

## **APPENDIX A**

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# **REGULATORY DISCUSSION**



## Regulatory Discussion

This appendix provides a detailed discussion of 14 regulations that could potentially impact the District.

### 1. Stage 1 Disinfectants and Disinfection Byproducts Rule

Stage 1 of the D/DBPR was finalized during late November 1998 and became effective during January 2002 for systems serving 10,000 or more consumers. The primary objective of this rule is to protect human health by reducing the concentrations of disinfection by-products (DBPs) in drinking water. Major provisions of the Stage 1 D/DBPR are as follows:

- The current maximum contaminant level (MCL) for total trihalomethanes (TTHMs) has been reduced from the current 0.10 milligrams per liter (mg/L) to 0.080 mg/L.
- New MCLs have been established for total haloacetic acids (HAAs), bromate (a by-product of disinfection using ozone), and chlorite ion (a by-product of disinfection using chlorine dioxide).
- Maximum Residual Disinfectant Levels (MRDLs) and MRDL Goals (MRDLGs) have been established for free chlorine, chloramine, and chlorine dioxide. MRDLs are enforceable standards, analogous to MCLs, which recognize the benefits of adding a disinfectant to water on a continuous basis and of maintaining a residual for controlling pathogens in the distribution system.
- A treatment technique has been established which requires that surface water systems (or groundwater systems under direct surface water influence) operate in either an enhanced coagulation or enhanced softening mode to achieve specified removals of total organic carbon (TOC).

The table below summarizes key requirements based on the new rule.

**Table 1 - MRDLGs, MRDLs, MCLGs and MCLs for Stage 1 Disinfectants and Disinfection Byproducts Rule**

Disinfectant Residual	MRDLG (mg/L)	MRDL (mg/L)	Compliance Based On
Chlorine	4 (as Cl <sub>2</sub> )	4.0 (as Cl <sub>2</sub> )	Annual Average
Chloramine	4 (as Cl <sub>2</sub> )	4.0 (as Cl <sub>2</sub> )	Annual Average
Chlorine Dioxide	0.8 (as ClO <sub>2</sub> )	0.8 (as ClO <sub>2</sub> )	Daily Samples

Disinfectant Residual	MRDLG (mg/L)	MRDL (mg/L)	Compliance Based On
Total trihalomethanes (TTHM) <sup>1</sup>	N/A	0.080	Annual Average
-Chloroform	N/A		
-Bromodichloromethane	Zero		
-Dibromochloromethane	0.06		
-Bromoform	Zero		
Haloacetic acids (five) (HAA5) <sup>2</sup>	N/A	0.060	Annual Average
-Dichloroacetic acid	Zero		
Trichloroacetic acid	0.3		
Chlorite	0.8	1.0	Monthly Average
Bromate	Zero	0.010	Annual Average

N/A Not applicable because there are individual MCLGs for TTHMs or HAAs.

- 1 Total trihalomethanes is the sum of the concentrations of chloroform, bromodichloromethane, dibromochloromethane, and bromoform
- 2 Haloacetic acids (five) is the sum of the concentrations of mono-, di-, and trichloroacetic acids and mono- and dibromoacetic acids.

A primary goal of the D/DBPR is to reduce the levels of organic/humic compounds (collectively referred to as DBP precursors) that react with chlorine-based disinfectants to form DBPs. This is to be accomplished through operation of treatment facilities in an “enhanced coagulation” or “enhanced softening” mode, which will typically involve increases in coagulant dosages or (in the case of softening facilities) adjustment of operating pH to optimize the removal of the precursor compounds. Precursor removal is to be quantified by measuring the removal of TOC across the treatment process. In general, for systems with average source water TOC concentrations exceeding 2.0 mg/L, enhanced coagulation/enhanced softening treatment will be required. Minimum TOC removal levels are summarized in Table 2. TOC removals are to be determined monthly, and compliance is to be assessed quarterly based on a running annual average of monthly TOC removals.

