NATIONAL DRINKING WATER ADVISORY COUNCIL

MEETING SUMMARY

MAY 23-25, 2007

THE MARRIOTT COURTYARD SILVER SPRING DOWNTOWN HOTEL
8506 FENTON STREET
SILVER SPRING, MD 20910

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

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, Ohio EPA, Columbus, OH
Nancy A. Beardsley, Director, State of Maine's Drinking Water Program, Bureau of Health, Department of Health Services, Division of Human Services, Augusta, ME
Dennis Diemer, General Manager, East Bay Municipal Utility District (EBMUD), Oakland, CA
Bruce Florquist, Small Systems Consultant, Windsor, CO
Gregg L. Grunenfelder, Assistant Secretary, Division of Environmental Health, Washington State Department of Health, Olympia, WA
Jennifer B. Nuzzo, Senior Analyst, Center for Biosecurity, Univeristy of Pittsburg Medical Center (UPMC), Baltimore, MD
Douglas M. Owen, Vice President and Chief Technology Officer, Malcom Pirnie, Inc., White Plains, NY
David Saddler, Manager, Water/Wastewater and Propane Department, Tohono O'odham Utility Authority, Sells, AZ
Blanca Surgeon, Rural Development Specialist, Environmental Rural Community Assistance Corporation, Sante Fe, NM
Jeff Taylor, Deputy Director, Public Utilities Division, City of Houston, TX
Lynn Thorp, National Programs Coordinator, Clean Water Fund, Washington, DC
Brian L. Wheeler, Executive Director, Toho Water Authority, Kissimmee, FL
John S. Young, Jr., Chief Operating Officer, American Water, Vorhees, NJ

U.S. Environmental Protection Agency Attendees

Pam Barr, Director, Standards and Risk Management Division (SRMD), Office of Ground Water and Drinking Water (OGWDW)
Jenny Bielanski, Utilities Team Leader, OGWDW
Valerie Blank, Standards & Risk Management Branch (SRRB), SRMD, OGWDW
Eric Burneson, Chief, Target and Analysis Branch, SRMD, OGWDW
Dr. Rebecca Calderon, Director, Human Studies Division, Office of Research and Development (ORD)
Ann Codrington, Chief, Prevention Branch, DWPD, OGWDW
Elizabeth Corr, Drinking Water Protection Division (DWPD), OGWDW
Cynthia Dougherty, Director, OGWDW
Beth Doyle, Chief, Human Health Risk Assessment Branch (HHRB), Office of Science Technology (OST)
Nanci Gelb, Deputy Director, OGWDW
Benjamin Grumbles, Assistant Administrator, Office of Water (OW)
Yu-ting Guilaran, Chief, SRRB, SRMD, OGWDW
Steve Heare, Director, DWPD, OGWDW
Bruce Kobelski, Prevention Branch, DWPD, OGWDW
Debbie Newberry, Chief, Security and Assistance Branch, Water Security Division (WSD), OGWDW
Edward Ohanian, Director, Health & Ecology Criteria Division, OST
Phil Oshida, Deputy Director, SRMD, OGWDW

Katie Porter, Associate Branch Chief, Protection Branch, DWPD, OGWDW
Suzanne Rudzinski, Deputy Director, OST
Peter Shanaghan, Infrastructure Branch, DWPD, OGWDW
Jacqueline Springer, Immediate Office, OGWDW
David Travers, Director, WSD, OGWDW

Designated Federal Officer (DFO)
Roy Simon, OGWDW (Acting DFO)

Centers for Disease Control and Prevention (CDC) Liaison
Dr. Richard Gelting, Environmental Health Services, CDC

Members of the Public
Howard Beard, The Cadmus Group, Inc.
Dr. George Hallberg, The Cadmus Group, Inc.
Jake Hegeman, Stateside Associates
Vanessa Leiby, The Cadmus Group, Inc.
Bridget O'Grady, Association of State Drinking Water Administrators (ASDWA)
Amena Saiyid, Bureau of National Affairs (BNA)
Jim Taft, ASDWA
Ed Thomas, National Rural Water Association (NRWA)
Diane VanDe Hei, American Water Works Association (AWWA)
Steve Via, AWWA

NATIONAL DRINKING WATER ADVISORY COUNCIL
MAY 2007 MEETING SUMMARY

DAY 1 (May 23rd)
(Agenda can be found in Appendix A)

OPENING REMARKS AND INTRODUCTION OF NEW MEMBERS

Brian Ramaley opened the meeting. He told the group that Roy Simon is the acting Designated Federal Officer (DFO) for this meeting, taking the place of Dan Malloy. Following this meeting, Veronica Blette will assume the role of DFO for NDWAC. Mr. Ramaley reminded the group to copy the DFO on all NDWAC communication.

