

Final Report

of the

SBREFA Small Business Advocacy Review Panel

on EPA's Planned Proposed Rule for

National Primary Drinking Water Regulations:

Ground Water

June 9, 1998

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1. INTRODUCTION

This report is presented by the Small Business Advocacy Review Panel convened for the proposed rulemaking on the Ground Water Rule (GWR) that the Environmental Protection Agency (EPA) is currently developing. On April 10, 1998, EPA's Small Business Advocacy Chairperson convened this Panel in accordance with section 609(b) the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Flexibility Act of 1996 (SBREFA). Section 609(b) requires convening a review panel prior to the publication of the initial regulatory flexibility analysis that an agency is required to prepare under the RFA. The Panel met a total of seven times between April 10 and June 5, 1998. In addition to its chairperson, the Panel members are the Director of the of the Standards and Risk Management Division in the Office of Ground Water and Drinking Water (OGWDW) within EPA's Office of Water, the Administrator for the Office of Information and Regulatory Affairs of the Office of Management and Budget, and the Chief Counsel for Advocacy of the Small Business Administration.

This report provides the statutory background of the GWR, a brief description of possible rule components, a description of the number and types of entities potentially affected by the rule, a summary of OGWDW's outreach activities, and the comments and recommendations of the small entity representatives (SERs). In addition, section 609(b) of the RFA directs the review panel to report on the comments of SERs and make findings regarding the key elements of the initial regulatory flexibility analysis (IRFA) under section 603 of the RFA. The key elements addressed in an IRFA are:

- The number and types of small entities to which the proposed rule will apply;
- Possible reporting, record keeping, and other compliance provisions of the proposed rule, including the classes of small entities which will be subject to the requirements and the type of professional skills necessary for preparation of the reports or records;
- Other relevant federal rules which may duplicate, overlap, or conflict with the proposed rule; and
- Any significant alternatives to the components under consideration which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

The completed Panel report is provided to the agency issuing the proposed rule and included in the rulemaking record. The agency is to make changes to the draft proposed rule, the IRFA for the proposed rule, or the decision on whether an IRFA is required taking into consideration information in the Panel report.

The Panel's findings and discussion are based on information available at the time this reported was drafted and EPA is continuing to conduct analyses relevant to the proposed GWR. The Agency expects additional information will be developed or obtained as part of the rule development process. It is important to note that the panel makes its report at an early stage in the rule development process. This is both a disadvantage and an advantage. On the one hand, it means that less information and analysis regarding possible regulatory options is available than would be the case at a later stage in the process. On the other hand, it affords the Panel and the Agency a better opportunity to identify and address small entity concerns before the Agency focuses in on a relatively narrow set of regulatory options. Any options the Panel identifies for reducing the rule's

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 proposed rule.

2. SCOPE AND STATUTORY BACKGROUND AND POSSIBLE RULE COMPONENTS

Ground water quality is influenced by natural factors, human activities, well construction, well location, and an aquifer's potential for contamination. Human sources of microbial contamination include septic systems, cesspools, leaking sewer lines, and cross contamination of well and distribution systems. The purpose of the Safe Drinking Water Act (SDWA) is to protect public health by ensuring that the tap water in the United States is safe for drinking and bathing. Section 1412(b)(1)(A) of the SDWA requires EPA to establish National Primary Drinking Water Regulations for contaminants that may have an adverse public health effect, are known to occur in public water systems with a frequency and at levels of public health concern, and that present a meaningful opportunity for health risk reduction. Congress also required under Section 1412(b)(8) that EPA develop regulations specifying the use of disinfection for ground water systems as necessary. Under these two provisions, EPA has the responsibility to develop a ground water rule which specifies where disinfection is necessary, and perhaps more importantly, addresses other components of a multiple barrier approach for ground water systems to assure public health protection.

EPA's Office of Ground Water and Drinking Water (OGWDW) has the responsibility to develop the GWR. To meet these requirements, OGWDW has undertaken a process of working with stakeholders to develop a proposed rule by March of 1999 and a final rule by November of 2000. Development and implementation of the rule will also involve public water systems, tribes, states, the Federal government and other interested stakeholders.

The Agency's goal in developing the GWR is to reduce the risk of illness caused by microbial contamination in public water systems relying on ground water. To achieve this goal, EPA is considering a multi-barrier approach that could include source water assessment and protection, identification and correction of system defects, proper maintenance of the well and distribution system, appropriate use of disinfection where necessary, and monitoring. It will address other components of ground water systems. This approach would establish a framework to identify public water supplies vulnerable to microbial contamination and develop risk control strategies that include best management practices, as well as disinfection. Options under consideration would give flexibility to primacy states to implement specific regulatory requirements appropriate to local conditions.

OGWDW has identified a number of general regulatory components that may be included in the proposed rule. It is anticipated that these general components will be developed in more detail in the course of discussions with states and other interested parties, including small entities. It is expected that a number of systems will be required to implement at least some of the barrier components as a result of the rule. The particular components a system may be required to implement will vary based upon conditions specific to a system and state requirements. The following is a brief description of each barrier component.

Ground Water Protection (Vulnerability Assessment)

The vulnerability assessment evaluates the vulnerability of a system's wells to microbial contamination. It is conducted by the agency with drinking water primacy, typically a state agency. The assessment consists of a review of system records that provide information on hydrogeologic conditions and an inspection to determine possible sources of contamination. If the inspection reveals a relatively high risk of contamination, the assessor may determine that certain wells are vulnerable. In this instance, the system may be required to implement specific barriers to contamination or install disinfection, where appropriate. The vulnerability assessment would require systems to prepare system records for review and it may be necessary for system operators to accompany the state assessor to wellheads.

System Integrity (Sanitary Survey)

The sanitary survey is conducted to determine if a system's wells, wellhead, and treatment processes are in proper working condition and whether there is adequate protection against microbial contamination. The survey is performed by the state agency with primacy and, therefore, the systems would only be responsible for preparing system records for review and possibly accompanying inspectors to the wells.

Distribution System Maintenance

Ground water systems may be required to perform distribution system maintenance as a barrier to prevent or minimize microbial contamination. The maintenance measures a system may be required to implement include a cross connection control program, a water main flushing program, or routine disinfection of pipes after repair or installation. Systems may be required to provide an annual report of flushing and cross connection prevention activities. Systems would also need to retain all maintenance and inspection records.

Monitoring

Monitoring which complements that required by the Total Coliform Rule may be required. The additional monitoring OGWDW anticipates as a result of the GWR could include raw water sampling at the system's wells. The frequency of monitoring may vary from once to four times per year, based upon the population served by the system. The samples would be analyzed for the presence of indicators of fecal contamination. In addition to the current indicator based on total coliform, other indicators under consideration include *E. coli* and male specific coliphage. The systems might be required to report the raw water monitoring results annually to the state agency with primacy. Systems would also be required to maintain records of the monitoring results for a minimum of three years following the collection of the samples.

