Why a Water Utility Should Join the National Initiative Titled Partnership For Safe Water

Presented at the AWWA Annual Conference
Orlando, Florida
June 16, 2004

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ABSTRACT

Cryptosporidium is still awaiting specific regulatory action due to the lack of precision and accuracy in identifying and correctly enumerating this particular organism with existing laboratory methodologies. Beyond the documented cryptosporidiosis outbreaks, there is also strong circumstantial evidence that low level (non-epidemic) transmission via the drinking water route may be occurring nationwide. Water suppliers in this country have a responsibility to be proactive in their approach to this *Cryptosporidium* threat, and therefore, not wait for federal or state regulatory action in order to limit the occurrence of this pathogen in drinking water.

One approach for water utilities would be to join the voluntary initiative called Partnership for Safe Water. This program is sponsored by the Environmental Protection Agency and the American Water Works Association, with participation by all major national drinking water organizations. This paper summarizes the requirements and benefits of this partnership and how this program will assist water suppliers in complying with upcoming water treatment regulations. It is critical that the water supply industry strongly respond to this *Cryptosporidium* challenge, not only to protect public health, but also to maintain consumer confidence in their drinking water.

I. HEALTH AND REGULATORY BACKGROUND

A. Overview of Drinking Water Regulations in the United States

Until June 29, 1993, filtration effectiveness was measured against the finished water meeting a maximum monthly average turbidity (clarity) standard of 1.0 units. This parameter was required to be analyzed only once each day at the water treatment facility. Water delivered to the consumer was also tested monthly in the distribution system, with sampling based on the population served. These "field" samples were tested for coliform bacteria, presently still used as a surrogate for the microbiological integrity of drinking water.

With the passage of the 1986 Safe Drinking Water Act Amendments came many regulations designed to further protect public health.[1] These regulations have changed the approach to water treatment in this country. One of the regulations enacted on June 29, 1993, associated with filtration efficiency, was the Surface Water Treatment Rule (SWTR). This SWTR tightened preexisting filtration and disinfection regulatory requirements to further assess the effectiveness of a water treatment facility to prevent waterborne disease outbreaks. Over the years, coliform bacteria have proven not to be a totally effective indicator of all types of microbiological contamination.[2] They are certainly not a surrogate for protozoan contamination, such as *Giardia* and *Cryptosporidium*, as recently proven in numerous disease outbreaks.

B. Summary of the Surface Water Treatment Rule

The goal of the Surface Water Treatment Rule was to set stricter regulations for filtration and disinfection in order to prevent outbreaks of giardiasis caused by the protozoan *Giardia lamblia*. According to the EPA, these *Giardia* cysts are larger than bacteria (7-12 micron in size - pear shaped), and are more resistant to disinfection than other microbes previously identified. Giardiasis was somewhat **the** waterborne disease of concern during the 1980s. Therefore, one of the reasons EPA instituted this rule was to safeguard public health, particularly due to the risk of giardiasis.[3] Over ninety-two percent of the surface waters tested in this country have *Giardia* present in the raw water in varying levels.[4] This revised rule included a lower turbidity standard of 0.5 units in the finished water, as well as turbidity testing every four hours; or six times per day. Turbidity compliance was not measured as an average of the daily samples over the month as previously existed, but as a 95th percentile value. This means in a 30 day month no more than five percent of the 180 turbidity samples tested (nine incidents) can be above the new Maximum Contaminant Level of 0.5 turbidity units. This updated method of monitoring turbidity forces water treatment facilities to operate in a more consistent turbidity reduction mode. A second, equally important, aspect of this rule relates to proper disinfection contact time (CT), prior to the water being consumed by the first customer on the water distribution system. Since *Giardia lamblia* cysts are resistant to chlorination, a facility must allow more storage time after disinfection to ensure that the chlorine concentration (C) has had sufficient time (T) to inactivate *Giardia* cysts. Contact time is critical in cold water since cysts survive best in colder temperatures. Therefore contact time requirements increase as water temperature drops. Additional contact time is also necessary as the pH of the finished water increases, since the potent "free" residual of chlorine reverts to less effective "combined" residuals as pH increases.[3] This regulation has been effective in reducing the waterborne giardiasis risk. The