Three Council members were not in attendance, Rebecca Head, Phil Singer, and Sharunda Buchanan. Richard Gelting is attending the meeting on behalf of the Centers for Disease Control and Prevention (CDC) in place of Ms. Buchanan. Mr. Ramaley then welcomed two returning and two new members to the Council:

- Nancy Beardsley, returning
- Jennifer Nuzzo, new
- Douglas Owen, new
- Brian Wheeler, returning

Mr. Ramaley briefly provided an overview of the agenda, noting that many of the topics on the agenda have been discussed at previous meetings.

Jeff Taylor thanked Lynn Thorpe for her organization's (The Clean Water Fund) assistance in helping Houston implement an ordinance regulating the maintenance of grease traps.

Cynthia Dougherty stated that the agenda includes many important topics and then described a few activities that have been keeping the Office of Groundwater and Drinking Water (OGWDW) busy. The implementation of newly promulgated rules, especially Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR), has been time-consuming for EPA staff. In addition, EPA has been upgrading the Safe Drinking Water Information System (SDWIS), including a "modernization" of the federal part of the system and modifications to SDWIS/State. There are still some data quality issues with the system, however. OGWDW is also working on the Source Water Collaborative, a collaboration of organizations that is working to advance source water protection. Ms. Dougherty hopes to see results from these efforts over the next few years.

One of OGWDW's highest priorities is the impact of carbon sequestration on the Underground Injection Control (UIC) Program. The underground injection of carbon dioxide may be an important tool in the future for mitigating greenhouse gas emissions. Sustainable infrastructure is another high priority of both the EPA Administrator and the Assistant Administrator, Ben Grumbles. OGWDW is also working on water security issues; a more in-depth update will be provided later in the meeting.

OGWDW is also busy with developing the Airline Drinking Water Rule (ADWR), the Lead and Copper Rule (LCR) Revisions, and the third Contaminant Candidate List (CCL3). In addition, a separate Federal Advisory Committee Act (FACA) is being established for revisions to the Total Coliform Rule (TCR).

CONSULTATION: AIRCRAFT DRINKING WATER RULE (ADWR)
Steve Heare (DWPD), Katie Porter (DWPD)

Steve Heare stated that Katie Porter, Associate Branch Chief, has taken the lead management role on this effort, which is moving forward quickly.

Ms. Porter began by providing background on the ADWR, stating that aircraft are considered nontransient noncommunity water systems (NTNCWSs) under existing regulations and as such are required to sample for coliforms and disinfectant residuals. Previously, aircraft water supplies were regulated under Water Supply Guidance 29, which allowed EPA to approve operation & maintenance (O&M) programs in lieu of monitoring. After examining the effectiveness of this Guidance, the document was suspended in 2003.

A "tailored" regulation for aircraft water systems is necessary because the systems have several unique operational characteristics: they take on water from many sources, including international sources, operate on tight schedules, and utilize many temporary connections (which introduce opportunities for cross contamination). EPA has placed forty-six airlines under Administrative Orders on Consent (AOCs) that include provisions for annual sampling of each plane, best management practices, corrective action and public notification, and research of possible external sources of contamination.

A key challenge in developing the ADWR is balancing public health protection with other concerns, such as economic and operational feasibility, changes in aircraft technology, and the large number of stakeholders and aircraft. To help resolve some of these issues, EPA is utilizing a collaborative stakeholder process to develop the regulation, which the Agency hopes will facilitate rule implementation. In addition, EPA is utilizing the Water Safety Plan (WSP) approach, a systematic risk management framework composed of nine steps that utilizes multiple layers of protection in the rule development.

Mr. Ramaley asked if the regulation addresses water derived from foreign countries. **Ms. Porter** replied that EPA is partnering with the World Health Organization to update the existing guidelines for aircraft water safety. When the revised guidelines are adopted within the Instructions for Continued Airworthiness (ICA), it ensures that the international flying community adheres to them. **Mr. Heare** noted that virtually the entire domestic aircraft fleet leaves the country. **Ms. Porter** said that some airlines make an effort to determine the quality of international water sources, and some airlines have made a conscious decision not to board water from certain areas.

