

# **National Drinking Water Advisory Council**

## **Meeting Minutes**

**November 20 & 21, 2002**

**Franklin Room, Westin Philadelphia Hotel  
99 South 17<sup>th</sup> Street  
Philadelphia, PA**

*Prepared for:*  
**United States Environmental Protection Agency  
Office of Ground Water and Drinking Water**

**December 16, 2002**

**Members of the National Drinking Water Advisory Council (NDWAC)**

Dr. David P Spath, Chair  
Mr. Michael G. Baker  
Mr. Henry M. Duque  
Mr. Bruce Florquist  
Dr. Jeffrey K. Griffiths  
Mr. Bradford McLane  
Mr. Kenneth J. Merry  
Ms. Diana Neidle  
Mr. Brian L. Ramaley  
Dr. Graciela I. Ramirez-Toro  
Ms. Vicki Ray  
Ms. Cynthia J. Roper  
Mr. Dennis Schwartz  
Ms. Blanca A. Surgeon  
Mr. John S. Young  
Dr. Mary Davis, Science Advisory Board Liason, U.S. EPA  
Ms. Brenda Johnson, Designated Federal Official, Office of Ground Water & Drinking Water,  
U.S. EPA

Also Present:

Mr. Eric Burneson, Office of Ground Water & Drinking Water, U.S. EPA  
Ms. Ann Codrington, Office of Ground Water & Drinking Water, U.S. EPA  
Mr. Bill Diamond, Office of Ground Water & Drinking Water, U.S. EPA  
Ms. Cynthia Dougherty, Office of Ground Water & Drinking Water, U.S. EPA  
Ms. Joan Harrigan-Farrelly, Office of Ground Water & Drinking Water, U.S. EPA  
Mr. Ephraim King, Office of Ground Water & Drinking Water, U.S. EPA  
Mr. Michael Osinski, Office of Ground Water & Drinking Water, U.S. EPA  
Mr. Peter Shanaghan, Office of Ground Water & Drinking Water, U.S. EPA  
Mr. James Taft, Office of Ground Water & Drinking Water, U.S. EPA

**WEDNESDAY, NOVEMBER 20, 2002**

**I. Opening Remarks – Dr. David Spath and Ms. Cynthia Dougherty**

Dr. Spath convened the meeting at 8:32 a.m. by giving a short overview of the field trip the Council took to see the City of Philadelphia's water system. Dr. Spath also mentioned that public participation via teleconference is unallowable due to the fact that it had not been noticed prior to the meeting in the Federal Register.

Ms. Dougherty outlined the following priorities within the Office of Water and the Office of Ground Water and Drinking Water (OGWDW):

- Strengthening water system security;
- Reinforcing implementation of drinking water standards, including supporting states and systems through training and guidances;
- Fostering source water protection activities;
- Completing priority chemical and microbial rules; and
- Developing a sound basis for future actions.

**II. Affordability Workgroup**

**Status of Affordability Workgroup and Overview of Science Advisory Board  
Deliberations on Affordability – Ms. Diana Neidle, Ms. Blanca Surgeon, and Mr. John Young**

- Ms. Neidle gave an overview of activities which the workgroup has been involved in and mentioned that the committee is very interested in discussing broader issues of small systems.
- The workgroup divided into three subcommittees: 1) affordability criteria for the variance technology; 2) financial strategies, including how existing and new funds can be targeted to help small systems; and 3) small system strategies, including how systems can use cooperative actions, that will allow them to deliver water at an affordable rate.
- Ms. Surgeon gave an overview of the affordability criteria subcommittee's actions. The subcommittee is tasked with defining the appropriate affordability level. The group has been deliberating and discussing whether affordability criteria relates to the affordability

for the system, or affordability for the household and has determined that the issues are difficult to separate. The subcommittee is also evaluating the formula and whether to keep 2.5% as the income percentage for the national level affordability threshold.

- Mr. Duque, chair of the second subcommittee, mentioned that the goal for this subcommittee is to come up with new funding ideas for small water systems. The group evaluated a number of ideas including: increasing appropriations from state and federal sources; creating an assistance program (temporarily called the LIWAP – Low Income Water Assistance Program) which would be structured similarly to the LIHEAP program for energy and possibly funded through assistance fund or initial appropriation by Congress; and a voluntary cooperative bank for water utilities.
- Mr. Young, chair of the system level strategy committee, outlined the efforts of the third subcommittee to make solutions as cost-effective and affordable as possible. Four white papers are being developed:
  1. Conventional treatment, including whether treatment is available for regulatory compliance. The paper includes discussion on how to promote technology and work with manufacturers and states for approval of these innovative technologies.
  2. Alternatives to central treatment, including point of use/point of entry for small systems. Mr. Young noted that this will likely be the affordable solution.
  3. Cooperation and consolidation/regionalization, which addresses how to incorporate planning, technical resources, and financial packages together to promote the cooperative effort.
  4. Capacity optimization addresses how the capacity of the systems can be lowered by reducing water loss, putting in water meters, looking at rate structure, and optimizing the design of the system. These measures can dramatically reduce the volume of water that must be treated for regulatory compliance.
- Mr. Young mentioned that possibly a fourth subcommittee will be formed to address public education issues. These issues include determining the role of the government and tactics to involve stakeholders and communicate risks and problems with consumers.

### **Questions and Comments:**

- Mr. Schwartz asked if the committee reached any conclusions regarding addressing systems' and households' affordability, and which of those options would require the least amount of finances. Ms. Surgeon responded by indicating that this issue has been the subject of large group discussion. The national affordability criteria covers the entire

system. Public education is important because the consumer needs to be aware of the benefits before he/she would be willing to pay for them. The working group has addressed how to make water system operation more efficient in order to keep rates down. Mr. Florquist added that the committee did not examine the relative costs of each approach and that the workgroup will likely recommend that in their final analysis.

- Mr. Ramaley asked if workgroup discussion included the use of point of entry devices in small system strategies. Mr. Young confirmed that this issue is the primary topic of the white paper on alternatives to centralized treatment. Working group discussion included the need for possibly enacting a certification program to assure the quality of these devices. In addition, the use of bottled water was evaluated as a short term gap measure.
- Mr. Ramaley asked if there has been discussion regarding the need for public education on the full range of activities that utilities undertake (e.g., environmental handling charges, etc.). Ms. Surgeon replied that public education is equally important as other issues, and Mr. Young put together a white paper on public education, but that it is something that is beyond the workgroup's capacity. The individual systems are already overburdened in many cases, and should not have to bear the additional burden for education. When considered at a national level, public education is feasible. Many citizens have the misconception that tap water is unsafe to drink. Mr. Young added that the public will not necessarily be seeing or tasting any aesthetic changes with their water, therefore it may be difficult for the consumer to recognize what their money is being spent on. It is also important to note that there are two classes of people: those who cannot afford water, and those who are unwilling to pay for it – education will address only those who are unwilling to pay for it. Dr. Spath commented that this last point regarding education is important.
- Dr. Spath asked if the working group is making a distinction between small versus all systems when considering affordability. Ms. Neidle indicated that this is a topic that the work group has not reached consensus on, and that there is a great deal of discussion still going on. The work group has looked at how other utility subsidies work for people below a certain poverty line (such as energy subsidies), but have not limited that to small systems exclusively. Dr. Spath added that there are a number of examples in the energy industry using lifeline rates and that these examples would likely apply to water as well.
- Dr. Ramirez-Toro commented that outreach and education of other regulatory communities and agencies is important so that small communities and systems receive a unified message. It is important to recognize that volunteer work is very important in many small systems, and this is outside the traditional set of solutions presented for systems. It is important to consider alternatives such as these that are outside of the urban setting.

- Mr. Ramaley commented that affordability discussions have focused solely on the magnitude of the water bill. Attention should be paid to what the public views as an acceptable rate of change for water bills, and what resistance is met at various rates of change.
- Mr. Ramaley commented that many communities have adopted lifeline rates for power programs and some states have similar water programs. For example, in Hampton Roads, VA, a voluntary program (identical to some power programs) called H2O (Water 2 Others) allows customers to contribute money through extra contributions to their water bill. Collected funds are funneled directly to community service organizations in each jurisdiction and apportioned out according to criteria that they oversee. The water utilities have nothing to do with the funds other than to collect them.
- Dr. Spath asked, regarding Mr. Ramaley's comment, if these programs are voluntary. Mr. Ramaley replied that this fund does not have a lifeline concept, and that it is voluntary. Many water utilities have adopted a lifeline rate, or have charged water usage up to a certain amount at a relatively low rate in order to encourage conservation. Having a lifeline concept built into the rate structure would require jurisdiction and approval, voluntary programs can be less problematic.
- Mr. Young commented that the committee is charged with defining an affordability level after which a group of customers who cannot afford to pay for certain technology are bumped into a potential variance procedure. The working group as a whole is uncomfortable with this variance procedure, and the states indicate that they're not going to implement variances anyway. There is a concern that even if the working group works to define a "correct" affordability level, states are not going to implement them and our efforts are for naught. Dr. Spath added that he is not sure that the states have said that they would not implement variances. Ms. Dougherty responded by indicating that this is clearly a difficult issue. If EPA triggers the variance procedure, the states will be in a difficult position to decide if they will implement them. The issue for the working group is at what point is the variance triggered, or is there a better way to have done this. These issues are also important for how we establish regulations in the future, and therefore worth deliberation.
- Ms. Neidle added that there is a strong view in the working group that these deliberations will not be useful to many states, but that the issue is being taken very seriously. She mentioned that Dave Mooney has been putting together a paper on rate design. Ms. Surgeon added that public education is very important when implementing variances. It is most important that systems and communities be given a choice of operating under a variance, because even a variance may cause a rate increase. Dr. Spath added that this is

a very good point, and that it is important to recognize that costs may increase even if the variance is triggered.

- Mr. Young commented that some subcommittee members are developing a white paper on a “super-BAT” (super best available technology). This technology has the potential to address several regulations at once and allow the system to operate in compliance for a number of years, until new regulations are promulgated. Piggy-backing of regulation is very difficult to address in terms of affordability.
- Ms. Ray added that Kentucky is concerned whether the improvements that water systems are currently implementing will take them through these new requirements for treatment. The state is trying to help systems foresee impending regulations so they can be better prepared, essentially a super-BAT.
- Dr. Griffiths commented that this discussion has many parallels and issues related to the Contaminant Classification List (CCL) work group. The goal of the working group is to look at how to identify contaminants in the future and determine how we’re going to deal with those contaminants. The equity issue that this committee has raised is a profound one, in terms of who gets what type of water. Is it acceptable to have a two-tiered approach? It is important to note that super-BAT issues cannot be considered without also looking at classes of contaminants, and this is something that is being discussed in the CCL group.
- Mr. Ramaley agreed that affordability issues and CCL are closely tied. Membrane technology is frequently discussed as a super-BAT, but it is not clear that this type of new technology will resolve system issues for all contaminants in the future.
- Dr. Spath asked about the time frame for recommendations from the group. Ms. Neidle responded that recommendations will be finalized by January or February at the latest. There are three working group meetings scheduled before that deadline. Mr. Young added that there is going to be a meeting on December 18<sup>th</sup> and 19<sup>th</sup>, at which point the text and recommendations will be complete.
- Mr. Ramaley reemphasized that even though super-BAT and leapfrog technology applications go to new levels, they will never be fully protective of public health. Technology and treatment will always be progressing, and to assume that a super-BAT or other technology will take us sufficiently far in the future that the affordability question has been answered once and for all may not be the case.

