

range of pathogens than a single disinfectant.

EPA is aware, though, that this requirement would not result in a redundant barrier for each type of pathogen. In the example of a plant using chlorine and UV, the chlorine would provide essentially no protection against *Cryptosporidium* and might achieve only a small amount of *Giardia lamblia* inactivation if it was designed primarily to inactivate viruses. However, since the watersheds of unfiltered systems are required to be protected (40 CFR 141.71), the probability is low that high levels of *Cryptosporidium* or *Giardia lamblia* would occur during the time frame necessary to address a short period of treatment failure.

Note the request for comment on this topic at the end of this section.

c. *Basis for source water monitoring requirements.* Monitoring by unfiltered systems is necessary to identify those with mean source water *Cryptosporidium* levels above 0.01 oocysts/L. In order to allow for simultaneous compliance with other microbial and disinfection byproduct regulatory requirements, EPA is proposing that unfiltered systems monitor for *Cryptosporidium* on the same schedule as filtered systems of the same size. Because EPA was not able to identify indicator criteria, such as *E. coli*, that can discriminate among systems above and below a mean *Cryptosporidium* concentration of 0.01 oocysts/L, EPA is proposing that all unfiltered systems monitor for *Cryptosporidium*.

Consistent with requirements for filtered systems, unfiltered systems are required to analyze at least 24 samples of at least 10 L over the two year monitoring period (one year for small systems). However, if an unfiltered system collected and analyzed only 24 samples of 10 L then a total count of 3 oocysts among all samples would result in a source water concentration exceeding 0.01 oocysts/L. To avoid a relatively small number of counts determining an additional treatment implication, unfiltered systems may consider conducting more frequent sampling or analyzing larger sample volumes (e.g., 50 L). Since the water sources of unfiltered systems tend to have very low turbidity (compared to average sources in filtered systems), it is typically more feasible to analyze larger sample volumes in unfiltered systems. Filters have been approved for *Cryptosporidium* analysis of 50 L samples. Note that analysis of larger sample volumes would not reduce the required sampling frequency.

### 3. Request for Comment

EPA solicits comment on the proposed monitoring and treatment technique requirements for unfiltered systems. Specifically, the Agency seeks comment on the following issues:

#### Use of Two Disinfectants

EPA requests comment on the proposed requirement for unfiltered systems to use two disinfectants and for each disinfectant to meet by itself the inactivation requirement for at least one regulated pathogen. The requirement for unfiltered systems to use two disinfectants was recommended by the Advisory Committee because (1) disinfectants vary in their efficacy against different pathogens, so that the use of multiple disinfectants can provide more effective protection against a broad spectrum of pathogens, and (2) multiple disinfectants provide multiple barriers of protection, which can be more reliable than a single disinfectant.

An alternate approach would be to allow systems to meet the inactivation requirements using any combination of one or more disinfectants that achieved the required inactivation level for all pathogens. This would give systems greater flexibility and could spur the development of new disinfection techniques that would be applicable to a wide range of pathogens. However, this approach might be less protective against unregulated pathogens. A related question is whether the proposed requirements for use of two disinfectants establish an adequate level of multiple barriers in the treatment provided by unfiltered systems.

#### Treatment Requirements for Unfiltered Systems With Higher *Cryptosporidium* Levels

Under the proposed LT2ESWTR, a filtered system that measures a mean source water *Cryptosporidium* level of 0.075 oocysts/L or higher is required to provide a total of 4 log or more reduction of *Cryptosporidium*. However, if an unfiltered system, meeting the criteria for avoiding filtration were to measure *Cryptosporidium* at this level, it would be required to provide only 3 log treatment. Available occurrence data indicate that very few, if any, unfiltered systems will measure mean source water *Cryptosporidium* concentrations above 0.075 oocysts/L. However, EPA requests comment on whether or how this possibility should be addressed.

### C. Options for Systems To Meet *Cryptosporidium* Treatment Requirements

#### 1. Microbial Toolbox Overview

The LT2ESWTR proposal contains a list of treatment processes and management practices for water systems to use in meeting additional *Cryptosporidium* treatment requirements under the LT2ESWTR. This list, termed the microbial toolbox, was recommended by the Stage 2 M-DBP Advisory Committee in the Agreement in Principle. Components of the microbial toolbox include watershed control programs, alternative sources, pretreatment processes, additional filtration barriers, inactivation technologies, and enhanced plant performance. The intent of the microbial toolbox is to provide water systems with broad flexibility in selecting cost-effective LT2ESWTR compliance strategies. Moreover, the toolbox allows systems that currently provide additional pathogen barriers or that can demonstrate enhanced performance to receive additional *Cryptosporidium* treatment credit.

A key feature of the microbial toolbox is that many of the components carry presumptive credits towards *Cryptosporidium* treatment requirements. Plants will receive these credits for toolbox components by demonstrating compliance with required design and implementation criteria, as described in the sections that follow. Treatment credit greater than the presumptive credit may be awarded for a toolbox component based on a site-specific or technology-specific demonstration of performance, as described in section IV.C.17.

While the Advisory Committee made recommendations for the degree of presumptive treatment credit to be granted to different toolbox components, the Committee did not specify the design and implementation conditions under which the credit should be awarded. EPA has identified and is proposing such conditions in today's notice, based on an assessment of available data. For certain toolbox components, such as raw water storage and roughing filters, the Agency concluded that available data do not support the credit recommended by the Advisory Committee. Consequently, EPA is not proposing a presumptive credit for these options.

For each microbial toolbox component, EPA is requesting comment on: (1) Whether available data support the proposed presumptive credits, including the design and implementation conditions under which