Final Report
of the
Small Business Advocacy Review Panel

on

Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR)

&

Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)

June 23, 2000

Table of Contents

1. Introduction 3

2. Background & Regulatory History 5
   2.1 Related Federal Drinking Water Rules 5
   Total Coliform Rule and Surface Water Treatment Rule 6
   Total Trihalomethanes Rule 6
   Information Collection Rule 6
   Interim Enhanced Surface Water Treatment Rule 6
   Stage 1 DBPR 7
   Long-term 1 ESWTR/Filter Backwash Rule 8
   Ground Water Rule 9
   Stage 2 DBPR and LT2ESWTR 9

3. Overview of Proposal Under Consideration 9
   3.1 Options Likely to be Proposed 9

4. Applicable Small Entity Definitions 14

5. Small Entities That May Be Subject to the Proposed Regulation 15

6. Summary of Small Entity Outreach 16

7. Small Entity Representatives 17

8. Summary of Comments from SERs 18

9. Panel Recommendations for Stage 2 DBPR and LT2ESWTR 23

Appendix A.....Pre-Panel Small Systems Outreach

Appendix B.....SER Outreach Materials

Appendix C.....SER Written Comments

Appendix D..... Recommended Data for Review in DBP2 Rulemaking

Appendix E.....Small System Compliance Forecasts and Household Costs

1.0 Introduction

As part of the 1996 Amendments to the Safe Drinking Water Act (SDWA), Congress required the U.S. Environmental Protection Agency (EPA) to develop a Stage 2 Disinfectants/Disinfection Byproducts Rule (DBPR). This rule would build on the Stage 1 DBPR, which was finalized on December 16, 1998.

The goal of the Stage 2 DBPR is to provide additional protection as necessary from exposure to disinfection byproducts (DBPs) which may pose a health risk. The Stage 2 DBPR is being developed in conjunction with the Long term 2 Enhanced Surface Water treatment Rule (LT2ESWTR) in order to ensure that microbial protection is maintained or enhanced while exposure to DBPs is reduced. EPA is working with stakeholders to develop these proposals by March 2001, and to promulgate final rule requirements by May 2002.

In addition, Congress required the U.S. Environmental Protection Agency (EPA) to develop an Enhanced Surface Water Treatment Rule (ESWTR), which would focus on surface water drinking water systems that serve fewer than 10,000 persons. EPA is promulgating this rule in two parts: the Long-Term 1 ESWTR, scheduled for promulgation in November 2000, and the Long-Term2 ESWTR, which is the focus of this report. These rules will supplement the existing 1989 Surface Water Treatment Rule (SWTR) which contains general microbial filtration and disinfection requirements as well as specific removal/inactivation provisions for *Giardia*, viruses, and bacteria for all surface water systems. Additionally, these rules will supplement the Interim Enhanced Surface Water Treatment Rule (IESWTR), promulgated in November 1998.

The goal of the LT2ESWTR is to provide additional protection from disease-causing microbial pathogens for community and non-community public water systems (PWSs) utilizing surface water. To ensure the goal is met, EPA is working with stakeholders to develop a proposal by February 2001 and to promulgate final rule requirements by May 2002. This effort is occurring in conjunction with the Stage 2 Disinfectants/Disinfection Byproducts Rule (DBPR) to ensure that microbial protection is maintained while exposure to disinfection byproducts is reduced.

This document is presented by the Small Business Advocacy Review Panel (SBAR Panel or Panel) convened for the proposed rulemaking for the Stage 2 DBPR and the LT2ESWTR, currently being developed by the Environmental Protection Agency (EPA). Under section 609(b) of the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), a Panel is required to be convened prior to publication of the initial regulatory flexibility analysis (IRFA) that an agency may be required to prepare under the RFA. In addition to EPA's Small Business Advocacy Chairperson, the Panel will consist of the Chief of the EPA's Standards and Risk Reduction Branch, the Deputy Administrator of the Office of Information and Regulatory Affairs within the Office of

Management and Budget, and the Chief Counsel for Advocacy of the Small Business Administration.

This document includes the following:

- Background information on these proposed rules being developed;
- Information on the types of small entities that may be subject to these proposed rules;
- A description of efforts made to obtain the advice and recommendations representatives of those small entities; and
- A summary of the comments that have been received to date from those representatives.

Section 609(b) of the RFA directs the Panel to report on the comments of small entity representatives and make findings on issues related to identified elements of IRFA under section 603 of the RFA. Those elements of an IRFA are:

- A description of and, where feasible, an estimate of the number of small entities to which these proposed rules will apply;
- C A description of projected reporting, record keeping, and other compliance requirements of the proposed rules, including an estimate of the classes of small entities which will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- C An identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with these proposed rules; and
- C A description of any significant alternative to these proposed rules which accomplish the stated objectives of applicable statutes and which minimizes any significant economic impact of these proposed rules on small entities.

Once completed, the Panel report is provided to the agency issuing these proposed rules and included in the rulemaking record. In light of the Panel report, and where appropriate, the agency is to make changes to these draft proposed rules, the IRFA for these proposed rules, or the decision on whether an IRFA is required.

As is explained further in this report, the two rules that are the subject of this report have an unusually high degree of linkage because the requirements established for the LT2ESWTR bear directly on the Stage 2 DBPR in that the Stage 2 DBPR regulates compounds that may result from the implementation of the first rule. Because of this unusual and unique degree of linkage, EPA has developed the two rules together. They were the common and simultaneous

subjects of a single advisory committee that EPA convened under the Federal Advisory Committee Act. EPA also convened two SBAR Panels together in order to discharge its responsibilities under the RFA as amended by SBREFA. The small entity representatives selected by EPA after consultation with SBA were asked to provide advice and recommendations to both Panels. EPA is proposing the rules together and plans to finalize them on the same date. Consistent with this approach, EPA also is taking the unusual step of preparing one Panel report that addresses both rules. This document therefore describes the Panels' reviews of both rules and will appear in the rulemaking record for each rule.

It is important to note that the Panel's findings and discussion will be based on the information available at the time the final Panel report is drafted. EPA will continue to conduct analyses relevant to these proposed rules, and additional information may be developed or obtained during the remainder of these rules development process. The Panel makes its report at a preliminary stage of rule development and its report should be considered in that light. At the same time, the report provides the Panel and the Agency with an opportunity to identify and explore potential ways of shaping these proposed rules to minimize the burden of these rules on small entities while achieving the rules' purposes. Any options identified by the Panel for reducing the rules' regulatory impact on small entities may require further analysis and/or data collection to ensure that the options are practicable, enforceable, environmentally sound, and consistent with the statute authorizing the proposal.