Dr. Spath closed discussion on affordability issue and introduced Mr. Taft from the Standards and Risk Management Division to discuss the SAB deliberations on affordability.

**SAB Deliberations on Affordability – Mr. James Taft**

- Mr. Taft reviewed the charge to the NDWAC working group. The SAB Environmental Economics Advisory Committee was given essentially the same charge, and addressed the following issues:
  1. Is EPA's basic approach sound, and appropriate for purposes for the affordability criterion and its determination?
  2. Is the measure that EPA developed, that median household income set at 2.5 percent, was appropriate?
  3. Should there be other approaches to determining the baseline, rather than the current approach of using the community water system survey that is conducted every 5 years?
  4. Should there be different approaches for ground water systems vs. surface water systems?
  5. Should the availability of outside assistance, particularly State Revolving Fund monies, be a part of the calculation?
  6. Is there a need for making a determination on a regional basis versus a national basis?
  
- Mr. Taft mentioned that the SAB panel has met twice and have produced a draft report that is available on their Web site. The SAB panel was comprised primarily of economists rather than water or water utility professionals.
  
- Mr. Taft summarized the overall recommendation of the SAB panel was that EPA's basic approach seemed justified on the basis of equity, economic efficiency, and practicality.
  - The panel indicated, however, that EPA should be aware of the limitations of the approach regarding the wide range of small systems and unique situations that are difficult to describe on a national basis.
  - The panel recommended that determinations be made on a basis lower than a national level, and at least on a regional basis.
  - The panel also recommended that a lower threshold (than 2.5 percent) should be considered – a threshold that would be more easily tripped. There was not, however, a consensus on that particular issue.
  - The panel specifically mentioned consolidation as something that should be considered in terms of what the trends are, and what is the likelihood for consolidation in the future. The SAB recommended that EPA develop clear and specific guidelines about when variances should be issued. In addition, EPA should conduct research into mechanisms for achieving greater equity and distribution of water costs.



- Mr. Taft provided observations about the NDWAC working group. He indicated that it seems appropriate to have three subcommittees, as issues are complex and require a lot of discussion. It is important to recognize that opinions about other programs and their effectiveness and future has implications for the affordability criterion. Ultimately, affordability has a value judgement associated with it, and that is a difficult issue. There have been excellent discussions and a great deal of technical information that has been presented to the working group. It's also clear that we're tracking a moving target, that there are trends out there in terms of system consolidation and some success stories to learn more about.
- Mr. Taft commented that an important issue for the working group regards trends and how they can be reflected and taken into account as recommendations are made.
- Mr. Taft discussed the next steps for EPA, including considering the recommendations of the NDWAC working group and SAB, and making any appropriate changes to the training order regulations as they're developed. Noted that this is the case for nonmicrobial rules only.
- Dr. Spath opened the floor to questions pertaining to the SAB deliberations.

### **Questions and Comments**

- Ms. Roper asked for clarification regarding the charge to the panel and what was in the March 2002 report to Congress, and commended the working group for its thorough consideration of a number of difficult issues. Mr. Taft answered that in October 2001, as part of an appropriations rider, Congress called upon EPA to reevaluate affordability criterion and approach, and to make specific recommendations on statutory changes. Ms. Dougherty added that when the report to Congress was made, both the SAB review and organization of the NDWAC working group was underway.
- Ms. Roper asked if there is latitude in what Congress is looking for in a report. Ms. Dougherty responded by indicating that the report to Congress has already been completed, but that deliberations from both the SAB and NDWAC committees may change some of the aspects of the report (if there is a statutory change, then that would need to be reported to Congress). Recommendations from both groups will be considered.
- Ms. Dougherty commented that earlier in the Senate, the bill that the Senate Environment and Public Works Committee had related to reauthorizing the State Revolving Fund loans actually included language related to allowing disadvantaged community consideration for large systems that had pockets of disadvantaged households.

- Mr. Taft mentioned that the SAB panel was glad that NDWAC is also evaluating issues associated with social components and broader implications of the affordability discussions.
- Dr. Griffiths commented that a freer variance policy, such as a low threshold for variances might be a way of providing attention and technical support for challenged communities, and asked if the implications for a high versus low threshold for variances have been evaluated, and what states may think. Ms. Ray answered that when considering the state perspective, most do not want to have variances, but that affordability criteria may help determine which systems cannot afford appropriate treatment and allow those systems to be targeted for assistance and education. Dr. Spath agreed that states issuing variances is very problematic, and that environmental justice issues run counter to variance issues. Dr. Spath suggested that states and consumers would be better off by doing away with the variance concept because of the danger of creating a two-tiered health standard.
- Dr. Davis voiced a concern that if treatment is too expensive, small or disadvantaged systems will cease to exist and people will be forced to go back to individual wells where there is less health protection. Ms. Surgeon commented that variances are part of a set of options that may be used to protect public health. She indicated that the entire community should be given the choice of what set of options to consider, and variances may be one of those options. There are many double standards in this country, but if a community is empowered to make a choice, that isn't necessarily negative. Ms. Dougherty responded by stating that it is the hope that NDWAC will provide recommendations on these issues of equity and health protection including whether people should be allowed to have different health standards for their water.
- Dr. Ramirez-Toro asked for some examples of issues that were raised in terms of microbial contaminants and affordability. Mr. Taft answered that the issue did not come up because affordability criteria cannot be used for microbial rules.
- Ms. Surgeon asked about procedure following submission of recommendations, including those issues that have been determined to be out of the working group's scope. Of particular concern are strong recommendations on that the NDWAC working group would like to submit for follow-up regarding a national public education campaign and the issues of the individual household versus the system. Ms. Dougherty responded that the subcommittee submits recommendations to the entire NDWAC Council, who then submits them directly to the EPA Administrator. Once the recommendations have gone through that process, EPA will determine what issues will be followed up on and respond to NDWAC on that activity. Usually EPA provides feedback on activities at the next meeting of the Council.

- Dr. Davis asked if the work group has considered system consolidation and the opinions of small systems on this issue. Ms. Neidle responded that the NDWAC working group has discussed many kinds of partnerships. There are options that would allow systems to retain some of their control and still benefit from greater efficiency of partnership. Mr. Young clarified that when the working group is discussing cooperation and consolidation, the physical interconnecting of the systems is a very small part of what actually goes into partnering. In most cases, consolidation will concern operations such as technical resources and management structure. Ms. Ray suggested that the working group come up with a clear definition of regionalization, partnership, or consolidation.
- Responding to Dr. Griffiths, Ms. Neidle commented that equity issues have been very important to this working group. The working group would like to see stricter guidance on how variances are implemented at the state level, and that there are public participation meetings at the system.
- Ms. Roper asked if there were any ways to encourage systems to consolidate. Dr. Spath added that most states are looking at giving SRF funds or grants to systems that consolidate. Ms. Dougherty added that the statutory requirement for loans is that a system be “viable,” and that a system that lacks proper technological and financial capacity will not be eligible for such loans. Ms. Neidle commented that the work group discussed barriers to cooperation. She indicated a study underway examines the most important barriers to cooperation, and the easiest ways to get around them in order to target incentives in a better fashion. Funding is a good incentive for consolidation.
- Ms. Surgeon stated that it is important that the working group provide recommendations on how states can facilitate cooperation and consolidation among systems. In New Mexico, and in many states, staff to implement programs is very limited, but in cooperation with another agency, they are setting up a fund to provide to communities that link together. This is where the education starts – it has to come from the bottom up and offer incentives.
- Ms. Ray commented that Kentucky spent half a day covering what efforts have been made to promote regionalization and cooperation. It’s a multi-agency effort in Kentucky through the Kentucky Infrastructure Authority which has funds from the SRF, Community Development Block Grants, and Rural Development funds. Systems need to consider all alternatives including partnering. Mr. Florquist added that the work group discussed the broad continuum of cooperation and regionalization options from sharing equipment up to a complete takeover and mentioned that the ultimate determining factor will be economics.
- Dr. Spath concluded by adding that it is important to educate systems with regard to variances, and that Mr. Florquist’s point on economic impact is important. It is important

to give systems information about the range of options available and the possible consequences of each option.

1<sup>st</sup> BREAK (Recess 10:30 a.m. to 10:45 a.m.)

Dr. Spath reinitiated the meeting and noted that the order of presentations has been changed so that Ms. Ann Codrington's CCL Emerging Contaminants presentation will precede the Status Report and Next Steps presentation. Dr. Spath introduced Ms. Ann Codrington.

## **II. CCL Classification Process Workgroup**

### **Emerging Contaminants: Pharmaceutical and Personal Care Products – Ms. Ann Codrington**

- Ms. Codrington outlined three major efforts of OGWDW related to CCL and emerging contaminants:
  1. CCL regulatory determinations. OGWDW published a preliminary notice of the regulatory determinations in June 2002 stating the intent not to regulate nine contaminants based on the health effects data. The notice is currently being finalized and will likely be published in March 2003.
  2. Developing the second CCL. Statutory requirement is to publish the second CCL in February 2003. OGWDW is working on that notice and plans to reissue CCL 1 to fulfill the requirement, but the bulk of the effort has gone into creating the NDWAC working group to address creating a new CCL classification process.
  3. Taking the National Academy of Science (NAS) recommendations and determining whether they can be applied to a new classification process by convening the NDWAC group. The next meeting of the CCL working group is on the 16<sup>th</sup> and 17<sup>th</sup> of December, and there have been a number of conference calls.
- Ms. Codrington presented an overview of the statutory requirements which the EPA is under regarding the development of CCLs. The 1997 SDWA amendments require that EPA publish a list every 5 years (the first CCL was published in March of 1998, CCL 2 is due in February 2003, and the future CCL is due in February 2008). In addition, regulatory determinations must be made every 5 years on at least 5 contaminants, the next regulatory determination is due in August 2006.
- Ms. Codrington gave an overview of the National Research Council's recommendations to EPA regarding CCL development. The NRC recommends:

- A new sophisticated classification approach that screens contaminants based on pattern recognition (i.e., neural networks) that will be applied for both chemical and microbial contaminants. Completion of a prototype by 2004.
- Use of new molecular/genetic methods to identify microbial contaminants that bases evaluation of microbes on similarities of virulence, physical and/or genetic attributes (Virulence Factor Activity Relationship, VFAR), relies on new genomic and molecular analytical methods and indicators, and suggests a VFAR working group be established in EPA.
- Emerging contaminants include pharmaceuticals, personal care products, detergents, and hormones. This class of contaminants was not included on the first CCL. EPA is working to include these contaminants into the potential universe of possible contaminants, and to collect as much information as possible about these substances.
- Ms. Codrington described key considerations and challenges for emerging contaminants and future CCLs. For example, pharmaceuticals are biologically active and are beneficial when used to treat the ill. It is unknown, however, how these substances may impact humans when they are found in a drinking water at very low levels and possibly over a long time span. These contaminants are found almost everywhere – in households, out of industrial and agricultural discharges. It is also necessary to learn more about microbial resistance, long-term effects, treatment, and the effects of mixtures of contaminants. Methods need to be developed to detect these contaminants. In addition, occurrence data is currently very limited.
- The U.S. Geological Survey (USGS) is working to gather data on a national level on emerging contaminants. The first study, the 1999-2000 National Scale Survey of Susceptible Streams sampled for pharmaceuticals, personal care products, and other compounds downstream of wastewater dischargers and/or livestock production areas. Ms. Codrington noted that the study did not evaluate temporal changes in contaminant presence. The second study undertaken by the USGS is the 2001 USGS Source Water Survey which sampled public water supplies for pharmaceuticals and other waste water compounds. Ms. Codrington noted that this second study is being questioned by the chemical industry because of the methods that the USGS used.
- Mr. Ramaley interjected with a question regarding in what way the USGS methods are being questioned. Ms. Codrington replied that the companies are questioning the analytical methods used for the study.
- Ms. Codrington concluded by summing up the challenges of emerging contaminants, including detection methods (analytical methods), health effects data, and occurrence data and data availability in treated water.

