

NATIONAL DRINKING WATER ADVISORY COUNCIL

MEETING SUMMARY

NOVEMBER 17-18, 2005

**WESTIN HOTEL
333 EAST OCEAN BOULEVARD
LONG BEACH, CA 90802**

**PREPARED FOR:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF GROUND WATER AND DRINKING WATER
1201 CONSTITUTION AVENUE, NW
WASHINGTON, DC 20004**

**PREPARED BY:
THE CADMUS GROUP, INC.
57 WATER STREET
WATERTOWN, MA 02472**

DECEMBER 2005

Members of the National Drinking Water Advisory Council (NDWAC) in Attendance

Brian Ramaley, Director, Newport News [VA] Waterworks, and Chair of NDWAC
Michael Baker, Chief, Division of Drinking Water and Ground Waters, State of Ohio, EPA
Nancy Beardsley, Director, Drinking Water Program, State of Maine, Department of Health Services
John Betkoski, Commissioner, Department of Public Utility Control, State of Connecticut
Jeffrey Griffiths, Director, Graduate Programs in Public Health and Associate Professor of Family Medicine and Community Health, Tufts University School of Medicine
Gregg L. Grunenfelder, Chief Administrator, Division of Environmental Health, Washington State Department of Health
Rebecca Head, Health Officer/Director, Monroe County Health Department, Monroe MI
Perialwar (Regu) Regunathan, Consultant, Wheaton, IL
Dennis Schwartz, General Manager, Rural Water #8, Tecumseh, KS
Jeff Taylor, Deputy Director, Public Utilities Division, City of Houston, TX
Brian Wheeler, Executive Director, Toho Water Authority, Kissimmee, FL

U.S. Environmental Protection Agency Attendees

Cynthia Dougherty, Director, Office of Ground Water and Drinking Water (OGWDW)
Nanci Gelb, Deputy Director, OGWDW
Janet Pawlukiewicz, Director, Water Security Division, OGWDW
Elizabeth Corr, Associate Director, Drinking Water Protection Division, OGWDW
Philip Oshida, Associate Director, Standards and Risk Management Division, OGWDW
Peter Shanaghan, Drinking Water State Revolving Fund Team, OGWDW

Designated Federal Officer

Clare Donaher, Office of Ground Water and Drinking Water

Members of the Public

Gary Lynch, Park Water Company, CA
David Saddler, Tohono O'odham Utility Authority, AZ
Ed Thomas, National Rural Water Association, DC

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NOVEMBER 2005 MEETING
SUMMARY**

DAY 1 (November 17)
(Agenda is found in Appendix 1)

OPENING REMARKS

Brian Ramaley opened the meeting and thanked the Long Beach Water Department and the Los Angeles Department of Water and Power for the tour of their water treatment facilities the day before. Mr. Ramaley acknowledged the members leaving the Council:

- John Betkoski
- Rebecca Head
- Dennis Schwartz
- Jeff Taylor
- Lynn Thorp

On behalf of the Council, Mr. Ramaley expressed his appreciation for their cooperation and participation.

Cynthia Dougherty then welcomed the Council by expressing her gratitude for their hard work. She reviewed the activities of EPA's Office of Ground Water and Drinking Water (OGWDW) since the last NDWAC meeting in early June. EPA recently signed into law an Underground Injection Control Program for Class I wells in Florida. The Agency will sign the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) by mid-December 2005. (N.B. These rules were signed on 12/15/2005.) EPA has been using the new approach to work on the arsenic cost review. The Agency also plans to put out a **Federal Register** notice for changes to the affordability criteria that include the Council's input. In addition, EPA is proposing changes to the Lead and Copper Rule based on recommendations from the NDWAC workgroup.

OGWDW is working with the states and water systems to implement the Arsenic Rule. Compliance with the Rule begins in January 2006, but depending on the circumstances, a system might not be in violation for up to a year. The Agency is also working closely with the Office and Research and Development and the National Rural Water Association to inform systems about the many treatment technologies available to remove arsenic. In 2006, EPA will also begin early implementation activities, such as numerous web casts and trainings for the Stage 2 DBPR and LT2ESWTR while states are doing the necessary work to attain primacy for these rules.

At the end of September, EPA launched the new federal Safe Drinking Water Information System and took the old system offline. The Agency is dealing with hardware and software issues related to data quality and is on schedule to have the new system fully functioning by the end of December.

EPA is drafting a series of consent agreements for major U. S. airlines to improve the quality of tap water on airlines. In addition to these consent agreements, the Agency is using a facilitated process to develop a rule regulating potable water on airlines. EPA expects a rule to be final within two years.

EPA is in the process of determining whether it will take any action on Perchlorate, which is on the second contaminant candidate list (CCL). The Agency is also beginning to work on CCL 3, which is expected to be a long process.

EPA's Partnership for Safe Water recognizes large water systems that meet or exceed current standards. The Agency is planning to expand the Partnership to new areas and topics, such as DBPs.