EPA believes that the Stage 2 DBPR and the LT2ESWTR could have a significant impact on a substantial number of small entities. Therefore, under SBREFA, EPA is required to convene an advisory panel of SERs to assess the impact of regulatory options on small entities. In January 2000, EPA identified and initiated discussions with representatives of small entities potentially affected by these rules. Through this process, EPA hopes to develop rules that are cost-effective and minimize potential economic impact on small entities while still providing the necessary public health protection.

2.0 Background and Regulatory History

A majority of the U.S. population (92 percent) receives their drinking water from a public water system with 61percent receiving surface water and 31 percent receiving ground water. Although ground water systems greatly outnumber surface water systems, most people are served by a small number of large surface water systems. Indeed, 80 percent of people in the U.S. receiving water from a public water system are supplied by systems serving more than 10,000 people. Although small systems serve a small portion of the total population, it is equally important that residents of small communities have safe drinking water.

Disinfection is the single most effective means of addressing microbial contamination in drinking water. Utilities disinfect drinking water supplies by adding chemicals to kill or inactivate pathogens. Chlorine is the most widespread disinfectant in use today, used both as a

primary and secondary disinfectant. While disinfectants are effective in controlling many microorganisms, they react with naturally occurring organic and inorganic matter in the source water to form disinfection byproducts (DBPs), which include total trihalomethanes (TTHMs) and haloacetic acids (HAAs), both in the plant and distribution system. Epidemiology studies of humans exposed to chlorinated drinking water have suggested possible carcinogenic and reproductive and developmental hazards. Since there is a very large population potentially exposed to DBPs, there is a substantial concern for any risks associated with DBPs.

2.1 Related Federal Drinking Water Rules

This section provides a brief description of the regulatory history of related rules.

Total Coliform Rule and Surface Water Treatment Rule

The 1989 Total Coliform Rule (TCR) applies to all PWSs and establishes a maximum contaminant level (MCL) for total coliforms. The TCR requires PWSs to collect a specified number of total coliform samples, based on population served, at sites which are representative of distributed water; no more than five percent of distribution samples collected in a month may contain coliform bacteria.

The Surface Water Treatment Rule (SWTR), promulgated in 1989, applies to all PWSs using surface water sources or ground water sources under the direct influence of surface water. It establishes health-based maximum contaminant level goals (MCLGs) for viruses, bacteria and *Giardia lamblia*. It also includes treatment technique requirements for filtered and unfiltered systems that are specifically designed to protect against the adverse health effects of exposure to these microbial pathogens.

Total Trihalomethanes Rule

In 1979, EPA set an interim MCL for TTHMs of 0.10 mg/L as an annual average. This applies to any community water system serving at least 10,000 people that adds a disinfectant to the drinking water during any part of the treatment process.

Information Collection Rule

To support the microbial and DBP rulemaking process, the 1996 Information Collection Rule (ICR) established monitoring and data reporting requirements for public water systems serving at least 100,000 people. This rule provided EPA with information on the occurrence in drinking water of microbial pathogens and DBPs. In addition, EPA collected PWS engineering data.

Interim Enhanced Surface Water Treatment Rule

EPA finalized the Interim Enhanced Surface Water Treatment Rule (IESWTR) in November 1998, as required by the 1996 Amendments to the SDWA, Section 1412(b)(2)(c). The final

rule resulted from formal regulatory negotiations with a wide range of stakeholders that took place in 1992 to 1993 and 1997.

The IESWTR applies to systems using surface water, or ground water under the direct influence of surface water, that serve 10,000 or more persons. The rule also includes provisions for States to conduct sanitary surveys for all surface water systems regardless of size. The rule builds upon the treatment technique requirements of the SWTR with the following key additions:

- 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.
- Systems using ground water under the direct influence of surface water now subject to the new rules dealing with *Cryptosporidium.*
- Inclusion of *Cryptosporidium* in the watershed control requirements for unfiltered public water systems.
- Requirements for covers on new finished water reservoirs.

The IESWTR, with tightened turbidity performance criteria and required individual filter monitoring, is designed to optimize treatment reliability and to enhance physical removal efficiencies to minimize the *Cryptosporidium* levels in finished water. In addition, the rule includes disinfection benchmark provisions to assure continued levels of microbial protection while facilities take the necessary steps to comply with new DBP standards.

Stage 1 Disinfectants and Disinfection Byproducts Rule

EPA finalized the Stage 1 DBPR in November 1998, as required by the 1996 Amendments to the SDWA, Section 1412(b)(2)(c). The final rule resulted from formal regulatory negotiations with a wide range of stakeholders that took place in 1992 to 1993 and 1997.

The Stage 1 DBPR applies to community water systems and non-transient non-community systems, including those serving fewer than 10,000 people, that add a disinfectant to the drinking water during any part of the treatment process or deliver water containing a disinfectant. The Stage 1 rule contains the following key provisions:

- Maximum residual disinfectant level goals (MRDLGs) for chlorine (4 mg/L), chloramines (4 mg/L), and chlorine dioxide (0.8 mg/L).
- MCLGs for four trihalomethanes: chloroform (zero)[1], bromodichloromethane (zero), dibromochlorome

[1] The chloroform MCLG has been withdrawn in May 2000 per D.C. Court of Appeals decision.

(dichloroacetic acid (zero) and trichloroacetic acid (0.3 mg/L)), bromate (zero), and chlorite (0.8 mg/L).

- MCLs for TTHM (0.08 mg/L), HAA5 (0.06 mg/L), chlorite (1.0 mg/L), and bromate (0.010 mg/L).
- MRDLs for chlorine (4.0 mg/L (as Cl_2)), chloramine (4.0 mg/L (as Cl_2)), and chlorine dioxide (0.8 (as ClO_2)).
- A treatment technique of enhanced coagulation or softening for removal of DBP precursor material.

The final rule includes monitoring, reporting, and public notification requirements for these compounds and describes the best available technology (BAT) upon which the MRDLs and MCLs are based. Compliance for all requirements, except chlorine dioxide and chlorite, is based on an annual average. Compliance for chlorine dioxide is based on daily monitoring while chlorite compliance is based on monthly or more frequent monitoring.

Long-Term 1 ESWTR/Filter Backwash Rule

In April 2000, the U.S. Environmental Protection Agency (EPA) proposed the Long Term 1 Enhanced Surface Water Treatment Rule (LT1) and Filter Backwash Rule (FBR) to increase protection of finished drinking water supplies from contamination by *Cryptosporidium* and other microbial pathogens. The proposed LT1 rule will apply to public water systems using surface water or ground water under the direct influence of surface water. This rule proposes to extend protections against *Cryptosporidium* and other disease-causing microbes to the 4000 non-purchased small water systems which serve fewer than 10,000 people annually. The proposed FBR rule also establishes filter backwash requirements for certain public water systems of all sizes. The filter backwash requirements will reduce the potential risks associated with recycling contaminants removed during the filtration process. The LT1 rule is scheduled to be final by November 2000. The FBR is scheduled to be final by August 2000. A brief description of the proposal follows:

LT1 Provisions - Apply to systems serving fewer than 10,000 people, and fall into the three following categories:

Turbidity

C Conventional and direct filtration systems must comply with specific combined filter effluent turbidity requirements; and individual filter turbidity requirements.