- Dr. Spath opened the floor for questions or comments.

### **Questions and Comments**

- Dr. Spath asked about ongoing efforts related to detecting types or classes of chemicals, and what is the time frame for acceptable methods for detecting them. Mr. King responded that OGWDW is currently developing a series of methods with ORD that will be available for the next Unregulated Contaminant Monitoring Rule (UCMR) 2006 proposal that will be coming out in 2004. These methods will apply particularly for contaminant classes. Dr. Spath asked if these will be developed in time for the future CCL. Mr. King responded that they will not.
- Mr. Schwartz asked if the Agency will look for occurrence in source water or treated water. Ms. Codrington answered that the effort should be focused on trying to begin to look at treated water to determine if conventional treatment is effective and what effect it has on some contaminants. Mr. King added that the UCMR requires sampling of treated water as opposed to the USGS studies, which looked at source water. Ms. Dougherty added that when making a regulatory decision, a lot of information on occurrence and exposure is needed, and that the effects of conventional treatment are included with that.

Dr. Spath next introduced Dr. Graciela Ramirez-Toro and Mr. Brian Ramaley to discuss the status of the NDWAC working group on CCL classification process.

### **Status Report and Next Steps for the CCL Classification Process Workgroup – Dr. Graciela Ramirez-Toro, Mr. Brian Ramaley, and Dr. Jeffrey Griffiths**

- Dr. Ramirez-Toro's presentation involved a description of the charge of the working group. It was agreed that the most important focus is public health protection. Additionally, the working group is evaluating recommendations from NRC and the overall implementation of the strategies, classification processes including methodologies. Pilot projects will likely be developed to validate the new classification approaches (neural networks and VFAR). Demonstration studies on the feasibility of VFAR, risk communication, and transparency issues will all be a part of the charge.
- The working group will meet six to eight times in the next year. The first meeting was September 18 and 19, 2002 and included discussion of characterizing the universe, culling the universe to the PCCL, culling the PCCL to the CCL, VFAR usefulness and feasibility, methodology, and transparency issues. Accordingly, four activity groups (subcommittees) were formed: guiding principles, universe, VFAR, and classification systems. Each activity group has met through telephone conferences.

- Mr. Ramaley provided an overview of the Guiding Principles activity group:
  - Determined that public health should be the foremost guiding principle, and that it should be inclusive and protective of sensitive subpopulations. This means that the CCL list will be an inclusive, rather than exclusive, list.
  - Stressed that maximizing transparency should not supplant policy and expert judgment by EPA.
  - That the process should provide a rationale for why a contaminant is on or off the list.
  - The process should apply equal rigor to chemical and microbial contaminants.
  
- Dr. Ramirez-Toro provided an overview of the VFAR activity group. She noted that a preliminary search of GenBank was completed to attempt to assess the usefulness of the VFAR approach.
  - The need and means to expand and refine database searches was discussed, such as creating indicator words to search over broad sources of data.
  - In addition, the need to distribute microbial expertise among other activity groups was discussed.

Dr. Griffiths added that the activity group will likely be able to recommend significant suggestions in terms of where to go, what the obstacles are, and the strengths of the approach.

- Dr. Ramirez-Toro summarized the activities of the universe group. She mentioned that she was not a part of this activity group, and that this summary is from notes provided by EPA.
  - There was discussion about how to characterize the universe. There is a tendency to limit the universe because of the determination that the universe should contain contaminants that have some minimal criteria, and that the universe should be based on certain data elements.
  - A need to identify all possible data sources to populate the universe was discussed.
  - The activity group will recommend guidelines about how to select what goes into the universe. The available sources of data cover international contaminants and contaminant sources, which may skew the universe to include fewer contaminants present in the U.S., and so another process to deal with these specific contaminants needs to be developed.
  
- Dr. Ramirez-Toro discussed the activities of the classification system activity group. Questions that have been identified include how to evaluate contaminant groupings and

surrogates in the classification scheme, how to characterize the contaminants recognizing that there is limited data, and how can treatment data be used.

- Dr. Spath opened the floor to questions pertaining to the CCL working group.

### **Questions and Comments**

- Dr. Spath asked about the practicality of the VFAR approach. Mr. Ramaley answered that the classification activity group saw the neural network approach as more fully developed, while the VFAR approach as less developed and possibly less practical. He indicated that there may be some gaps in how the activity groups were set up, namely, that no one is focusing on how to go from the universe to the PCCL. There were a number of questions about how the neural network approach might be used and if it can be used in a preliminary fashion. How a neural network addresses contaminant groups and data gaps are also key issues for classification group. The activity group also needs to discuss where some set of criteria might be used in the screening process.
- Dr. Davis commented that it is surprising that the neural network is better accepted than the VFAR approach, and asked if it is a function of the expertise of the classification activity group. Mr. Ramaley answered that the reflection on the neural network approach came out of the larger group discussion. Generally the neural network approach is viewed as viable and feasible, and the VFAR approach is viewed as having tremendous potential but it is not clear if this is ready for use. Dr. Griffiths added that the NAS committee viewed the VFAR approach as easier and more powerful, and ready to handle this type of analysis.
- Dr. Ramirez-Toro commented that activity groups were formed by volunteering. Dr. Griffiths added that people sat in groups that they were most comfortable with. The composition of the activity groups will change.
- Dr. Davis commented that the VFAR approach seems very straightforward, but was skeptical that a training set for chemicals will strain out particular non-toxic chemicals. Dr. Ramirez-Toro responded that the problem with the VFAR approach is not the understanding of the approach, rather it is where are we in terms of the development of comprehensive databases. There will always be data gaps and the question is how to avoid those and screen correctly despite those gaps.
- Mr. King emphasized that the CCL process is one to screen and prioritize, not one to pass final judgment. The recommendations of the NAS urged that these classification schemes be transparent and used in combination with common sense and expert judgment.



- Dr. Spath asked how the EPA is validating data quality in the databases. Mr. King answered that there are many data gaps in both the chemical and microbial sides. Regarding microbial contaminants, this is a relatively new area that we have many questions about. With chemicals, a number of fairly major databases have been identified. EPA needs guidance on how to characterize the universe based on these databases. Mr. King reemphasized that the CCL process is a prioritization process and not the final regulatory determination.
- Mr. Ramaley commented that with respect to security issues there may be an opportunity for genetic manipulation for bioterrorism if the data is readily accessible. If the VFAR approach is recommended or used, balancing transparency issues with maintaining security should be considered.
- Dr. Spath asked about timing for the working group's final report. Mr. Ramaley responded that there are six additional meetings of the full working group scheduled between the present and September 2003, and that they are working for a September 2003 deadline.
- Dr. Griffiths commented that the first working group meeting was spent presenting background information and getting everyone up to speed. The crucial point that the CCL process is used for screening only.

Dr. Spath presented Mr. Henry Duque with a plaque commemorating his service to the NDWAC. Mr. Duque accepted the award and said that he was very glad to work with this group.

The meeting adjourned for lunch at 11:56 am.

Dr. Spath reconvened the meeting at 1:30 p.m. and mentioned that there will be a public comment period from 4:30 to 5:30 p.m. Dr. Spath introduced Mr. Eric Burneson.

### **III. Ground Water Rule – Mr. Eric Burneson**

- Mr. Burneson commented that the Ground Water Rule (GWR) was proposed on May 10, 2000, and the public comment period closed in August 2000.
- The GWR was structured into five components which are referred to as the multi-barrier or multi-component approach. The components are the sanitary survey, source water monitoring, hydrogeologic sensitivity assessment, corrective actions, and compliance monitoring to ensure that systems enact corrective actions.
- Mr. Burneson described the requirements of the GWR:

- Sanitary surveys are already required of public water systems by the Total Coliform Rule. The GWR proposed to increase the frequency of sanitary surveys to once every 3 years for community water systems (CWS) and once every 5 years for noncommunity water systems. In addition, the rule proposed that sanitary surveys evaluate 8 elements of the system, and that states are required to identify all significant deficiencies and have the authority to require systems to take corrective action. What constitutes a significant deficiency is at the state's discretion. Comments were requested on whether a 3- and 5-year frequency for sanitary surveys was appropriate.
- A one time hydrogeologic sensitivity assessment must be performed by states for systems without disinfection. The assessments are to be completed by the sixth year post-promulgation for CWSs, and by the eighth year post-promulgation for NCWSs. In addition, assessments are required for systems in sensitive areas (e.g., karst, gravel, fractured bedrock). The assessments are an attempt to identify undisinfected wells that are located in sensitive hydrogeologies such as karst, gravel, or fractured bedrock aquifers. If wells are identified that lie within sensitive aquifers, the state has an option to do an additional evaluation to determine the presence of a hydrogeological barrier protecting the drinking water from contamination. A system that is found to be sensitive would be required to perform routine monthly source water monitoring for at least 1 year. Comments were requested for issues such as the time frame, determining how to address systems that the state does not conduct assessments for, and what aquifer types should be classified as sensitive.
- Triggered source water monitoring applies to all undisinfected systems. The TCR already requires systems to sample for the presence of total coliform in their distribution system, the GWR would add the requirement for systems to test its source for the presence of fecal coliform as well. Comments were requested for issues such as whether fecal coliform is the appropriate indicator, what to do in the case of a NCWS with no distribution system, and whether it is appropriate to require monitoring for both bacterial and viral indicators.
- Corrective action is the step in which something is done about the contamination. The rule requires that as soon as possible, within 90 days of identifying possible contamination source, or on a state approved schedule, the system would have to consult with the state to determine the appropriate corrective action. Comments were requested about the correction time frame, whether systems that select disinfection as their treatment technology should be required to achieve 4-log inactivation of viruses but should also be required to maintain a residual disinfection throughout the distribution system.

- The final component pertains to the subset of systems that select disinfection as their corrective action or those systems that already disinfect. These systems will not be subject to any of the microbial source water monitoring and would be required to maintain the disinfection system in a manner that ensures continuous and reliable public health. The frequency of monitoring is dependent on the system size.
- Mr. Burneson commented that promulgation of the rule will be late summer, or early fall of 2003.
- Dr. Spath opened the floor to questions.

### **Comments and Questions**

- Mr. Young asked for clarification regarding vulnerability assessments and whether they triggered a system into monitoring or out of it. Mr. Burneson responded that the proposal included a hydrogeologic sensitivity assessment of which there is an optional component that the state has called the “hydrogeologic barrier determination.” The vulnerability assessment is an alternative to the hydrogeologic sensitivity assessment and is what EPA took comment on. The hydrogeologic sensitivity assessment is what is proposed in the rule, and will be something that the state can do from existing data compiled through source water assessments, well construction programs, and other sources.
- Mr. Young asked if a state determines that there is no barrier, but that there is no change of contamination, will that mean that the system is kicked out of the monitoring program. Mr. Burneson stated that the definition of a hydrogeologic barrier is sufficiently broad to allow the state to interpret the absence of a microbial source within a certain travel time as a barrier. Mr. King commented that the particular example would be difficult to justify given increasing urbanization. Mr. Young added that his concern is that systems would become exempt from monitoring. Mr. King replied that rigorous demonstration that there is no source of contamination would be needed to exempt a system from monitoring.
- Ms. Roper asked how the source water assessment program relates to these vulnerability assessments. Mr. Burneson clarified that the source water assessment program (SWAP) does require a susceptibility determination which is very similar to the vulnerability assessment required under the GWR. Unlike the GWR, the SWAP does not require states to evaluate aquifers or look for microbial sources of contamination. Mr. Burneson added that it is expected that many states anticipated the Hydrogeologic Sensitivity Assessment (HSA) and conducted their SWAP such that they would be gathering the data needed.

