due to a lack of any industrial cyanide source

Waivers (3)

- Waiver Implementation: SOCs

Systems serving $\leq 3,300$ persons can apply for a waiver for one or more of the SOCs after 3 consecutive years of annual sampling results are below the detection limit

- Must renew every 3 years

- Waiver Implementation: VOCs

GW Systems: Systems can apply for a monitoring waiver for VOCs after 4 initial quarters **OR** 3 consecutive years of annual sampling results are below the detection limit.

- Must renew every 6 years.

SW Systems: Systems can apply for a monitoring waiver for VOCs after 4 initial quarters **OR** 3 consecutive years of annual sampling results are below the detection limit.

- Must renew every 3 years.

Note:

GW sources – sample each well head

SW sources – sample each water intake

Waivers (3)-Vulnerability Assessment (VOCs and SOCs)

- Previous analytical results
- Proximity to sources of contamination
- Environmental persistence, fate, and transport of the contaminant
- How well the source is protected
- Elevated nitrate levels at the source (SOCs)
- Use of PCBs in equipment used in the production, storage, or distribution of drinking water
- Depending on their level of detail, Source Water Assessments may be useful tools during vulnerability assessments

EDT Regulations

- As of March 1, 2002, all source water quality monitoring results must be submitted by Electronic Data transfer (EDT) to the Department
- All certified laboratories are required to have EDT capabilities

Note: Treated Water

- Any water supplier utilizing treatment to comply with an MCL shall collect monthly samples of the treated water prior to distribution

Distribution System

Water Quality Monitoring

- Bacteriological monitoring, as described previously
- Color, odor, and turbidity monthly monitoring, if required by the Department
- Lead and Copper
 - Community and nontransient water systems
 - Samples required at customer taps
 - # Sample sites based on population
- Federal Disinfectants/Disinfection Byproducts

Rules (EPA Stage 1 DBP Rule is plant-based, dependent on number of treatment plants or wells; EPA Stage 2 DBP Rule is population based, dependent on population served)

Distribution System Monitoring

Lead and Copper Tap Monitoring

- Monitoring Requirements
 - First and Second Round Initial Tap Monitoring
 - First and Second Round Annual Tap Monitoring
 - First and second Round Triennial Tap Monitoring
- Standard vs. Reduced monitoring

Title 22, Table 64684

| <u>System Size</u> | <u>Standard Monitoring</u> | <u>Reduced Monitoring</u> |
|--------------------|----------------------------|---------------------------|
| 501 to 3,300 | 20 | 10 |
| 101 to 500 | 10 | 5 |
| < 101 | 5 | 5 |

Federal Stage 1 DBP

- **Purpose:** Increase public protection from disinfection byproducts (DBPs) by reducing the exposure to TTHMs, HAA5, bromate, and chlorite
- **Scope:** Applies to ALL sizes of CWS and NTNC water systems that add a disinfectant to the drinking water during any part of the treatment process and TNC water systems that use chlorine dioxide
 - Addresses both acute and non-acute health effects

| <u>Regulated Contaminants/Disinfectants:</u> | <u>MCL (mg/L)</u> |
|--|-------------------|
| Total Trihalomethanes (TTHMs) | 0.080 |
| Five Haloacetic Acids (HAA5) | 0.060 |
| Bromate (plants that use ozone) | 0.010 |
| Chlorite (plants that use chlorine dioxide) | 1.0 |

| <u>Maximum Residual Disinfectant Levels:</u> | <u>MRDLs (mg/L)</u> |
|--|---------------------|
| Chlorine | 4.0 |
| Chloramines | 4.0 |
| Chlorine Dioxide | 0.8 |

Federal Stage 1 DBP

TTHM & HAA5 Distribution System Monitoring

| <u>Type of System</u> | <u>Monitoring Frequency</u> | <u>Locations</u> |
|------------------------|---|------------------------------|
| Subpart H Serving <500 | 1/plant/year in month in month of warmest temperature* | Max. Residence Time (MRT) |
| GW serving <10,000 | 1/plant/year in month in month of warmest temperature* | MRT |