Disinfection Benchmarking

C Public water systems will be required to develop a disinfection profile to ensure that if changes are made to the disinfection practices in order to comply with the Stage 1 DBPR, current microbial inactivation is not undercut.

Other Requirements

- Finished water reservoirs for which construction begins after the effective date of the rule must be covered; and
- Unfiltered systems must comply with updated watershed control requirements that add *Cryptosporidium* as a pathogen of concern.

FBR Provisions - Apply to all systems which recycle regardless of population served:

C Recycle systems will be required to return certain recycle streams prior to the point of primary coagulant addition unless the State specifies an alternative location;

C Direct filtration systems recycling to the treatment process must provide detailed recycle treatment information to the State; and

C Certain conventional systems that practice direct recycle, must perform a one month, one-time recycle self assessment.

Ground Water Rule

EPA is proposing to require a targeted risk-based regulatory strategy for all ground water systems. The proposed requirements are intended to reduce public health risk associated with the consumption of waterborne pathogens from fecal contamination for a substantial number of people served by ground water sources.

The proposed strategy addresses risks through a multiple-barrier approach that relies on five major components: periodic sanitary surveys of ground water systems requiring the evaluation of eight elements and the identification of significant deficiencies; hydrogeologic assessments to identify wells sensitive to fecal contamination; source water monitoring for systems drawing from sensitive wells without treatment; a requirement for correction of significant deficiencies and fecal contamination through the following actions: eliminate the source of contamination, correct the significant deficiency, provide an alternative source water, or provide a treatment which achieves at least 99.99 percent (4-log) inactivation or removal of viruses, and compliance monitoring to insure disinfection treatment is reliably operated where it is used. The Ground Water Rule is expected to be promulgated in November 2000.

Stage 2 DBPR and Long-Term 2 ESWTR

The SDWA, as amended in 1996, requires EPA to finalize a Stage 2 DBPR by May 2002. In order to ensure a proper balance between microbial and DBP risks, EPA believes it is important to finalize this rule in conjunction with the LT2 rule.

EPA began discussions with stakeholders in December 1998 on the direction for these rules, and anticipates proposing these rules in March 2001. The intent of the rules is to provide additional public health protection, if needed, from DBPs and microbial pathogens. Section 3.0 describes some of the regulatory options that EPA is currently considering.

3.0 Overview of Proposals Under Consideration

EPA has been working with stakeholders under the Federal Advisory Committee Act (FACA) to develop rule options for the Stage 2 DBPR and the LT2ESWTR. The FACA committee is discussing a range of possible approaches and EPA expects the group to narrow the options over the next few months. In this section, the Agency describes several potential regulatory approaches that may be considered followed by specific options the FACA is currently analyzing.

Stage 2 DBPR

- Tighter MCL standards for DBPs regulated under the Stage 1 DBPR (i.e., TTHMs, HAA5, bromate, or chlorite).
  - Health effects data may support lower DBP standards for some DBPs. For example, reproductive and developmental concerns have been raised for certain THMs and haloacetic acids.
  - In order to mitigate these risks, lower MCLs (e.g., less than 80 ug/L for TTHMs and/or less than 60 ug/L for HAA5) may be considered.

- Compliance by system maximum rather than average values.
  - Animal laboratory studies and human drinking water epidemiology studies have indicated a concern for reproductive and developmental health risks from DBPs. These adverse health effects may be the result of short term exposure to DBPs.
  - The Stage 1 DBPR allows various methods for averaging occurrence values over distribution system points and over time. The rationale for averaging occurrence values is primarily based on concerns about exposure to DBPs over an extended period of time, e.g., for cancer risk.
  - Averaging occurrence values may not be protective for acute health risks such as reproductive and developmental effects.

- MCLs for individual DBPs (e.g., BDCM) as opposed to MCLs for classes of DBPs (i.e., TTHMs and HAAs).
  - Health effects data indicate that some DBPs within classes pose higher risks than others. For example, within the TTHM class, exposure to BDCM may be more harmful than exposure to chloroform.

- Expansion of HAA monitoring and compliance to include more brominated species (i.e., HAA6 or HAA9).

- The Stage 1 regulation of HAA5 does not include bromochloroacetic acid (which is included in HAA6) or any of the brominated trihaloacetic acids (HAA9).
- Utilities with high bromide source waters may produce a higher proportion of brominated HAAs to chlorinated HAAs than utilities with low bromide source waters, which tend to produce a higher proportion of chlorinated HAAs. Therefore, utilities with high bromide source waters may be in compliance with the HAA5 standard but still have significant production of unregulated HAAs.
- Health effects data has indicated that brominated DBPs may pose a greater risk than chlorinated DBPs. Exclusion of some of the brominated HAAs in the HAA5 standard may not be adequately protective of public health.

• Regulation of DBPs based on occurrence surrogates.
  - As knowledge about DBP occurrence increases, more DBPs of concern may be identified.
  - If appropriate surrogates for DBPs or specific classes of DBPs are determined, the need for separate standards for each DBP of concern will be reduced.

• Additional DBP precursor removal requirements.
  - Some utilities have the ability to remove more DBP precursors than is required by the Stage 1 DBPR.
  - Removal of DBP precursors is an effective way of reducing DBP production that has little impact on microbial protection.

• Incentives for reliability and improved plant operations.
  - Utilities strive to deliver the highest quality of water possible to their customers.

LT2ESWTR

It is assumed that plant requirements for inactivating or removing *Cryptosporidium,* a difficult microbial pathogen to inactivate or remove from drinking water, will simultaneously protect against all other pathogens (i.e., *Giardia,* viruses, and total coliforms; *E. Coli.*; and fecal coliforms). Thus, the following options are expressed in terms of inactivation or removal of *Cryptosporidium*.

Alternative 1 — No Change

• Continue the current requirement of two logs of *Cryptosporidium* removal (removing 99 percent). Most systems meet this requirement by using filtration, which is credited with two logs of removal capacity.

Alternative 2 — All Plants 2.5 Logs Inactivation or Removal of Cryptosporidium (An Additional 0.5 Log Inactivation or Removal)

- Control of an additional 0.5 log inactivation or removal of *Cryptosporidium* (inactivation or removal of a total 99.68 percent) would require many systems to add technologies to their current treatment scenarios, including using chlorine dioxide, UV, ozone, or membrane technologies.