- Ms. Roper commented that she is unsure if Michigan tailored their SWAP program to meet the HSA requirement, but that there is likely enough data to fulfill that data need. Dr. Spath added that it is likely that many states did not look at the hydrogeology issue with regard to SWAPs, but that presumably the states have identified contaminant sources including microbial sources.
- Ms. Roper asked for clarification on what EPA was seeking comments on for the HSA. Mr. Burneson replied that some specific request for comments were associated with the SWAP and how data from those assessments could be used to fill the GWR requirement.
- Dr. Griffiths clarified that sanitary surveys occur in all systems regardless if they lie in a hydrogeologically sensitive area. Mr. Burneson agreed and restated that the sanitary surveys will occur at 3- and 5-year intervals.
- Dr. Griffiths asked if the sanitary surveys are considered a part of the GWR or the TCR. Mr. Burneson replied that there is a sanitary survey requirement in the TCR. The GWR changed only the frequency at which sanitary surveys are conducted.
- Ms. Surgeon asked who will be conducting the HSA and what it entails. Mr. Burneson answered that the HSA can be completed by the state employee in their office and does not require a field assessment. The HSA will be based on existing information from SWAPs, well construction requirements, or through hydrogeologic maps. The first step is to determine the location of undisinfected wells and if they draw from a sensitive aquifer. If the well does draw from a sensitive aquifer, and depending on the state's policy, the state can require that they be monitored.
- Dr. Spath asked how many ground water systems there are, and why is there so much emphasis on this screening approach. Mr. Burneson replied that there are over 150,000 ground water systems across the country. Approximately 44,000 - 45,000 of those are community water systems. Mr. Burneson pointed out that Michigan has 11,000 or 12,000 systems alone, so there will be a tremendous workload for states, Michigan in particular. He added that disinfection is performed by 50 to 60 percent of CWSs, 20 percent of TNCWS, and about 30 percent of NTNCWs.
- Referring back to the presentation, Mr. Florquist asked about disinfection residual monitoring for systems serving more than 3,300 and where that would be done and if more than one monitoring station would be needed. Mr. Burneson replied that the proposed requirement is only disinfectant residual to ensure you would achieve the 4-log viral inactivation before the first customer rather than through the entire distribution system.

- Ms. Ray asked for clarification that states with universal mandatory disinfection are not required to conduct the HSA, and instead are required to ensure that systems are in compliance through monitoring. Mr. Burneson answered that systems that already disinfect and achieve 4-log inactivation would notify the state of that. Systems that fail to notify the state of 4-log viral inactivation are either required to submit notification that they meet that requirement, or that state would be required to conduct the HSA. Ms. Dougherty added that the state could also enforce against them for failing to notify.
- Ms. Ray commented that states are required to conduct the sanitary survey, inspections, collect monthly operating reports with disinfection residuals, and now will be required to collect an additional piece of paper that states that the system meets 4-log disinfection – and that this seems an unnecessary burden. Mr. King replied that if the state demonstrates that there is, as a part of their existing program, a mandatory requirement for disinfection, then that would fulfill the requirement. Mr. Burneson added that there is no source water monitoring if a system uses 4-log inactivation. Ms. Dougherty commented that if a state has 4-log inactivation as the requirement, that the state already has rules that are more stringent than EPA’s rules which is all that is required.
- Mr. Burneson clarified the requirements for a state which already requires disinfection for all systems. HSAs are not required, sanitary surveys must still be performed, and that the states would have to ensure that the systems are conducting the compliance monitoring in order to achieve 4-log inactivation of viruses.
- Dr. Spath closed discussion on the GWR, and introduced Mr. James Taft and the Radon Rule presentation.

#### **IV. Radon Rule – Mr. James Taft**

- Mr. Taft’s presentation included scientific and technical background information about radon. He emphasized that radon poses risks to health principally through indoor air. Approximately 1 percent of the total risk posed by radon is associated with the consumption of drinking water and the inhalation of radon in water that occurs when showering and washing hands. Mr. Taft emphasized that even the 1 percent risk is relatively high when compared with other drinking water contaminants.
- The National Academy of Science (NAS) estimated that approximately 170 fatal cancer cases resulting from radon in water, and between 15,000 to 22,000 fatal lung cancer cases from radon in air occur each year.
- Mr. Taft’s presentation included a map of radon occurrence across the United States. The principal areas of concern are New England, and the upper Midwest. Radon in water and radon in air generally co-occur, although not always.

- The 99 to 1 split with respect to exposure motivated a unique set of statutory provisions. Congress determined that a state will decide, 90 days after the rule is promulgated, whether to develop a radon and air mitigation program, termed the multimedia mitigation (MMM) program. If a state chooses this approach, its public water systems will have the benefit of a higher alternative maximum contaminant level (AMCL) of 4,000 pCi/L (picocuries per liter). If a state chooses not to adopt the MMM program, the water systems would be required to meet an MCL of 300 pCi/L. If the state does not choose the MMM route, an individual water system also has the option to enact its own MMM program subject to state approval.
- The MCL for radon will be developed in the same fashion as all other provisions of the SDWA. The Radon Rule adds consideration for the costs and benefits of control programs for radon. The statute envisions that the combination of the AMCL and the MMM program will achieve equal or greater risk reduction as compared to the MCL.
- The MCL was proposed to be set at 300 pCi/L which is roughly equivalent to a risk of  $2 \times 10^{-4}$  as a mean risk. The AMCL was proposed at 4000 pCi/L and based on a NAS recommendation that the average ambient outdoor air level was .4 pCi/L, the air to water transfer factor is 10,000 to 1.
- The Radon Rule will apply only to community water systems (CWSs), not to non-transient, non-community water systems (NTNCWSs).
- Mr. Taft discussed the process of creating the MMM program. It was determined that there would be four key elements in the MMM program: public participation; quantitative goals set by the state to mitigate risk in existing homes and to ensure that new homes are built to be radon resistant; program strategy for testing/mitigation of existing homes and construction of new homes; and the measuring and reporting of results every 2 years. Mr. Taft noted that this program is designed to build on existing radon and indoor air programs.
- Mr. Taft gave an overview of the health costs and benefits summarized in table form. He commented that it's difficult to see a breakpoint of benefits and costs, and that the undiscounted benefits and costs generally track one another through all of the different MCL options. When the rule was proposed, EPA did not discount the benefits (i.e., did not consider that in calculating the benefits there are lost opportunity costs for the funds that are used in meeting the rule requirements). The benefits, then, are about half of the undiscounted benefits. In addition, that the majority of the systems that will be affected by this rule are small systems.

- Issues raised on the proposed rule included comments on the MCL level, the overall rule structure, and why an indoor air problem is being addressed in a water rule. In addition, many state drinking water administrators were concerned about lack of state resources to implement the MMM program, and there was concern over the appearance of a double standard. Further regarding equity, concerns were voiced regarding the MMM program and that it does not reduce risk in all homes.
- The final rule went to OMB in January 2001. The rule has been under reconsideration since that time. EPA is working towards promulgation by the end of 2003. Mr. Taft mentioned that the General Accounting Office (GAO) completed an extensive review of the costs, and submitted recommendations in 2001. EPA estimated that taking the GAO recommendations into account would increase the cost by approximately 15 percent over the costs in the proposal.
- Dr. Spath opened the floor to questions.

### **Comments and Questions**

- Ms. Roper asked about the GAO recommendations, the increase in cost, and if the SAB recommended that undiscounted benefits be used in the final approach. Mr. Burneson replied that the SAB panel recommended that discounted benefits be used to account for cessation lag and cancer latency. The overall result is that the benefits would be less than what EPA had proposed. Mr. King added that this is a very controversial issue for EPA.
- Mr. McLane asked about calculated risk and if it includes risk from other exposure routes such as air inhalation. Mr. Burneson replied that the calculated risks are only from water. Mr. McLane commented that  $2 \times 10^{-4}$  is a high risk. Mr. Burneson restated that this is a high risk when compared with other drinking water contaminants, though the risk is much less than through indoor air. Mr. McLane added that in most states, waterways are posted if the consumption of fish containing PCBs resulted in that same level of risk.
- Dr. Griffiths asked that if the MCL of 300 pCi/L is associated with a fatal cancer risk of  $2 \times 10^{-4}$ , what is the fatal cancer risk at the AMCL and why is that considered equivalent risk? Mr. Taft responded that the combination of the MMM program and the AMCL would be an equivalent risk reduction to the MCL alone. The difficulty is that the risk reduction does not accrue to individuals in the same manner. Mr. Taft added that the fatal cancer risk at the 4,000 pCi/L level is approximately  $4 \times 10^{-3}$ .
- Mr. Ramaley asked if the overall risk should be  $2 \times 10^{-2}$ . Mr. Taft replied that the overall risk would be equivalent to 4,000 pCi/L, which is the average outdoor ambient air level.

- Regarding the MMM program, Mr. Ramaley asked, if states adopt the program and implement it in areas where there is radon in drinking water, would there be concomitant benefits extrapolated to many other people? Mr. Taft responded “yes” and added that there are states that have indicated they will target the MMM program to areas where the CWSs have problems because that will better address equity issues. This is different from what was originally envisioned, which was that as state MMM programs are implemented, the benefits would accrue statewide.
- Mr. Ramaley raised the concern that air and ground water radon levels do not always co-occur and that these areas may be missed by this regulation. Ms. Dougherty pointed out that in the benefits calculation, the MMM program will have equivalent benefits to the MCL of 300 pCi/L.. EPA believes that, if the MMM programs are carried out effectively, the benefits may actually be greater.
- Mr. Ramaley asked if the analysis was confined to systems that have high radon levels in their water. Ms. Dougherty replied that is not the case. Mr. Taft added that for the purposes of calculation, only the risks equivalent to reducing the water risk are claimed.
- Ms. Neidle reemphasized the point that there will be communities with radon which do not receive benefits from the MMM program and that indoor air radon levels will not be mitigated. Mr. Taft answered that even in a state with an MMM program, all of the systems would need to meet the AMCL at least.
- Ms. Roper asked if there has been an estimate of the co-occurrence of radon, and where to find data regarding occurrence. Mr. Taft answered that he did not know if co-occurrence has been determined. He added that radon is not currently a regulated contaminant, so water systems do not routinely monitor for it; EPA used state databases to create a large occurrence database.
- Dr. Spath mentioned that granite contributes to radon levels.
- Mr. Taft commented that surface water systems typically do not have radon problems, even in areas with indoor air radon problems.
- Ms. Ray added that Kentucky does not intend to implement an MMM program because areas with severe indoor air radon problems are served by surface water systems.
- Mr. Schwartz asked about timing for the final rule. Mr. Taft replied that the final rule is expected in November or December 2003.

2<sup>nd</sup> BREAK (TIME OF RECESS NOT NOTED.)



Dr. Spath reconvened the meeting with the introduction of Mr. Ephraim King.