**Table 2 - TOC Removal Requirements for Enhanced Coagulation/Enhanced Softening**

Source Water TOC (mg/L)	Source Water Alkalinity (mg/L as CaCO <sub>3</sub> )		
	0-60	>60-120	>120*
>2.0 to 4.0	35%	25%	15%
>4.0 to 8.0	45%	35%	25%
>8.0	50%	40%	30%

\*Systems practicing softening must meet the TOC removals shown in this column.

The D/DBPR also provides alternative compliance criteria that are independent of the criteria discussed above. Systems will be exempt from the enhanced coagulation/enhanced softening requirements if any of the conditions listed in Table 3 or Table 4 are met:

**Table 3 - Alternative Compliance Criteria**

Alternative Compliance Criterion	Description
1	Source water TOC < 2.0 mg/L (annual average)
2	Treated water TOC < 2.0 mg/L (annual average)
3	Source water TOC < 4.0 mg/L, alkalinity > 60 mg/L (annual average) and annual average TTHM ≤ 0.040 mg/L and HAA <sub>5</sub> ≤ 0.030 mg/L; or, system has made clear and irrevocable financial commitment to use technologies that limit TTHM and HAA <sub>5</sub> to ≤ 0.40 mg/L and ≤ 0.030 mg/L, respectively (financial commitment must be made by the applicable compliance dates and technologies must be operational no later than June 16, 2005)
4	TTHM ≤ 0.040 mg/L and HAA <sub>5</sub> ≤ 0.030 mg/L (annual averages) and system uses only chlorine for primary and residual disinfection
5	Source water specific UV absorbance (SUVA) ≤ 2.0 L/mg-m (annual average)
6	Treated water SUVA ≤ 2.0 L/mg-m (annual average). The SUVA measurement must be made prior to the addition of a chemical oxidant, which will likely be problematic for most utilities

Systems practicing enhanced softening that cannot meet the TOC removal percentages discussed above may qualify for the alternative compliance criteria listed in Table 4.

**Table 4 - Alternative Compliance Criteria (Softening)**

Alternative Compliance Criterion	Description
7	Softening that results in lowering the treated water alkalinity < 60 mg/L (as CaCO <sub>3</sub> ), measured monthly and calculated quarterly as a running annual average.
8	Softening that results in 10 mg/L removal of magnesium hardness (as CaCO <sub>3</sub> ), measured monthly and calculated quarterly as a running annual average.

Systems that elect to utilize one of these alternative compliance criteria must still conduct monthly raw and treated water TOC monitoring.

## **2. Interim Enhanced Surface Water Treatment Rule**

EPA finalized the Interim Enhanced Surface Water Treatment Rule (IESWTR) and the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) in November 1998. The rules were published in the Federal Register on December 16, 1998. Together, these rules are intended to increase protection against microbial contamination while also limiting the concentrations of disinfectants and disinfection byproducts.

The IESWTR applies to all public water systems using surface water or groundwater under the direct influence of surface water (GWUDI) that serve 10,000 or more people. This rule is intended to ensure that protection against

microbial contaminants is not lowered as utilities comply with the Stage 1 DBPR and to provide increased protection against gastrointestinal illness from *Cryptosporidium*. The rule builds upon the Surface Water Treatment Rule (SWTR) with the following key modifications:

- Maximum Contaminant Level Goal (MCLG) of zero for *Cryptosporidium*.
- 2-log *Cryptosporidium* removal requirements for systems that filter.
- Strengthened combined filter effluent turbidity performance standards.
- Individual filter turbidity monitoring provisions.
- Disinfection profiling and benchmarking provisions.
- Inclusion of *Cryptosporidium* in watershed control requirements for unfiltered public water systems.
- Systems using GWUDI are now subject to new rules dealing with *Cryptosporidium*.
- Requirements for covers on new finished water reservoirs.
- Sanitary surveys conducted by states for all surface water systems regardless of size.