Alternative 3 — 20 Percent of Plants 4 Logs Inactivation or Removal of Cryptosporidium (An Additional 2 Logs Inactivation or Removal)

- Systems with lower vulnerability for *Cryptosporidium* because of water quality, watershed characteristics or controls, or advanced treatments would not be required to provide additional log inactivation or removal of *Cryptosporidium*; those with higher vulnerability for *Cryptosporidium* would be required to provide two additional logs inactivation or removal of *Cryptosporidium* (total inactivation or removal of a total 99.99 percent). Under this alternative, perhaps 20 percent of plants would comply by using additional technologies such as UV or membrane technologies.

Alternative 4 — All Plants 4 Logs Inactivation or Removal of Cryptosporidium (An Additional 2 Logs of Inactivation or Removal)

- Control for four logs inactivation or removal of *Cryptosporidium* (inactivation or removal of a total 99.99 percent) would require most systems to add technologies to their current treatment scenarios, including using UV or membrane technologies.

The Agency and FACA committee are currently analyzing a set of specific options that are described in the following matrix:

Stage 2 MDBP Scenarios Matrix

DBPs: / **Microbial:**	**120/90 Single Highest***	**80/60 Locational Running Annual Ave***	**80/60 Annual Ave of the Maximum****	**80/60 Single Highest****[xx]	**40/30 Single Highest***
0 log *Crypto* removal (UV off)	x	x	x	x	x
0.5 log *Crypto* removal	xx (UV on/off) (Bromate=10)	xx (UV on/off) (Bromate=10)	xx (UV on/off) (Bromate=10)	xxxx (UV on/off) (Bromate=5/10)	xx (UV on/off) (Bromate=10)
Sort Only 20%	x	x	x	x	x

2.0 log *Crypto* removal-(UV on)					
2.0 log *Crypto* removal	xx (UV on/off) (Bromate=10)	xx (UV on/off) (Bromate=10)	xx (UV on/off) (Bromate=10)	xxxx (UV on/off) (Bromate=5/10)	xx (UV on/off) (Bromate=10)

* Large/medium system compliance forecast and large/medium rough costs for comparison

** Also includes small system compliance forecast and full national technology costs (except bromate = 5 ppb).

x The number of analysis/options required for each box..

xx This option also reflects the possibility of establishing a LRAA of 80/60 together with a 80/60 SH as an action level.

Explanation of DBP Options

Running Annual Average (RAA)

- This is the current monitoring approach for TTHMs/HAA5s under Stage 1 DBPR
- Provides temporal and spatial averaging in the distribution system
- A system monitors at 4 points in the distribution system (at least one sample at point of longest residence time, remaining samples representative of at least average residence time)
- Calculation: four samples per quarter are averaged, then, running annual arithmetic average of quarterly averages is calculated for each consecutive 4 quarter period

Location Running Annual Average (LRAA)

- Provides temporal averaging at specific locations in the distribution system
- Of the four distribution system sample points, system identifies a single sample point representing maximum residence time in the distribution system
- Calculation: samples are taken at that location once a quarter and the average is calculated on a running annual average of four quarters

Annual Average of the Maximum (AAM)

- Provides temporal averaging of highest values in distribution system
- *(For purposes of impact calculations using current models, LRAA and AAM provide similar results and LRAA is used to estimate AAM option impacts)*
- Of the four distribution system sample points, system identifies the sample point with the highest value each quarter

- Calculation: running annual average of the highest sample value each quarter of monitoring

Single Highest (SH)

- Provides no averaging, but identifies temporal and spatial peak
- Standard four distribution points are sampled each quarter
- Calculation: Single highest value among all sample points in four consecutive quarters is identified on a rolling basis

In addition to the possible regulatory options discussed above, the FACA committee may consider a combination of these options or the committee may discuss options that have not yet been anticipated. EPA has requested comment on whether any of the potential regulatory components outlined above may entail small system burdens.

4.0 Applicable Small Entity Definitions

The Regulatory Flexibility Act (RFA) defines small entities as including "small businesses," "small governments," and "small organizations" (5 USC 601). The RFA references the definition of "small business" found in the Small Business Act, which authorizes the Small Business Administration to further define "small business" by regulation. The SBA defines small business by category of business using Standard Industrial Classification (SIC) codes (13 CFR 121.201). For example, in the manufacturing sector, the SBA generally defines small business in terms of number of employees; in the agriculture, mining, and electric, gas, and sanitary services sectors, the SBA generally defines small businesses in terms of annual receipts (ranging from $0.5 million for crops to $25 million for certain types of pipelines). The RFA also authorizes an agency to adopt an alternative definition of "small business" "where appropriate to the activities of the Agency" after consultation with the SBA and opportunity for public comment. A discussion of how these definitions pertain to this rulemaking effort follows:

C A "small business" is any small business concern that is independently owned and operated and not dominant in its field as defined by the Small Business Act (15 USC 632). Public water systems within this category include privately owned community water systems, mobile-home parks, and day-care centers.

C A "small organization" is any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Examples of water systems that are small organizations are churches, schools, and homeowners associations.

C A "small governmental jurisdiction" includes cities, counties, towns, school districts or special districts with populations of less than 50,000 (5 USC 601).

In 1998, EPA proposed that PWSs with populations of 10,000 or fewer persons be defined as "small entities" within the context of the Consumer Confidence Report (CCR) rulemaking (63 FR 7620, February 13, 1998). EPA requested public comments on this alternative definition. For that rulemaking, the SBA Office of Advocacy agreed with the Agency's alternative definition. EPA intends to define "small entity" in the same way for RFAs under SBREFA for all future drinking water regulations, including the Stage 2 DBPR and the LT2ESWTR.

EPA selected this alternative definition for small water systems for several reasons, including:

- A large proportion (94 percent) of all PWSs are small entities, although they serve a minority of the population (20 percent).
- Certain key financial ratios (e.g., total debt as a ratio of total revenue) show a distinct break point at the 10,000 or fewer system size level.[2] In general, the size of a PWS is an important financial characteristic, as larger systems can spread investments in fixed assets across a broader customer base. Smaller water systems typically serve primarily residential customers. Larger systems have fewer residential customers as a percentage of total water sales and more commercial customers. Annual sales revenue per connection is significantly higher for nonresidential than for residential connections.[3] Similarly, larger publicly owned systems are more likely to have rated bond issuances, another indicator of financial strength.[4]
- In the 1996 SDWA Amendments, several measures intended to create regulatory relief defined small community water systems as those serving 10,000 or fewer customers.
- EPA has previously used this criterion in both rulemaking and implementation activities pertaining to PWSs. The TTHM rule applied only to systems serving more than 10,000 persons. EPA chose the 10,000 person cutoff in 1979 primarily out of a concern that smaller systems would have to divert resources from other activities to comply with the rule.
- Throughout the Stage 1 DBPR development process, small systems were defined as those serving fewer than 10,000 people. Surface and ground water systems serving fewer than 10,000 people are were unregulated with respect to DBPs prior to the Stage

---

[2]Community Water Systems Survey, Volume I: Overview, US. EPA Office of Water, p.26. January 1997.