Ms. Porter continued her presentation, describing the nine steps of the WSP. These steps are:

1. *Assemble ADWR team*. This team includes staff from EPA Headquarters and the Regions, the U.S. Food and Drug Administration (FDA), and the Federal Aviation Administration (FAA), and has communicated with CDC as necessary.

2. *Describe the water system (including the onboard water system) and construct process flow diagrams.* Jurisdiction for various parts of the water system is split among the state, FDA, and EPA.

3. *Identify and evaluate hazards.* Potential hazards include boarding contaminated water, improper water system design, unsanitary operation and maintenance (O&M) practices, degradation of water, and failure of backflow prevention devices. Hazards are evaluated based on the severity of consequences and the frequency of occurrence on aircraft water systems.

4. *Identify critical control points and possible control measures.*

5. *Critical limit and validation.*

6. *Monitoring.*

7. *Corrective action.* Example corrective actions include resampling, flushing, and disinfecting.

8. *Establish responsibilities, reporting, and recordkeeping.*

9. *Establish procedures for program oversight and regulatory verification.*

Michael Baker asked how frequently monitoring was required to which **Ms. Porter** replied that each aircraft must be sampled annually. She noted that if aircraft were regulated under the TCR, one sample per month would be required.

Yu-ting Guilaran added that monitoring of water trucks and other parts of the water system had been proposed previously. **Ms. Porter** stated that difficulties arose with sampling at watering points because they are not under EPA jurisdiction. FDA does perform some monitoring, **Mr. Heare** noted.

Ms. Guilaran and **Ms. Porter** acknowledged that annual sampling is not very rigorous. However, the ADWR includes a suite of safety provisions that balance feasibility, economics, and public health protection.

Ms. Porter explained that the key elements of the WSP approach are combining best management practices (BMPs) with comprehensive fleet monitoring. She noted that if airlines follow BMPs, they are less likely to need corrective actions; incentives for adhering to BMPs should be considered. In addition, it is important that the public is informed; this is also a component of the Multiple Barrier Approach, she said.

The scope of the ADWR is to address aircraft within US jurisdiction, focusing on onboard water systems; EPA is collaborating with FDA and FAA to do this. **Ms. Porter** noted that FDA may revisit its regulations governing airport watering points after EPA's action.

EPA will continue analyzing data gathered as part of the AOCs and collaborating with stakeholders. The goal is to propose the regulation in December 2007 and promulgate the final rule in November 2008. After that, EPA may decide to address water supplies on other categories of Interstate Carrier Conveyances (ICCs) such as trains and ferries.

Ms. Porter asked for the Council's input on additional hazards for consideration and topics on which to request comment in the preamble to the proposed rule.

Bruce Florquist asked if a parallel effort was being pursued for cruise ships. **Mr. Gelting** responded that cruise ships are regulated by the CDC.

Mr. Florquist then asked how airlines would notify consumers when a public notification was required. **Ms. Porter** replied that onboard bathroom taps could be placarded or slips of paper could be distributed to passengers (FDA is concerned, however, that the latter method may induce unnecessary panic). She added that most airlines will "do anything" to avoid providing complete public notification. **Mr. Heare** added that some aircraft will simply shut off water supply rather than provide public notice, which causes additional problems.

Next, **Mr. Florquist** asked if airlines had considered utilizing Point of Use (POU) devices to treat their water supply. **Mr. Heare** replied that this would require the airplane to be retrofitted, which is very expensive, and then recertified. Airlines are reluctant to do this. Many newer aircraft, however, do have onboard treatment

systems. **Mr. Florquist** asked if this could be a requirement of new aircraft, and **Mr. Heare** replied that this may be feasible.

Blanca Surgeon inquired if international planes could be inspected while they were in U.S. domain. **Ms. Porter** replied that international carriers are only in U.S. jurisdiction if they fly to additional U.S. destinations outside of their initial destination. Most international carriers do not do this, however.

Douglas Owen stated that BMPs seem to be the most feasible path for airlines and encouraged EPA to request comments on BMPs when they propose the rule. He also noted that coordinating with FDA is important, citing that there are many opportunities for contamination prior to when water is boarded.