TTHM & HAA5 Reduced Monitoring

| <u>Type of System</u> | <u>Requirement</u> | <u>Reduced Level</u> |
|------------------------|--|--|
| Subpart H Serving <500 | N/A | N/A |
| GW serving <10,000 | TTHM RAA** < 0.040 mg/L HAA5 RAA ** < 0.030 mg/L For 2 years OR TTHM RAA ** < 0.020 mg/L HAA5 RAA ** < 0.015 mg/L For 1 year | 1/plant/3-year monitoring cycle cycle at MRT |

Subpart H Systems – surface water or GWUDI systems

** - System must increase monitoring to 1 sample per plant per quarter in an MCL is exceeded

* - Running Annual Average

Federal Stage 1 DBP

- DBP Precursors
 - Found naturally in water
 - React with disinfectants to produce DBPs
 - Reducing DBP limits formation of DBPs
- DBP Precursor Treatment Technique (TT)

Applies only to Subpart H systems using conventional filtration or enhanced softening which include these 4 filtration components:

 1. Coagulation
 2. Flocculation
 3. Sedimentation
 4. Filtration
- DBP Precursor Routine Monitoring Requirements (1 sample set per month)
 - Source water alkalinity
 - Source water TOC & Treated water TOC (**Paired sample**)

TOC – Total organic carbon

Federal Stage 1 DBP

DBP Precursor Removal Percentages

Removal requirements depend on source water characteristics:

Treatment Technique Removal Percentages

| Source Water TOC (mg/L) | Source Water Alkalinity (mg/L as CaCO ₃) | | |
|-------------------------|--|---------|-------|
| | 0-60 | >60-120 | >120 |
| >2.0 - 4.0 | 35.0% | 25.0% | 15.0% |
| >4.0 – 8.0 | 45.0% | 35.0% | 25.0% |
| >8.0 | 50.0% | 40.0% | 30.0% |

¹*Systems meeting at least one of the alternative compliance criteria in the rule are not required to meet the removals in this table*

²*Systems practicing softening must meet TOC removal requirement in the last column to the right*

DBP Precursor Reduced Monitoring

Qualify if average treated water TOC level is:

- Less than 2.0 mg/L for 2 years OR less than 1.0 mg/L for 1 year
- Reduced Schedule: 1 sample set per quarter. Return to routine monitoring if RAA off treated water TOC > 2.0 mg/L

Federal Stage 1 DBP

DBP Precursor Alternative Compliance Criteria

1. RAA of monthly source water TOC samples < 2.0 mg/L
2. RAA of monthly source treated water TOC samples < 2.0 mg/L
3. RAA of source water TOC samples < 4.0 mg/L, RAA of source water alkalinity >60 mg/L, and either:
TTHM RAA ≤ 0.040 mg/L and HAA5 RAA ≤ 0.030 mg/L
OR System has made a “clear and irrevocable commitment” to installing technology to limit TTHM & HAA5 to those levels
4. TTHM RAA ≤ 0.040 mg/L and HAA5 RAA ≤ 0.030 mg/L, and system uses only chlorine for primary disinfection and maintenance of a residual
5. RAA of SUVA prior to any treatment < 2.0 L/mg-m
6. RAA of treated water SUVA < 2.0 L/mg-m

Distribution System Water Quality

- Water supplier shall:
 - Maintain records on the following:
 - Water main flushing
 - Consumer complaints
 - Other data relative to physical water quality
 - Conduct monitoring and keep records on color, odor, and turbidity if directed by the Department
 - Keep the distribution system free from significant amounts of particulate matter

Records and Reporting

- Analytical results for a calendar month shall be reported to DHS or LPA no later than the 10th day of the following month.

| Type of Records | Retention Time |
|---|------------------------------|
| Complaint records | 5 years |
| Bacteriological analyses results | 5 years |
| Chemical analyses results | 10 years |
| Records relating to violations | 3 years from final action |
| Reports, summaries, communication relating to an inspection | 10 years after inspection |
| Variances or exemptions | 5 years following expiration |
| Permits | Forever |

Notification of the Department and Water Consumers

- Acute health risk
 - Significant rise in bacterial count
 - **Notify consumers via electronic media w/in 24 hrs**
- Water quality failure
 - Exceedance of an MCL
 - Failure to comply with a treatment technique established in lieu of an MCL
 - Violation of a schedule for variance or exemption
 - **Notify consumers via newspaper w/in 14 days and mail or hand deliver w/in 45 days**
 - **Or if no newspaper, expedited hand delivery w/in 14 days or continuous posting initiated w/in 14 days**

Notification of the Department and Water Consumers (cont.)