Finally, performance measures for OGWDW, which will be discussed later in the meeting, are a critical issue both in the short term and the long term. It will be very important for EPA and its partners to work with and educate the Office of Management and Budget so that OMB understands the importance of preventative efforts to protect public health by the drinking water community.

SUSTAINABLE INFRASTRUCTURE INITIATIVE

Peter Shanaghan provided an in-depth overview of EPA's Sustainable Infrastructure Initiative, which the Assistant Administrator for Water, Ben Grumbles, has made a centerpiece of EPA's effort to reshape the future of the drinking water and wastewater industries. This initiative is fundamental to EPA's drinking water and wastewater mission.

The issue of sustainability came to the forefront with the issuance of EPA's Infrastructure Gap Report in 2002 - - an estimation of the need for infrastructure investment and infrastructure expenditure levels between 2000 and 2020. The analysis estimated that the current rate of spending on infrastructure is not sustainable. The analysis also determined that money is not the only issue as there are significant efficiencies that water utilities can capture that would reduce the gap. In addition, the gap is not inevitable. The projected gap could be closed with revenue growth of 3 percent above inflation (assuming that this additional revenue would be spent on replacing and upgrading infrastructure).

EPA has made a long-term strategic commitment to sustainable infrastructure as an opportunity to help utilities understand how to reduce their costs and increase their revenues. The Agency has identified four pillars to make the water industry sustainable:

1. management changes
2. full-cost pricing
3. watershed management
4. water efficiency

Management changes target the managerial and technical capacities of water system operators. EPA is promoting management changes through a number of education and outreach efforts, including the capacity development program's series of simple tools for effective performance (STEP) guides, training, and technical assistance. The Agency has segmented drinking water systems into three tiers of water system management capacity. Tier 1 systems need to improve their capacity through better management practices. Tier 2 systems have standard management practices. Tier 3 systems, the smallest group, are "best in class" in regard to management practices. EPA's management change goal is to move systems up the scale into Tiers 2 and 3.

Full-cost pricing recognizes all business costs for providing safe drinking water and creates a rate structure that recovers these costs. Full-cost pricing has a long term planning horizon that includes the depreciation of infrastructure, which enables systems to build the costs for rehabilitating and replacing infrastructure into water rates. A critical step is for each utility to choose its level of service. Subsidies are part of the industry that is unlikely to change, but because water utilities are supposed to be managed as enterprise funds, these subsidies should not be in the form of transfer payments. We do not want to force people to relocate because they cannot afford to have safe drinking. EPA acknowledges that the subsidy for some systems will be very large. However, if a system cannot afford full-cost pricing, maybe the system needs to reconsider the type of system it wants to be.

Watershed management can be achieved through both source water protection activities and elements of the Clean Water Act. There are a number of watershed-related efforts in the work, but EPA has found that focusing the attention of water and wastewater utilities on the watershed pillar has been difficult. Systems are still wary of spending money upstream of a problem rather than building physical infrastructure. Alton, IL is a classic example of a system that has realized tremendous savings by investing in upstream sediment reduction.

Water efficiency values water as a limited resource and markets it as a precious commodity. EPA is hoping to focus attention on opportunities for increasing drinking water and wastewater efficiency, especially by promoting water reuse in areas of the country facing shortages (which has become common nationwide).

Discussion

Jeffrey Griffiths suggested that EPA could communicate the importance of the gap by framing it as a challenge that would equal five Hurricanes Katrina (\$500 billion over 20 years).

Mr. Shanaghan responded that comparing the gap to Katrina is not accurate because the drinking water infrastructure gap is a dynamic estimate influenced by numerous variables—the age of infrastructure, growing populations, and increased public health requirements—that are constantly changing. If systems ignore the problem, the size of the gap could be even larger. But if systems begin addressing the problem, the gap could be considerably smaller.

Dennis Schwartz commented that he does not want this problem nationalized because he fears a nationalized solution. We should not be using federal money to pay for a local problem because

it is not efficient. Sustainable infrastructure should be achieved locally by well-run water systems using full-cost pricing.

Mr. Shanaghan replied that EPA agrees. EPA has three ways to address the issue: information, money, and regulation. The sustainable infrastructure initiative is built around getting information to local utilities and decision-makers so that more utilities will use best practices.

John Betkoski suggested that sustainable infrastructure should be addressed at the national level. The infrastructure needs are growing in every state; ratepayer, utilities, and states cannot meet these needs.

Mr. Shanaghan replied that EPA's latest *Drinking Water Infrastructure Needs Survey* is a more accurate estimate of the total national needs because this Survey better captured long-term need. Yet most water systems still do not use an adequate planning horizon. Seattle is an exception because it employs a 100 year planning horizon, which allows it to capture life cycle costs. Long term analysis such as this allows a system to answer the fundamental question of what is the annuity or annual payment needed to deliver the level of service that the local community wants.

This issue is also a national issue because of the important link to national security—systems need the capacity to be able to consistently ensure safe drinking water.