**V. Total Coliform Rule Revision and Distribution System Requirements – Mr. Ephraim King**

- Mr. King discussed background information regarding distribution systems. The drinking water program has historically been focused on treatment and source water quality, rather than the distribution systems themselves.
- Mr. King outlined three main sources of contamination in the distribution system:
  - Cross-connections exist where a connection leads into the distribution system.
  - Intrusions (leaks, holes, and main breaks).
  - Water storage and flow management.
- There are documented incidents of cross-connections or main breaks that have led to illness or outbreaks through chemical or microbial contamination of the water in the distribution system.
- Mr. King provided background on regulations covering distribution systems. Pre-1996 rules focus primarily on the treatment plant or the end of the pipe. The 1989 TCR and the 1979 THM rule are exceptions to that focus. The 1996 SDWA amendments identified new issues including microbial disinfection byproducts, radon, and arsenic. Distribution systems were identified as an issue out of the microbial disinfection byproducts process.
- Mr. King reviewed the M/DBP rule recommendations. The first recommendation was to evaluate existing distribution system information. The second recommendation was to determine which portions of the distribution systems are related to public health risk. The second recommendation is very important because it started a process for initiating cross-connection control and backflow prevention requirements.
- The 6-year review process requires EPA to reevaluate existing regulations to determine if there is new information suggesting the regulation should be revised or strengthened in some way. As part of that process, EPA looked at the TCR rule and requested comment on the tentative determination, in April of this year, that EPA should reevaluate the TCR. It was also indicated that, as part of the same process, distribution system issues should be evaluated as well.

- Mr. King provided a background of the TCR. There exists a range of monitoring for various system sizes. Community systems serving fewer than 1,000 persons are required to complete monthly monitoring; if they have no previous total coliform violations, they may monitor quarterly. Non-community systems may monitor annually if they have no history of total coliform violations.
- If a system has a total coliform (TC) positive, follow-up is required with either an *E. coli* or fecal coliform test. Five routine samples are required in the next month unless the larger system is already doing that number of samples. An MCL acute violation requires notification of the state by the end of the next business day and tier-two public notification.
- Mr. King summarized some of the issues that came up as part of the 6-year review process. These include concern that annual monitoring required for non-transient, non-community water systems is not frequent enough. Other comments included possibly increasing monitoring frequency for systems that have many cross-connections or where the SWAP has identified a vulnerability. There were also comments that monitoring should be reduced in terms of the five routine samples in the next month. Comments were received regarding whether or not total coliform is the right indicator and trigger. The reasoning behind this is that many total coliforms are not pathogenic, so the presence of total coliforms does not necessarily indicate a public health risk. However, many would agree that if coliforms are in the system at all, some vulnerability is indicated.
- In the same context, EPA has been evaluating other aspects of the distribution system. EPA and AWWA hosted an expert workshop to determine the range of conceivable issues with regards to public health and distribution systems. The issues were condensed to nine that had potentially significant health implications. As a result of that workshop, many of the participants agreed to produce white papers on those nine issues to summarize available information, extent of the problem, and known health risks. The papers provided a common starting point and helped identify areas needing further research. The papers were reviewed in March 2002, and since then an initial stakeholder meeting was held in Seattle.
- Mr. King listed the nine issues the white papers discuss:
  1. Cross-connection control
  2. Deteriorating infrastructure
  3. Repair/replacement of water mains
  4. Intrusion
  5. Nitrification
  6. Covered storage
  7. Biofilms

8. Permeation
  9. Leaching
- Regarding cross-connection contamination, this issue is one that has possibly the most information. Cross-connections are any point in the piping system where there is a potential contact between drinking water and a non-potable substance. Examples include hoses left in tubs where pesticides are being mixed and coolant systems in large buildings that are tied into water systems. A drop in distribution system pressure can pull contaminants into the system, or an adjacent system, such as a cooling system, may not have a proper check valve to prevent its higher pressure from overwhelming the distribution system and introducing contaminants. CDC Waterborne Outbreak reports 57 outbreaks between 1981 and 1998, and over 9,000 illnesses are documented. This indicates a fairly significant underestimation of the impacts of potential cross-connections that may have occurred. One of the problems with gathering information on cross-connections is that the utility manager generally deals with the problem effectively and does not notify the state or CDC. EPA intends to examine what states are doing to control cross-connections, and determine which are the most effective and why. EPA intends to then examine whether cross-connections should be addressed nationally, or what kinds of options are available.

At this point the floor was opened to questions:

- Mr. Ramaley interjected with a question regarding Mr. King's comment that cross-connections generally are not reported, and asked if Mr. King was implying that they should have been reported some place. Mr. King responded that systems are not required to report these types of incidents, and that is why there is a lack of information.
- Dr. Spath asked if the illnesses were documented. Mr. King replied "yes." Dr. Spath added that then it is likely that the incident was reported to the state or the county in some format. Mr. King replied that those are CDC-investigated situations. Mr. Burneson added that the AWWA Northwest Section and the University of Southern California have also been important sources. Mr. King commented that reporting varies by state. Some states and counties are very rigorous in their requirements for mandatory reporting.
- Dr. Spath commented that there are a number of cross-connection incidents that have occurred without any disease outbreak.
- Mr. Ramaley commented that cross-connection and backflow are physical connections that are not always non-potable substances. It's an undesirable connection, particularly in the case of backflow, reverse pressure. In some cases the real risk is from the security perspective.

- Dr. Griffiths addressed the issue of unreported incidents and cited from Mr. King's presentation that 90 percent of backflow incidents are not documented enough to be included in case histories. This report is emblematic of the level of difficulty when gathering information about the number of incidents.
- Mr. Florquist added that an important problem is that of contractors and others tagging onto hydrants without properly maintaining pressure in the system, which can result in a blown line somewhere.

At this point Mr. King resumed his presentation:

- Mr. King discussed the next group of issue papers dealing with aging infrastructure, intrusion, and repair/replacement. The point to take from these papers is that the problem of aging infrastructure is going to get worse before it gets better. There are over 800,000 miles of distribution systems nationally and current estimates count over 200,000 main breaks a year. Over half of our existing infrastructure system is over 50 years old, and in some cases, 70 years old and possibly reaching the end of its lifetime.
- Intrusion is a separate paper because there is growing concern about the impacts of pressure changes in the distribution system. Pressure surges happen often, and coupled with distribution system with leaks or corrosion, poses a high potential for contamination.
- Repair/replacement issues with water systems include difficulties following proper procedures for repairing main breaks, including flushing and disinfecting the system. Overall, there is information indicating potential risk that needs further evaluation.

At this point the floor was again opened for questions:

- Mr. Florquist pointed out that the implication that intrusion events and leakage from surges occur only where there are leaks or problems or aging infrastructure is incorrect. Pipe joints are designed to bear pressure from the inside, not from the outside, so it is possible to tender surge conditions if negative pressures are drawn, even in a brand new pipe joint. Aging infrastructure would certainly exacerbate this problem, but the issue itself is not necessarily infrastructure related. Mr. King followed up by noting that there are figures that show that even with new and particularly tight systems, there is still a leakage rate of 7 to 10 percent. Mr. Ramaley said that those incidents are not necessarily leakage, just unaccounted-for water. Unaccounted-for water can include fire department use, water-quality flushing, water lost during breaks or repairs, leaks, and inaccurate metering.

- Mr. Young emphasized that Mr. King's presentation indicates that we're investing a third or a quarter of what needs to be invested in infrastructure replacement. Mr. King added that there is no economic incentive to replace a pipe until a system has three or four main breaks a year.
- Mr. Florquist commented that if a utility has gone through the certification process and has properly certified operators, proper treatment and repair procedure is covered in that process. Mr. King responded that the requirement that certification cover repairs and main breaks is state specific. In the next few months, EPA will look at what states require.
- Dr. Griffiths urged everyone to read the white papers. He emphasized that the process of developing the white papers is very useful in determining next steps. Dr. Griffiths added that it is very important for EPA to factor health risks into analysis. It might be valuable to convene a group of public health experts to evaluate these white papers with respect to health risks.
- Dr. Griffiths commented on a slide in the presentation that shows the straw prioritization from voting through stakeholders and public health experts. Mr. King added that the straw vote should not be given too much significance. It does, however, represent how experts might prioritize these nine issues.
- Mr. Ramaley clarified that much of the distribution piping in the United States has been installed since World War II and consists of cement, mortar-lined cast and ductile iron pipe that has a useful service life of 60 to 80 years. This indicates that much of the piping in the nation has not yet reached the end of its useful life. Ms. Dougherty mentioned that the Gap Analysis Report, which analyzes the gap for infrastructure replacement for both water and waste water systems, states that sewer piping is actually coming to the end of its useful life sooner than water system piping. This implies that, even if there is not a problem now with failing water system piping, there will soon be a greater need for pipe repairs and replacement. Individual water systems are handling this problem differently.
- Mr. Young added that many of the older systems are in crisis due to the low rate of pipe replacement.

At this point Mr. King resumed his presentation:

- Mr. King summarized the remaining issues: nitrification, water age, covered storage, biofilms, and permeation and leaching.

- Nitrification is important because the disinfection byproduct rule encourages systems to begin using chloramines for disinfection. There is an existing nitrite/nitrate rule, but the monitoring for compliance with that rule occurs at the entrance to the distribution system.
- Water age applies to disinfection byproduct formation and biofilm growth.
- Covered storage is a separate issue because in terms of storage tanks, there is the potential for aged water to reach the consumer. Without conducting a tracer study, however, many systems are unaware of how old their water is.
- Biofilms are an important issue because many pathogens have been found in biofilms. The next question is whether the pathogens actually grow in the biofilms and occur in high enough concentrations to represent a public health threat.
- Permeation relates to plastic pipes and the permeation of volatile organic compounds (VOCs) from the plastic pipe into the water. Leaching relates to liners in the pipe that, either because of pH changes or other changes in the water chemistry, leach out metals or fibers into the water.
- Mr. King reemphasized that EPA is currently requesting comments on a determination that a rule should be developed in regards to the TCR and distribution system issues. Mr. King also encouraged the Council to look at the white papers on the EPA Web site. Additional stakeholder meetings will be conducted around March 2003.
- Mr. King concluded that existing information indicates that there are distribution system issues that represent public health concerns.
- Dr. Spath then opened the floor for additional questions following the completion of the presentation.

### **Comments and Questions**

- Ms. Neidle asked about the schedule regarding TCR review. Mr. King responded that EPA will make an initial determination in February or March 2003 whether to proceed with the TCR revision formally and to address distribution systems in a regulatory context. A tentative determination that a revision and new rule is appropriate has been issued. Once the final determination is issued, the schedule for developing the rule will depend on other priorities including completion of the GWR, the LT2 and Stage 2 rule, radon, and other priorities. Information will continue to be gathered in the meantime.
- Mr. Schwartz asked where to access the white paper on the EPA Web site. Mr. Burneson replied that they are available from the Safe Water Web site under TCR.

- Dr. Ramirez-Toro commented that she is happy to see issues like biofilms and water age being evaluated together. Dr. Ramirez-Toro added that other potentially related issues are disinfection byproducts, biofilm, and bacteria in water systems.
- Mr. Young emphasized that the easiest work has been completed and that the difficult next step will be to link these distribution system issues with public health. The next stakeholder meeting should focus on that.
- Dr. Griffiths asked if it is the intent that there will be a regulatory negotiation process regarding the revision of the TCR. Ms. Dougherty responded that has not been determined yet.
- Dr. Griffiths asked how the TCR revision and white papers would be addressed. Mr. King responded that the white paper approach has worked very well because it allows EPA to evaluate whether the Agency is operating off common available information. EPA is open to similar approaches.
- Mr. Ramaley commented that it is important to note that practical implications and public health aspects should be focused on. The national investment in distribution systems is already astounding without factoring in these issues.
- Dr. Spath concluded it is likely that, as EPA queries the states on their activities, it will find that some states have been very aggressive addressing these issues, and these programs may provide a template for future federal approaches.
- Dr. Spath closed discussion and introduced Ms. Cynthia Dougherty.