Disinfection Treatment

Disinfection is a means to ensure inactivation of microbial contamination. This barrier would be based on the vulnerability of systems to microbial contamination and whether the state has an alternative, effective, multiple barrier approach in place. The method of disinfection treatment would be determined by the system, subject to the approval of the state. Disinfection methods include chlorination, ozonation, and ultraviolet disinfection. Systems would not be required to provide annual reports but would need to keep records documenting monitoring efforts that ensure proper disinfection.

3. APPLICABLE SMALL BUSINESS DEFINITIONS

EPA's authority under SDWA extends to all "public water systems." The law applies the term "public water system" to water utilities and a wide range of businesses (e.g., campgrounds, factories, and schools). As part of the 1996 SDWA amendments, Congress expressly addressed the issue of system size and included several provision for small system regulatory relief for systems serving 10,000 or fewer people and/or systems serving 3,300 or fewer people. OGWDW believes it is appropriate to define a small system as one that serves 10,000 or fewer people. However, the Small Business Administration (SBA) regulations typically define a small business in terms of either total revenues or total employees. Under SBA's definition, a "small," privately-owned water utility would be one with revenues of less than \$5,000,000. Under the RFA, a "small" governmental entity is one with a jurisdiction of 50,000 or fewer people. Data from the Community Water System Survey (CWSS) indicate that the median revenue of a community water system serving between 3,300 and 10,000 people is \$605,000. Systems serving less than 10,000 people would actually have annual revenues well below \$5 million. The proposed definition of a small water system as one serving 10,000 or fewer people is therefore more narrow than the SBA definition for small business and the RFA definition of a small government entity. However, OGWDW believes the proposed definition is appropriate both because of the statutory provisions of the SDWA, and because it believes this definition appropriately distinguishes public water systems that have stronger technical expertise and revenue sources from those that do not.

4. PROFILE OF THE AFFECTED INDUSTRY

As noted above, EPA's authority under SDWA extends to all public water systems. A public water system provides water for human consumption through pipes and other constructed conveyances. Based on information in EPA's Safe Drinking Water Information System (SDWIS), there are 158,000 public water supply systems that use ground water. The term "public water systems" applies not only to water utilities, but also to a wide range of privately or publicly owned businesses and entities that provide drinking water (e.g., campgrounds, factories, restaurants, and schools).

Public water systems are classified as community (C), non-transient non-community (NTNC), or transient non-community (TNC) systems. Approximately 80% of all public community systems have primarily ground water as their source, while approximately 97% of all public non-community systems have primarily ground water as their source. Descriptions and statistics regarding each of these types of systems are given below.

Community Water Systems

Community systems provide drinking water to at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents. Approximately 28 percent (44,000) of all ground water public systems are community ground water systems. These systems serve approximately 89 million people. A community water system that provides drinking water as a service that supports its primary business (e.g., a mobile home park) is referred to as an ancillary system. Approximately 25 percent (11,000) of all community ground water systems are ancillary systems. Approximately 98 percent (43,000) of community ground water systems are considered small systems and these serve

approximately 37 percent (33 million) of the population served by community ground water systems. Data provided in the document *Ground Water Disinfection and Protective Practices in the United States* (EPA 1996) indicate that approximately 55% (27,000) of community water systems using ground water currently disinfect their water supply in some way.

Non-Transient Non-Community Water Systems

NTNC systems serve a least 25 of the same people at least six months of the year and include schools, factories, and hospitals. Approximately 13 percent (20,000) of all public ground water systems are NTNC systems and these serve approximately 5.3 million people. Approximately 99 percent of NTNC systems are considered small. These small systems serve approximately 94 percent (5 million) of the population served by NTNC systems. According to data in *Ground Water Disinfection and Protective Practices in the United States*, approximately 30 percent (8,000) of NTNC systems practice disinfection.

Transient Non-Community Water Systems

TNC systems, such as campgrounds and motels, serve transient populations. There are approximately 94,000 TNC systems serving approximately 15 million people. Approximately 99 percent of all TNC systems are considered small. These small systems serve approximately 73 percent (11 million) of the population served by TNC systems. Data in *Ground Water Disinfection and Protective Practices in the United States* show that just under 20 percent (18,000) of TNC systems practice disinfection.

5. SUMMARY OF OUTREACH ACTIVITIES

To facilitate regulation development, EPA has actively involved stakeholders in the development of the proposed rule. The first EPA sponsored Stakeholder Meeting was held in Washington, D.C. on December 18 and 19, 1997. The purpose of the meeting was to provide stakeholders with summaries of the data that support rule development; engage stakeholders in analysis and discussion of the implications of the data; solicit additional data; discuss EPA's next steps for rule development, data analysis, and stakeholder involvement; and identify additional parties who may be interested in future meetings. A second meeting was held by EPA on May 5, 1998, in Portland, Oregon. The Portland stakeholder meeting was similar in scope to the first stakeholder meeting with the exception that EPA presented alternative regulatory approaches for discussion. OGWDW is planning two additional stakeholder meetings to collect additional information regarding the potential impact the GWR may have on regulated systems. The meetings will be held on June 9, 1998 in Madison, Wisconsin; and June 25 in Dallas, Texas.

EPA has also organized a Small System Data Needs Working Group. The group is comprised of representatives from the American Water Works Association, Association of State Drinking Water Administrators, National League of Cities, National Resources Defense Council, and National Rural Water Association. Established in the spring of 1997, the group held six meetings, from March through December, to discuss the availability of water quality and financial data for small systems that is needed to support the GWR and other drinking water regulations.

OGWDW believes that input from small entities is particularly important in the rulemaking process because so many systems are small. To develop a list of small entity representatives (SERs), who could provide input into a series of drinking water regulations that are currently under development, OGWDW consulted with trade associations, EPA regional offices, state drinking water programs, individuals who have attended stakeholder meetings, foundations, and the Small Business Administration. These efforts produced a list of representatives of small water utilities and businesses providing drinking water ancillary to their primary business, such as restaurants, mobile home parks, hotel/motels, factories, and campgrounds. The list also includes representatives from home-owner associations, investor-owned systems, purchased water systems, small local governments, and churches. OGWDW has also included “Drinking Water System Circuit Riders,” i.e. individuals who do not directly own systems but provide technical and compliance assistance to small systems. EPA invited 23 SERs to participate in the GWR consultation process. **Table 1**, on the following page, lists the names of these SERs and the organizations that they represent.