Surface Water Treatment Rule requirements have proven to be much less effective in reducing the waterborne *Cryptosporidium* threat.[1]

II. OVERVIEW OF PRESENT CRYPTOSPORIDIUM THREAT

A. Historical Perspective

Coinciding with the promulgation and passage of the Surface Water Treatment Rule another protozoan, *Cryptosporidium*, began to be identified as the causative agent in waterborne disease outbreaks. In the ten identified outbreaks in North America since 1984 nearly 500,000 people have been affected by Cryptosporidiosis.[5] The bad news regarding these *Cryptosporidium* oocysts is that they are smaller than *Giardia* cysts. Oocysts range in size from four to six micron, exhibit a circular shape, and are **much** more resistant to disinfection than *Giardia*. As an example, it has been estimated that utilizing chlorine for oocyst inactivation would require a CT value, as described above, 250 times higher than the CT for *Giardia*.[6] Due to this resistivity, *Cryptosporidium* must be physically removed by the water treatment process.[1]

Historically, according to Craun, in the epidemiological studies performed during and following water disease outbreaks, 68% of the time the causative agent is not identified.[7] Over the last ten years when the causative agent was identified, 64% of the time it was a protozoan related outbreak. Rose estimates that 20% of our country is at risk for protozoan contamination.[8] This population includes infants, pregnant women, the aged, and the immune compromised (AIDS patients, cancer patients, and organ transplant patients).

The largest of the ten identified Cryptosporidiosis outbreaks in the United States occurred in April of 1993 in Milwaukee, Wisconsin. Half of the city's population of 800,000 people were stricken with the illness, which caused over 100 deaths. There are multiple barriers to reduce the threat of *Cryptosporidium* such as source protection, and proper water distribution system management. The most important barrier is the physical treatment process, with effective filtration being the final barrier, due to the resistivity of the oocysts to disinfection. LeChevallier found that over ninety-six percent of the systems tested in this country were *Cryptosporidium* positive in their raw waters.[6] It is impossible to predict raw water *Cryptosporidium* concentrations, so facilities must be operated as if these pathogens are always present in large numbers. Plants must establish new goals to meet this challenge and operate to the best achievable turbidity levels of under 0.10 units on each **individual** filter, not simply operating to the present Surface Water Treatment Rule's regulated turbidity levels for the combined filter effluent. With outbreaks, such as Milwaukee's, the threat from this organism has been fully established and the water industry must strongly respond.

B. Analytical Limitations

Cryptosporidiosis is caused by the protozoan, *Cryptosporidium parvum.* Symptoms associated with this disease include diarrhea, fatigue, loss of appetite, and nausea. According to the Vermont Health Department, as late as 1976 the Centers for Disease Control and Prevention reported this parasite was not known to cause disease in humans. A stool sample tested specifically for *Cryptosporidium* is the only way to identify this disease in an infected person. *Cryptosporidium* oocysts are shed in the stools of infected humans and animals. The disease is spread by placing something in the mouth that has been contaminated with the feces of an affected person or animal. A person can contract this disease by drinking contaminated water, eating contaminated raw or undercooked food, direct contact with the droppings of infected animals or feces of infected humans, or hand-to-mouth transfer from surfaces that may have become contaminated with microscopic amounts of feces from an infected person or animal. In the absence of a recognized outbreak, it is very difficult to determine how most patients become infected. It is presently very difficult to initially detect an outbreak of Cryptosporidiosis since it is not a reportable disease in most U.S. states. Even in states where it is a reportable disease, most physicians and laboratories do not routinely screen for this parasite. Lastly, for healthy individuals *Cryptosporidiosis* is a self-limiting disease, which normally does not warrant a doctor's care.