### **3. California IESWTR**

The California Department of Health Services (DHS) believes, based on its own experiences and understanding of treatment plant performance, that some changes to the federal IESWTR are prudent and would increase the level of protection from exposure to pathogens, especially *Cryptosporidium*. As such, DHS has developed the California IESWTR. Primary requirements of the California IESWTR are as follows:

- Combined Filter Effluent (CFE) turbidity continuous monitoring increases from every 4 hours to every 15 minutes.
- Beginning January 1, 2002, a water system that provides conventional filtration or direct filtration must report the total number of combined filter turbidity measurements taken during the month and:
  - The 50th, 90th, 95th, 98th and 99th percentile turbidity values and the date, time and value of any turbidity measurements taken during the month that exceed 1 NTU **or**:
  - The results of turbidity measurements recorded at intervals no greater than every 4 hours and all results that exceed 0.3 NTU, recorded at intervals no greater than every 15 minutes and the percent of turbidity measurements that are less than or equal to 0.3 NTU, based on all measurements recorded during the month at intervals no greater than every 15 minutes.

- Sets an “action level” for an individual filter at 0.3 NTU and applies it to two consecutive measurements taken no more than 15 minutes apart after the filter has been in continuous operation for 60 minutes. (Federal language sets the level at 0.5 NTU after four hours of continuous operation.).
- Requires annual filter media inspections.
- Requires that by January 1, 2002 each system shall have completed TTHM and HAA<sub>5</sub> monitoring and reporting and any system that had either a TTHM annual average  $\geq 0.064$ mg/L or an HAA<sub>5</sub> annual average  $\geq 0.048$  mg/L, shall have developed a disinfection profile over a period of 12 to 36 months.
- Requires weekly verification of on-line turbidimeters for combined filter effluent, and at least monthly verification for those meters monitoring individual filter elements, regardless of manufacturer recommendations.
- Requires monthly source water monitoring for total coliform and either fecal coliform or *E.coli* bacteria using density analysis.
- Requires all systems using a disinfectant to have detectable residual in at least 95 percent of distribution system samples every month unless:
  - The supplier serves less than 500 persons and the system is in compliance with 17 CCR section 7583 through 7605, and with 22 CCR sections 64566 and 64630, the supplier has no means for having a sample transported and analyzed for heterotrophic plate count (HPC) by a certified laboratory under the appropriate time and temperature conditions and the supplier is providing adequate disinfection in the distributions system.
- Requires monitoring and reporting of sedimentation basin effluent turbidity.
- Requires monitoring of turbidity and flow of recycled backwash water at least once each day or once during each recycle event, whichever is less.

#### **4. Arsenic Rule**

The 1996 SDWA Amendments required EPA to propose an arsenic regulation by January 2000 and to finalize that regulation by January 2001. The National Academy of Sciences (NAS) released its review of the arsenic risk assessment in February 1999; this report clearly states that the then current standard needed to be lowered. EPA published the proposed arsenic regulation in the *Federal Register* on June 22, 2000. EPA proposed a revised arsenic standard of 5 ppb, and took comments on 3, 10, and 20 ppb. In December 2000, an MCL of 10 ppb was adopted and scheduled for promulgation. In mid-March of 2001, the Arsenic rule was rescinded by EPA, to be re-issued at a later date pending review by the new federal administration. On February 22, 2002, the arsenic in drinking water rule became effective. All systems must comply with the new 10 ppb standard by January 23, 2006. California is required to adopt a new arsenic MCL of not greater than 10  $\mu$ g/L by June 30, 2004.

## **5. Sulfate**

On December 20, 1994, the EPA published a proposed regulation for sulfate with an MCL set at 500 mg/L. The proposed regulation would allow water systems to choose between central treatment and an alternative compliance option, which included public education and notification and delivery of bottled water to sensitive subpopulations (infants, travelers, and new residents).

The 1996 Amendments require EPA, in conjunction with the Centers for Disease Control (CDC), to conduct a joint study that would "establish a reliable dose-response relationship for adverse health effects." This study was scheduled to be completed by February 6, 1999, but ran into some problems. Sulfate was on the 1998 drinking water contaminant candidate list (CCL) and by August 2001 EPA must decide whether or not to regulate sulfate. Should EPA decide to regulate sulfate, the regulation will likely have an MCL or an alternative compliance option (the decision is expected to be made by December 2002).