Table 1. GWR Small Entity Representatives

| Name | Organization |
|-------------------|-------------------------------------------------|
| Bob Beaver | Adams Friendship Schools |
| Greg Bouc | Village of Valparaiso |
| Ken Bruzelius | Midwest Assistance Program Inc. |
| Bob Campbell | Wilson School |
| Cathy Ekendahl | New Concord Inn |
| Doug Evans | Salt Lake County Service Area #3 |
| Paul Gardner | Queen Creek Water Company |
| Shirley Glynn | Bates Township Water Authority |
| L. E. Godwin, III | City of Plains |
| Sandy Graham | Clarkston United Methodist Church |
| J.D. Hightower | City of Escalon |
| Jonathan Hirst | Southeastern Rural Community Assistance Project |
| Michael Knox | Cherry Valley and Rochdale Water District |
| Paul Noran | Consumers Water Co. |
| Alan Ordway | Camp Winona |
| Ron Payne | Payne Utilities, Inc. |
| Albert Ricksecker | Brooklyn Tapline Co., Inc. |
| Jesse Royall | Sydnor Hydrodynamics, Inc. |
| Jim Sheldon | Cedar-Knox Rural Water Project |
| Rafael Terrero | Florida Water Services |
| Paul Torok | Seeley Lake, Missoula County Water District |
| Gary Walter | Tuolumne Utilities District |
| Wayne Weikel | Southeastern Rural Community Assistance Project |

EPA convened a meeting of SERs including those listed above on March 4, 1998 in Washington, D.C. The purpose of the meeting was to discuss SDWA and SBREFA and introduce upcoming rules that are relevant to public water systems. While the meeting focused on the GWR, the SERs also received a brief review of the Long Term Enhanced Surface Water Treatment Rule, Filter Backwash Recycling Rule, Radon Rule, and Arsenic Rule. The GWR discussion focused on possible components of the rule and the occurrence and public health

data supporting the rule. EPA presented information concerning vulnerability assessments, sanitary surveys, distribution system maintenance, monitoring, and disinfection in connection to the GWR. EPA encouraged the SERs to ask questions and provide feedback and comments throughout the meeting as well as afterward. A summary of that meeting is included as **Appendix A**.

On May 5, 1998 the Small Business Advocacy Review Panel for the GWR distributed additional information to the GWR SERs for their review. The materials included a table developed by EPA describing regulatory approaches to the GWR and updated fact sheets. The SERs were asked to review the new materials and to provide any additional comments to the Panel in writing and at a May 18, 1998 conference call meeting with the Panel. The SERs were asked to comment specifically on the activities of the possible regulatory approaches which they felt were “most helpful” and those which they found to be “least helpful.” The Panel distributed another memo to the SERs on May 14, 1998 related to the occurrence information which had been provided previously by EPA. A list of all documents distributed to the SERs, as well as a copy of the table containing the regulatory approaches, is provided as **Attachment A**.

6. SUMMARY OF WRITTEN COMMENTS

The following is a summary of written comments received from the SERs, after the March 4, 1998 meeting, organized by the topic. OGWDW received 23 written comments from SERs. **Table 2** provides a record of the comments and the date received. The topic is listed in bold followed by a brief summary of the SERs written comments. The complete written comments received from the SERs after the March 4, 1998 are provided as **Attachment B**. Additional written comments received from the SERs based on information provided to SERs on May 5 and 14, 1998 are provided as **Attachment C**. Verbal comments made by the SERs in the March 4, 1998 meeting and May 18, 1998 conference call are summarized in the meeting summaries of **Appendix A** and **Appendix B**.

Table 2. Comments Received on the Development of the GWR

| Comment Letter | Name | Date Received | Number of Pages |
|----------------|-------------------|---------------|-----------------|
| 1. | J.D. Hightower | 3/23/98 | 4 |
| 2. | Greg Bouc | 3/24/98 | 2 |
| 3. | Sandy Graham | 3/24/98 | 2 |
| 4. | Paul Noran | 3/24/98 | 1 |
| 5. | Gary Walter | 3/25/98 | 3 |
| 6. | Albert Ricksecker | 3/25/98 | 4 |
| 7. | Doug Evans | 3/26/98 | 2 |
| 8. | Michael Knox | 3/26/98 | 5 |
| 9. | Rafael Terrero | 3/26/98 | 4 |
| 10. | Cathy Ekendahl | 3/26/98 | 7 |

| Comment Letter | Name | Date Received | Number of Pages |
|-----------------------|-------------------|----------------------|------------------------|
| 11. | Wayne Weikel | 3/26/98 | 3 |
| 12. | Alan Ordway | 3/26/98 | 3 |
| 13. | Albert Ricksecker | 3/26/98 | 1 |
| 14. | Jim Sheldon | 3/26/98 | 6 |
| 15. | Shirley Glynn | 3/26/98 | 4 |
| 16. | Bob Beaver | 3/37/98 | 41 |
| 17. | Paul Gardner | 3/27/98 | 3 |
| 18. | Jesse Royall | 3/37/98 | 31 |
| 19. | Ron Payne | 3/27/98 | 2 |
| 20. | Ken Bruzelius | 3/27/98 | 2 |
| 21. | Bob Campbell | 3/30/98 | 1 |
| 22. | L. E. Godwin, III | 3/31/98 | 3 |
| 23. | Paul Torok | 4/1/98 | 1 |

6.1 Number of Small Entities

The SERs did not provide comments addressing the estimates of the number of small entities which would be impacted by the rule.

6.2 Reporting, Record Keeping, and Other Compliance Requirements

Reporting and Record keeping

There was a diversity of opinions expressed regarding the potential requirements for systems to provide records to support vulnerability assessments and/or sanitary surveys. A few of the SERs indicated that many small systems do not have many of the records that could potentially be required readily available, while other SERs indicated that the records are maintained at a central location or are maintained by the county or state. For example, one SER indicated that finding the records “will be a challenge,” while another SER felt it should be easy to locate drawings needed for a sanitary survey. A SER stated that the time and cost to compile records may be great when records do not exist or the system pre-dates the regulations. A SER suggested using questionnaires and combining the vulnerability assessment and sanitary survey to reduce the burden of providing records. Another SER commented that requiring annual reports would be an excessive burden to utilities as all reports are forwarded to state regulators.

Vulnerability Assessment

Many of the SERs expressed concern regarding the cost of the vulnerability assessment and suggested that the burden be minimized by either prioritizing the systems which will perform a vulnerability assessment or making the assessment as cost effective as possible. Several SERs commented that state source water assessment programs collect some of the information required for the vulnerability assessment, and, therefore, these could be used as a source to prevent redundant data collection. One SER also stated that, due to budget constraints, most states could not provide adequate technical assistance to support a rule relying heavily on information and assistance from small town water systems. Another SER stated that financial assistance should be provided to small systems to gather data, otherwise they may wind up being required to disinfect simply because they lack the data to demonstrate that disinfection is not necessary. Another SER expressed concern over the cost of system personnel accompanying state assessors on site visits, and the cost of obtaining permission to inspect neighboring property for sources of contamination. This SER also noted that many private operators and small municipalities lack the authority to deal with neighboring sources of contamination once they are identified.