Mr. Heare noted that some planes have vacuum flush toilets; it is obvious when these toilets have back siphonage because a different color water is used.

Ms. Thorpe asked if it was feasible to limit water consumption onboard aircrafts to bottled water. **Mr. Ramaley** replied that he understands that this is not feasible because the coffee makers and hot water heaters are connected directly to the plane's water supply. In addition, FDA requires water for hand washing if food service is provided. Serving ice classifies as food service, **Mr. Heare** added.

Ms. Dougherty said that even if airlines serve water from bottles onboard, the bottles are sometimes filled or refilled at the tap.

Greg Grunenfelder added that consideration needs to be given to the implementation of this Rule as it will require extra resources from the Regions.

Jennifer Nuzzo asked if information about the water served onboard could be made available to passengers. **Ms. Porter** replied that improving notification within airports so airlines will know if they are boarding safe water has been discussed. There is little interest among airlines in communicating with the passengers, however. **Ms. Nuzzo** stated that there should be a requirement to disclose this information if asked, and **Ms. Porter** said this will be considered.

CONSULTATION: LEAD AND COPPER RULE (LCR) REVISIONS
Pam Barr (SRMD), Eric Burneson (SRMD/TAB)

Eric Burneson informed the group that their feedback from the June 2006 meeting has been incorporated into the LCR revisions. He presented the following proposed revisions and their associated issues:

1. Allow systems with fewer than five taps to take one sample for each tap. Issues with this revision include the difficulty in accounting for variability in lead levels

with a small number of samples and the potential to introduce bias with repeat sampling.

2. Revise the definition of compliance and monitoring periods to clarify when actions following an exceedance need to be completed and when triennial samples must be taken (i.e., the routine samples must be taken every 3 years, rather than once in a 3-year period, which allowed a water system to sample in the first year of a 3-year period and then in the third year of the next 3-year period – creating a 5-year period without any sampling).

3. Revise the eligibility criteria for reduced monitoring criteria. This revision would prevent systems from moving to reduced monitoring if they exceed lead monitoring levels, even if these systems are in compliance.

4. Require systems to notify the state prior to making any treatment changes and obtain approval before moving forward with modifications. This would allow states adequate time to consider the impact of changes on corrosion control.

5. Require systems to notify occupants of households at which samples are taken of sample results. This may be difficult for some types of systems (e.g., schools).

6. Revise the public education requirements, including content changes to make information more accessible, changes to the distribution of materials, and provision of additional avenues to reach at-risk populations. Modify statements about lead in annual consumer confidence reports (CCRs).

7. Reevaluate the classification of "tested out" lead service lines if action levels are exceeded.

EPA also requested comments on other issues such as plumbing component replacement, use of Point of Use (POU) and Point of Entry (POE) devices as optimal corrosion control, site selection requirements, and timing of water quality parameter monitoring to determine if additional clarification was needed.

Fifty-six public comments were received, mostly in support of the proposed revisions. Although most commenters preferred the alternative sampling option presented, some wanted to retain the current language and allow states the flexibility to reduce sampling requirements. Commenters supported the concept of advance notification of treatment changes but questioned what will constitute a change of action. Regarding changes to consumer notice, commenters felt that including both the maximum contaminant level goal (MCLG) and action level (as was proposed) would be confusing; they were also concerned about tracking these notices. Most comments were against a mandatory state review of the content and some were concerned that the language would be too alarming and public notification would be burdensome.

They also felt it would be confusing to provide different information for different levels of lead.

In response to a question from **Ms. Surgeon**, **Mr. Burneson** explained that the comments were taken seriously and EPA hopes to promulgate the revisions shortly.

UIC GEOSEQUESTRATION (GS) UPDATE

Steve Heare (DWPD), Anne Codrington (DWPD/PrevB), Bruce Kobelski (DWPD/PrevB)

Mr. Ramaley noted that the issue of geosequestration (GS) of carbon is currently a "hot" topic; he predicts this issue will be a major initiative in the future with widespread impacts.

Mr. Heare agreed that this issue is moving quickly and introduced **Bruce Kobelski**, who gave a presentation on the topic.

Mr. Kobelski provided a brief background on GS and the UIC program, explaining that the Intergovernmental Panel on Climate Change (IPCC) declared that there must be a program to monitor carbon sequestration (this program is the UIC program). Some states have primacy for this program, some have joint programs with EPA, and others are under EPA jurisdiction. There are five classes of UIC wells, one of which is a "catchall" (Class V). There is also the potential to create a new class of wells, which could be tailored to carbon sequestration wells.