## **6. Radon Rule**

The National Academy of Sciences (NAS) completed its risk assessment study and a study of health benefits from various radon mitigation measures in early 1999. EPA released its Health Risk Reduction and Cost Analysis (HRRCA) document in the *Federal Register* in February 1999, and there are many concerns with this analysis. EPA proposed the radon regulation in the *Federal Register* on November 2, 1999, with comments due on February 4, 2000. EPA has proposed an MCL of 300 pico curies per liter (pCi/L) and an alternative MCL of 4,000 pCi/L. In order to comply with the alternative MCL, water systems would have to participate in a state-run multimedia mitigation (MMM) program, or run their own MMM program. Implementation of MMM programs by the states could be problematic unless sufficient funding is provided. As of August 2000 the MCLG for radon is zero, the MCL is 300 pCi/L, and the AMCL is 4,000 pCi/L. Final promulgation is expected in mid 2003.

## **7. Long Term Stage 1 Enhanced Surface Water Treatment Rule (LT1ESWTR)**

The LT1ESWTR proposes to extend protection against *Cryptosporidium* pathogens to systems serving less than 10,000 people.

LT1 provisions include:

- Treatment technique requiring 2-log *Cryptosporidium* removal.
- Strengthened combined filter turbidity performance and new individual filter provisions.

- Disinfection Benchmarking - Public systems required to develop disinfection profile unless DBPs are less than 80% of the MCLs. A system must develop a disinfection benchmark before making changes to their disinfection practice.
- All finished water reservoirs must be covered.
- Unfiltered systems must comply with updated watershed control requirements.

## **8. Filter Backwash Rule**

The rule was proposed in April 2000 and finalized in June 2001. It applies to all systems that use surface water or groundwater under the direct influence of surface water and that filter and recycle.

Recycling filter backwash water can affect treated water quality by returning high concentrations of pathogens to the plant and introducing already-formed DBPs to upstream processes when pre-chlorination is practiced. In addition, recycling filter backwash water can affect treatment performance by surging solids loading to upstream processes, increasing demand for coagulant chemicals, and surging flow regimes without equalization. The purpose of the FBR is to control the re-entry of pathogens and other contaminants into the drinking water treatment process and minimize the effects on treatment.

The Rule:

- Requires all recycle streams to be returned prior to the point of primary coagulant addition.
- Requires direct filtration systems that recycle to provide detailed recycle treatment information to the state.
- Requires conventional systems that recycle and have fewer than 20 filters to perform a one-month, one-time recycle self-assessment. (requires hydraulic flow monitoring).

## **9. Microbial/Disinfection By-Products Stage 2 M-DBP Agreement in Principle**

Pursuant to requirements under the Safe Drinking Water Act (SDWA), the EPA is developing interrelated regulations to control microbial pathogens and disinfectants/disinfection byproducts (D/DBPs) in drinking water. These rules are collectively known as the microbial/disinfection byproducts (M-DBP) rules.

The Stage 2 Agreement in Principle was approved in September 2000.

### Requirements and Implementation Schedule

Once the Stage 2 M-DBP rules have been promulgated, systems will conduct *Cryptosporidium* and initial distribution system evaluation (IDSE) monitoring and submit the results to their State/Primacy Agency. Large and medium systems must submit a report with the results of the IDSE (including any monitoring) and the results of the *Cryptosporidium* monitoring two years and two and a half years after rule promulgation, respectively.

Systems will comply with the Stage 2 DBPR MCL for TTHMs/HAA5 in two phases:

- Phase 1: Three years after rule promulgation (with an additional two-year extension available for systems requiring capital improvements), all systems must comply with 80/60 running annual average (RAA) and 120/100 Locational Running Annual Average (LRAA) based on Stage 1 monitoring sites.
- Phase 2: Six years after rule promulgation (with an additional two-year extension available for systems requiring capital improvements), large and medium systems must comply with 80/60 LRAA based on new sampling sites identified under the IDSE.

### Part A – Disinfection By-Products

The requirements in the Stage 2 DBPR will apply to all community water systems and non-transient, non-community water systems that add a disinfectant other than ultraviolet (UV) or deliver water that has been disinfected.

The Stage 2 DBPR is designed to reduce DBP occurrence peaks in the distribution system based on changes to compliance monitoring provisions. Compliance monitoring will be preceded by an IDSE study to select site-specific optimal sample points for capturing peaks.