**VI. Water Infrastructure Protection – Ms. Cynthia Dougherty for Ms. Janet Pawlukiewicz**

- Ms. Dougherty's presentation included a summary of activities of the Water Protection Task Force over the past year with working with the water industry and others on security issues related to drinking water systems; the Public Health Security and Bioterrorism Response Act of 2002; and EPA's Homeland Security Strategic Plan.
- The Water Protection Task Force has worked with the drinking water community to develop tools and conduct training on security. Immediately following September 11, 2001, EPA sent notices to utilities outlining immediate steps to take to ensure the security of their systems, including funding potentially available for security improvements. The task force also worked to develop tools in terms of how to conduct a vulnerability assessment to determine where the system was vulnerable to a potential terrorist attack

(different from the source water vulnerability assessment, which was discussed earlier). The task force also worked with AWWA, AWWARF, and Sandia National Laboratory to provide training and workshops on a methodology for large systems developed by Sandia.

- Vulnerability assessments begin with the system characterizing and identifying adverse consequences to an attack. The assessments also should identify what their critical assets are and what countermeasures exist to prevent or minimize damage.
- Last year, security for drinking water systems had a large budget increase the largest portion of which went to provide vulnerability assessment grants to systems that served greater than 100,000 people. The grants went out to approximately 450 systems and totaled \$51 million.
- EPA developed a small and medium system strategy and provided grant funds to the states for technical assistance to these systems.
- EPA established information sharing and analysis system which the Association of Metropolitan Water Agencies (AMWA) is setting up. AMWA is working to make information available to the entire community of drinking and waste water operators. Included will be information regarding what kinds of threats exist. Facilitating communication has been a challenge.
- EPA has worked with the CDC, FDA, FBI, and DOD to identify the kinds of contaminants that might be used in an attack on a water system and what the current level of knowledge about those contaminants is. An Environmental Technology Verification Program has been established to test market ready technologies that address this issue.
- Networking to enhance awareness and facilitate good communication and collaboration among all of the different stakeholders in the water community has been very important. These stakeholders include waste water systems, law enforcement, and public health and health practitioners with CDC.
- The Public Health Security and Bioterrorism Response Act of 2002 includes one title amending the SDWA dealing with vulnerability assessments for drinking water systems, emergency response plans, research, and funding.
- Utilities serving more than 3,300 persons are required to conduct vulnerability assessments and develop and revise emergency response plans under the Act. They are also required to certify to EPA that the assessment has been completed, and to submit the actual assessment to EPA between March 2003 and June 2004.



- EPA was required to provide baseline information regarding the kinds of attacks and possible threats that systems may receive by August 1<sup>st</sup>. The document also includes what should be considered key components of a vulnerability assessment.
- EPA was required to develop guidance for systems serving fewer than 3,300 persons on how to conduct security activities.
- EPA is required, by November 30<sup>th</sup>, to develop an information protocol on how to protect the information received in the submitted vulnerability assessments. The Administrator designates who may review the assessments. Those persons are required, under criminal penalty and loss of employment, not to provide any information about the assessments or copies of the assessments to anyone not designated to receive them.
- EPA is required to look at methods to prevent, detect, and respond to contamination events as a result of terrorism.
- EPA has the responsibility to ensure compliance with the new requirements.

At this point some questions were addressed:

- Dr. Griffiths commented that many medical communities have been involved in bioterrorism simulations and asked if there are equivalent activities for water systems. Ms. Dougherty responded that there have been some simulations developed within the industry, but that these have not been widespread. EPA is currently considering how to support the enhancement of water and waste water utility security. To date, EPA has conducted activities to keep communications open. EPA did sponsor an ASDWA meeting in June which brought together state drinking water personnel and state emergency response personnel to discuss these issues.
- Mr. Ramaley pointed out that EPA has also run tabletop exercises through AMWA for the nation's largest water utilities.
- Ms. Dougherty added that EPA has suggested that individual water systems begin communicating to local law enforcement and the local medical profession to ensure that all three groups understand what could happen.
- Dr. Spath commented that EPA also has a program with CDC to fund health departments in various states and regions.
- Mr. Ramaley commented that there is a great deal of credit that should go to Cynthia, Janet, and EPA for the speed with which the vulnerability assessment grant program was enacted. However, these initial grants are not enough for systems to install and enact

those security measures deemed appropriate. Ms. Dougherty added that an important issue has been determining the total magnitude of need for security enhancements without asking systems to tell us what they need spend. This is important because of EPA's new authority with regard to classifying information.

- Ms. Neidle commented that she was impressed with the vulnerability assessment training, and glad that EPA is taking the steps needed to ensure water systems security.
- Mr. Schwartz asked if smaller systems would eventually receive funding for vulnerability assessments. Ms. Dougherty replied that there is less money available this year, but that EPA hopes to implement workshops and training to assist these systems.
- Mr. Ramaley commented that AWWARF is sponsoring a project to draw conclusions from the vulnerability assessment work that has been completed. In addition, the Information Sharing and Analysis Center (ISAC) will also serve as an avenue for disbursement through secure channels of information and solutions.

At this point Ms. Dougherty resumed the presentation:

- Ms. Dougherty concluded by summarizing remaining challenges including gathering additional research to address some of these important issues, coordination and communication, and incorporating security into daily operations also remain important issues.
- Dr. Spath opened the floor to remaining comments.

### **Questions and Comments**

- Dr. Spath commented that EPA has done a great job diverting resources to meet this challenge. Ms. Dougherty added that staff has been taken away from other priorities within EPA, which has increased the time lines on some of the rules that the Council has heard about today.
- Dr. Spath voiced states' concern that EPA is unable to share information relative to methods of analysis. Ms. Dougherty commented that EPA has been working with ASDWA and NGA to identify states' abilities to protect information. There is a balance that needs to be struck with regard to sharing information with those who need it and making sure that sensitive information is not released.
- Dr. Davis asked about EPA's Homeland Strategic Plan and if personnel from EPA will be moving to the new Homeland Security Department. Ms. Dougherty replied that no

EPA functions are moving to the new department currently, though there will be much coordination between the two agencies.

- Ms. Roper asked when the separation of the vulnerability assessment information and the source water assessment information will occur. Ms. Dougherty responded that a letter was sent to the states that outlined what needs to be reported in terms of source water assessments. The source water assessment process should not stop, and information should still be made public, but that systems may want to reevaluate how much information needs to be made public.
- Dr. Spath closed discussion on security issues and opened the public comment period.

## **VII. Public Participation**

Dr. Spath indicated that Mr. McLane will speak to the issue of hydraulic fracturing during the comment period even though the issue will be discussed on Thursday's agenda. Dr. Spath mentioned that there was an intent to have public participation through teleconferencing, but because it was not noticed in the **Federal Register**, the Council is unable to do this.

- Mr. McLane made a statement on behalf of Peggy Hocutt from Lake View, Alabama. Mr. McLane read from a comment letter to Senator Bingaman on January 2, 2001. Ms. Hocutt's letter regarded her family's health problems resulting from and a coalbed methane development well on the property her family was renting. The letter documents difficulties with getting USX-Amoco, the Alabama State Oil and Gas Board, and the Alabama Department of Environmental Management to respond to her complaints of environmental contamination and resulting health problems. Ms. Hocutt described serious personal health problems as well as neighbors' serious health problems and related them to the well that was being operated on their property.
- The Council adjourned at 5:15 p.m., to be reconvened at 8:30 the following morning.

**THURSDAY, NOVEMBER 21, 2002**

**VIII. Review of Day 1 and Presentation of Plaques**

Ms. Dougherty began with presentations of plaques to Ms. Cindy Roper, Ms. Diana Neidle, and Mr. Dennis Schwartz for completing their terms with the NDWAC.

- Ms. Roper thanked everyone and commented that she really valued the opportunity to sit on the Council.
- Mr. Schwartz commented that sitting on the Council has been very rewarding, and that it has been a pleasure to serve with the other Council members.
- Ms. Neidle commented that she appreciated the chance to work with the Council.
- Ms. Dougherty thanked the three plaque recipients and the rest of the Council for their hard work and dedication.

Dr. Spath opened the second day of meetings with a discussion of the presentations that were given yesterday including the affordability group, the Contaminant Candidate List (CCL), the Ground Water Rule, the Radon Rule, the 6-year review of the Total Coliform Rule and related distribution issues were discussed, and water security issues. Last, the Council heard from the public regarding hydraulic fracturing issues.

Dr. Spath introduced Ms. Joan Harrigan-Farrelly, who discussed source water protection.

**IX. Source Water Protection – Ms. Joan Harrigan-Farrelly**

- Ms. Farrelly updated NDWAC on the progress of source water protection efforts.
- Source water protection begins with every one of us, and there are many ways to protect our source water. There are protection barriers in place including risk management, monitoring, compliance, individual actions, and risk management.
- There has been an increase in demand for source water because of population growth. Source water protection needs to be in place to protect not only public health, but for the environment as well. Source water protection is also meant to be a cost effective means of protecting our drinking water. If sources are protected, it is estimated that there can be a 30 to 40 percent decrease in costs associated with cleaning up the water.
- Treatment technology is becoming increasingly difficult for many existing and emerging contaminants.

- Existing programs that protect drinking water sources include the Underground Injection Control (UIC) program and the Clean Water Act programs.
- Source water assessments are also a key protection measure and entail delineation, a susceptibility determination, public involvement, and contingency planning. Source water assessments are due from the states in May 2003, and currently 20 percent are complete. EPA is evaluating how to help the states complete their assessments and helping the regions ensure that the assessments are of good quality. Many states are encountering difficulties making information in the source water assessments publicly available following the September 11, 2001 terrorist attacks. However, it is important that the public have access to information in order to empower source water protection efforts in their communities.
- Information that will come out of the source water assessments includes the vulnerability of the system. System vulnerability will be color coded red, for high vulnerability; yellow, for medium vulnerability; and blue, for low vulnerability. Sources with various vulnerabilities can then be targeted and prioritized.
- Management measures should be in place to prevent, reduce, and eliminate risks to the drinking water supply.
- Only about 4 percent of the public is aware of source water assessments. The more the public is involved in these assessments, the greater the benefit and protection of the source water.
- Four questions that are being asked at this point: Are the states and tribal source water assessments completed? What threats to the source waters have been identified? How are current and future drinking water supplies being protected? How well are protection/management measures working?
- EPA is working to ensure that data from states and local communities are credible and compatible to facilitate sharing.
- EPA has been working with regions and states to assist completion of the source water assessments. This work includes providing technical and financial assistance. Some assessments have been financed through EPA, and Congress supplied some money through the SRF. EPA has also been working with NRWA, AWWA, and other groups to develop guidances and pilot projects and programs.
- NDWAC's role is to help educate others that the assessments are being conducted. Stressing the value of installing prevention measures rather than after-the-fact treatment

is difficult. NDWAC can also provide guidance in terms of how best to approach states and communities and educate them to the significance and importance of this program. In addition, participation in the June 2003 source water protection conference in Washington, D.C. can be very important and helpful.