Many SERs provided suggestions on how to prioritize the vulnerability assessment. For example, a SER suggested that the requirements for systems using filters be streamlined, possibly leading to exemption from the rule. Another SER recommended assessments be conducted only when “a problem exists,” and that the system be responsible for gathering necessary information. Another suggested that compliance history should be the "starting point for determining vulnerability" if violations occur then the next focus should be on the condition of the wellhead, followed by the distribution system if no problems with the wellhead are found. Several SERs suggested that EPA provide guidance on conducting assessments, perhaps including a checklist for use by both water systems and state assessors. One SER indicated that this guidance should be general, with states given flexibility to tailor it according to system size and risk. Other SERs also supported the idea of state flexibility in determining vulnerability assessment requirements. Regarding the frequency of assessment, the SERs suggested a range of possibilities. For example, one SER suggested that assessments need only be performed once followed by subsequent assessment if monitoring indicates a recurrent problem or if land use changes, while another SER recommended following the schedule for sanitary surveys (in his state), once every two years.

Sanitary Survey

Most comments expressed support for the use of sanitary surveys as a barrier to microbial contamination. Several SERs provided specific suggestions to improve their effectiveness. A SER stated that to avoid discrepancies, there should be only one definition of what constitutes an acceptable minimum sanitary survey that is accepted by all programs within the EPA. Another SER commented that state sanitary survey programs that include follow-up training and support are one of the best tools to prevent waterborne disease outbreaks. One SER concurred that sanitary surveys are important, but recommended that surveys only cite dangerous conditions. Many SERs indicated that not all defects identified by a sanitary survey needed to be corrected and provided suggestions for the definition of a significant defect requiring correction. A SER suggested using four categories to classify system defects based on the potential for contamination: 1) defect is currently allowing fecal coliform contamination, 2) defect has high potential for allowing fecal coliform

contamination, 3) defect has lower potential for allowing fecal coliform contamination, 4) defect isn't representative of best system standards. This categorization scheme could then be used to prioritize correction of defects using available resources. The suggested frequency of surveys ranged from annually to once every five years.

Monitoring

SERs generally expressed support for existing monitoring requirements as a means for determining compliance, and some indicated support for increased requirements for total coliform monitoring. One SER stated that monitoring "must remain the foremost trigger for violation." However, another SER noted that coliform bacteria and nitrate/nitrite monitoring are limited monitoring tools. Strong concerns were expressed that the costs of more expensive laboratory analysis for viruses would be too much of a burden on small systems. A SER stated that small systems do not have the staff or budgets to conduct additional, expensive monitoring for viruses. This was also noted by another SER who stated that monitoring for viruses is in the best interest of public health, but the costs will be a fiscal burden to small schools. SERs also expressed concern about the additional operator training that may be needed to conduct virus sampling, and the specialized laboratories required to analyze such samples. Many SERs emphasized that testing for viruses, if required at all, should be kept to a minimum.

It was also recommended that the test results of wells using the same aquifer be compared so that PWSs also using the aquifer can be notified of any detections. Another SER stated that if there are detections, then immediate testing should be conducted at the wellhead. Then, if testing does not indicate a problem with the source water, disinfection should not be required. One SER questioned the need for additional monitoring when the Total Coliform Rule (TCR) already addresses contamination of the distribution system, evaluation of the system, and frequency of testing. Two SERs indicated that training on proper sampling techniques is critical. The suggestions for monitoring frequency ranged from monthly to annually. However, one SER stated that frequency should be based on system compliance. To integrate wellhead protection and monitoring, a SER commented that Wisconsin uses wellhead protection information to increase or reduce system monitoring. [*EPA notes that Wisconsin's wellhead protection program is used to reduce monitoring for chemicals only.*] One SER also suggested that monitoring and reporting requirements should be reduced for systems that are less vulnerable based on other factors (e.g., adherence to Uniform Plumbing Code, use of filtering, disinfection of new pipes). This SER also indicated that any requirement for system personnel to accompany contractors in the collection of samples would be an additional burden. Another SER suggested that point of use monitoring not be required, stating that "our financial and regulatory responsibility for microbial contamination must end when the water leaves the public system."

Distribution System

Many of the comments received from SERs regarding distribution system maintenance stressed that maintenance requirements vary from system to system. Many SERs stated that the frequency of water main flushing should be particular to each system. For example, one SER stated that flushing may be of limited value to very small systems that have only on-site plumbing, small diameter pipes kept clear through continuous use, or an active fire hydrant testing program. This SER also stated that flushing would be considered wasteful in areas

where there is a premium on adequate water supplies. Another SER stated that checking fire hydrants in his system fulfills the intent and purpose of flushing the distribution system. However, this SER stated that dead end or infrequently used mains should be flushed weekly. Regarding water mains, several SERs stated that replacement or repairs should be on an as needed basis. A SER stated that replacement of worn out waterlines is more protective than cross-connection control programs for very small systems. Another SER stated that it cannot force compliance with cross connection control requirements by its customers. A SER recommended annual maintenance on all system valves and hydrants, but also noted the difficulties for small systems of performing maintenance on system components located underground or inside walls. This SER also suggested frequent inspection and operator training to ensure system integrity. A SER questioned why distribution maintenance should be included in the GWR given the wide variation in system needs and current industry practice. Several SERs stated that the GWR should exclude the distribution system, given that microbial quality within the distribution system is covered under other regulations (e.g., the Total Coliform Rule). One SER also noted that most aspects of distribution system maintenance and design are already covered by various professional codes and guidance which he believes are adequate. Another SER states that technical assistance from the primacy agency or others is imperative, to ensure proper maintenance of the smallest systems, which often have poorly trained, part-time operators.

Disinfection

Almost all of the comments submitted by the SERs expressed concerns regarding disinfection. Many indicated that disinfection should not be a substitute for proper engineering and maintenance and other "preventative" measures. Several stated that an occasional positive detection of microbial contamination should not result in mandatory disinfection and that the contamination history of the system should be considered. A SER stated that "triggers" for disinfection requirements should be clearly defined and should be based on an imminent public health threat; examples of such triggers included persistent TCR violations or refusal to correct dangerous deficiencies identified during a sanitary survey. Another SER stated that small system operators in his area believed that disinfection should not be required for systems with a continuous history of no TC violations. Systems with a limited number of violations attributable to the distribution system should also not be required to disinfect if the problem is corrected. If disinfection is required, this SER stated that the rule should permit the use of all cost-effective commercial disinfection products, even those that do not have a detectable residual. Two SERs support the use of the multi-barrier approach as an alternative to disinfection. One SER recommended imposing a disinfection requirement only for systems that are classified as having "high" vulnerability. Several SERs indicated that a system should have the ability to cease disinfection if problems causing the contamination are corrected. At the same time that many SERs were concerned about mandatory, across-the-board disinfection requirements, however, a number of them stressed the importance of disinfection if contamination is found. Additionally, one SER supports disinfection of all water produced for public consumption.