[3]Id., p.14.

[4]Id., p.28.

1 DBPR. As a result, there are two different baseline conditions from which water systems will approach additional DBP control.[5]

5.0 Small Entities that May Be Subject to the Proposed Regulation

Based on the regulatory options under consideration, EPA anticipates that the Stage 2 DBPR will impact small community water systems and LT2ESWTR will impact small community water systems using surface water as a source or GWUDI. Community water systems are those drinking water systems that provide drinking water to at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents. Approximately 93 percent of all community water systems are considered small systems (<10,000), and they serve serve 20 percent (50 million) of the total population served by community systems.

The Stage 2 DBPR may also impact non-transient non-community (NTNC) water systems serving fewer than 10,000 people. These systems serve a least 25 of the same people at least six months of the year and include schools, factories, and hospitals. In addition, certain requirements for chlorine dioxide under the Stage 2 DBPR may apply to small transient non-community (TNC) water systems that add chlorine dioxide. Non-community surface water systems serving under 10,000 people may be impacted by the LT2ESWTR.

6.0 Summary of Small Entity Outreach

In January 2000, EPA began informal outreach to SERs. In an effort to identify potential small entity representatives to participate in this effort, EPA consulted with trade associations, EPA regional offices, State drinking water programs, and FACA representatives. Through this process, EPA identified and contacted 24 SERs across the country who agreed to participate in this outreach effort. We believe this group is representative of small entities that may be impacted by rules proposed in the near future. Table 1 provides the list of participating SERs.

Once EPA identified the SERs, the Agency communicated with them on an ongoing basis and provided them with information from ongoing FACA process. The outreach for the Stage 2 DBPR was performed in conjunction with the LT2ESWTR, since these rules are closely related and will be promulgated together.

---

[5]Stage 1 DBPR, Final RIA, US EPA Office of Ground Water and Drinking Water, p. 5-19, November 12, 1999.

EPA conducted three stakeholder conference calls on Jan. 28, Feb. 25 and April 7 to solicit early input on the rules. Prior to each call, EPA sent materials to each participant that were referenced and discussed in the conference calls. The purpose of these informal outreach conference calls was to provide a forum for stakeholder input on issues affecting small entities, including:

- New health data or information;
- Issues and concerns related to rule development; and
- Issues and concerns related to specific options being considered by EPA.

In addition, EPA provided extensive background information to the SERs to provide them with the foundation for judging future rules. In order to foster SER participation, EPA contacted candidates before each conference call to determine if they could participate and to pick dates and times that were most convenient to the majority of SERs.

In total, EPA sent five packages of materials to SERs to help inform them of the process. Three of the packages contained specific presentation materials for the calls. The other two packages contained background documents, including:

- Fact sheets on the Stage 1DBPR and IESWTR;
- An information sheet on the Stage 2 DBPR and LT2ESWTR rule development process;
- A SDWA summary booklet;
- The SDWA Guide for Small Entity Representatives; and
- Information on the SBREFA process.
- Stage 2 Options- Costs/Health Effects

EPA encouraged comments and questions throughout the outreach process, and meeting notes drafted after each call recorded participants' comments. EPA solicited formal written comments from SERs after the third conference call. Meeting notes, summary of the SERs comments and the actual SERs comments are provided in the Attachment A of this report.

7.0 Small Entity Representatives

Twenty-four SERs participated in the outreach effort for the Stage 2 DBPR. Table 1 provides each participating SERs' name and organization.

Table 1: List of Potential SERs

Name	Organization	Type of System	State
Rodney Tart	National Rural Water Association	All	NC
Jen Jensen	Penn Yan Municipal	SW/CWS	NY
Donald Kiernan	Port Ewen Water District	SW/CWS	NY
Steve Saulnier	Rural Community Assistance Program	All	NY
David Hinkle	King George County Service Authority	GW	VA
Karin Franklin	Town of Purcellville	SW	VA
David Jones	Perryville Water Treatment Filtration	SW/CWS	MD
Gary Barr	Tyronborough Water Dept.	SW/CWS	PA
Neil Carpenter	Maggie Valley Sanitary District	SW/CWS	NC
Robert Dill	ADGPTV Water Commission	SW/CWS	IL
Donald Detemple	City of Menominee	SW/CWS	MI
Ken Bruzelius	Midwest Assistance Program	All	MN
Charlie Abbe	Southern Oklahoma Water Corporation	All	OK
Roy Clayton	City of Campwood	SW/CWS	TX
Mayor Carl Allen	Village of Bosque Farms	GW	NM
Gerald Penka	Russell Water Treatment Plant	SW/CWS	KS
Tim Miller	Midwest Assistance Program	All	MT
Paul Torak	Seeley Lake, Missoula County Water District	SW/CWS	MT
Wade Blasius	Aurora-Brule Rural Water System	SW/CWS	SD
Bill Kroeker	Town of Mancos	SW/CWS	CO
Rich McAlpin	Ketchikan Gateway Burrow	SW/CWS	AK
Ted Wixom	East Sound Water	SW/CWS	WA
David Vik	Town of Cathlamet	SW/CWS	WA
Bob Beaver	Adams Friendship Schools	SW/GW/NTNCWS	WA

8.0 Summary of Input from Small Entity Representatives

As previously discussed, the Panel conducted SER outreach. This included a package to the SERs on May 11, 2000 and a meeting held with the SERs on May 25, 2000 (see Appendix D for description of materials reviewed by the SERs). The panel received seven sets of comments from SERs. A summary of these comments follows.

8.1 Number and Types of Entities Affected

One SER recommended that unilateral rules, regulations, and standards must be adopted/apply to all PWSs, regardless of size and the populations served by the system.

One SER had concerns about how the THM regulations pertain to small purchased water systems and whether these systems will need to do massive flushing in order to meet the regulations during sample periods.

8.2 Potential Reporting, Recordkeeping, and Compliance Requirements

One SER suggested that quarterly monitoring for DBPs should be administered and accomplished by the state agencies, with sampling directed to the state labs for analysis.

One SER commented that operational compliance should remain the jurisdiction of appropriate state regulatory agencies, and be verified through entity to agency submittals such as disinfection residuals, log inactivation and contact times.

One SER recommended that TTHM and HAA5 be calculated on an annual average basis since most states and systems are used to this method.

8.3 Related Federal Rules

One SER commented that the DBP and Disinfection requirements can conflict. She has concerns that EPA will address an unknown health risk with the DBP rule and jeopardize treatment for known microbial health risks. She also suggests that the rules would be better implemented concurrently.