Jeff Taylor commented that the infrastructure gap is a national issue. EPA needs to add a fifth pillar for funding. Houston's drinking water system has exerted significant effort to rehabilitate and better manage its infrastructure, yet the replacement needs for the system are \$300 million annually. At the time of installation for much of Houston's drinking water components, the design standards did not account for the Gulf Coast's environment of sandy, corrosive soils and a high water table. The City of Houston needs to annually replace 2-3 percent of its pipe. Most of the cities in Texas are dealing with a similar crisis.

Mr. Shanaghan responded that this is a national issue composed of unique local situations. Texas is one of the states facing the greatest infrastructure challenge. One important step for EPA and the industry is the research and development needed to identify new materials and technologies that will lower the gap.

Brian Wheeler advocated that the infrastructure gap should be considered an important national issue because drinking water and wastewater are the most capital-intensive utility in the country. We need to find a way to lower the capital costs through asset management. Too many utilities are focused on GASB 34, and too few are practicing true asset management. Water systems need incentives to encourage asset management, which will significantly lower the gap.

Michael Baker added that water systems need to expand their planning horizons. Systems still need short-term plans for immediate needs. The role EPA needs to fill is to create a mindset at the local level of long-term planning and to provide relief when full-cost pricing is not affordable, especially in small communities.

Mr. Ramaley believes that water systems have finally recognized the capital-intensive nature of providing drinking water. Utilities are good at financing infrastructure over time, rolling it into rates, and paying for it. However, most utilities do not take into account the need to rehabilitate and replace infrastructure in the long term. Local systems are responsible for knowing their issues and addressing those issues before emergencies happen. Special cases like the Gulf Coast deserve funding and attention because these needs are not affordable for local utilities. Most utilities ignore infrastructure until it does not work.

Mr. Taylor added that other utilities, like electric utilities, are designed to accept certain periods of outage. Water systems, on the other hand, are designed for 100 percent service reliability. The assumption is that infrastructure in the ground will always be there and function properly. We need a voice that informs the public and elected officials that this assumption is not true or safe.

Mr. Wheeler suggested that one way to frame this issue to the public is to emphasize the need for constant reliable water service. Customers would not accept a 90 percent reliable service of water. People can live without power but not without water.

Mr. Shanaghan added that another confounding factor of water service is that water is a heavy, non-compressible fluid. There are no shortcuts that ensure continual, reliable service.

Mr. Ramaley believes that the four pillars are an important discussion and foundation for sustainable infrastructure. If we spend more time improving the cultural recognition that the drinking water industry is capital intensive, we can expect new strategies to naturally emerge.

Rebecca Head asked what EPA is doing to get the message out about sustainable infrastructure. Has EPA reached out to the National Association of Counties or the Council of Mayors? If the information is given to these organizations, the information will trickle down to the local level.

Mr. Shanaghan answered that one of the key parts of EPA strategy is to identify and target key stakeholders such as elected officials and utilities. EPA wants to reach operators at the same time that it reaches other policy makers. Everyone is attuned to transportation issues like roads and bridges. The same attention is needed for drinking water.

Gregg Grunfelder cautioned that his state's experience with capacity development shows that communities and utilities with problems have trouble consistently improving performance and maintaining those gains unless they are under pressure by the state.

Mr. Shanaghan said that EPA's goal is to create systems that become sustainable with little to no support from outside agencies and instead reach into their community to provide drinking water.

Nancy Beardsley asked how a goal like infrastructure sustainability is possible for small utilities that only have a few employees and lack the capacity for better management.

Mr. Shanaghan responded that there are different institutions for managing these utilities, such as area-wide management through a regional cooperative. The challenge of small systems is fundamental to this effort.

Brian Wheeler suggested that the public pays attention to labels. There needs to be flexibility so that systems that are the best run are provided some regulatory relief.

Dr. Griffiths inquired whether there was a way that EPA and systems could use the Consumer Confidence Reports (CCRs) to educate the public.

Mr. Ramaley responded that using the CCR was a good idea in theory, but that few utilities use their CCR beyond what is required. In addition, in a survey conducted in his water system, few customers could even recall receiving a CCR. He suggested using separate mailings, which the customers are more likely to read.

Mr. Baker advocated that EPA and the water industry need to develop new, innovative ways to communicate, such as through the media. His state is working with Stormcenter Inc., which provides information to the local news about weather for their broadcasts. Many media outlets have shown willingness to include drinking water educational information as part of the regular weather forecast. The state will be working on producing 1-3 minute drinking water segments for weather broadcasts.

Ms. Dougherty added that EPA has had some success working with the Weather Channel to broadcast water-related information.

Perialwar (Regu) Regunathan asked what EPA means by evaluating technologies to identify cost-effective options for water systems.

Mr. Shanaghan responded that EPA intends to consider a broad array of technologies, including point-of-use and point-of-entry devices. For some situations, such as a small cluster of households that face a contamination issue, conventional treatment may not be cost-effective.