SERs also commented on the implications of disinfection. They expressed concern regarding the costs potentially associated with chlorine disinfection (e.g., capital costs of corralling wells, providing additional storage capacity to ensure minimum contact times, adding tank fill lines, providing proper storage for chlorine gas and breathing apparatus for leak repairs, and installing filtration systems for source water with high iron and manganese content; engineering costs; additional costs for monitoring of residuals and disinfection byproducts, and costs of additional operator training and time). One operator of multiple systems that already disinfect noted

that for systems without storage, it would be a great hardship to make the capital investment to provide the recommended contact time. A SER described his experience with local resistance to siting a new facility to comply with the Lead and Copper Rule and the significant resulting costs to the utility, and expressed concern that a similar problem could arise if a new facility for chlorination were required. Concern was also expressed about various negative aspects of chlorination, including undesirable water aesthetics (including color, odor, and taste); health risks due to chlorine byproducts, hazards of chlorine gas, and inadvertent chlorine slug loadings; and corrosion (leading to both reduced system life and possible elevations in lead and copper levels). One SER stated that disinfection can result in other water quality problems. As an example, the SER described the formation of ferric hydroxide solids that readily sorb and concentrate arsenic present in low levels in ground water into concentrations that exceed the MCL. [*EPA recognizes the problem but believes disinfection does not cause the formation of the ferric hydroxide solids, nor the adsorption of arsenic. A recent investigation of a ground water system in Fremont, Nebraska concluded that elevated arsenic levels in the system were due to the corrosion of arsenic containing ferric hydroxide particles which had accumulated over the years in the pipe lining. The corrosion of the pipe lining was attributed to the sudden introduction of chlorine residual to the water system. EPA believes that this problem could be prevented through the gradual introduction of chlorine to the system.*] Several SERs expressed concern over potential liability issues associated with storage and use of hazardous chemicals such as chlorine gas. One SER also mentioned the risk from high voltage associated with ozonation. Another SER suggested that mandatory continuous disinfection would mask system problems and likely result in decreased use of BMPs.

Compliance Cost Data

In addition to the comments summarized above, **Table 3** lists information regarding costs of the various components. The table reports the component and associated cost as provided by the SER.

Table 3. Component Cost and Burden Estimates Provided by SERs

| SER | Component | Cost |
|----------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Robert Beaver | Coliform Sampling | \$32.50 per sample (sampling conducted by contractor) |
| Cathy Ekendahl | Vulnerability Assessment | 1 to 10 hrs (1.5 ave) per well to assemble records; Full time employee: \$50.00 per hour (includes wages, insurance, overhead, and travel) |
| | Sanitary Survey | 1 to 10 hrs (1.5 ave) per well to assemble records; Full time employee: \$50.00 per hour (includes wages, insurance, overhead, and travel) |
| | Monitoring | Sample: \$20-50 (including transport) Virus sample: \$50-100 to \$500-\$800 per sample |
| Paul Gardner | Disinfection Treatment | Capital to establish contact time: \$90,000-100,000 |
| | Lab Tests | E-coli: \$15-\$25 per sample; nitrate \$15 per sample |
| J.D. Hightower | Monitoring | Additional testing: \$23,680 annually (\$2.32 increase per billing cycle), based on quarterly monitoring for four wells at \$1,480 per well |

| SER | Component | Cost |
|-------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Paul Noran | "Comprehensive" Vulnerability Assessment | \$10,000 - \$20,000 |
| Albert Risksecker | Coliform Monitoring | 1.5 hrs for collection, plus mileage costs to lab (16), plus \$10 lab sample fee |
| Jesse Royall | Vulnerability Assessment | Qualified consultant: \$75.00 per hour Phase 1 Site Analysis: \$5-10,000 Hydrogeologist site visit: \$1,000 plus travel/expenses Determination of well depth: \$250 (for wells less than 200 ft deep) Determination of unsaturated soil depth: \$500-2,000 Pump test to determine drawdown: \$2,000-4,000 plus engineering analysis |
| | Sanitary Survey | Average survey cost in Michigan for NCWS: \$122-163/year (based on 1989-1990 & 1994) Cost for annual survey in California: \$200/system . |
| | Disinfection Treatment | Installation of simple hypochlorination: \$2,500-4,000 plus annual maintenance of \$1,000-10,000 Construction capital to establish contact time: \$15,000-75,000 |
| Jim Sheldon | Disinfection Treatment | Simple chlorination at the well: \$130,000 for a 100-300 gpm well and \$320,000 for a 1,000-2,000 gpm well Iron and manganese removal: \$6,000 for a system serving 750 plus O&M costs of \$5,000-10,000 |
| | Vulnerability Assessment | \$10,000 and up for detailed evaluation |
| Wayne Weikel | Disinfection Related | Breathing apparatus for gas system leak repair: \$1,000 - \$2,000 |

6.3 Relevance of Other Federal Rules

OGWDW received several comments on the potential overlap or conflict between the GWR and other regulations. A SER noted that the Total Coliform Rule (TCR) already addresses contamination of water in the distribution system. Another SER stated that the introduction of chlorine into distribution systems that have not been exposed to oxidants for prolonged periods can cause corrosion. This could affect compliance with the Lead and Copper Rule and the TCR. DBP formation (and compliance with current and future standards) will also be a significant issue for systems with TOC in their groundwater, a problem that has already been documented in Florida, North Carolina, and parts of the Midwest. This SER also stated that the storage and use of disinfectants at certain businesses could require compliance with OSHA, CERCLA and EPCRA, and local ordinance provisions.

6.4 Suggested Regulatory Alternatives

SERs suggested a number of potential modifications or regulatory alternatives for consideration under the GWR. A suggestion was made by a SER that implementation criteria for the GWR be determined based upon the system size and type. Another SER suggested the implementation of BMPs as an alternative to

system-wide, mandatory disinfection. A SER recommended that if a jurisdiction follows the provisions of the Uniform Plumbing Code (UPC), then these provisions should supersede any requirements of the GWR, and such systems should be provided streamlined monitoring and reporting requirements. This SER also noted that according to CDC data, filtered systems appeared to be associated with many fewer water borne illness outbreaks than disinfected systems and suggested that there should be streamlined monitoring and reporting requirements, or even exemption from the GWR, for filtered systems. This SER also stated that the adoption of the UPC and the use of filtering should be key decision points of the vulnerability assessment, to help streamline the requirements of the GWR. Several SERs suggested that the vulnerability assessment and sanitary survey requirements be combined for small systems and/or that the vulnerability assessment be coordinated with the source water protection area delineations currently being conducted by states.