TTHM/HAA5: Compliance with each MCL will be determined based on a LRAA (a running annual average must be calculated at each sample location).

Initial Distribution System Evaluation (IDSE): IDSEs are studies conducted by Community Water Systems and are intended to select new compliance monitoring sites that more accurately reflect sites representing high TTHM and HAA<sub>5</sub> levels. The studies will be based either on system-specific monitoring or other system-specific data that provides equivalent or better information on site selection. Systems will recommend new or revised monitoring sites to their State/Primacy Agency based on their IDSE study. IDSE results will not be used for compliance purposes.

Systems conducting IDSE monitoring shall monitor for one year under a schedule determined by source water type (e.g., surface water vs. ground water) and system size as discussed below. As a part of the monitoring schedule, all systems conducting IDSE monitoring must monitor during the peak historical month for DBP levels or water temperature. All IDSE samples will be paired (i.e., TTHM and HAA<sub>5</sub> sample at each site).

Surface Water Systems Serving >10,000: Systems must monitor bimonthly on a regular schedule of approximately every 60 days for one year at eight distribution system sites per plant (sites are in addition to the Stage 1 DBPR compliance monitoring sites).

The location of the eight sites will be determined by residual disinfectant type as follows:

- For plants with chloramine distribution systems: two sites near distribution system entry point, two sites at average DBP concentration, and four sites at points representative of highest DBP concentrations;
- For plants with chlorine distribution systems: one site near distribution system entry point, two sites at average DBP concentration, and five sites at points representative of highest DBP concentrations.

System Specific Studies – In lieu of the IDSE monitoring, systems may perform an IDSE study based on other system-specific monitoring or system-specific data, which will provide comparable or superior selection of new monitoring sites that target high DBP levels. EPA agrees to work with stakeholders to develop guidance on criteria for system-specific studies.

Systems that certify to their State/Primacy Agency that all samples taken in the last two years were below 40/30 are not required to conduct the IDSE.

Long Term Compliance Monitoring (Phase 2): Principles of the reduced compliance monitoring strategy reflected in the Stage 1 DBPR shall be continued in the Stage 2 DBPR. These principles are designed for systems with very low DBP levels.

Systems will collect paired samples (TTHM and HAA<sub>5</sub>) at each compliance monitoring sample site with the possible exception of some systems serving less than 500 people.

Surface Water Systems Serving > 10,000:

Systems must monitor quarterly on a regular schedule of approximately every 90 days at four distribution system sites per plant. At least 1 quarterly sample must be taken during the peak historical month for DBP levels.

The location of the four sites in the distribution system will be determined as follows:

- One representative average from among current Stage 1 locations
- One representative highest HAA5 identified under IDSE
- Two at highest TTHM identified during IDSE

Peaks:

Recognizing that significant excursions of DBP levels will sometimes occur, even when systems are in full compliance with the enforceable MCL, public water systems that have significant excursions during peak periods are to refer to EPA guidance on how to conduct peak excursion evaluations and how to reduce such peaks. Such excursions will be reviewed as a part of the sanitary survey process. EPA guidance on DBP level excursions will be issued prior to promulgation of the final rule and will be developed in consultation with stakeholders.

Bromate MCL:

The Stage 2 M-DBP Advisory Committee has considered the present potential that reducing the bromate MCL to 0.005 mg/L would both increase the concentration of other DBPs in the drinking water and interfere with the efficacy of microbial pathogen inactivation. Therefore, the Committee recommends, for purposes of Stage 2, that the bromate MCL remain at 0.010 mg/L.

*Part B - LT2ESWTR*

The requirements of the LT2ESWTR will apply to all public water systems that use surface water or ground water under the direct influence of surface water.

The proposed rule recognizes that systems may need to provide additional protection against *Cryptosporidium* and that such decisions should be made on a system-specific basis. The LT2ESWTR incorporates system-specific treatment requirements based on a 'Microbial Framework' approach. This approach generally involves assignment of systems into different categories (or bins) based on the results of source water *Cryptosporidium* monitoring. Additional treatment requirements depend on the bin to which the system is assigned. Systems will choose technologies to comply with additional treatment requirements from a 'toolbox' of options.