Mr. Taylor commented that utilities would benefit if EPA embraces the technology component of treatment practices. Currently there is not enough time spent looking at technologies to help public sector utilities. Homeowners need to be brought into the discussion so that they understand the impact of their decisions.

Mr. Schwartz contended that the solution to the infrastructure issue is capacity development. The critical issue is whether systems have the fortitude to make the decisions that are needed to achieve sustainability. Every community has challenges that are unique. If a system cannot achieve capacity, then it will ultimately have to face the regulatory repercussions.

Mr. Shanaghan noted that utilities have seen a steady decline in indoor water use due to the use of water efficient appliances and devices. These changes in usage have rate implications on rates.

Mr. Ramaley agreed that low-flow devices and a water efficiency ethic have lowered water use both indoors and outdoors. But he also believes that the change in water use illustrates the price elasticity of water.

Mr. Schwartz added that full-cost pricing also reduces water demand. He believes that water should be priced as a service as opposed to a commodity. EPA needs to lead a paradigm shift in how water is valued.

Mr. Wheeler asked about whether NDWAC has a role in the sustainability effort.

Ms. Dougherty replied that EPA does not have a specific charge for NDWAC, but sustainability is an important issue that is in the forefront of our industry. It is important for NDWAC to understand what the Agency is doing and to hear suggestions about what else can be done. Ben Grumbles, EPA's Assistant Administrator for Water, will meet with NDWAC to discuss ideas at the spring meeting in 2006 in Washington, D.C.

Mr. Ramaley added that awareness is a natural role for the Council.

UPDATES/STATUS REPORTS

1. Water Security Practices, Incentives, and Measures

Janet Pawlukiewicz updated the Council on EPA's progress in adopting and promoting the water security practices, incentives, and measures as recommended in NDWAC's June 2005 report to EPA's Administrator. OGWDW has received funding for two new initiatives: Water Sentinel and the Water Alliance for Threat Reduction (WATR). The purpose of Water Sentinel is to design a water contamination warning system for drinking water distribution systems. Water Sentinel will incorporate information from online water quality monitoring, public health surveillance, consumer complaints, physical surveillance, and contaminant specific sampling.

The WATR initiative targets drinking water systems that serve at least 100,000 people in order to help them improve emergency preparedness and response as well as implement active and effective security programs as defined by NDWAC.

EPA has developed a water contaminant database tool to be used for planning, and response to emergencies. The database is password-protected and provides information on specific contaminants. Access is limited to water and wastewater utilities, state officials, federal officials, and water industry groups. Participants in the Water Information Sharing and Analysis Center (WaterISAC) will have ready access to the tool. Interested parties can request access through: www.epa.gov/wcit .

2. Workgroup on Revised Public Education Requirements for the Lead and Copper

Gregg Grunfelder presented a status report on the NDWAC workgroup focused on the public education requirements for the Lead and Copper Rule.

The workgroup met in October 2005 and is now up to speed on background information. The current education requirements and outreach do not work well. Therefore, one subgroup of the workgroup will work on good communication language and developing guiding principles. The other workgroup is considering whether more detailed guidance is needed and how the education should be communicated. This information will include how quickly education information is sent to homes that need it, who should receive it, how to conduct in-depth follow-up, and what is needed on an ongoing basis.

The workgroup will meet again in December 2005 and expects to present its findings to the Council at the spring 2006 meeting. If any findings are completed before that meeting takes place, EPA may host a NDWAC conference call to consider the findings so that EPA can work any NDWAC recommendations into ongoing rule revisions.

DISCUSSION OF SUBGROUP ON DRINKING WATER PROGRAM PERFORMANCE MEASURES AND INDICATORS

Mr. Baker, Dr. Griffiths, and Mr. Taylor presented the findings of the Performance Measures and Indicators Subgroup. (See Appendix 2)

After discussing performance measures in December 2004 and June 2005, NDWAC formed the Drinking Water Program Performance Measures and Indicators Subgroup to analyze ways to make EPA performance measures more oriented to public health protection. The Subgroup was given three charges:

1. Consider changes to EPA's current performance measures.
2. Design new performance measures that capture some public health outcome for inclusion in EPA's next 5-year strategic plan.
3. Identify future performance measures that need additional development and will be discussed at future NDWAC subgroup meetings.

The Subgroup spent a majority of its time on the first and second charges.

Existing Measures

The Subgroup's finding was that the suggested changes that arose from the EPA/State (through representation by the Executive Director of the Association of State Drinking Water Administrators and selected states' officials) Workgroup's discussion would do a great deal to improve current violation measures. In particular, the subgroup found that current measures should be revised to account for the duration of violations, the population affected, and the importance and severity of the violation. In addition to the EPA/State Workgroup's recommendations, the Subgroup suggested framing current measures in public health language, such as:

Percentage of population served by community public water systems continuously achieving at least the required reduction in the risk of disease and other health effects of contaminants in drinking water.

This language explicitly links compliance with reducing public health risks.