One SER commented that the CT rule for disinfection may conflict with the new DBP rule. CT rule may require excess disinfection. Towns may be able to demonstrate that they can meet the disinfection requirements without adding so much chlorine.

One SER mentioned the potential conflict between achievement of DBP reduction and iron and manganese removal.

8.4 Regulatory Alternatives

8.4.1 Alternative Technologies

One SER suggested that EPA should look into costing mix-oxidants.

One SER commented that moving the point of chlorination would be a big challenge for a small system, especially packaged plants. He also commented that for some plants UV would not address the oxidation. If EPA chooses move in point of chlorination as a regulatory requirement, EPA should prioritize the treatment objectives. It would be helpful for the small towns to understand what the priorities are. Perhaps the removal of iron and manganese would be second priority health wise to the removal of DBPs, but the small town would not agree when they receive calls concerning the brown and black spots on their white laundry and the metallic taste in the water.

One SER commented that UV will address the disinfection requirements and not the oxidation of iron and manganese.

One SER commented that the chloramination dosing and regrowth issues require a high level of technical support that many small systems might not have.

One SER commented that the resources and expertise needed to utilize chlorine dioxide are not available to small systems. In addition, ozonation is a very expensive option for small utilities and it is difficult to control the byproducts resulting from high ozone doses.

One SER commented that most alternative technologies (R/O and GAC) are very expensive and complicated to operate and are probably beyond the capabilities of a small town.

One SER commented that pre-oxidant step cannot be eliminated in systems that are using it for taste and odor, algae, iron and manganese, or as part of their contact time calculations. He commented that microfiltration and GAC are not options for these systems.

One SER commented that small systems might benefit from newer technologies such as UV, but options like membranes are very expensive and would require greater operator competence than most small systems can't afford.

8.4.2 Delayed Compliance Date

No comments were received pertaining to this category.

8.5 SER Comments: Other Issues

8.5.1Cost

Some SERs commented that systems will be unable to handle the financial burdens of compliance by restructuring rates alone. They suggested that the government grant funding and make subsidized loan programs available to ensure protection of public health on all levels at all times.

One SER commented that hiring more trained people and limiting the water operators responsibilities to drinking water are potential budget-busters. Therefore solutions by EPA need to be very carefully weighted against costs and effectiveness.

One SER commented that small systems cannot afford interim requirements with dubious benefits, while they wait for the science to move forward. Right now there is too much uncertainty. If limited budgets are spent on drinking water, it may well be done at the expense of replacing outdated ambulance, fire truck, EMT equipment, school programs and improvements, and the like. Once EPA is more certain about the risks and technologies, considering DBP regulations for small systems becomes appropriate.

One SER commented that the cost associated with the technology shifts are significantly understated. He commented on the unit cost assumptions and how these assumptions do not consider the costs for some necessities such as need for new buildings, staffing needs, monitoring equipments and especially power if the systems want to use UV. His discussion with the local power company reveals that he needs to pay $150,000 per year to run a three-phase power to one of his water treatment plants and $100,000 to the other. He recommends that EPA should provide worksheets so that systems can do their own cost estimates.

One SER commented that sampling for DBPs would double or triple the system's budget. She also commented that the State of VA does not have the manpower, expertise and financial resources to provide the support that the small towns would need to begin a sampling program.

One SER commented that grants funding for capital improvements would help with financial hardships facing the small entities.

8.5.2 MCLs/Standards

One SER recommended 80/60 single highest, 2 log, UV off (high and low bromate) for the Stage 2.

One SER commented that the single highest option is a scary option for systems with hot temperatures during the summer.

8.5.3 *Cryptosporidium* Removal

One SER expressed concerns that systems do not have an understanding of what it will take to remove *Cryptosporidium*.

8.5.4 Turbidity

One SER commented that many small systems will have trouble maintaining the lower turbidity levels.

8.5.5 Consolidation

One SER commented that consolidation might be possible, but that it requires substantial pipelines to reach the rivers and massive permitting to obtain withdrawal permits. The costs of new infrastructure may cancel out any cost benefit from economies of scale. She also mentioned the political side of this issue where small towns may feel that they will lose control of their growth if water and sewer services are consolidated.

8.6 General Comments

One SER commented that the proposed rule poorly characterizes the level of risk that is associated with TTHMs. He thinks that the risk information presented has high levels of uncertainties and recommends that EPA provide a clear health risk statement.

One SER questioned EPA's assumption that majority of systems will not have to make significant changes to meet the Stage 2 rules because of a good raw water quality. He claims that his source water has a very good quality and he still needs to make changes to meet the proposed rule. He recommends that EPA should provide a summary of small systems THM levels.

One SER commented on the difficulties in hiring experienced operators. She recommends that EPA develop a federal testing program which would allow for reciprocity of licenses. She also suggests EPA develop a program to train operators and provide them with salaries. She also recommended that EPA work with NRWA to develop in-house training.

One SER suggested that EPA should require all small entities to conduct testing for DBPs and use this information to analyze the financial burden on small entities and evaluate the appropriate treatment choices more accurately.

One SER indicated that microfiltration and nanofiltration are very expensive and would require greater operator's skills that most systems can afford.

One SER commented that there is no science suggesting that DBPs are harmful on a short time basis. Therefore, a single highest MCL for DBPs is inappropriate in the absence of any scientific justification.

One SER commented that it is untimely to develop a Stage 2 DBPR, which could affect small systems, before there is any information to indicate how much improvement has been accomplished under the Stage 1 DBPR.

One SER commented that there are limited information on the occurrence of *Cryptosporidium*, its dose-response relationship/health effects, types of treatment effective for removal, and cost of such treatment in small communities. Assumptions have to be made on the danger of the threat and the cost & efficiency on the treatment under any potential regulatory options. He commented that the poor families and communities need to be protected from precipitous increases in utility bills that will have a deleterious impact.

One SER suggested that EPA should refine the CT calculations and develop a new method for determining disinfection.

One SER commented that there is no satisfactory test for *Cryptosporidium* at any price. Therefore, until these is a good, inexpensive test and legitimate studies are completed, any regulation of Crypto, based on current knowledge, would be pure speculation- not a good basis to force small systems into expensive or even inexpensive but unproven technologies.

One SER commented that there are very few small systems that have tested for *Cryptosporidium*. This area will stay unknown for most small operations, until the state agencies help setup a testing schedule.

One SER indicated that there are studies that show viable oocysts in the finished water of some large water systems, without outbreaks of disease.

One SER states, if screening would work, it would be an excellent approach.

One SER indicated that data on small systems are not yet collected. Stage 1 may well reveal substantial DBP improvements.