Cryptosporidium is not currently federally regulated in drinking water, although there is strong circumstantial evidence that low-level (non-epidemic) transmission via the drinking water route may be occurring nationwide. The main reason it is not regulated is that it is very difficult to reliably test for *Cryptosporidium* in drinking water. Current analytical methods drastically underestimate the actual number of oocysts.[6] This is due to direct losses of the actual parasites throughout every stage of the testing procedure, including collection. Even when oocysts are identified, current methods cannot distinguish between viable organisms that cause disease in humans and nonviable organisms. Therefore interpreting the public health significance of a water system's monitoring data is also challenging.

C. Regulatory Climate

It is difficult to set any type of numerical standard or Maximum Contaminant Level to respond to this threat until solid data from improved analytical methodologies is available. Once *Cryptosporidium* is reliably isolated and the present variability between laboratories is addressed, epidemiology will improve. Success in controlling this organism requires a greater knowledge of its transmission, epidemiologic profile, and immunopathogenic mechanisms in order to identify effective treatment.[9]]

To begin this data collection task, EPA has instituted the Information Collection Rule (ICR). Water systems serving more than 100,000 people are targeted to comply with additional monitoring requirements. The goal of this rule is to improve drinking water quality by gathering information concerning the occurrence of specific microorganisms and chemicals in public drinking water. Sampling will also determine the ability of water treatment facilities to remove these microorganisms and contaminants. In addition, information concerning disinfection by-products will be collected to support the development of improved disinfection by-product standards. The Information Collection Rule was developed through a negotiated rule making process and was originally intended only to assist in developing new disinfection by-product standards. However, participants in these negotiations agreed that better microbial standards would also be needed to prevent increases in microbial risk, while public water systems made treatment changes to comply with future more stringent disinfection by-product standards.

A major objective of the ICR is to obtain national occurrence and water treatment data for *Giardia, Cryptosporidium,* viruses, and indicator organisms. Another major objective is for each public water utility to estimate the concentration of *Giardia* and *Cryptosporidium* in its raw water source. These estimates can then be used to determine the level of treatment required to comply with potential future regulations proposed in the continued rule making process. Occurrence data will enable water utilities to comply with new disinfection by-product standards, while determining the appropriate approach to improved microbial treatment.

The key to future compliance with the upcoming Interim Enhanced Surface Water Treatment Rule (IESWTR) will be the filtration plant's ability to consistently produce a combined filter effluent turbidity less than or equal to 0.3 NTU in at least 95% of the measurements taken each month. The turbidity level of a system's combined filter effluent must also not exceed 1 NTU 100% of the time. For both the maximum and the 95th percentile requirements, compliance shall be determined based on measurements of the combined filter effluent at four-hour intervals. For individual filter requirements, utilities must conduct continuous monitoring of turbidity for each individual filter and shall provide an exceptions report to the State on a monthly basis. Exceptions reporting shall include the following: 1) any individual filter with a turbidity level greater than 1.0 NTU based on two consecutive measurements fifteen minutes apart; and 2) any individual filter with a turbidity level greater than 0.5 NTU at the end of the first four hours of a filter operation based on two consecutive measurements fifteen minutes apart. A filter profile of the entire run will be required if no obvious reason for the abnormal filter performance can be identified. If an individual filter has turbidity greater than 1.0 NTU based on two consecutive measurements fifteen minutes apart at any time in each of three consecutive months, the system shall conduct a self-assessment of the filter utilizing relevant portions of guidance issued by the Environmental Protection Agency for Comprehensive Performance Evaluation (CPE). If an individual filter has turbidity levels greater than 2.0 NTU based on two consecutive measurements fifteen minutes apart at any time in each of two consecutive months, the system will make arrangements to conduct a CPE by the State or a third party approved by the State. The promulgation date for the IESWTR for facilities serving greater than 10,000 people is November 2001, and if less than 10,000 are served the date is November 2003.[10] This requirement for systems serving less than 10,000 is called the Long-Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR). Therefore, now is the time to assess, and optimize, your water treatment process to meet these more stringent filtration requirements, while insuring future compliance.