- Procedural failure
 - Failure to take and report required # of samples
 - Failure to comply with a testing procedure
 - Water system operating under a variance or exemption
 - **Notify consumers via newspaper w/in 3 months and mail or hand deliver w/in 3 months**
 - **Or if no newspaper, hand delivery w/in 3 months or continuous posting initiated w/in 3 months**
- All public notifications must follow a specific format and include required language

Notification of the Department and Water Consumers (cont.)

- NOTE: Federal Public Notification Rule may take precedence, though not yet adopted in CA.
- Use most conservative approach.
- EPA has published guidance, including templates for various types of notification.
- Even when observing CA timeframes and methods, federal templates may be used for notice.
- Visit <http://www.epa.gov/safewater/pn.html>

Surface Water Treatment Rules

- Purpose: To improve public health protection through the control of microbiological contaminants
- Scope: Apply to ALL public water systems using surface water or ground water under the direct influence of surface water (GWUDI), otherwise known as “Subpart H Systems”.
- Surface water treatment regulations
 - Establish treatment techniques in lieu of MCLs for turbidity and microbiological contaminants
 - Require all Subpart H systems to:
disinfect, filter, monitor individual filters, meet CFE limits, apply treatment technique requirements for control of microbials

Surface Water Treatment Rules

- Type of Filtration:
 - Conventional Filtration
 - Direct Filtration
 - Slow Sand Filtration
 - Diatomaceous Earth Filtration
 - Alternative Filtration Technologies

Overview of CA SWTR and LT1ESWTR Requirements

- All Subpart H systems must comply with the following requirements:
 - Removal/inactivation requirements for viruses, *Giardia*, and *Cryptosporidium*
 - Residual disinfectant monitoring
 - Disinfection profiling and benchmarking
 - Sanitary surveys (no less than every 3 years for CWS and no less than every 5 years for noncommunity water systems)
 - Covered finished reservoirs/water storage facilities
 - Certified operators

Overview of CA SWTR and LT1ESWTR Requirements

Regulated Pathogens: *The removal/inactivation requirements are as follows:*

| <u>Microbial</u> | <u>MCLG</u> | <u>Removal/Inactivation Req.</u> |
|------------------------|-------------|----------------------------------|
| Viruses | | 99.99% (4-log) |
| <i>Giardia Lamblia</i> | Zero | 99.9% (3-log) |
| <i>Cryptosporidium</i> | Zero | 99% (2-log)(removal only) |

Residual Disinfectant Monitoring Requirements

| <u>Population</u> | <u>Entrance to Distribution Sys.</u> | <u>In Distribution Sys.</u> |
|-----------------------|---|---|
| All Subpart H systems | Cannot be <0.2 mg/L for more than 4 hours ¹ monitored continuously | Detectable in at least 95% of samples in a month for any 2 consecutive months |

¹DHS or LPA may allow systems serving ≤3,300 pop to take grab sample from-1-4 times per day, depending on system size (Title 22, Section 64656, Disinfection)

Overview of CA SWTR and LT1ESWTR Requirements

Residual Disinfectant Reporting Requirements

Monthly reports to DHS or LPA due within 10 days of the end of the following month

- Lowest daily CT value for each day
- A calculation of the % of distribution residual samples that were undetectable
- The date and duration when residual disinfectant was <0.2 mg/L
- When DHS or LPA was notified of events when residual disinfectant was <0.2 mg/

Overview of CA SWTR and LT1ESWTR Requirements

Additional Disinfectant Monitoring Requirements

| <u>Frequency</u> | <u>In Distribution System</u> |
|------------------|--|
| Daily | Before or at the first customer: <ul style="list-style-type: none">- Temperature- pH (if chlorine is used)- Disinfectant contact time(s) at peak hourly flow- Residual disinfectant concentration measurement(s) at peak hourly flow used in the inactivation calculation(s) |

Additional Disinfectant Reporting Requirements

- Daily residual disinfectant concentration(s) and disinfectant contact time(s) used for calculating the CT value(s)
- Instances where the residual disinfectant level entering the distribution system was <0.2 mg/L

SWTRs

Compliance Scenario: Disinfectant Residual

PWS takes 3 routine TCR samples, uses surface water and has a conventional filtration

Q. In addition to taking one sample at the entry point to the distribution system, what does this system need to do to comply with the SWTRs residual disinfectant monitoring requirements?