- Dr. Spath opened the floor for questions.

### **Questions and Comments**

- Ms. Surgeon asked what happens if the source water assessments are not completed by 2003, and what is EPA doing to ensure that the assessments include quality information. Ms. Farrelly replied that EPA is going state by state through the regions and redeveloping within our office the regional liaisons to work directly with the regions. There is no hard deadline for the completed assessments, but EPA is working with those states to ensure that the assessments get done through technical assistance when appropriate. To ensure data quality, EPA has been comparing the approved program with the assessments to make sure those assessments are at least meeting the minimum criteria for the state. Ms. Dougherty added that there is a requirement in the law for states to complete assessments, but there is no penalty if they do not meet the May 2003 deadline. Ms. Surgeon added that she agrees that it is important that data quality is being stressed.
- Dr. Spath commented that states are doing most of the assessments, but some of the larger water systems are completing their own assessments.
- Ms. Neidle asked the utilities personnel what they have in the way of authority, money, and strategies to implement protection practices. Mr. Ramaley replied in Hampton Roads, Virginia, 16 utilities cooperated to complete a master source water assessment. The most important issue for us was that the screening criteria did not differentiate the surface water systems. This means that the surface water systems all generally tended to come out with some risk, which made it difficult to prioritize the systems. In terms of authority for the utility, it depends on where the sources are, property ownership, ability to work with the land owners, and availability of funds. It is important to make source water protection attractive to the farmers owning the land upstream of the intake.
- Dr. Spath commented that in many cases, the watersheds are geographically remote which makes protection a regional or state-wide activity. California is attempting to fund source water protection through the SRF. It is important to note that local community involvement will be the most important aspect of source water protection. Ms. Dougherty added that EPA originally pushed for a very prescriptive source water protection program and not simply a source water assessment program. Congress set up the source water assessments and provided some opportunity in the SDWA for funding. Congress also made it clear that getting the information from these assessments to the

local communities was the most important aspect of the program. The farm bill that was recently passed has funds available that could be used for protection activities, and the SRF could be used for some protection activities as well.

- Dr. Griffiths asked how the source water assessments will be used by utilities given the upcoming M/DBP rule, and how will those be integrated into their toolbox. Mr. Diamond responded that the use of the assessments will be determined by local contaminants and problems. The assessments can be a valuable tool not only for source water protection, but also for regulatory determinations and priority setting. Ms. Dougherty added that assessments may also provide systems with some information that would help them understand the potential sources of some pathogens, which may help determine which tool in the toolbox systems should use. Dr. Griffiths added that it should be made clear to utilities that they can use these assessments.
- Mr. Diamond commented that EPA is working to convince people that the assessments can apply to multiple issues. The assessments are designed to increase the level of knowledge and information in order to make better decisions regarding drinking and source water.
- Ms. Farrelly stated that many systems or states are applying a secondary screening in order to better prioritize vulnerabilities. Ms. Dougherty added that utilities, communities, or states may be able to enact simple source water protection measures that reduce a specific threat to the source water and therefore reduce the vulnerability.
- Mr. Young commented that assessments pertaining to ground water sources and wellhead protection have indicated that it is a local issue. Wellhead protection programs have been successful in areas that have a focus on regulatory or public education on the value of wellhead protection. In these locations, we have been able to partner with the local communities and enact protection measures. In addition, looking at a larger scale, many of the state source water assessments contain a lot of high vulnerability source waters which may be an issue better dealt with by a basin commission or the like. Dr. Spath added that the regional issue is very important in terms of determining who takes the lead in cooperation.
- Mr. Diamond pointed out that the central challenge to this entire process is moving from the mandatory portion of the assessment program to a voluntary part. The key is communication. We're trying to gather information on national trends to target our responsibility as a federal entity as well. It is important that this process keep moving forward into this next phase.
- Mr. Ramaley stated if the Council wants to focus on this issue, he would be very interested in supporting that effort.

- Dr. Spath suggested that the Council think about what it could do in terms of recommendations for source water protection implementation before the next meeting.
- Dr. Ramirez-Toro asked about the programs in respect to her experience with Puerto Rico. Source water protection programs are being developed for the three or four major plants, leaving two-thirds of the island unassessed. There are close to 70 plants in other watersheds that have not been included in the source water assessments. Mr. Diamond responded that each of the primacy agencies was required to develop a plan for all systems. Ms. Dougherty stated that the requirement of the law is that an assessment be completed for every system.
- Ms. Roper asked if there are any models of good programs coordinating source water protection in states with many assessments and in terms of funding and cooperation. Ms. Farrelly replied that case studies of good local source water protection programs are being pulled together to provide that kind of guidance. EPA is also building a Web site containing all of the various funding activities and sources available to promote source water protection.
- Dr. Spath commented in California there are multiple activities covered under source water protection and coordination does not always happen.
- Ms. Ray commented that there are lists of all of the source water assessment coordinators in the states. Ms. Ray also commented on Kentucky's status with regard to its source water assessment program. Kentucky has many activities ongoing including encouraging the use of the SRF to buy property adjacent to wellheads, and requiring every farm to have an environmental water quality management plan.
- Mr. Diamond commented that there is not one central lead determining who is responsible for various parts of the program. The most successful programs have gotten people together at the state or community level. Mr. Diamond suggested that Ms. Roper contact Minnesota for more information as they have an active program that combines source water protection with the clean water act programs.
- Dr. Spath closed discussion on source water protection programs and introduced Mr. Bill Diamond and his presentation on hydraulic fracturing.

**X. Hydraulic Fracturing – Mr. Bill Diamond**

- Mr. Diamond shared the results of EPA's hydraulic fracturing study. The draft study has been completed and is out for public comment.



- This study has a very narrow focus in terms of the range of SDWA implications.
- Hydraulic fracturing is one step in the oil and gas recovery production process. Oil and gas production activities are not under EPA's authority, however, injection and waste disposal are under EPA's authority.
- Hydraulic fracturing is a pressurized injection of hydraulic fluid consisting of water and proppants (generally sand) to create fractures to enhance coalbed methane recovery. Components of the injected fluid may also include chemical additives to act as a lubricant to move the proppants underground into the fractures. Coalbed methane wells occur generally at depths of approximately 3,000 feet.
- There are approximately 35,000 fracturing events annually, and coalbed methane accounts for approximately 5 percent of those. Coalbed methane supplies approximately 1 percent of the United States' energy demand. A typical coalbed methane well has 2 or 3 fracturing events over its 4-to-15-year lifetime. It generally costs about half a million dollars to drill a well and conduct some recovery on it. Haliburton, BJ Services, and Schlumberger are the three largest developers of coalbed methane (CBM) wells.
- The major U.S. coal basins are in Alabama, West Virginia, the San Juan Basin in New Mexico and Colorado, and the Powder River Basin in Wyoming and Montana.
- Mr. Diamond's presentation included a depiction of the subsurface. Included in the depiction are a municipal well, coalbed seams, and a hydraulic fracturing coalbed methane recovery well.
- The process of hydraulically fracturing a coalbed seam involves first injecting high pressure water, which flows out along the coal seam. As the pressure builds up, the coal seam opens along the primary channels. Part of the hydraulic fracturing fluid is the lubricant and the proppant, which maintains the openings in the main channel. The seam is then de-watered, which decreases the pressure in the seam that creates a pressure hydraulic gradient that flows back toward the well and begins the methane recovery process. After this process, some of the proppants and injected fluid remains in the well. The remaining injectate creates the public health impact and risk.
- Hydraulic fracturing is a SDWA issue because of the assertions that CBM fracturing has contributed to the degradation of water quality in private water wells. There have been no reported cases in public wells. There is also a statutory concern following the Legal Environmental Assistance Foundation's (LEAF) successful petitioning of EPA to withdraw Alabama's UIC program for failure to regulate CBM fracturing. EPA asserted that these activities are not covered under SDWA because they fall under the category of oil and gas production, which is exempt from the law. The Eleventh Circuit court ruled

- in LEAF's favor arguing that this is an injection practice and therefore covered under SDWA. The result of that process was that Alabama developed regulations which EPA approved and were upheld by the courts. Other states have not regulated CBM fracturing.
- Further issues include water quantity issues following de-watering of an area from a CBM operation, and the disposal of waste pumped from the well. Neither of these issues are subject to regulation under SDWA.
  - EPA conducted a study of hydraulic fracturing as a result of citizen complaints about the practice; industry insists that this practice does not represent a danger.
  - EPA's hydraulic fracturing study was narrowly focused on hydraulic fracturing only in coalbed methane wells. The purpose of the study was to determine the extent and nature of the process and if there are any public health risks.
  - There were three potential phases of the study. The first phase, which has been completed, involves a broad determination of the level of threat and whether additional study is necessary. Phase two involves a detailed risk assessment. A potential phase three determines what state and local regulation exists.
  - The study's approach and methodology involved investigating alleged contamination instances and evaluating potential contamination.
  - Contamination from CBM fracturing might result from a breach of the confining layer between the well and the underground source of drinking water (USDW), or from contaminants' direct injection into the USDW.
  - Data collection included soliciting comments, reviewing technical studies and peer reviewed publications, and speaking with citizens and industry. Notices were sent to local and county public health agencies asking for information about incidents. EPA conducted field trips to view drilling sites.
  - EPA calculated the point of injection concentrations to analyze the possibility for MCL violations and found that once injected, the fluid will be diluted. Concentrations in the fracture radius at the outermost edge of the seam were calculated using best, medium, and worst-case assumptions.
  - The technical basis of the study was verified through peer review from hydraulic fracturing experts; state, federal and USGS experts; and industrial experts.
  - A "ballpark estimate" of the risks posed by contaminants was conducted.

- Data collection began in December 2000. Data analysis and development of first drafts began around June 2001. In October 2001, the draft report was sent to a peer review panel. From June to August 2002, final revisions were made to the study and a 60-day comment period ended on October 28, 2002. The expectation is that the report will be finished by next spring.
- The study included summaries of CBM hydraulic fracturing practices and identified areas of contamination potential. In terms of the contamination potential, there is no evidence that confining layers can be breached. There are documented cases for de-watering of aquifers, but that is not under the scope of SDWA. Most fluids directly injected into USDWs are diluted to below the MCL. In addition, in many states, hydraulic fracturing practices require a protective zone in which no drinking water wells may exist.
- Some of the difficulties with the study include not having detailed information about past complaints.
- The preliminary findings are that there are no documented cases that the hydraulic fracturing process has affected drinking water wells. The breach of confining layers is not likely. Contaminants of concern are diminished by the production and recovery aspect that all fluids, subsequent to injection, are drawn out. Contaminants are further reduced by chemical, biological, and physical activities of the underground geology. It is noted that the use of water-based alternatives would be preferable to the use of diesel fuel additives. The conclusion was that threats to public health posed by hydraulic fracturing practices appears to be small and does not justify further study.
- The study is currently drafted in terms of the Energy Policy Act of 2002 and is still under consideration by the Senate. Amendments still under consideration may require the Agency to conduct a broader study of all hydraulic fracturing processes, not just coalbed methane wells. It also requires completion in 24 months (the Agency estimated that additional study would take 4 to 7 additional years, thousands more well, and \$4 million to \$5 million), suggests additional public comment hearings, and review of the findings by the National Academy of Sciences. During this period of time it exempts all states, except Alabama, from regulating hydraulic fracturing unless and until it is determined that regulations are necessary.
- Dr. Spath opened the floor to questions.