III. SUMMARY OF PARTNERSHIP FOR SAFE WATER PROGRAM

A. Introduction

The *Cryptosporidium* outbreak in Milwaukee in 1993 certainly raised the awareness of the susceptibility of drinking water to protozoan contamination. Many water utilities began a critical review of their operating procedures related to protecting the public from microbial pathogens. These water suppliers realized that any future *Cryptosporidium* regulation would entail, in part, treatment based requirements to document filtration efficiency well beyond the existing Surface Water Treatment Rule criteria. To proactively begin the process of data collection to determine raw water source characteristics, while optimizing their water treatment barriers to protect public health, was simply prudent utility management.

Formation of the Partnership for Safe Water program in 1995 allows a standardized procedure to be applied in the assessment of surface water treatment plants on a national scale. Partnering allows utilities to learn from each other, which is very important in this treatment optimization process. It is equally important for the regulatory community and the water supply industry to proactively work together on this issue, realizing that federal legislation is not the immediate solution.

The Partnership for Safe Water includes the following major drinking water organizations:

-American Water Works Association (AWWA)
-Environmental Protection Agency (EPA)
-American Water Works Association Research Foundation (AWWARF)
-Association of State Drinking Water Administrators (ASDWA)
-Association of Metropolitan Water Agencies (AMWA)
-National Association of Water Companies (NAWC)

The goals of the Partnership for Safe Water include:

1. Improved public health protection beyond the existing Surface Water Treatment Rule
2. Cooperative partnering between regulatory agencies, water suppliers, and the public
3. Recognition for supplying a high quality drinking water with tenacity toward improved public health protection

B. Phase I - Commitment to Program

To be eligible to join this program, a community water system must provide **filtered** water to more than 10,000 consumers. The only additional requirement is that the qualifying utility must be free of any type of Surface Water Treatment Rule violation in the past six months. This initial phase simply commits the participating utility to complete, as a minimum, the first three of four partnership phases. To be successful in this commitment, a utility must have the tenacity toward continuous quality improvement throughout all levels of the organization. A utility must approach water treatment to meet the **intent** of regulatory standards, rather than the letter of the law, or simply the present Maximum Contaminant Levels.

Once the commitment document is formally executed and returned to the Performance Effectiveness Assessment Committee (PEAC), essentially a contract is in place to proceed with the first three phases of the partnership. The utility then receives public relations materials that can be used for press releases or public information programs. Utilities also receive a Certificate of Participation for committing to the Partnership goals.

C. Phase II - Data Collection and Reporting

In this phase, the participating water utility must submit basic plant performance data within 180 days of joining the program. This collected data allows the utility to begin a critical evaluation of areas that can be optimized to improve public health protection. This data collection mainly relates to historical turbidity reduction efficiency. The partnership program provides the required computerized spreadsheets allowing the utility to easily enter this data in a standardized format. This baseline report is submitted to the PEAC. This committee is comprised of representatives from participating organizations and utilities. Operational data from the previous year of treatment plant performance is submitted to allow a review of seasonal water quality variations. The goal of a well operated water treatment facility would be to consistently show low filtered water turbidity levels regardless of incoming raw water turbidity fluctuations. Data submitted by the Champlain Water District shows that the daily maximum 4 hour combined filter effluent turbidity for calendar year 1995 did not exceed 0.10 units, and was less than 0.10 units 98.8% of the time for the entire year. Although not required by the program, submission of the highest raw water turbidity event beyond the past one year period, would be useful to analyze the operational response to this type of process performance challenge.

D. Phase III - Self-Assessment

This step of the program is by far the most challenging and rewarding to facility staff. In this phase the utility conducts a self-assessment of the entire utility organization following the existing Composite Correction Program.[11]] This Composite Correction approach consists of two components, the Comprehensive Performance Evaluation (CPE) phase, and the Composite Correction Program (CCP) phase. The initial evaluation phase is a thorough review and analysis of the water treatment plant's design capabilities and associated administrative, operational, and maintenance practices. This review is conducted to identify factors that may adversely impact a plant's capability to achieve optimal performance. The major objective is to determine if significant improvements can be achieved without major capital improvement costs. The second correction and improvement phase is implemented in the previously identified areas where improved performance can be achieved. The major benefit of this phase is that it optimizes the capability of existing treatment facilities without the expense of major capital improvements, while also improving the tenacity of staff throughout all levels of the organization. The completed self-assessment document is sent to the PEAC for review. Upon approval by this committee, the utility is granted the Director's Certificate of Recognition by the Partnership for Safe Water.