There is pressure from the Department of Energy (DOE) to move forward on this issue. Small-scale pilot projects are currently underway, and there is a goal for commercial application to begin sometime between 2012 and 2020. A guidance on experimental wells has been issued to assist in permitting these projects. This document encourages communication, information sharing, and public participation, and presents a clear expectation for outcomes, procedures, and compliance. The goal is to establish the management framework to regulate these wells during the 2007 through 2012 period. Information gathered from the pilot studies will be essential in the development of this framework.

Several workshops on issues related to GS have been held or are planned. A workshop for state regulators of the UIC program was held in January 2007 and concluded that sound data were needed to model impacts and develop risk assessments. A March 2007 workshop on well construction concluded that "we know how to build a well," but more research is required on the viability of wells. A workshop is planned for July 2007 that will focus on the geological considerations for well placement. Another workshop will be held in late 2007 to address additional issues related to GS wells, such as financial responsibility. In addition to these workshops, EPA is continuing to partner with other agencies and organizations to research GS and its impacts on public health.

Next steps for the program include use of upcoming workshops to define technical issues, review of pilot projects, identification of data gaps, and work with the internal GS Workgroup. There is a need to begin developing a management framework so that when commercial projects begin, EPA has a regulatory plan in place. EPA would like to engage an advisory committee to provide recommendations.

Mr. Florquist asked how far carbon dioxide can be transported. Carbon dioxide can be transported long distances, **Mr. Kobelski** replied, although larger amounts transported longer distances require a dedicated pipeline.

John Young asked about the geological requirements for installing GS wells and inquired about what was being monitored in the pilot wells. **Mr. Kobelski** responded that the ideal location for these wells is within a solid geologic formation that does not have potable water. He noted that carbon dioxide is injected as a liquid below 800 meters (and it should be monitored to ensure that it remains in liquid form). There are different goals for different pilot projects, including studies on geologic formations, well design, and well failure.

Mr. Baker stated that the pilot well in Ohio is a deep saline injection (8,000 feet), which is not close to the carbon source. He observed that interest in carbon sequestration has "mushroomed" lately, which has led Ohio to invest millions of dollars to drill another well in an effort to determine how much carbon dioxide the various geologic formations in Ohio can hold. **Mr. Baker** foresees additional interest in this practice and the desire to use it commercially. He added that Ohio has ethanol facilities that discharge large amounts of carbon dioxide.

Mr. Kobelski commented that the commercial interest adds another level of complexity to the issue and that private industry are researching GS on a more aggressive schedule than DOE (some commercial GS projects are already planned). EPA is in communication with the oil and coal industries, which want the regulatory certainty that the projects they are planning will be approved.

Mr. Ramaley stated that he is concerned about the impact of large-scale carbon dioxide injections, explaining that his utility, on the Eastern coastal plain, uses deep saline aquifers as a source. **Mr. Kobelski** acknowledged this concern and said that EPA is currently assessing the nation's geologic formations. There are many areas in the U.S. that would be good locations for GS, he said.

Mr. Baker agreed that there are some deep saline formations with large carbon dioxide capacities in the Western US, although the sequestration capability of other formations is still unknown. He expressed the need for continued research on this topic, especially in regards to enhanced recovery. There are many unresolved questions on this topic, as well as intense political and industrial interests that keep the issue moving

forward; it is going to be a challenge for the regulatory community to "keep up," and states may begin developing their own regulations to address the issues.

Mr. Ramaley reiterated his concern, noting that full-scale projects are under aggressive timelines, some aiming to begin operation in 10-15 years. **Mr. Baker** interjected that some projects are only 5 years away.

In response to a question from **Mr. Florquist, Mr. Kobelski** said that some pilot projects are being implemented through state oil and gas regulatory agencies. If the projects are deep saline projects, they must work through the state environmental agency. It is important, he noted, that all the issues are "put on paper;" this will improve understanding and communication. The guidance document, which was sent to 3,000 stakeholders, is a step in this direction.

Mr. Ramaley stated that this is a topic that the NDWAC needs to keep abreast of for the years to come and recommended that an update on this issue remain on the Council's agenda at least annually.