A. System needs to take 3 disinfectant residual samples at the same time and place in the distribution system as the total coliforms sample

SWTRs Turbidity Requirements Conventional & Direct Filtration Systems

Combined Filter Effluent (CFE) Requirements

| Monitoring Requirement | Monitoring Frequency | Measurement |
|------------------------|----------------------|----------------|
| CFE 95% Value | At least every 4 hrs | ≤ 0.3 NTU |
| CFE Max Value | At least every 4 hrs | 1 NTU |

CFE Reporting - *Monthly reports to DHS or LPA due within 10 days of the end of the following month*

- Total number of CFE measurements
- Percentage of CFE measurements $\leq 95\%$ limit
- Date and value of any CFE measurement that exceeded 1 NTU

SWTRs Turbidity Requirements Conventional & Direct Filtration Systems

serving < 10,000 people

Individual Filter Effluent (IFE)

IFE must be monitored continuously every 15 minutes

IFE Follow-up Steps

| | <u>Condition</u> | <u>Action</u> |
|----|---|---|
| 1. | 2 consecutive measurements >1.0 NTU taken 15 minutes apart | Reporting only |
| 2. | 2 consecutive measurements >1.0 NTU taken 15 minutes apart at the same filter for 3 months in a row | Conduct a filter self- assessment within 14 days |
| 3. | 2 consecutive measurements >2.0 NTU taken 15 minutes apart at the same filter for 2 months in a row | Arrange for a CPE* within 60 days and submit report within 120 days |

* *Comprehensive Performance Evaluation. Exception if a CPE was done in the last 12 months.*

SWTRs Turbidity Requirements Conventional & Direct Filtration Systems

serving < 10,000 people

IFE Reporting – Condition 1

Monthly reports to DHS or LPA due within 10 days of the end of the following month:

- *Filter number*
- *Turbidity value*
- *Cause (if known)*
- *Date*
- *If applicable, date CPE was triggered*

IFE Reporting – Condition 2

Monthly reports to DHS or LPA due within 10 days of the end of the following month (or within 14 days of filter self-assessment being triggered in the last 4 days of the month).

Report: Date the filter self-assessment was triggered
 Date the filter self-assessment was completed

Overview of CA SWTR and LT1ESWTR Requirements Disinfection Profiling and Benchmarking

- **Purpose:** to balance disinfection and proper inactivation with Stage 1 DBP requirements
- **Applies to :** all Subpart H PWSs
- **Profiling requirements vary by system size**
- **Disinfection benchmark must be calculated and DHS or LPA must be consulted if the system is considering:**
 - Changes to the point of disinfection
 - Changes to the disinfectant(s) used
 - Changes to the disinfection process
 - Any modification identified by the DHS or LPA

Consumer Confidence Report (CCR)

- An annual report to the customers of a water system
- Informs customers of water quality and related information
- Replaces previous requirement for an Annual Water Quality Report
- Required for all community and nontransient water systems
- Must be delivered by July 1 of each year

Consumer Confidence Report (cont.)

- Required content:
 - Description of water source
 - Information from source water assessment, if completed
 - Definition of terms (MCL, MCLG, PHG, AL, Treatment Technique)
 - Detected contaminants
 - Results, MCL, likely source of contaminant, health effects language
 - Sodium and hardness results
 - Required information language

Conclusion

- For more information contact your local State DWFOB office or County DHS office
- Make sure to review materials on the DHS website: <http://www.dhs.ca.gov/ps/ddwem/>
Info on Regulations, TMF Capacity, State Revolving Fund, Proposition 50, Consumer Confidence Reports, Operator Certification, and more.