Monitoring and Treatment Requirements for Filtered Systems

Monitoring for Bin Classification Systems > 10,000

For purposes of bin classification, source water *Cryptosporidium* monitoring shall be conducted using EPA Method 1622/23 and using

samples of no less than 10-L. EPA will provide guidance for those cases where it is not possible to process a 10-L sample.

*Cryptosporidium*, *E. coli*, and turbidity source water sampling shall be carried out on a predetermined schedule for 24 months. There are two options for conducting this monitoring:

- Bin classification based on highest 12 month running annual average if monthly samples, or
- Optional bin classification based on 2-year mean if facility conducts monitoring twice per month for 24 months (i.e. 48 samples). Systems may carry out additional sampling but it must be evenly distributed over the 2-year monitoring period.

Systems with at least two years of historical *Cryptosporidium* data that is equivalent in sample number, frequency, and data quality (e.g. volume analyzed, percent recovery) to data that would be collected under the LT2ESWTR with EPA Method 1622/23 may use that data to determine bin classification in lieu of further monitoring. Systems which are able to use historical data in lieu of conducting new monitoring must submit such *Cryptosporidium* data to the State/Primacy Agency for consideration in selecting bin placement.

Systems that provide 2.5 logs of treatment for *Cryptosporidium* (equivalent to Bin 4, including inactivation) in addition to conventional treatment are exempt from monitoring for purposes of selecting bin placement. Conventional treatment is defined as coagulation, flocculation, sedimentation, and granular media filtration.

EPA agrees to work with stakeholders to develop a guidance manual with appropriate QA/QC procedures for *Cryptosporidium* sampling

Action Bins (for Conventional Treatment Plants):

The bins have been structured considering the total *Cryptosporidium* oocyst count, uncorrected for recovery, as measured using EPA Method 1623 and 10 L samples.

Systems have three years following initial bin classification to meet the treatment requirements associated with the bin (see Table 5 below). The State/Primacy Agency may grant systems an additional two-year extension to comply when capital investments are necessary.

Systems currently using ozone, chlorine dioxide, UV, or membranes in addition to conventional treatment may receive credit for those technologies towards bin requirements.

**Table 5 - Bin Requirements Table (For systems with conventional treatment that are in full compliance with IESWTR)**

<b>Bin Number</b>	<b>Average <i>Cryptosporidium</i> Concentration</b>	<b>Additional treatment requirements</b>
1	<i>Cryptosporidium</i> < 0.075/L	No action
2	0.075/L ≤ <i>Cryptosporidium</i> < 1.0/L	1-log treatment (systems may use any technology or combination of technologies from toolbox as long as total credit is at least 1-log)
3	1.0/L ≤ <i>Cryptosporidium</i> < 3.0/L	2.0 log treatment (systems must achieve at least 1-log of the required 2log treatment using ozone, chlorine dioxide, UV, membranes, bag/cartridge filters, or in-bank filtration)
4	<i>Cryptosporidium</i> > 3.0/L	2.5 log treatment (systems must achieve at least 1-log of the required 2.5-log treatment using ozone, chlorine dioxide, UV, membranes, bag/cartridge filters, or in-bank filtration)

The additional treatment requirements in Table 5 are based, in part, on the assumption that conventional treatment plants in compliance with the IESWTR achieve an average of 3 logs removal of *Cryptosporidium*. The total *Cryptosporidium* removal requirements for the action bins with 1 log, 2 log, and 2.5 log additional treatment correspond to total *Cryptosporidium* removals of 4, 5, and 5.5 log respectively.

Toolbox

Meeting the log treatment requirements identified for each “Action Bin” may necessitate one or more actions from an array of management strategies, which include watershed control, reducing influent *Cryptosporidium* concentrations, improved system performance, and additional treatment barriers.

Based on available information, the Federal Advisory Committee (FACA) recommends that LT2ESWTR employ a "toolbox" approach and that the following tools when properly designed and implemented receive the following log credit (or range of credit).