Ms. Dougherty said that EPA may need an advisory committee to help guide the development of a long-term management framework and any additional regulations that may be required. A NDWAC workgroup could be formed that includes NDWAC members and representatives from the UIC program. This group could also coordinate with existing advisory groups in the air arena.

Ms. Thorpe said she did not know if a NDWAC advisory committee is appropriate for this issue, but she believes there needs to be some method to keep the broader voice of drinking water experts involved in this issue though.

Mr. Ramaley asked if the advisory committee would be just for drinking water issues or for all issues relating to GS.

Ms. Thorpe noted that the issue is so large the drinking water portion may get lost but wants to make sure that it does not. There is also a question of agency responsibility, she said, and asked if there was discussion about moving the program from EPA to DOE.

Brian Wheeler said that the NDWAC does not have expertise in all the areas of complexities of GS, but it is important to keep the drinking water industry involved in the discussion. He related GS to wastewater underground injections, around which unforeseen issues arose.

Mr. Baker said that GS is a large, challenging issue for OGWDW. As long as this issue is under the authority of the Safe Drinking Water Act (SDWA), OGWDW needs to form a workgroup to provide assistance on this topic. The workgroup should have

some linkage to the NDWAC, he said. He also suggested that the Agency come to the Council before any regulatory development.

Ms. Dougherty said that the workgroup should have at least three NDWAC members.

Mr. Baker asked about the scope of the potential workgroup, and **Ms. Dougherty** replied the group would assist EPA in the development of a long-term management strategy for the GS program. The workgroup would provide input on whether existing regulations suffice or if new regulations are required. This discussion should involve DOE, non-governmental organizations (NGOs), as well as drinking water and UIC experts.

Mr. Ramaley commented that this is a significant issue and agreed that a workgroup of some form is needed.

Mr. Owen said that the rapid implementation of technologies such as underground carbon sequestration to address climate change may not recognize other sustainability issues, such as impact on water resources, and thereby create unintended consequences.

Ms. Dougherty reiterated that OGWDW's goal is to protect drinking water and ensure that carbon dioxide injected into wells does not adversely affect water supplies.

WATER SECURITY PROGRAM UPDATE—CONTAMINANT WARNING SYSTEMS, MEASURES, EMERGENCY RESPONSE
David Travers, Debbie Newberry (WSD)

David Travers explained that the Water Security Program, which is voluntary, encourages utilities to adopt water security measures to address risks. He described the key "next steps" for the Program, which are to confirm partnerships, review the overall program strategy, and establish water security priorities. Partnerships are essential and must include mutual accountability and focus on a common agenda with clear expectations. The participation of utilities is also critical to implementing the program and reducing risk. WSD has developed draft water security priorities. These are: response, detection, recovery, and prevention programs.

One of the overarching programs is the Water Security Initiative. The purpose of this initiative is to design a contaminant warning system for the "timely detection and appropriate response to drinking water contamination incidents." Warning systems are currently being piloted. Following the pilots, guidance materials will be developed to aid systems in the adoption of a warning system.

Cincinnati is implementing one pilot system, led by a local utility. The utility has partnered with many local groups and agencies to implement the system quickly; and a

fully operational warning system should be in place in July 2007. From this pilot study, EPA hopes to learn more about the performance of the system (including design limitations), approaches for reducing false alarms; effective consequence management planning; and information about the costs and benefits of developing a system (including dual use applications and sustainability considerations).

Mr. Ramaley commented that his water utility has implemented a "mini installation" of a system similar to the pilot in Cincinnati. He has observed that frequent false positives slow the response time and cautioned that systems should not be so sensitive that they are triggered by natural fluctuations in water quality.

Mr. Travers acknowledged that this is a challenge—it is difficult to develop a baseline that accommodates natural variability, is not triggered too frequently, but remains sensitive enough to detect events.

Ms. Nuzzo asked to what extent the triggers are "rooted in what you can do." **Mr. Travers** replied that determining the routine operation is part of the consequence management plan. A decision tree was developed to deal with events and eliminate false alarms. The first step in the decision tree is to determine whether the event is a true contamination or whether it can be attributed to technical failures.

Ms. Nuzzo suggested that conflict management could set the trigger level and may be more realistic than developing action plans based on arbitrary levels of contamination.