**Comments and Questions:**

- Mr. Diamond clarified that a USDW is an underground source of drinking water, which EPA is required to protect. It is defined as anything ground water that is currently or could be used in the future for drinking water.

- Mr. McLane commented that the point of sharing the letter from Ms. Peggy Hocutt during the public comment portion of the meeting was to provide a specific incident that, in his view, contradicts the findings of this study. This example represents an issue of environmental justice. Alabama Rivers Alliance strongly disagrees with most of EPA's conclusions and with EPA's interpretation of the law. EPA has the authority to regulate this practice. There is concern that Congress could even infringe on EPA's existing authority under the Class II injection program. Mr. McLane noted that he is interested in submitting a resolution to NDWAC that would instruct EPA to further study this issue and use its authority to address the threat to drinking water.
- Ms. Neidle commented that this is a very basic source water protection issue. EPA should conduct some actual field testing and drill monitoring wells next to a sample to evaluate whether contaminants travel over time. It is not surprising that at this point there is no evidence for contamination of drinking water wells. A similar case was MTBE contamination, which no one thought would become a public health issue. It is very important that EPA continue to monitor and gather empirical evidence to support eventual policy on hydraulic fracturing. We wouldn't want to support legislation that infringed on the current authority that EPA has to regulate injection processes at some point in the future.
- Mr. Florquist added that lowering the water table and disposing of waste water are serious concerns in many of the coalbed methane areas. Waste water has become a serious issue in the Powder River Basin in Wyoming. EPA's study was oversimplified particularly as it relates to geology and discussing where the aquifer may be – aquifers may also lie below CBM wells. The municipality he works for is spending hundreds of thousands of dollars to clean up a VOC plume of concentration just over the MCL, and yet the oil and gas industry has considerable preferential treatment with regard to the law and not being responsible for clean up.
- Dr. Griffiths expressed appreciation at this exercise has been completed. He believes there is a substantial public health problem potential associated with these types of wells. The reports states approximately 13,000 existing wells and 10,000 proposed wells that represent a potential for a large quantity of contaminants to be injected into drinking water. There is a cognitive dissonance between what people fear and anecdotal evidence and in terms of what the modeling in this study shows. The Agency should collect additional information. It was indicated that there are three large companies that conduct these types of activities, and it seems that those companies should be interested in avoiding liability suits in the future and conduct their own studies into the contamination potential of hydraulic fracturing. This is a substantial environmental justice issue, and if you save one life, you've paid for the cost of regulation.

- Mr. Diamond addressed some of the points that have been raised. In terms of potential health problems, technical experts looked at the data and it seems that these risks are low. EPA evaluated fractures, contaminant travel, and contaminant concentration. In terms of valuing a person's life, we would all agree with Dr. Griffiths statement. However, funding and economics must consider the limited amount of funding that EPA has for regulation. The National UIC program has just over \$1 million per year, and that figure is decreasing. In terms of EPA's risk management investment responsibilities, there are higher risk management activities that can be used for those resources in terms of trying to reduce those types of risks. In addition, there is a misconception that there is no regulation for underground injection and hydraulic fracturing activities; there is a non-endangerment standard. Mr. Diamond addressed negative waste water impacts and indicated that Clean Water Act enforcement is evaluating this problem.
- Dr. Spath passed out handouts from Mr. Mike Baker (absent Council member) covering examples of underground injection control issues related to Ohio that are not hydraulic fracturing. The point Mr. Baker makes with these handouts is that hydraulic fracturing is not a major risk when compared to other activities covered by the UIC program, and that resources would be better spent on these other issues.
- Dr. Spath asked why the industry is not responsible for generating water quality data from monitoring wells prior and subsequent to activity. Mr. Diamond replied that EPA evaluated over 200 studies in addition to talking with industry personnel. Industry is required to indicate the presence of injection constituents and concentrations in the Material Safety Data Sheets (MSDS). In terms of requiring industry to monitor, the Agency must first establish control regulations and monitoring regulations to determine the necessity of monitoring to meet the public health standard. There is not a basis to mandate a larger data collection program or an additional regulation specific to CBM fracturing.
- Mr. McLane moved the Council to adopt a resolution at this time. Ms. Ray seconded. Dr. Spath suggested that the Council deliberate over the next month and possibly have a conference call to finalize any resolution or recommendation.
- Ms. Surgeon asked why the industry is not required to put in testing wells or gather field data in the same manner as landfills, and why is industry not required to treat the waste water. She also commented that this may not be a good time to raise this issue given the current political climate. Ms. Dougherty responded that waste water discharges to waters of the United States are covered under the NPDES discharge permit program. Discharges to land are not regulated by EPA. Ms. Dougherty added that the initial language proposed by Senator Imhofe, Chair of the Senate Environment and Public Works Committee, would have exempted the oil and gas industry from all EPA regulation.

- Mr. Diamond added that industry monitoring of wells is the source of information for the EPA study. In addition, drilling more wells introduces more potential conduits for contaminants.
- Ms. Farrelly added that trade-offs should be considered, and NDWAC can take a look at the current potential threats to drinking water sources, rank those source water contamination threats identified in the source water assessments, and compare them with the potential threats of hydraulic fracturing. There are more immediate threats to drinking water safety that should be focused on.
- Dr. Davis asked if hydraulic fracturing is covered by the Department of Energy (DOE). Mr. Diamond replied “no,” that DOE produces training technical guidelines, and the primary regulation from the oil and gas production side is done at the state level through oil and gas regulatory agencies. Ms. Dougherty added that the Department of the Interior (DOI) possibly has regulations covering this process.
- Dr. Davis commented that in West Virginia, if coal mining activities contaminate drinking water, the industry is required to supply drinking water.
- Dr. Griffiths commented that the Council should be cognizant of prioritizing risks and asked what the limitations of the study are. In the long run, investing relatively small resources for preventative efforts may pay off. Mr. Diamond replied that the limitations are the lack of existing data and the fact that EPA did not conduct extensive field study. However, there is a high degree of confidence in the results.
- Ms. Neidle asked if industry data are reliable and commented that EPA should collect more information regarding injected chemicals. Ms. Dougherty responded that EPA relies on industry data when setting an MCL. Mr. Diamond added that it is common for EPA to use industry data. Requiring EPA to independently verify data is not a good investment of resources.
- Mr. McLane submitted a resolution to the Council. The resolution calls for EPA to undertake additional field investigation, and recommends that EPA and states should retain their existing legal authority to regulate oil and gas extraction practices including hydraulic fracturing. Ms. Ray seconded.
- There was discussion of Council procedure regarding meeting and discussing this resolution. A meeting to discuss the resolution was tentatively scheduled for December 12, 2002, 12:00 p.m. EST.

1<sup>st</sup> BREAK (11:30 to 11:40 p.m.)

Dr. Spath reconvened the meeting by introducing Mr. Peter Shanaghan.

**XI. Managing the Drinking Water Program for Results and Accountability – Mr. Peter Shanaghan**

- Mr. Shanaghan prepared a brief presentation discussing the program and its challenges regarding new management demands, reporting results, and accountability.
- The Government Performance and Results Act of 1993 set up requirements for federal agencies to have 5-year strategic plans. These plans are revised every 3 years. The focus is on outcomes such as describing the level of public health protection that has been achieved.
- The President's five-point management agenda puts emphasis on tying the to real outcomes that are achieved.
- The strategic plan requires agencies to begin with a grand mission statement. Then there are a series of goals that are defined. EPA's present strategic plan has 10 goals to cover all activities. Under each goal, there are a series of objectives and sub-objectives. There are also annual performance goals and annual performance measures that are defined. EPA is currently revising their strategic plan which will be released next September.
- Under EPA's current strategic plan, the Drinking Water Program is included under the second of the 10 goals, which deals with clean and safe water. One of the objectives under that goal is that by 2005, 95 percent of the population served by community water systems will receive water that meets drinking water standards. There are 3 sub-objectives which state that 95 percent of the population will be served by compliant systems, that 10 new priority standards for high-priority contaminants will be established, and that 50 percent of the population will be served by systems with source water protection programs in place.
- Mr. Shanaghan's presentation included a graphic describing the hierarchy of indicators put in place to measure the program and indicate who is accountable for results.
- The "Common Measures" initiative is a program undertaken by OMB to attempt to compare programs with general similarities and determine outcome metrics. The focus is generally on economic efficiency – a cost per unit outcome achieved.
- EPA's SRF, the Rural Utility Service, the Bureau of Reclamation, and the Indian Health Service were brought together and charged with developing measures to compare the programs. The agencies felt that there were many fundamental statutory differences

separating the programs, and that it is very dangerous to look at measures of economic efficiency for programs designed to serve economically inefficient situations. Two measures were developed: a population served per million dollars spent, and a number of connections served per million dollars spent. These figures were reported to OMB.

- The Program Assessment Rating Tool (PART) was developed as a quantitative instrument built around yes or no responses. The Tool rates programs along four dimensions: program purpose and design; the strategic planning for the program; the management of the program; and program results. Each dimension is weighted differently; the results are 50 percent, strategic planning is 20 percent.
- Ms. Dougherty added that the director of OMB has testified on the Hill that he will be using the results of the analysis to make yes or no decisions as to whether to fund the programs. The result is that if your program gets a low score, Congress may not have the program funded at all even if the program has been around for a long time.
- Mr. Shanaghan summarized that there is an increasing emphasis on outcomes. Questions include determining the outcome of public health protection and if that can be measured at all.
- Dr. Spath opened the floor for questions.

### **Comments and Questions**

- Ms. Neidle asked if OMB decides whether there is a “yes” or “no” in each of the categories of the PART. Mr. Shanaghan replied “yes,” the agency begins with a self-assessment and then the OMB analyst decides whether it should be a yes or no answer.
- Ms. Roper asked where the enforcement activities fall in terms of the indicators. Ms. Dougherty responded that all the activity drinking water program leads to increasing that percentage of people served by high quality water. That is the outcome measure. The agencies are taking planning architecture and enforcement as a separate goal.
- Ms. Roper asked if there is a trade-off between how much money you put into evaluating outcome and resources and the efficiency with which those dollars are being spent. How expensive is the transaction cost. Mr. Shanaghan responded that is a good question. Ms. Dougherty commented that EPA and CDC are looking at new ways to measure disease prevention and drinking water programs and determining how much it would cost to do that kind of information gathering.
- Mr. Young asked for clarification regarding the goal for the percentage of populations served with compliant water. Ms. Dougherty responded that the strategic planning goal



is for 95 percent of the population served by community water systems to have water that meets standards. A sub-measure of that goal is related to systems in compliance as well as population served. We are looking at creating annual goals by system size category which eliminates the bias towards large systems. EPA wants to implement a balanced program across the country.

- Ms. Ray commented that part of the transaction costs involve what data are reported. A problem with large systems is, if a total coliform positive at a particular location affects perhaps fewer than 100 persons, the way it is reported makes it seem that the entire service population of the system is affected. This type of problem has implications for trying to meet these indicator levels.
- Mr. McLane commented that philanthropic groups' emphasis on measurable outcomes has led to a shift away from funding for policy efforts to funding land purchases to restore streams. For the federal government, this could lead to a shift away from environmental funding overall. It is very difficult to protect public health and the health of ecosystems on a 5-year planning horizon. There are important activities that need to be completed that are difficult to measure.
- Dr. Spath closed the discussion of the management and drinking water program.

## **XII. Final Thoughts/Review Action Items/ Next Steps**

- Dr. Spath urged the Council before the next meeting to think about source water protection issues.
- The meeting was adjourned at 12:22 p.m.