**Table 6 - Microbial Toolbox Components (To Be Used in Addition to Existing Treatment)**

Approach	Potential Log Credit			
	0.5	1	2	>2.5
<u>Watershed Control</u>				
Watershed Control Program (1)	X			
Reduction in oocyst Concentration (3)	As measured			
Reduction in Viable oocyst Concentration (3)	As measured			
<u>Alternative Source</u>				
Intake Relocation (3)	As measured			
Change to Alternative Source of Supply	As measured			
Intake Management / Reduce Source Water oocysts (3)	As measured			
Managing Timing of Withdrawal (3)	As measured			
Managing Level of Withdrawal in Water Column (3)	As measured			
<u>Pretreatment</u>				
Off-Stream Raw Water Storage w/Detention~X days (1)	X			
Off-Stream Raw Water Storage w/Detention~Y weeks (1)		X		
Presettling Basin w/Coagulant	X	→		
Lime Softening (1)	→	→		
In-Bank Filtration (1)		X	→	→
<u>Improved Treatment</u>				
Lower Finished Water Turbidity (0.15 NTU @ 95%)	X			
Slow Sand Filtration (1)				X
Roughing Filter (1)	X	→	→	→
Membranes (MF, UF, NF, RO) (1)				X
Bag Filters (1)		X	→	→
Cartridge Filters (1)			X	
<u>Improved Disinfection</u>				
Chlorine Dioxide (2)	X	X		
Ozone (2)	X	X	X	
UV (2)				X
<u>Peer Review/Other Demonstration/Performance Validation</u>				
Peer Review Program (ex. Partnership Phase IV)		X		
Performance studies demonstrating reliable specific log Removals for technologies not listed above.	As demonstrated			
<u>Key to table symbols:</u>				
(X) indicates potential log credit based on proper design and implementation in accordance with EPA Guidance.				
Arrow indicates estimation of potential log credit based on site specific or technology-specific demonstration of performance.				
Footnotes:				
(1) Criteria to be specified in guidance to determine allowable credit.				
(2) Inactivation dependent upon dose and source water classification.				
(2) Additional monitoring for Cryptosporidium after this action would determine new bin classification and whether additional treatment is required.				

EPA will provide guidance for determining if toolbox options are properly designed and implemented.

### Reassessment and Future Monitoring

Systems that provide a total of 2.5 logs of treatment (equivalent to Bin 4 including inactivation) for *Cryptosporidium* in addition to conventional treatment are exempt from reassessment and future monitoring.

Four years after initial bin characterization, EPA will initiate a stakeholder process to review available methods and the bin characterization structures.

Six years after completion of the initial bin characterization, systems will conduct a second round of monitoring, equivalent or superior to the initial round from a statistical perspective, as part of a national reassessment. In the absence of an improved *Cryptosporidium* method (specified by the State/Primacy Agency, based on EPA guidance or rule and appropriate adjustment factors), site-specific reassessment monitoring will utilize Method 1623 and site-specific re-binning will occur under the current bin structure and time interval. If a new monitoring method is used, or the assumptions underlying the current bin structure change, the resulting data will be used for a site-specific risk characterization in accordance with a revised bin structure (may require a revised rule) reflecting the changes in the underlying method.

As part of the five-year sanitary survey process, the Primacy Agency will assess any significant changes in the watershed and source water. The Primacy Agency will determine with the systems what follow-up action is appropriate. Actions that may be deemed appropriate include those outlined in the toolbox in this agreement.

### Uncovered Finished Water Reservoirs

Systems with uncovered finished water reservoirs must:

- Cover the uncovered finish water reservoir, or
- Treat reservoir discharge to the distribution system to achieve a 4 log virus inactivation, unless

State/Primacy Agency determines that existing risk mitigation is adequate.

Systems must develop and implement risk mitigation plans that address physical access, surface water run-off, animal and bird waste, and on-going water quality assessment.

## **10. MTBE**

California has adopted a new primary MCL of 13 ppb and a secondary MCL of 5 ppb for MTBE. EPA is expected to propose a secondary MCL in 2002.