Mr. Ramaley told the group that his system conducted a contamination drill, staging the injection of a contaminant with significant acute health impacts. The water quality panel in place helped define the event and determine the contaminant (although it could not determine the exact location where the contaminant was introduced), but the panel may not have significantly enhanced the utility's response. He commented that the initial reaction of many first responders to the contamination event was to shut down the system; this would have disastrous consequences (e.g., to medical facilities that would no longer have a water supply, fire protection, decontamination). Ultimately, the drill made him question the usefulness of the single water quality panel, he said, given current technology.

Mr. Travers elaborated on the decision tree, explaining that responses are situation-specific. He added that the guidance materials will be designed to help systems make the correct decisions. Also, water systems should not rely only on one data stream (e.g., water quality sensors), but should corroborate evidence from other data sources to form a "suite of detection capabilities."

Mr. Ramaley noted that the sensors and the WaterISAC contaminant database allowed them to identify the type of contaminant, but this could also have been done by the emergency health response agencies that responded to the first victims

(although it may have taken more time to determine that the contaminant came from the water system). **Mr. Travers** agreed that there are other methods to identify contamination events.

Mr. Ramaley said that the goal is for water systems to have early warning detection devices to increase public health protection.

Mr. Travers continued with his presentation, describing the water security goals and product schedule for 2007. These goals include issuing a request for additional pilot grants, interim guidance on the design of water security systems, and interim guidance on Consequence Management Plans. He concluded with a brief discussion of the water security budgets for 2007 and 2008, which include grant money for the pilot projects.

Debbie Newberry then described the roles of two Critical Infrastructure Advisory Partnership Councils (CIPACS) that work in partnership to provide guidance on key resource protection activities. The Sector Coordinating Council (SCC) is self-governing and represents many different sectors (including drinking water and clean water utilities of varying sizes). The Government Coordinating Council (GCC) is the government counterpart to the SCC and is composed of members from government agencies, states, and other associations. The GCC meets quarterly and also meets periodically with SCC. Council meetings are exempt from FACA requirements.

There is also a CIPAC workgroup on metrics. This workgroup has two objectives: (1) updating the "14 Features" of an active and effective security program; and (2) finalizing a national performance measurement system to track progress on security risk reduction that is aligned with and supports the goals and objectives of the water sector. A key modification to the 14 Features is to modify the approach so that it adequately captures all hazards (i.e., not just terrorists). WSD's ultimate goal is to begin collecting data on measures by 2008.

Emergency response mechanisms are another focus of WSD. A key component of these mechanisms is mutual aid and assistance. There is also an effort to define the role of the water sector under Emergency Support Function-3, Public Works and Engineering.

Mr. Taylor stated that while he believes WSD is moving in the right direction, he does not believe that public decision makers are convinced that water system security is worthy of their resources and attention. Time should be spent thinking about how to communicate the importance of this fundamental issue to the decision makers. He noted that the U.S. Department of Homeland Security (DHS) grant money is awarded to those DHS perceives as "first responders" (e.g., police), and as they do not view utilities as first responders, they do not see value in spending money to support utility efforts.

Ms. Dougherty agreed that it is important that staff responsible for emergency responses at the government level have an understanding of the importance of water and water security. She urged people in the drinking water industry at the state level to educate their local and state governments so they will identify water security projects as a priority.

Mr. Taylor said the industry is trying to communicate on this issue, but the public decision makers are not yet committed.

Ms. Dougherty mentioned the American Waterworks Association (AWWA) campaign, Only Tap Water Delivers™, which strives to communicate the importance of water infrastructure.

Mr. Baker said that EPA's approach to security from an "all hazards" standpoint is important. He inquired about the timeline for the development of the measures, which seems aggressive, and about the baseline for the measures.

Ms. Newberry said that the baseline is still being discussed. In terms of timing, the goals and objectives for the measures have been defined and the revisions of the 14 Features are almost complete.

Ms. Dougherty commented that the ultimate question—are systems more secure now?—can only be answered anecdotally. The industry needs to demonstrate the effect of a voluntary approach.

Ms. Beardsley stated that developing measures is an important and complicated issue, and the timeline for developing measures may need to be expedited.

Mr. Ramaley said that, without question, water systems are more secure now than they were 5 years ago, but conceded that it is difficult to measure this progress.