9.0 Panel Recommendations for Stage 2 DBPR and LT2ESWTR

The number of small entities to which the proposed rule will apply

Based on the regulatory options under consideration, EPA anticipates that the Stage 2 DBPR and LT2ESWTR requirements will likely apply to small community water systems and non-transient noncommunity water systems. Community water systems are those drinking water systems that provide drinking water to at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents. Approximately 93 percent of all community water systems are considered small systems serving <10,000, which equates to approximately 50,300 systems, serving 20 percent (50 million) of the total population served by community systems. Non-transient non-community (NTNC) water systems are systems that serve a least 25 of the same people at least six months of the year and include schools, factories, and hospitals. Essentially all non-transient non-community water systems are considered small systems serving <10,000, which equates to approximately 20,000 systems, serving 6 million people. In addition, certain requirements for chlorine dioxide under the Stage 2 DBPR may apply to small transient non-community (TNC) water systems that add chlorine dioxide. There are approximately 93,624 TNC water systems, all of which are considered small. It is not known how many of these use chlorine dioxide, but the percentage that do is expected to be very small.

Regulatory impact estimates are available for non-purchased, surface water systems serving <10,000. Non-purchased water systems account for 53 percent (4084) of all small surface water systems. EPA currently anticipates that purchased water systems would not be directly regulated under the LT2ESWTR, since rule requirements would already have been met by the provider from whom the water is purchased. They might be formally subject to requirements under Stage 2 DBPR, but would likely incur no costs meeting these requirements. They might end up paying higher prices for water however. EPA estimates that fewer than 8% of small non-purchased surface water systems (approximately 325 systems) would be affected by a DBPR rule requiring an 80/60 LRAA if there were no additional inactivation requirements for *Cryptosporidium*. In contrast, a requirements to meet an 80/60 LRAA with *Cryptosporidium* inactivation across the board would impact 79-83% of small surface water systems (approximately 3200-3400 systems), depending on where in the range from 0.5 to 2.5 log inactivation the requirements was set and assuming UV is available. The estimates are less than 100% because it is anticipated that some systems will have already gone to advanced technologies under Stage 1.

EPA considers this to be a conservative estimate. Current discussions in the FACA regarding criteria for requiring *Cryptosporidium* inactivation have focused on a more targeted approach under which systems would assess their vulnerability and perhaps conduct some type of screening monitoring. Under such an approach, EPA expects that only a small percentage of systems would actually need to inactivate. However, all small systems could potentially be required to conduct some type of vulnerability monitoring, probably for *e. coli*. EPA estimates that 2.7% (983 systems) of small ground water systems are likely to be impacted by the regulatory options under consideration beyond Stage 1. The number is small, given the fact that ground water systems are generally less vulnerable to DBP formation due to their low TOC content and the fact that such ground water systems will not be required to address *Cryptosporidium* control.

Projected Reporting, Recordkeeping, and Other Compliance Requirements

SERs commented that requirements may be burdensome to small systems and that the States should play a part in relieving this burden. EPA is committed to working with the States to ensure appropriate capacity for rule implementation. The Panel recommends that EPA evaluate ways to minimize the recordkeeping and reporting burdens under the rule.

Under the Stage 1 DBPR, surface water systems serving less than 500 and ground water systems serving less than 10,000 are required to sample at one sample point per plant per year. If these samples exceed the regulatory level of 80 ug/L TTHM or 60 ug/L HAA5, the system is required to sample at one sample point per plant per quarter. If the annual average of these samples exceeds the MCL, the system is in violation. This is effectively the same as a locational running average for systems that follow the minimum sampling requirements, except that the single sampling point is supposed to represent the point of maximum chronic long term exposure, and thus would not necessarily be chosen to address concerns regarding high seasonal exposure at a particular point in the distribution systems, due perhaps to seasonal patterns in the use of particular sources or storage capacity. For surface water systems serving between 500 and 10,000 and ground water systems serving greater than 10,000, the systems are required to sample at one sample point per plant per quarter. If the running annual average of these samples exceed the MCL, the system is in violation. For all small system sizes, if a system wishes to monitor at more sites than is required by the regulation, they may do so under a State approved monitoring plan and must use all samples in calculating a Running Annual Average. For the Stage 2 DBPR, EPA does not anticipate that the small system long term monitoring requirements would significantly change.

However, under an approach based on compliance with an LRAA, the method of determining compliance would change for any system monitoring at more than one location. While systems could still average quarterly results from a single location to compute an annual

compliance value, they could no longer average across locations. This could make compliance more difficult for systems with significant spatial variability across the distribution system. Further, under an approach based on compliance with a single highest (SH) maximum, systems would not be able to average quarterly samples to determine compliance. This would make compliance more difficult for systems with significant seasonal variation. EPA may also propose an approach under which compliance with the MCL is based on an LRAA, but individual high values could trigger additional assessment and/or notification requirements. This could impose additional burden on some small systems.

Panel Recommendation: The Panel recommends that EPA provide as much monitoring flexibility as possible to small systems. The panel suggests exploring long term monitoring options similar to those under the Stage 1 rule, while acknowledging that additional short term monitoring may be necessary to establish a baseline of DBP occurrence in the distribution system.

Some SERs were concerned that the Stage 2 DBPR may limit their use of chlorine as a preoxidant. The Panel recommends that EPA carefully consider the importance of preoxidation in various treatment trains before proposing any regulatory requirements that would significantly impact its availability as a treatment step.

Other Relevant Federal Rules Which May Duplicate, Overlap, or Conflict with the Proposed Rule

The Panel is unaware of any Federal rules that would duplicate or overlap with the proposed rule. There are a number of existing rules that are closely associated with the rules under development; these include the THMR, SWTR, IESWTR, Stage 1 DBPR, LT1ESWTR, FBR, and GWR. The Panel is aware of the potential conflict between rules regulating control of microbial contaminants and those regulating disinfection byproducts, as well as between those regulating DBPs and other treatment needs that may require preoxidation (e.g.: iron and manganese removal, taste and odor control). Some SERs were concerned that EPA maintain an appropriate balance between control of known microbial risks through adequate disinfection and concern for the more uncertain risks that may be associated with DBPs. In accordance with the SDWA, EPA must develop the Stage 2 rules and maintain an appropriate risk-risk balance. EPA is also sensitive to the importance of maintaining preoxidation treatment options for utilities. The Panel recognizes that the availability of UV disinfection may partially address these concerns by providing a cost-effective technology for controlling *Cryptosporidium* that does not appear to generate significant DBPs. The Panel recognizes, however, that use of UV would not necessarily eliminate the need for preoxidation for purposes other than disinfection and recommends that EPA carefully considers the impacts on other treatment steps of any DBP requirements that might limit the use of preoxidation.