E. Phase IV - Third Party Assessment

The final partnership phase is voluntary; it requires assessment of the participating utility by an independent team of investigators. This assessment follows the exact Composite Correction Program format used in the Phase III self-assessment evaluation. The advantage to this third party approach is that an unbiased opinion is provided to confirm all previous Partnership improvement efforts to date. For a utility to successfully complete this phase, all recommendations for corrective actions identified by the assessment team must be implemented. It is noted these corrective measures will be limited only to improvements that do not require major construction or extensive capital investment. Following review and approval of the completed Phase IV report by the PEAC, the utility is granted the Administrator's Certificate of Recognition by the Partnership for Safe Water. It should be noted, field-testing is presently being performed in order to finalize this phase of the Partnership, and this independent assessment option should be available to interested utilities within the next year.

IV. BENEFITS TO JOINING THE PARTNERSHIP FOR SAFE WATER

A. Champlain Water District Case Study

The Champlain Water District is a regional water supplier serving 65,000 people in twelve separate municipal water systems in northwestern Vermont. In July 1994, the District performed a Filter Plant Performance Evaluation (FPPE) following the above Composite Correction Program format, but focusing solely on the effectiveness of the treatment process.[1],[12] This evaluation was scheduled following the completion of a two year filtration study which the District conducted to measure the effectiveness of utilizing various coagulants for particulate log reduction. A phased treatment process upgrade was completed in 1991 with retrofitted adsorption clarification pretreatment constructed prior to previously existing deep bed dual and multimedia filters. Filtration efficiency during these various coagulant trials was measured by Microscopic Particulate Analyses (MPA), Scanning Electron Microscopy (SEM), and low range (0.5 micron) sensitivity particle counting (HIAC Model 4100 w/light scattering sensor), as well as routine water quality operational parameters. Due to the experience gained during this two year study, the District felt the treatment process was optimized for *Giardia* and *Cryptosporidium* removal, but wanted to look at this issue in more detail. The District's water source, Shelburne Bay in Lake Champlain, had been tested regularly since 1990 for *Giardia* and *Cryptosporidium*, and was rarely positive for either organism. Also the finished water had never detected a confirmed *Giardia* or *Cryptosporidium* organism over this same sampling period.

The actions taken as a result of this third party assessment have increased the ability of the District to produce a high quality drinking water.[13],[14] The independent assessor recommended low cost methods to optimize plant performance. Improvements have since been made in flow control, process control, turbidimeter calibration, chlorine contact tank optimization, in-line mixing, and alum/polymer dose optimization. The options that involved costs were initiated by the District based upon further evaluation, and were not specifically recommended by the assessor. A brief overview of each of these improvements follows:

1) Flow control - Intermittent clarifier flow rate surges due to improper automatic valve operation (hunting) were corrected. Gradual filter flow changes were implemented using a

programmed slow ramping of all filter effluent rate of flow controllers.

2) Process control - The District adopted 0.10 turbidity units as maximum allowable turbidity from **each** filtering unit and begins phased investment in particle counting equipment for each filter.
3) Turbidimeter calibration - New turbidimeters were purchased for the plant operator's laboratory and the raw water pump station. Quarterly calibration of all existing turbidimeters was implemented with a weekly quality assurance/quality control check on the operator's laboratory turbidimeter.
4) Chlorine contact tank optimization - Minimum contact tank levels were established based on raw water temperature, and a spreadsheet to be used by operators to calculate the multiple chlorine contact time parameters under varying plant operational conditions was implemented.
5) Media addition - The last two remaining dual media filters were rebuilt to trimedia specifications. All trimedia filters were capped with additional anthracite to improve particle removal efficiency.
6) In-line mixing - Yankee ingenuity improved coagulant mixing through installation of high pressure water jets just downstream of alum and polymer solution tube injection points respectively.
7) Alum/polymer dose optimization - Coagulant pacing was improved by incorporating raw water clarifier backwash flow into automatic pacing of the coagulant injection pumps.

