

evaluating each water treatment plant in the data set relative to two factors: (1) Did the plant *E. coli* level exceed the trigger value being assessed? and (2) Did the plant mean *Cryptosporidium* concentration exceed 0.075 oocysts/L? Accordingly, plants were sorted into four categories, based on *Cryptosporidium* and *E. coli* concentrations:

- Plants with *Cryptosporidium* < 0.075 oocysts/L that did not exceed the *E. coli* trigger level (Figure IV-1, box A)
- Plants with *Cryptosporidium* < 0.075 oocysts/L that exceeded the *E. coli* trigger level (Figure IV.1, box B)
- Plants with *Cryptosporidium* ≥ 0.075 oocysts/L that did not exceed the *E. coli* trigger level (Figure IV.1, box C)
- Plants with *Cryptosporidium* ≥ 0.075 oocysts/L that exceeded the *E. coli* trigger level (Figure IV.1, box D)

Summary data with *E. coli* trigger concentrations ranging from 5 to 100 per 100 mL are presented for Information Collection Rule and ICRSS data in Figures IV-2 and IV-3.

The performance of each *E. coli* level as a trigger for *Cryptosporidium* monitoring was evaluated based on false negative and false positive rates. False negatives occur when plants do not exceed the *E. coli* trigger value, but exceed a *Cryptosporidium* level of 0.075 oocysts/L. False positives occur when plants exceed the *E. coli* trigger value but do not exceed a *Cryptosporidium* level of 0.075 oocysts/L. The false negative rate is critical because it characterizes the ability of the indicator to identify those plants with high *Cryptosporidium* levels. In general, low false negative rates can be achieved by lowering the *E. coli* trigger concentration. However, when the *E. coli* trigger concentration is decreased, more plants with low *Cryptosporidium* levels in their source water exceed it. As a result, more plants incur false

positives. Consequently, identifying an appropriate *E. coli* concentration to trigger *Cryptosporidium* monitoring involves balancing false negatives and false positives to minimize both.

Results of the indicator analysis for plants with flowing stream sources are shown in Figure IV-2. An *E. coli* trigger concentration of 50/100 mL produced zero false negatives for both data sets. This means that in these data sets, all plants that exceeded mean *Cryptosporidium* concentrations of 0.075 oocysts/L also exceeded the *E. coli* trigger concentration and would, therefore, be required to monitor. However, this trigger concentration had a significant false positive rate (*i.e.*, it was not highly specific in targeting only those plants with high *Cryptosporidium* levels). False positive rates were 57% (24/42) and 53% (9/17) with Information Collection Rule and ICRSS data, respectively. At a higher *E. coli* trigger concentration, such as 100/100 mL, the false negative rate increased to 12.5% (3/24) with Information Collection Rule data and 50% (2/4) with ICRSS data, while the false positive rate decreased to 43% (18/42) and 35% (6/17), respectively. Consequently, EPA is proposing a mean *E. coli* concentration of 50/100 mL as a trigger for *Cryptosporidium* monitoring by small systems with flowing stream sources.

Results of the indicator analysis for plants with reservoir/lake sources are shown in Figure IV-3. An *E. coli* trigger of 10/100 mL resulted in a false negative rate of 20% (2/10) with Information Collection Rule data and 67% (2/3) with ICRSS data (misclassified 2 out of 3 plants over 0.075 oocysts/L). Going to a lower concentration *E. coli* trigger, such as 5 per 100 mL, decreased the false negative rate in both the Information Collection Rule and ICRSS data sets by one plant, but increased the false positive rate from 20% to 43% (13/30)

in the ICRSS data and from 24% to 39% (44/114) in the Information Collection Rule data. Based on these results, EPA is proposing that a mean *E. coli* concentration of 10/100 mL trigger small systems using lake/reservoir sources into monitoring for *Cryptosporidium*. While the false negative rate associated with this trigger value in the ICRSS data set is high, the ICRSS data set contains only 3 reservoir/lake plants that exceeded a *Cryptosporidium* level of 0.075 oocysts/L.

Due to limitations in the available data, the Advisory Committee did not recommend that large systems use the *E. coli* indicator screen, as *Cryptosporidium* monitoring is less of an economic burden for large systems. Rather, the Advisory Committee recommended that large systems sample for *E. coli* and turbidity when they monitor for *Cryptosporidium* under the LT2ESWTR. These data will then be used to verify or, if necessary, further refine the proposed indicator trigger values for small systems. EPA concurs with these recommendations and they are reflected in today's proposal.

The proposed monitoring schedule under the LT2ESWTR is set up to allow EPA and stakeholders to evaluate large system monitoring data for indicator relationships prior to the start of small system *E. coli* monitoring. After one year of large system monitoring is completed, EPA will begin analyzing monitoring data to assess whether alternative indicator strategies would be appropriate. Depending on the findings of this analysis, EPA may issue guidance to States on approving alternative indicator trigger strategies for small systems. Therefore, the proposed rule is written with the allowance for States to approve alternative indicator strategies.

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