6.5 Other Comments

Many SERs submitted comments regarding the potential burden of the GWR on small systems, stressing that these systems' resources are limited. Several of the comments describe the difficulty small systems would have in raising revenue or finding time for staff (usually only one or two people, and those often part-time) to perform the GWR requirements currently under consideration. For instance, a SER stated that systems will face the same problems complying with the GWR as other regulations: lack of funding options, poor system management, lack of requirement for certified operators, and lack of state enforcement to address current violation. It was pointed out that compliance with the GWR rule may compete for limited small system resources with other priorities, such as upgrading of distribution systems and water sources and compliance with other EPA standards. As an example that might be indicative of potential compliance costs for the GWR, one SER noted that its water rates increased by 160% (from \$280 to \$730 annually for a family of five) following promulgation of the Enhanced Surface Water Treatment Rule, which addressed microbial contamination in surface water systems and contained some of the same provision being considered for the GWR. Another stated that in Maine, some TNC systems have invested substantial resources in switching to ground water sources in order to avoid costly filtration requirements for surface water. Several SERs stressed the need to identify funding sources for small systems to comply with any new requirements. One noted that funding from the Drinking Water State Revolving Fund is not available to many small private systems because they lack collateral and/or can't afford the loan payments; another commented more generally on the limited borrowing capacity of small systems. One SER also noted that unfunded federal mandates may expose municipalities unable to comply with them to litigation. Other SERs indicated that some small systems may elect to reduce their size to avoid being subject to regulations for public water systems, or that system users may elect to convert to unregulated private wells if costs of public water become too high.

A number of SERS questioned if the CDC waterborne disease outbreak data (showing 356 ground water related disease outbreaks over a 24 year period) was really indicative of a serious problem. Several SERs noted that 35% of the outbreaks occurred in ground water systems which were already disinfecting. Another SER stated that the data presented by EPA may inappropriately bias the estimate of waterborne disease in ground water systems. The SER stated that the bias existed because the data includes outbreaks which took place prior to the implementation of the Total Coliform Rule and the Enhanced Surface Water Treatment Rule. The SER presented an excerpt from a document prepared by the American Water Works Association which show only 4 outbreaks attributable to "true"(not under the influence of surface water) ground water systems for

the period between 1993 and 1994. *[EPA notes that it believes, and the CDC concurs, waterborne disease outbreaks are significantly under reported to the CDC].*

Several SERs also commented on the contamination occurrence data. One SER questioned whether the occurrence data (from 8 studies of over 670 wells showing microbial occurrence rates of from 8 to 38 percent) was nationally representative. A SER provided information upon bacterial contamination in water systems which was obtained from the states of Virginia, Michigan and Minnesota. Virginia provided data on approximately 24,000 samples which were taken from well heads of which 124 (0.5%) tested positive for E. coli bacteria. Michigan provided data from 32,294 samples taken from non community water distribution systems (in compliance with TCR) of which 25 (0.08%) tested positive for E. coli bacteria, and 7% tested positive for total coliform bacteria. Minnesota provided data from over 32,000 samples of 8,000 noncommunity water systems of which 222 (0.7%) tested positive. *[EPA notes that the occurrence percentages from the 8 studies are based upon viral indicators sampled at the well head, while the data collected from the states are indicators for bacteria which were collected in the distribution system for Michigan and Minnesota and at the well head in Virginia].*

The following comments were also submitted by the SERS:

- A SER commented that the multi-barrier approach is the cornerstone of drinking water treatment, but the application of multiple barriers must take place within the limits of cost effectiveness and reality. He believes that if source water is reasonably protected (e.g., if it is a "true" ground water source and not one under the influence of surface water) then there is less need for additional barriers. He also stated that poor well construction is probably the cause of most contamination problems for ground water systems and that ensuring proper construction and correcting deficiencies is the most important barrier.
- A statement was made by a SER that there tends to be a significant difference in the translation of the rule at the state level, creating additional financial, operational, and reporting burdens.
- A SER commented that private utilities should be provided the same mechanisms in grants and loans as municipalities.
- A SER stated, based on experience in his state, that the lack of state enforcement for systems in noncompliance is perhaps the biggest impediment to any new rule.
- A statement was made by a SER that a comprehensive guidance on how small systems may utilize the barrier system would be useful. This SER also urged EPA to develop guidance and set aside SRF money to support training of small system operators, with a major focus on proper sampling.
- Another SER suggested that EPA develop pre-designed plans and specifications for required treatment systems, stating that engineering was the biggest cost factor for small systems.
- A SER suggested a system classification which categorized water systems serving less than 3,300 as small, and subdivided small systems into three classes (0-500, 501-1000, and 1001 to 3300); this would allow a targeting of the rule to better manage implementation costs.
- A recommendation was made by a SER that TNC systems serving between 25 and 50 people have reduced requirements.

- C Several SERs emphasized the need for state flexibility to tailor appropriate requirements, rather than a "one size fits all" approach.

6.6 Additional Comments Based on Information Provided to SERs on May 5 and 14, 1998

Three SERs responded to the Panel's request for additional comments following the distribution of additional information on May 5 and 14, 1998. **Table 4** lists the SERs that submitted comments.

Table 4. Comments Provided by SERs After the Review of Additional Information

| Comment Letter | Name | Date Received | Number of Pages |
|----------------|----------------|---------------|----------------------------|
| 1. | J.D. Hightower | 5/20/98 | 2 |
| 2. | Greg Bouc | 5/21/98 | 1 |
| 3. | Cathy Ekendahl | 5/22/98 | 1 (plus 4 page attachment) |

Comments were submitted by a SER regarding enforcement and compliance issues surrounding the GWR. The SER stressed his concern that there is not enough funding for small entities to foster compliance with current rules and if new standards are to be developed, additional funding must be made available for compliance with the GWR. A suggestion was made by a SER that funding specially targeted for small water systems should be allocated to help small systems achieve compliance. This SER also expressed concern over compliance issues, such as who will inspect wells and what happens to a small municipality if a non-compliant well is taken off-line?

Two SERs commented on options for enhanced monitoring requirements. One supported an increase in coliform monitoring from once to twice a year and a requirement for E. coli monitoring once a year, but questioned the need for enterococci monitoring as well and stated that viral monitoring should only be required if all other tests showed positive results. The other SER suggested that source monitoring requirements be imposed only on those systems which pose the highest risk of contamination. This SER recommended virus testing be carried out only on a case-by-case basis for wells located in highly vulnerable areas. He also expressed concern that testing for additional contaminants (e.g., viruses) which may not pose a serious health risk could needlessly undermine consumers' confidence in the safety of their drinking water.

A SER stated that in California cities and counties are charged with compliance to the Uniform Plumbing Code and the National Fire Code, thus creating overlap with the proposed rule and possible conflict with these established rules. The SER raised concerns that the GWR may go beyond the scope intended by the Safe Drinking Water Act by setting standards for the construction and distribution of water. It was recommended that EPA consult with applicable professional organizations, such as the International Congress of Building Officials,

the American Society of Civil Engineers, and the American Planning Association regarding industry standards for distribution system construction and maintenance and wellhead protection.

A SER recommended that each local government be encouraged to develop wellhead protection ordinance as a proactive measure to preserve ground water quality. The SER commented that the development of a wellhead protection ordinance would allow local governments to act within the planning processes currently in place. The SER pointed out that although funding is required for the mapping and planning of present and future well sites, the cost would be minimal when compared to retro-fitting an existing well, taking a well off-line or constructing a new well. The SER suggested that funds specifically marked for mapping and development of wellhead protection ordinances should be allocated as a result of the GWR. The SER stated that secured funding for these type of programs would be a proactive and a positive way to protect drinking water.