Over the past three years, the District has completed phased installation of particle counters on the effluent of each of their trimedia filters. Filter backwashing is performed when “real time” individual filter particle counts, in the 3.0 to 15.0 micron size category, exceed 10 particles per milliliter. This parameter now controls backwashing over the previously maximum value of 0.10 turbidity units from each individual filtering unit. We also limit the length of the filter run to a maximum of 50 hours. We feel satisfied with our optimization efforts in that our individual filter “average” particle counts on a typical run are 2-3 particles per milliliter (ml) in the greater than 3 micron size range, and 5-6 particles per ml in the greater than 2 micron size range. Given CWD’s excellent quality raw water source, this is a minimum 3.0 log reduction of particles in both the greater than 2 micron, and greater than 3 micron, size ranges. Individual filter post backwash turbidities rarely exceed 0.10 NTU, and these post backwash maximum turbidities reduce to normal levels (i.e. ±0.05 NTU) within 30 minutes of returning the filter back into service.

V. CONCLUSIONS AND RECOMMENDATIONS

It is imperative, due to this *Cryptosporidium* threat, that all surface water treatment facilities adopt a water quality improvement plan, and proceed toward treatment process optimization goals. The easiest way to ensure success in this effort is to join the Partnership for Safe Water. The Partnership believes that establishing treatment performance goals similar to those in the proven Composite Correction Program, and working toward these goals, is prudent given the many uncertainties presently surrounding a number of microbial pathogens. However, the Partnership also recognizes that depending upon a variety of factors, these goals may not be appropriate for all water systems. Accordingly, each system should set appropriate goals, considering the intent of the Composite Correction Program. These adopted goals should challenge the water system toward significant improvements in overall performance. This is the purpose of the Partnership program. It is the intent of the self-assessment to provide a structured way for water utilities to assess and improve performance. With this approach, a water utility can improve public health protection from the risk of Cryptosporidiosis on a schedule, which they determine, while also properly posturing to meet future, more stringent, filtration regulations. If utilities fail to meet all future requirements of the IESWTR, or the LT1ESWTR, they will be forced to implement Partnership Phase III and/or Phase IV criteria in order to optimize their approach to their entire water treatment process philosophy.

The Champlain Water District was a field test site, as well as a utility reviewer of the Partnership for Safe Water program. The District was also the fifth utility in the country to be granted a Director's Certificate of Recognition for successful completion of the program's Phase III requirements. We have been very satisfied with our involvement in the Partnership and look forward to conducting a second, more encompassing, independent assessment. By joining this program a utility receives assistance from their peers, federal regulators, as well as the top experts in the major national water associations. Working together proactively to address these microbial threats, prior to passage of formal regulations, will make compliance with these future regulations much easier. The recognition received from this effort is very beneficial for use in utility public information programs. These programs will be necessary as our water consumers are further educated regarding threats to their drinking water supplies via programs such as the mandated Consumer Confidence Reports.

It is important to remember that plant effluent water quality is only as good as the plant's **weakest** filtering unit. The Champlain Water District is an advocate of individual filter particle counting as a process control parameter with a standard of 10 particles per milliliter in the 3.0 to 15.0 micron size category. Particle counting on individual filters gives a much faster *real time* analysis of particulate breakthrough as compared to increases in turbidity. Therefore, the use of particle analyzers will optimize filter run length, and determine the best time to backwash from a public health standpoint. It is important to note that the more tools you give your operations staff, the more tenacious they can be in supplying the highest quality product possible. It is critical that the water supply industry make a strong response to this *Cryptosporidium* challenge, not only in order to protect public health, but also to maintain consumer confidence in their drinking water.