## **11. Lead and Copper Rule**

EPA made minor changes to the Lead and Copper Rule in December 1999. The minor revisions streamline requirements, promote consistent national implementation, and in many cases, reduce the burden for water systems. The Lead and Copper Rule Minor Revisions (LCRMR) do not change the action levels of 0.015 mg/L for lead and 1.3 mg/L for copper, or Maximum Contaminant Level Goals established by the 1991 Lead and Copper Rule which are 0 mg/L for lead and 1.3 mg/L for copper. Additionally, they do not affect the rule's basic requirements to optimize corrosion control, and, if appropriate, treat source water, deliver public education, and replace lead service lines. The changes became effective April 11, 2000.

## **12. Radionuclides**

The EPA finalized the regulations for alpha emitters, beta emitters, photon emitters, and radium in December 2000. The rule retains the current MCL for combined radium 226/228 and the current MCL for alpha particle radioactivity. The current MCL for beta particle and photon radioactivity has also been retained. A new MCL for uranium has been set at 30 µg/L.

The rule establishes:

- MCLG of zero for all radionuclides.
- Gross alpha of 15 pCi/L (includes radium- 226, excludes uranium and radon) (maintains 1976 current MCL).
- Maintain current MCL of 5 pCi/L for combined radium 226 and 228.
- Uranium MCL of 30 µg/L (comments on 40 µg/L and 80 µg/L).

All community water systems are required to complete initial monitoring requirements by December 31, 2007.

## **13. Perchlorate**

Perchlorate is a component of solid rocket propellant. Originally DHS established an 18 µg/L action level for perchlorate. Following the release of EPA's draft risk evaluation, DHS concluded that the action level needed to be revised downward. On January 18, 2002, DHS reduced the perchlorate action level to 4 µg/L corresponding to the current detection limit for purposes of reporting.

The Office of Environmental Health Hazard Assessment (OEHHA) has released a draft 6 µg/L public health goal for perchlorate.

#### **14. NDMA (N-nitrosodimethylamine)**

NDMA is a component of solid rocket propellant, also found in treated wastewater, and in low concentrations in water treatment plants. DHS has set an interim Action Level of 10 nanograms per liter (ng/L) for NDMA. Currently, there are no monitoring requirements for NDMA.

#### **15. Unregulated Contaminant Monitoring Rule**

The purpose of the Unregulated Contaminant Monitoring Rule (UCMR) is to gather data for EPA in advance of setting future regulatory limits for a variety of contaminants. Data collected under this regulation will be used to evaluate and prioritize contaminants on the Drinking Water Contaminant Candidate List. Large public water systems (serving > 10,000) are responsible for their own monitoring, testing, and reporting.

Briefly, the Rule contains three different lists of contaminants.

- List 1 - 12 chemical contaminants. Quarterly sampling for large public water systems (PWS) using surface water during 2001 - 2003. Bi-annual sampling for ground water supplies.
- List 2 - 15 chemical and 1 microbial contaminant. EPA will select 120 systems in 2002 and another 120 systems in 2003 to monitor for the contaminants on this list that have approved analytical methods available. EPA has posted a list of 160 large PWS for each year, and the 120 systems selected for monitoring will be finalized from this initial list.
- List 3 - 7 microbial contaminants and 1 radionuclide. None of these contaminants currently has an approved analytical method so testing has not yet been scheduled.

#### **16. California *Cryptosporidium* Action Plan**

The 1996 California Legislature passed SB 1307 requiring DHS to enact the *Cryptosporidium* Action Plan (CAP). The plan, originally developed in 1995, was intended to assist utilities with over 1,000 service connections in optimizing treatment processes to ensure maximum removal of *Cryptosporidium* oocysts, thereby reducing the risk of waterborne illness.

The plan outlines existing requirements for surface water utilities that can be used to optimize water assessment and treatment including: conducting a watershed sanitary survey, setting turbidity goals, improving reliability through alarms and maintenance, and public notification. The turbidity optimization goals outlined by DHS are shown in the table below.

**Table 7: Cryptosporidium Action Plan Turbidity Goals**

	<b>Optimization Goals</b>
Sedimentation Basin Effluent	1 to 2 NTU
Combined Filter Effluent	0.1 NTU
Recycled Backwash Water	Less than 2.0 NTU
Individual Filter Effluent After Filter Backwash/Filter-to-Waste	Less than 0.3 NTU