7. PANEL FINDINGS AND DISCUSSION

It is important to note the Panel's findings and discussion are necessarily based on the information available at the time this report was drafted. EPA is continuing to conduct analyses relevant to the proposed rule, and additional information may be developed or obtained during this process and from public comment on the proposed rule. Any options the Panel identifies for reducing the rule's 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 Safe Drinking Water Act.

7.1 Number of Small Entities

No commenters questioned the information provided by EPA on the number and types of small entities which may be impacted by the GWR. Because EPA maintains the national Safe Drinking Water Information System (SDWIS) database, with information about all public water systems in the country, the Panel believes that EPA has very good information about the number and types of systems impacted by drinking water rules. The Panel notes that the number of potentially impacted small systems is significant (about 157,000) and suggests EPA focus the compliance requirements upon only those systems which are at risk of fecal contamination. In this regard, the Panel suggests that EPA continue to evaluate whether it may be appropriate to establish different ground water requirements for a particular system based upon system type, size, or location. This can also be accomplished by giving maximum flexibility to primacy states, consistent with ensuring an appropriate minimum level of public health protection nationally, to tailor specific requirements to individual system needs and resources.

7.2 Record Keeping, Reporting and Other Compliance Requirements

The Panel notes the concern of many SERs that small systems often have a single, part-time operator with many other responsibilities. EPA should keep this limitation in mind when developing reporting and record keeping requirements, and keep these requirements to the minimum necessary to ensure adequate protection of public health. The Panel further suggests EPA focus the record keeping, reporting and other compliance

requirements upon the ground water systems which face the greatest risk of contamination. Minimal requirements should be imposed upon systems which demonstrate they are at a low risk of contamination.

The Panel further notes the concern that many small systems will not have easy access to all of the records that would ideally be available for a vulnerability assessment or sanitary survey. The Panel thus recommends development of cost effective approaches for evaluating the risk of contamination at a particular system that minimizes the need for system operators to produce records that are not readily available. Risk evaluation approaches should focus upon techniques which are inexpensive and effective. EPA, after consultation with the SERs, stakeholders and SBAR Panel has determined that it will not use factors such as: (1) lack of adequate well records, (2) lack of a cross connection control program, or (3) intermittent pressure fluctuations as automatic triggers to indicate a potential risk of contamination, although these factors may be considered along with other evidence which more definitively demonstrates risk (e.g. uncorrected significant defects noted in past sanitary surveys) in evaluating whether corrective action is needed and what that action should be. The Panel supports this determination.

The Panel notes the SERs' concerns regarding the impact additional monitoring would have upon small systems, particularly if expensive viral indicator methods are required. The Panel believes that in determining whether and under what circumstances to require monitoring for viral indicators, EPA should consider the value of the information obtained from such monitoring in comparison to the cost of obtaining that information. EPA should only require monitoring for additional indicators if it determines that such monitoring can cost-effectively provide significant additional information on the presence of fecal contamination in ground water. Furthermore, the Panel is concerned about the practicability of requiring viral monitoring for small systems unless there is a significant decline in the cost (which currently ranges from several hundred to a thousands dollars per sample). Therefore, the Panel recommends continuing to support, as a high priority, efforts to develop cost effective viral indicator methods (such as a \$50 coliphage test). In addition, the Panel notes that EPA is currently supporting research intended to develop an approach by which states can identify those systems with the highest risk of viral contamination and strongly endorses this effort. If a reliable and workable method for identifying high risk systems is developed and some viral monitoring is required, the Panel believes that EPA should consider requiring viral monitoring only for these high risk systems.

The Panel also notes that a number of SERs indicated that they were not opposed to a modest increase to the minimum frequency of total coliform monitoring that is currently required under the Total Coliform Rule (TCR) or to an increase in sampling locations to include the source water in the event of a positive TCR sample. These SERs indicated that this would be far less burdensome than a requirement for regular viral monitoring. The Panel thus urges EPA to evaluate continued use of the sampling methods required by the TCR as the central tools for detecting fecal contamination until cost effective alternative methods are developed.

The Panel notes that many SERs believe sanitary surveys are effective tools for identifying problems which may lead to fecal contamination, and that many of the SERs have already had sanitary surveys performed on their systems by the States. The Panel believes that States should also have the authority to require the correction of significant defects as a cost effective method of eliminating risks of contamination. The Panel recommends, however, allowing States the flexibility to distinguish among the defects those which are significant for public health protection and those which are not.

The Panel also notes concerns expressed by many SERs that EPA should not require disinfection for all public water systems regardless of the potential risk of contamination. The Panel agrees with EPA that fecal contamination of public drinking water is a public health threat that must be corrected. The Panel recommends, however, that States be provided with the flexibility to select the most appropriate corrective action from a list which includes, but is not limited to, disinfection. At the same time, States should also have the flexibility to mandate across-the-board disinfection for all or a subset of systems if they determine that this provides the most appropriate level of public health protection. In this context, however, the Panel notes the concern of several SERs that disinfection not be viewed as a substitute for good sanitary engineering.

Although disinfection may be necessary in some circumstances, the Panel is concerned with the potential cost burden to systems that may be required to disinfect as a result of the GWR. In developing requirements or guidance concerning the appropriate use of disinfection, EPA should consider (and include in its regulatory cost estimates to the extent possible) the complete burden and benefits, which may include the following components:

- Purchasing and installing disinfection equipment;
System re-engineering;
- Purchasing and storing disinfectant chemicals or other materials;
- Purchasing and installing safety equipment (e.g. chlorine leak detection equipment, breathing apparatus for leak repair if chlorine gas is used);
- Ⓒ Correcting other problems that may result from disinfection (e.g.: elevated DBP levels; corrosion; color, odor, and taste problems; problems with other regulated contaminants);
- Training operators;
- Providing additional operator time to monitor and maintain disinfection equipment;
- Ⓒ Requiring a minimum contact time for disinfectants, which may require the construction of additional storage tanks or the installation of oversized piping in the discharge lines from the disinfection treatment units; and
- Ⓒ Requiring disinfectant residuals in the distribution system.

EPA should also consider (and quantify to the extent possible) health risks and benefits that may result from the use of disinfectants, including those associated with elevated levels of other contaminants and with the storage and use of hazardous chemicals.

The Panel recommends allowing flexibility in the selection of disinfection treatment technologies, including chlorine based disinfection, ultraviolet disinfection, and ozone disinfection. EPA should permit the use of all technologies which are capable of meeting statutory requirements. Furthermore, EPA should be as flexible as possible in specifying requirements for the use of particular technologies (e.g., contact time and residual for disinfection) consistent with providing adequate protection of public health.