Regulatory Alternatives

The primary alternatives under consideration for the Stage 2 DBPR are compliance with an 80/60 LRAA, compliance with an 80/60 SH, and compliance with an 80/60 LRAA combined with a trigger level for additional action based on the single highest value. The primary alternative under consideration for LT2ESWTR is a framework approach in which some percentage of systems would be required to provide inactivation of *Cryptosporidium* at levels ranging from 0.5 to 2.5 log (in addition to the existing 2 log removal requirements) based on various screening/ assessment criteria. There would also likely be a monitoring strategy using *E coli* and/or *Cryptosporidium* monitoring to identify systems needing additional inactivation. The recurring comment from the SERs is that alternative technologies are expensive and complicated to operate.

Panel Recommendation for the Stage 2 DBPR: The Panel recognizes the concern shared by most stakeholders with reducing temporal and spatial variability of DBPs in the distribution system. This concern stems from recent studies which, while not conclusive, suggest that there may be adverse reproductive effects associated with relatively short term exposure to DBPs. Under Stage 1 rules, a system may be complying with the 80/60 regulatory limits on average and still have individuals who are exposed to much higher levels, either chronically or seasonally. The Panel notes, however, that in general, this is less of a concern for small systems because even under Stage 1 DBPR, most will be monitoring at only a single point in the distribution system (which is supposed to represent the point of maximum exposure), and many will be monitoring only once during the year, which is supposed to correspond to the season with the highest potential occurrence. Thus, these systems are effectively complying with a single highest maximum and may be adequately addressing temporal and spatial variability. However, given that small systems have the option under Stage 1 to average across both monitoring locations and quarterly measurements to determine compliance, there may still be concerns with seasonal or locational "hot spots" even for small systems. The Panel thus supports EPA's efforts to explore options for reducing spatial and temporal variability, while still minimizing the compliance burden on small systems.

An approach based on compliance with an 80/60 LRAA appears to be an effective way of addressing concerns regarding spatial variability. As noted above, most small systems will be effectively complying with such a requirements under Stage 1 anyway, so making it the formal basis for compliance would not impose additional burden on most small systems, although it would remove flexibility and potentially impose burden for that subset of small systems that are voluntarily monitoring at more than one point in the distribution system. EPA may also require additional short term monitoring to better characterize the spatial distribution of DBP occurrence throughout the system, and this would impose additional burden. In developing any additional monitoring requirements for small systems, the Panel recommends that EPA attempt to minimize any such burden.

Regarding temporal variability, the Panel would be concerned about an approach requiring regulatory compliance with an 80/60 SH, because this may impose significant additional cost on some small systems. The Panel recommends that EPA explore instead an approach under which individual high values might trigger additional assessment and/or notification requirements, rather than an MCL violation. Such an approach might involve a graduated set of requirements, depending on how high the value was. If an individual value were only slightly above the LRAA regulatory level, it might lead to no action, or perhaps a reporting requirement to the State. At higher levels, an individual value might trigger a requirements for additional monitoring and/or assessment to better understand the cause of the high value and seek out cost-effective means of reducing the potential for similar high values in the future. At very high levels, an individual value might also trigger some kind of public notification requirement, including appropriate information on potential health effects.

The Panel also recommends that EPA provide with the rulemaking record, more detailed information from the FACA modeling effort about the estimated changes in DBP effluent levels, technology changes, system costs and household costs that are projected for each Stage 2 regulatory alternative under consideration by the Agency. Comparisons should be made with the changes required currently by the Stage 1 regulation. In Appendix D we provide a list of recommended tables. The Panel additionally recommends that EPA review these tables during the development of the final rule. The Panel further recommends that EPA explain that the modeling of small systems is based on a monitoring frequency of 16 samples per year, which is different from the current monitoring requirements for small systems under Stage 1 (see above), and how the use of different monitoring frequency influences the resulting data analyses with the effect of overestimating Stage 2 costs and benefits for small systems.

The Panel also notes the strong concerns expressed by some SERs with the uncertainty in the current scientific evidence regarding health effects from exposure to DBPs, particularly with regard to short term exposure. These SERs questioned whether it was appropriate to impose additional regulatory requirements with respect to DBPs at this time, given the scientific uncertainty and the fact that most small systems are only just now figuring out how to comply with Stage 1, which may impose significantly higher costs on some small systems, and will produce significant benefits to the extent that DBPs actually do contribute to the health effects that have been identified in the scientific literature. Further, in implementing any additional requirements to control DBPs, it would be very useful to small systems to have the benefit of several years of experience on the part of both large and small systems in implementing the Stage 1 requirements. Under these circumstances, these SERs suggested that imposing significant additional costs to further control DBPs at this time may be premature. As one SER put it, such expenditures may well be "at the expense of outdated ambulance, fire truck, EMT equipment, school programs and improvements, and the like."

Given these considerations, one Panel member recommends that, in addition to considering options to reduce temporal and spatial variability, EPA give further serious consideration to

making a determination that the currently available scientific evidence does not warrant imposing additional regulatory requirements, beyond Stage 1, at this time. This Panel member recommends that EPA instead continue to vigorously fund on-going research into health effects, occurrence, and appropriate treatment techniques for DBPs, and reconsider whether additional requirements are appropriate during its next six-year review of the standard, as required under SDWA. This panel member also recommends that EPA separately explore whether adequate data exist to warrant regulation of NTNCs at a national level at this time.

Panel Recommendation for the LT2ESWTR: Regarding the LT2 rule, the Panel would be concerned by an across-the-board additional log inactivation requirement because of the potential high cost to small systems and the lack of current data on the extent to which implementation of the Stage 1 rules will adequately address *Cryptosporidium* contamination at small systems. The Panel notes that the FACA is currently exploring a more targeted approach based on limited monitoring and system assessment that would identify some subset of vulnerable systems that might be required to provide additional inactivation in the range of 0.5 to 2.5 log removal. This approach would probably allow *e. coli* monitoring in lieu of *Cryptosporidium* monitoring as a screening device for small systems. The Panel is also encouraged by recent developments suggesting that UV is likely a viable, cost-effective means of fulfilling any additional inactivation requirements that may be commercially available to small systems on a widespread basis in the near future.

The Panel recommends that, in developing any additional inactivation requirements based on a targeted approach, EPA carefully consider the potential impacts on small systems and attempt to structure the regulatory requirements in a way that would minimize burden on this group. The Panel supports *e. coli* as an indicator parameter if additional monitoring is required. The Panel further recommends that, among the options EPA analyzes, the Agency also evaluate the option of not imposing any additional *Cryptosporidium* control requirements on small systems at this time as it considers various options to address microbial concerns. Under this option, EPA would evaluate the effects of Stage 1, once implemented, and then consider whether to impose additional requirements during its next six-year review of the standard, as required by SDWA.