New Performance Measures

The Subgroup reached consensus on developing three new performance measures all based on a common risk reduction framework for three contaminants:

1. Organics – Total Trihalomethanes (TTHMs)
2. Inorganics – Arsenic
3. Microbials

These contaminants were chosen as pilots for three broad classifications of contaminants (as shown above) because of a readily available data source and/or because they are regulated by a relatively new drinking water rule.

For each example contaminant, the Subgroup laid out how to build a performance measure that estimates the probability of risk reduction due to reduced contaminant exposure, which is approximated by occurrence levels of contaminants in drinking water systems. As proposed, each measure would report an estimated number of cases avoided due to the implementation of drinking water rules by linking real world contaminant occurrence data with established risk factors from rule development.

The common framework is to develop (if possible) a historical baseline of gains that EPA can take credit for prior to the implementation of the new rule. Once this pre-rule baseline is established, each measure is based on using annual occurrence data to measure annual reductions in occurrence. This will allow EPA to annually report benefits in terms of estimated public health outcomes. The following sections provide more in-depth detail on each new proposed measure. For more information, see the full Subgroup findings in the Appendix.

TTHMs

The Subgroup decided that EPA could build a historical pre-rule baseline by using data from a number of sources. The first estimate would analyze the reductions in occurrence in TTHMs that

has occurred between the 1970s (before TTHMs were regulated nationally) and implementation of the Stage 1 DBPR. Using these data, EPA would model the number of bladder cancer cases avoided and compare that estimate to actual bladder cancer incidence rates (controlling for the lag effect and other variables).

Once the baseline is established, EPA would measure annual progress by taking a national sample of state-held Stage 1 and 2 DBPR data (masked to protect system and state identification). Using this annual data, EPA would estimate the additional number of avoided bladder cancer cases each year.

Arsenic

The framework and approach would be similar for arsenic. One difference is that EPA would not be able to measure historic gains because of differences in detection limits in analytical methods over time. Therefore, EPA would start by developing a pre-2003 national baseline of arsenic occurrence. Then, EPA would define a pool of arsenic-challenged systems from which to draw a sample for analysis. Using state-held compliance monitoring data for those systems, EPA would estimate the number of avoided cases of bladder and lung cancer. This estimate would be a conservative estimate for national benefits since it assumes that non-challenged systems will not reduce their arsenic levels once they are in compliance.

Microbials

The Subgroup's suggested methodology for microbials is different because of data availability issues and the nature of the public health threat. EPA should use epidemiological data to estimate reductions in risks before the 1989 Surface Water Treatment Rule and since the Rule has gone into effect. In addition, EPA should use data from a variety of sources to model raw water quality since 1989. EPA should analyze the relationship between turbidity levels and concentration times to improvements in public health outcomes (both endemic and epidemic disease outbreaks). These efforts may inform EPA's long-term measures for microbials by improving our understanding about the links among drinking water quality surrogates (like turbidity), violations, and human health outcomes.

To build an annual performance measure, EPA would target a sample of ground water and surface water systems. These systems would take a special monitoring regimen for raw and finished water to gauge microbial occurrence levels. EPA would also monitor any drinking water violations committed by these systems. Using the raw and finished data, EPA would quantify the reduction in occurrence of microbial pathogens and estimate the number of endemic and epidemic disease outbreak cases avoided.

Overarching Needs

The key to success for these new performance measures is access to state-held compliance monitoring data from systems. Therefore, a critical finding of the Subgroup is the need for the drinking water community and NDWAC to support the voluntary information collection request (ICR) being considered for the six-year review of existing regulations. Data collected under the

ICR would allow EPA to establish the baselines needed for the annual performance measures. In addition, EPA will need to determine an ongoing way to access state-held system monitoring data.

In addition to data collection needs, EPA and NDWAC need to develop robust risk reduction language for verbalizing these new measures. Finally, EPA needs to consider possible ways to frame these benefits, including highlighting the equity considerations as well as the economic impacts on the Gross Domestic Product.

Conclusion

The Subgroup's findings are to move forward with new risk-based performance measures that will allow the entire drinking water community to understand the benefits created by current drinking water rules and to better understand what changes should be made in the future to protect public health and use EPA resources most efficiently. Given the many data gaps that exist, these measures will not be exact or perfect. Although based upon a common framework, the exact methodology and timeframe of analysis differs for each contaminant.

The benefits of these efforts can be framed in a number of ways to show the public health importance of the drinking water program. This can start with simple wording changes for the revised current measures discussed by the EPA/State Workgroup. EPA must work with the states to capture the data that have already been collected and reported by systems and build the trust needed to ensure a broad state response to EPA's voluntary requests. Using these data, EPA can communicate the public health benefits of drinking water regulations and find new ways to educate the public. Finally, EPA can use the data and knowledge generated by this effort to build even better, more sophisticated measures and rules in the future.

Discussion

Mr. Shanaghan asked whether it is feasible to look at historical benefits since there are so many other environmental variables that affect cancer rates.