The Panel also notes the comments of many SERs that maintenance needs are highly system specific. The Panel suggests that EPA give flexibility to states and/or systems to determine appropriate maintenance and cross connection control activities and schedules. To the extent practicable, maintenance requirements should be

performance based (e.g., "maintain the integrity of the wellhead to prevent contamination") rather than prescriptive regarding specific activities.

7.3 Interaction with Other Federal Rules

The Panel suggests using the Source Water Assessment Program's (SWAP) susceptibility determination as a component of the vulnerability assessment process. SWAP assessments could provide much of the data needed to evaluate the risk of fecal contamination. EPA should encourage States and systems to utilize SWAP data to the extent possible when assessing system vulnerability, in order to avoid duplicative data collection.

The Panel also recommends consideration of the monitoring already being performed by systems to comply with the TCR. Any monitoring required under the GWR should complement TCR monitoring. The Panel understands that EPA may consider changes to the frequency and location of samples required under the TCR, and notes that several SERs indicated that a modest increase in coliform sampling requirements would not be unduly burdensome. The Panel recommends relying as much as possible on the TCR's analytical methods as indicators of fecal contamination in ground water.

The Panel also notes the concerns of several SERs that disinfection could lead to increases in other contaminants of concern, depending on the specific characteristics of the source water and distribution system. Contaminants mentioned in this context include disinfection byproducts, lead and copper, and arsenic, but there may also be others. In developing regulations or guidance relating to disinfection, EPA should carefully consider these effects and allow states and systems adequate flexibility to avoid or mitigate them in the most cost-effective manner. They should also be appropriately accounted for in the Regulatory Impact Analysis for the GWR.

7.4 Regulatory Alternatives

Because this outreach was conducted at an early stage in the rule development process, before there was a draft proposal for SERs to react to, few comments were received containing specific regulatory alternatives. In general, SERs supported the multi-barrier approach, while at the same time commenting on various aspects of it that might be burdensome or otherwise problematic for them. These comments are discussed throughout the report.

Several SERs suggested tailoring compliance requirements to system size, in recognition of the limited resources available to small systems. The Panel recommends that EPA consider such an approach. For example, the burden upon the smallest systems (e.g. systems serving 500 or less) could be decreased by reducing the required monitoring frequency, or the minimum required frequency of sanitary surveys.

Another suggestion was to combine the vulnerability assessment and sanitary survey into a single requirement. This requirement could be tiered, with a relatively low-effort screening assessment used to eliminate low-risk systems, followed by more data-intensive assessments for systems that might be at risk. Systems that find no contamination over a period of years may be considered low-risk. Some variation on this approach could significantly reduce the record-gathering burden on small systems and the assessment burden on primacy

states, and the Panel recommends that EPA give it consideration. One option might be to allow a streamlined, combined vulnerability assessment and sanitary survey for very small systems, which are least likely to have complete records, while requiring more comprehensive (and perhaps separate) vulnerability assessments and sanitary surveys for larger systems.

7.5 Other Comments

The Panel notes that EPA received a number of comments indicating concern that the data presented at the March SER informational meeting on viral and bacterial occurrence in ground water was not representative of national conditions. The range in the occurrence rate is reflective of the different testing methods used in the different studies and the sensitivity of particular methods. EPA would like to clarify that these figures were not intended to represent a nationally applicable occurrence rate for fecal contamination. The studies underlying those numbers were conducted at different times and for different purposes. Some emphasized high-risk wells, and some examined a variety of wells, including many that were not expected to present high risk. Therefore, the 600 wells included in these studies do not represent a statistically random sample of ground water wells.

With regard to national data on TCR violations, EPA presented data at the March Meeting aggregated from the Safe Drinking Water Information System (SDWIS) indicating that, from 1993 to 1997, 15% of ground water systems accounted for 90% of all violations of the MCL for the TCR. After reviewing this information, commenters requested data on an annual basis for violations of both the TCR and fecal coliform MCLs. For fiscal year 1996, the total number of ground water systems with violations of the MCL for TCR was 8,281 (5.2%) with 1,879 (1.2%) systems having violations of the MCL for fecal coliform. EPA is concerned that fecal coliform data are not necessarily a good indicator of national microbial pathogen occurrence, both because of a low frequency of sampling for many systems and because neither fecal nor coliform tests can identify the presence or absence of virus. However, these data are clearly relevant to the rule development process and will be included with the other information that EPA considers with stakeholders in developing the GWR proposal.

One of the points that EPA emphasized in its fact sheet distributed to SERs on Microbial Occurrence is the question of how all these data should be interpreted and used in developing the GWR. EPA believes these data raise an important concern that current microbial monitoring approaches may significantly understate the occurrence of ground water contamination from fecal viruses and fecal bacteria. This is particularly the case for viral contamination since there is no current monitoring requirement to assess the occurrence of viral pathogens. This information indicates that both viral and bacterial contamination can and do occur in underground sources of drinking water, though the degree and extent of this contamination is not fully known.

EPA believes that most ground water supplies are safe. However, EPA has a statutory obligation to protect public health by regulating contaminants of concern for which there is a meaningful opportunity for health risk reduction. Taking into account all the data currently available to the Agency, EPA believes that fecal contamination of ground water warrants such regulation.

OMB and SBA shared the concern of some commenters that the study data presented by EPA may significantly overstate the extent of ground water fecal contamination nationally. OMB and SBA thus recommend that in evaluating the usefulness of these data for estimating national occurrence rates, the agency give careful

consideration to the well selection criteria and methodologies used in the individual studies. Studies in which wells were selected because of a known risk of contamination would not be appropriate for estimating national occurrence. EPA should also be alert to inadvertent sources of bias in the occurrence rate estimates produced by these studies. For example, if all of the wells in a study are currently disinfecting, this may be an indication that many of them previously detected contamination and are therefore more likely to be high risk. Conversely, if well operators volunteered for participation in a study, there may have been a natural self selection process in which those most likely to have contamination problems would be least likely to volunteer. Finally, if a study included a mix of targeted high risk wells along with a more representative sample, occurrence rate estimates should only be based on the subset of wells considered to be representative.

EPA recognizes and understands the concern that available study data may overstate the extent of ground water contamination. OGWDW notes, however, that it has received input from a number of virologists and microbiologists suggesting that available information may also possibly understate the extent of ground water contamination for several reasons. Much of the current occurrence data is based on single grab samples; the analytical methods used are sensitive only to a subset of virus families associated with water-borne diseases; and, as noted above, there may have been significant self-selection among system operators volunteering to participate in these studies. In light of these different perspectives, EPA continues to stress that a central issue facing all participants and stakeholders in this rulemaking is how to interpret available information. EPA agrees that the Ground Water Rule must be based on the best available data, good science, and sound analysis. OGWDW will continue to evaluate existing information, gather new information from studies not yet complete, and consult with all stakeholders on the nature and scope of the problem. As noted above, the studies EPA has under examination were conducted at different times and for different reasons; each requires careful analysis to ensure its proper use and to avoid misuse.