AUTHOR'S NOTE:

The Champlain Water District's goal of being the first water supplier in the country to complete all four phases of the Partnership for Safe Water was achieved in 1999. The following information was used by the District as a Press Release to publicize this accomplishment:

CHAMPLAIN WATER DISTRICT - FIRST WATER SUPPLIER IN THE NATION TO RECEIVE "EXCELLENCE IN WATER TREATMENT AWARD" FOR COMPLETION OF ALL FOUR PHASES OF THE PARTNERSHIP FOR SAFE WATER PROGRAM

The Cryptosporidium outbreak in Milwaukee in 1993 certainly raised the awareness of the susceptibility of drinking water to protozoan contamination. Many water utilities began a critical review of their operating procedures related to protecting the public from microbial pathogens.

Formation of the voluntary Partnership for Safe Water Program in 1995 allowed a standardized procedure to be applied in the assessment of surface water treatment facilities on a national scale. It was equally important for the regulatory community and water suppliers to proactively work together on this Cryptosporidium threat, realizing that federal legislation was not the immediate solution, due to the analytical difficulties in reliably testing, and enumerating the viability of this organism.

Presently, the Partnership for Safe Water Utility membership (April 1999) consists of 210 water utilities, representing approximately 330 water treatment plants. Collectively, the utility partners serve a combined population of more than 90 million people.

The Partnership for Safe Water is sponsored by the following major drinking water organizations:

- American Water Works Association (AWWA)
- Environmental Protection Agency (EPA)
- American Water Works Association Research Foundation (AWWARF)
- Association of State Drinking Water Administrators (ASDWA)
- Association of Metropolitan Water Agencies (AMWA)
- National Association of Water Companies (NAWC)

The goals of the Partnership for Safe Water include:

1. Improved public health protection beyond the existing EPA regulations
2. Cooperative partnering between regulatory agencies, water suppliers, and the public
3. Recognition for supplying a high quality drinking water with tenacity toward improved public health protection

The four phases of the Partnership Program are as follows:

I. Written commitment to program requirements for Phases I, II, and III

II. Collection of required water quality data in standardized Partnership format

III. Submit utility Self Assessment Report to be reviewed by Partnership's Performance Effectiveness Assessment Committee

IV. Final "voluntary" phase requirements include an onsite assessment of the participating water utility by an independent team of investigators, following the updated Comprehensive Performance Evaluation protocol, which is part of the National Composite Correction Program that has been in place since 1988.

An independent eight-person team performed Champlain Water District's (CWD) onsite Phase IV Comprehensive Performance Evaluation during the week of May 17, 1999. This (3) day onsite evaluation encompassed fifty separate assessment parameters in the areas of facility design, and associated administrative, operational, and maintenance practices and capabilities. The review was conducted to identify any factors that may be adversely impacting the water treatment facility's capability to achieve continuous optimal performance protective of public health. Once potential performance limiting factors are identified, they are classified according to the following guidelines:

A = Major effect on a long term repetitive basis

B = Moderate effect on routine basis, or major effect on a periodic basis

C = Minor effect

Not only did the Champlain Water District "pass" the Comprehensive Performance Evaluation, we were told by the Assessment Team that CWD was the first water utility, **since protocol inception in 1988, that did not have any performance limiting factors identified during the extensive onsite evaluation.**

Champlain Water District is Vermont's largest regional public water supplier, serving 65,000 people in twelve municipal water systems in Chittenden County. CWD's receipt of the first "Excellence in Water Treatment Award" is a culmination of ten years of staff effort. Following water treatment upgrades beginning in 1989 to further protect public health, CWD has extensively researched optimization of its upgraded water treatment processes. CWD has also made numerous regional and national presentations on our process optimization efforts, with many of these papers being published in both the New England Water Works, and the American Water Works Journals.

CWD was the fifth water utility in the country to receive recognition for successful completion of the Program's Phase III, Self Assessment requirements, in 1997. CWD was recognized as the first water supplier in the nation to successfully complete all four phases of the Partnership for Safe Water Program during Opening Ceremonies of the New England Water Works Annual Conference on September 20, 1999 at the Sheraton Hotel and Conference Center in South Burlington, VT. CWD was also recognized for this achievement at AWWA's Water Quality Technical Conference on November 1, 1999, in Tampa, Florida, and by USEPA on December 16, 1999 in Washington D.C., as part of the 25th Anniversary Celebration of the Safe Drinking Water Act.

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