Dr. Griffiths answered that there were a number of sophisticated methodologies that could allow for the controlling of other variables. In the short term, the Subgroup believes that it is only possible to model benefits based on the probability of risk reduction not actual health outcomes. The long-term goal, however, is using actual health outcomes. Some of the Subgroup's recommendations build towards that future step by investigating the link between occurrence data and actual health outcomes.

Mr. Shanaghan followed by explaining that he wants to figure out a way for the DWSRF program to take credit for water systems that have used DWSRF resources to come into compliance. Can the link go even farther and show actual changes in public health outcomes?

Dr. Griffiths answered that making that link is possible, but not without a large amount of effort.

Mr. Ramaley mentioned that the Subgroup decided to focus on building new measures and limited their analyses of existing measures to refining them (in line with the EPA/State Workgroup's findings) and using new language to more explicitly link compliance to public health risk reduction. The next step, which is feasible for EPA's next 5-year strategic plan in progress, is to use existing risk estimates from rule development and using pre- and post-rule (or -treatment) data to estimate some risk reduction as a result of those rules. The final step, which the Subgroup has yet to focus, is creating measures that are based on actual human health outcomes.

Mr. Baker agreed with Mr. Ramaley's assessment. The first step is getting the data from states so that EPA can build a baseline. The Subgroup is explicit - - these measures are not based on actual health outcomes. For the near future, EPA should focus on getting pre-rule and post-rule occurrence data for these three contaminants. Using dose-response models, EPA can estimate public health outcomes for each level of contaminant occurrence. That is why the measures are reported as estimated risk reduction rather than actual risk reduction.

Dr. Griffiths added that although data gaps are present, the analysis framework developed by the Subgroup should be capable of producing good estimates. Once these measures are implemented, the analysis can define pathways for acquiring more information in the future for more accurate estimates.

Mr. Ramaley clarified that the Subgroup had short-term and long-term goals. The framework designed by the Subgroup addresses the short-term goal. There will be additional time for the analysis needed to meet the long-term goal.

Mr. Baker agreed that as occurrence data become available, EPA should be able to conduct more sophisticated analyses.

Dr. Regunathan then addressed that there are complicating factors with microbials. Much of the compliance monitoring is focused on surrogates. In addition, while we have some handle (though not great) on the incidence of epidemic disease, we have no handle on the incidence of endemic disease. We should not disregard the public health protection accomplished over the last century and continues to be accomplished because of the federal program.

Ms. Dougherty asked what the public health outcome would be from microbial pathogens if all drinking water rules went away.

Dr. Regunathan hypothesized that public health protection would not stop entirely, but that the consistency and standards would disappear.

Mr. Ramaley echoed that performance measures for microbials are messier than those for other contaminants.

Dr. Regunathan added that although messier, the health effects from microbial contamination are more immediate and tangible.

Ms. Pawlukiewicz commented that she hopes the proposed data collection efforts and analysis for benefits will include water security. So far, it seems the emphasis of the new measures is on drinking water rules and compliance. But there are very important programs - - water security, capacity development programs, source water protection efforts and the DWSRF - - that should be a part of the analysis.

Mr. Taylor added that the new measures should really steer clear of compliance; compliance will doom these measures to failure.

Ms. Dougherty reemphasized that it is crucial for these new measures to focus on linking changes in exposure levels, public health outcomes, and a broad array of drinking water efforts.

Mr. Baker agreed with Ms. Dougherty and stated that essentially all activities in the drinking water program are geared toward reducing exposures. The key is measuring those exposures and translating them to human health.

Mr. Schwartz commented that ultimately the drinking water program needs to demonstrate actual improved health benefits to validate the process by which EPA builds regulations.

Mr. Ramaley answered that the goal to demonstrate actual health benefits is the long-term goal for the Subgroup and EPA.

Ms. Dougherty noted that two drinking water initiatives, the Area Wide Optimization Project and the Partnership for Safe Water, should be examined closely by the Subgroup. Although the programs do not quantify health outcomes, they do conclusively show that drinking water is improving. These initiatives can be part of the toolbox for the performance measure effort.

Mr. Baker commented that the proposed microbial framework employs a special regime of monitoring for a select group of systems, including ground water systems. Monitoring would include the distribution system because EPA could use this data in the future as it considers new rules.

Mr. Ramaley replied that there are many potential pitfalls and sources of resistance when EPA asks states and systems to share data.

Elizabeth Corr stated that she is heartened to hear the Subgroup's acknowledgement of the data gaps and the complexities in creating health-related measures. She hopes that the performance measures effort will be tied in to the PWSS logic model.

Clare Donaher responded that the Subgroup was briefed on the logic model at its July 2005 meeting. The general consensus of the Subgroup as well as Ron Bergman, who made the presentation on the logic model, was that the model could lead to revision of drinking water PAMs (performance activity measures) and that the Subgroup would limit their attention to strategic targets.

Mr. Taylor asked EPA what the timing was for receiving NDWAC's recommendations.

Ms. Dougherty answered that EPA would like the recommendations before the conclusion of this meeting. At this point, EPA only needs the architecture so that the new measures can be included in the first draft sent to states.

Dr. Head replied that the Subgroup has the framework for three contaminants, but not the language.

Ms. Dougherty replied that the framework for the microbial approach is problematic because it is not really an annual measure, but more of a measure before and after treatment.

Dr. Griffiths replied that the measure could still be considered an annual one because the reduction in microbial contamination (from raw water to finished water) can be compared to the reduction in previous years.

Mr. Baker added that the initial analysis will establish a baseline. Then, on an annual basis, EPA will measure back against the baseline to determine incremental improvements. The findings of the Subgroup are to focus on the systems with the greatest “noise,” i.e., possible impact because they will drive the national benefits. But we will need to pair that approach with equity language so that the small group of systems participating does not feel targeted. He suggests creating three new strategic targets under the overall strategic measure for the performance measures developed by the Subgroup.

Ms. Dougherty replied that EPA is under pressure to reduce the number of measures. EPA will determine how best to incorporate NDWAC’s suggestions into the strategic plan.

Mr. Ramaley added that NDWAC needs to really get behind the voluntary ICR.

Mr. Taylor inquired whether NDWAC or EPA needed to identify resources to support the performance measures in the near future.

Ms. Dougherty replied that the only thing that is needed immediately is the architecture.

Ms. Pawlukiewicz asked whether the long-term goal of developing performance measures based on actual outcomes should be expressed as a measure in development.

Ms. Donaher responded that the strategic plan is not just for the Agency but for the drinking water community as a whole, so it is probably best not to include it as a goal.

Ms. Beardsley asked about how NDWAC and EPA were going to work with OMB to update them on the performance measure efforts.

Ms. Dougherty answered that she would like EPA to arrange a meeting between OMB and a few NDWAC representatives (perhaps in early 2006).

The Council then decided to ask the Subgroup to meet after the adjournment of Day 1 to craft a formal set of findings for NDWAC to approve and then recommend to EPA.

PUBLIC PARTICIPATION (There were no statements or comments from members of the public in attendance, so the Council used that allotted time to discuss experiences related to Hurricanes Katrina, Rita, and Wilma by EPA and some NDWAC members.)

HURRICANES' ACTIVITIES

Dr. Griffiths: The Science Advisory Board (SAB) went through a number of rapid actions to comment on sampling plans for the Agency's response to Hurricane Katrina. There were multiple conference calls in the first 72 hours following the disaster. The waters off the Mississippi coast needed sampling for chemical contaminants. The SAB worked quickly to expedite recommendations for emergency sampling so that relief efforts could begin.

Mr. Wheeler: In 2004, many Florida water utilities cooperated to provide mutual aid to other systems facing emergencies from hurricane damage. This informal cooperation grew into a core of utilities that wanted to emulate the electric industry and help each other through a formal mutual aid network. The utilities signed a common mutual aid agreement that is also signed by the State of Florida, which took care of liability and all other issues. Websites were created that provided important contact information for all the partners (including home phone numbers for key contacts). When Hurricane Katrina hit Mississippi, the State asked Florida for help. It took two days to resolve legal issues and obtain clearances allowing State of Florida's utility workers to cross state lines. The effort was successful, but it could definitely be more efficient. For instance, the linkage between states' Emergency Operations Centers needs improvement.

The same network worked well when Hurricane Wilma crossed South Florida. Within a few hours, crews were on the road with emergency generators. The efforts of the network doubled the number of people responding on the ground for the water utilities. Jacksonville is promoting the efforts as a national model with web casts and training sessions. Local response is the best in terms of availability and knowledge of the problems in the area.

Mr. Taylor: The State of Texas' emergency relief efforts for Katrina victims were managed by the mayor of Houston, the county judge for Houston, and Governor of Texas. Within hours of the levees breaking in New Orleans, these leaders decided that Houston would provide aid. After some guarantees at the federal level for reimbursement of funding, the response began. The mayor and county judge had daily meetings that focused on concrete steps such as short term housing.

The effort involved all levels of government and used many resources. People were housed in the Houston Astrodome, which required county approval. Others stayed in the convention center, which required city approval. Churches got involved by having their members open their houses to displaced people. The area hospitals mobilized to create a triage center for the temporary shelters. After the short-term housing issue was solved, the real estate community

started providing assistance to solve the long-term housing need. The number of volunteers, who required organization and leadership, was staggering.

Houston's public water utility sent millions of bottles of water and equipment to Louisiana but could not send people due to liability issues. The utility participated in the relief effort on a local level by ensuring consistent and reliable water service in the Houston area.

Nanci Gelb: EPA's response started before the storm. Literature was put on the Agency's webpage in preparation. Before the landfall, the Agency activated the Emergency Command Center. Under the national response plan, everything starts at the local level. There are 14 emergency response functions, and EPA is the lead on one of them.

EPA activated both the national command and regional command teams. Regions 4 and 6 were geared up and ready. When Katrina hit, everyone was already in place with his/her FEMA mission assignments. The Agency is in charge of response to chemical issues and was there to assist Army Corps of Engineers on water issues. The federal response involved all levels of the Agency and the White House immediately. Meetings were held 7 days a week with staff available at all hours of the day. EPA was constantly fielding phone calls and providing assistance.

EPA worked with the Department of Homeland Security to activate the National Emergency Resource Registry to list resource needs and capabilities for water and wastewater utilities, such as gasoline and generators. The big issue in the early days was flooding and monitoring standing water. The SAB responded to this issue within 72 hours by revising sampling plans and methodologies to ensure accurate, timely results.

The relief effort took coordination on a daily basis. As the response shifted from emergency response to a long-term response, the Agency tried to work with FEMA to determine long-term response and actions. EPA did this by understanding the physical locations of infrastructure as well as the issues, the conditions, and the areas that faced the greatest challenges.

Ms. Pawlukiewicz: At the request of the States, EPA helped assess affected water systems and fill out necessary forms to receive federal assistance.

On a technical level, the SAB became involved in monitoring flood waters by addressing issues, such as the pathogens to test for. EPA also advised emergency workers that had to go into the water. Working with the CDC and OSHA, EPA quickly revised guidance to suggest that emergency workers wear hip boots.

There were hundreds of EPA employees and contractors dealing with water and air chemicals. Other efforts at the Agency included looking beyond formal mechanisms and getting information to the owners of private wells in English, Spanish, and Vietnamese to help them understand what they would need to do to make their wells safe again. The Office of Water has established a hurricane team focused on wetlands restoration. In addition, the sustainable infrastructure staff is developing innovative ideas for addressing some of the water contamination and restoration issues.

The hurricane response was a massive effort requiring expertise and coordination from all federal agencies to ensure the relief effort went as smoothly as possible. These agencies are now discussing the lessons learned to determine what changes need to be made for the future.

DAY 2 (November 18)

On the second day of the meeting, NDWAC spent a few minutes revising the statement of findings from the Performance Measures and Indicators Subgroup in order to create a formal set of NDWAC recommendations, which are presented verbatim.

In support of EPA's efforts to measure the performance of the national drinking water program, the National Drinking Water Advisory Council (NDWAC) recommends the following:

EPA should modify subobjective 2.1.1 in the current Strategic Plan to better reflect the public health benefits (outcomes) of national efforts to reduce exposures to contaminants in public drinking water. NDWAC recommends the following language for the revised subobjective:

Percentage of population served by community water systems continuously achieving at least the required reduction in the risk of disease and other health effects of contamination in drinking water.

NDWAC recommends including strategic targets that address the EPA/Association of State Drinking Water Administrators (ASDWA) recommendations relative to duration of violations and population affected. Further, NDWAC recommends for inclusion a measure that addresses the specific nature of the violations so that public health effects can be assessed. EPA should (in cooperation with ASDWA) craft language for the inclusion in the Agency's Strategic Plan, 2006-2011.

After examination of existing measures, public health risks, and occurrence data, NDWAC recommends performance measures focused on risk reduction. Accordingly, NDWAC strongly recommends that EPA incorporate additional strategic targets for three contaminant categories. NDWAC identified important and representative contaminants in each category to serve as prototypes for this approach. They are:

1. Organic Contaminants—Total Trihalomethanes
2. Inorganic Contaminants—Arsenic
3. Microbial Pathogens

These new performance measures should link occurrence of contaminants in drinking water to estimated risk reductions and human health outcomes through the following framework:

1. Use historic occurrence data, compliance monitoring data, and other data collection efforts to establish a baseline and subsequent estimated exposure reductions.

2. Use human health risk estimates established during drinking water rule development to calculate reductions in risk as a result of reduced exposure.

NDWAC recommends that the Agency go forward with an information collection request for voluntary sharing of existing data for the Six-Year Review and institute an on-going data sharing process. In addition, EPA will need to establish a microbial monitoring program of raw and finished water at targeted public water systems.

The Council recommends that NDWAC members, EPA, and Centers for Diseases Control and Prevention officials meet with the Office of Management and Budget to discuss resource requirements to establish and implement these human health outcome measures.

For future program measures, NDWAC will continue its efforts to refine and improve ways to measure public health outcomes. In 2006, NDWAC will recommend ways for EPA to develop a long-term performance measurement and management program and ways to communicate to the public the health protection value of drinking water programs that ensure safe and reliable drinking water.

Dr. Head made a motion that the Council adopt the revised Subgroup findings and send these recommendations to EPA. **Mr. Taylor** seconded the motion. The members of NDWAC unanimously adopted the findings and unanimously voted to send them as recommendations to EPA.

A brief discussion of the planning and timing of the spring 2006 meeting took place and the meeting was adjourned by the Chair at 10:15 a.m.