DAY 2 (May 24th)

EMERGING ISSUES—OVERVIEW

Mr. Ramaley explained that the day's agenda focused on two areas within the umbrella of emerging issues: climate change and emerging contaminants. He noted that he previously chaired the AWWA Research Foundation (AwwaRF) Research Strategy Committee. This committee was tasked with determining the issues of most importance and strategic value for the drinking water community to focus drinking water research initiatives. Two of the three initiatives identified by the Committee were climate change and emerging contaminants. Both of these topics are

controversial and are being actively discussed. The intent of the day's sessions is to describe the Office of Water's (OW's) and utilities' efforts on these issues, and what EPA can do to help utilities address these issues.

EMERGING ISSUES: ADAPTING TO CLIMATE CHANGE
Elizabeth Corr (DWPD), Dennis Diemer (EBMUD)

Elizabeth Corr explained that the National Water Program (NWP) Climate Change Workgroup was formed to develop a climate change strategy for oversight of water programs following a memorandum from Ben Grumbles to the office directors. The Workgroup is chaired by Mike Shapiro and has representatives from all OW offices, the Office of Air and Radiation (OAR), the Office of Research and Development (ORD), and Regional water programs.

There has been a quick learning curve on the development of the NWP climate change strategy, and the workgroup is beginning to hold listening sessions with stakeholders, including representatives from industry and government. The workgroup must first examine the impacts of climate change on water resources. Next, the workgroup must address responses to change impacts. Possible responses include mitigation, adaptation, and research.

Dennis Diemer then gave a presentation on the steps his utility, East Bay Municipal Utility District (EBMUD), is taking to analyze, mitigate, and adapt to climate change impacts. EBMUD has used models to analyze the impact of climate change on water supply availability, flood control and storage, operational reliability, and water quality. To determine the effect on water supply availability, EBMUD focused on anticipated changes in snowpack and runoff patterns. A key finding was that more runoff is predicted earlier in the spring, which may necessitate the release of water for flood control. This in turn will reduce the reservoir's holdings later in the season when water demands are high (summer demands may also increase with predicted temperature increases). Also, more frequent and intense storms and sea level rise attributable to climate change would threaten EBMUD's infrastructure. Water quality would also be affected by climate change impacts such as damaged infrastructure, increased water temperature, and increased storms.

EBMUD's response to climate change is multifold, including adaptation and mitigation. Specific responses include increased promotion of water conservation, diversification of water supply, and efforts to reduce the utility's carbon footprint. To reduce emissions, EBMUD has adopted a renewable energy policy to increase the use and development of renewable energy sources. Specific efforts include hydroelectric generation, biogas cogeneration, resource recovery (R2) renewable power, solar power generation, natural gas microturbines, and the "greening" of EBMUD's vehicle fleet. EBMUD's goal is to reduce emissions to 1990 levels by 2010. EBMUD plans to

continue to work toward these goals with future efforts such as the conversion to full-scale biodiesel and expansion of the biogas power generation program.

Mr. Florquist commented that, in some areas, the international water law must be considered when analyzing climate change impacts (e.g., reduced snowpack) to ensure that water is properly distributed. He added that, in his experience, snow fences, although expensive, can be successful in extending runoff periods.

Mr. Diemer said that EBMUD has focused on logging practices in the watershed, as aggressive harvesting impacts runoff.

Mr. Taylor asked Ms. Corr if WSD has considered partnering with other agencies, such as the U.S. Geological Survey (USGS) and the U.S. Army Corps of Engineers (USACE), for expertise on hydrogeological issues related to climate change.

Ms. Corr replied that partnership on this topic has been considered but noted that hydrogeological issues are a small piece of the whole picture. EPA is currently working with OAR and ORD, but also trying to expand partnerships on climate change.

Because of the magnitude of this issue, **Mr. Taylor** encouraged cross-agency collaboration.

Mr. Ramaley noted that state agencies could also be engaged in collaboration efforts.

Ms. Surgeon thanked Mr. Diemer for a great presentation. Water conservation programs are very important, she said. She asked if EBMUD encourages conservation through its pricing structure and if they partner with other utilities to protect their watershed.

Mr. Diemer responded that EBMUD has a tiered pricing system with three rates. The rate structure is based on the average indoor and outdoor water use. The tiered system, which was controversial when it was started 10-12 years ago, is now supported by the community and has improved water conservation, especially in the summer. EBMUD also offers its customers a free water conservation survey that checks for leaks and other inefficiencies. EBMUD has an ongoing education program, and the utility works with the city on landscape ordinances to ensure that the landscape is conducive to water efficiency.

Mr. Diemer continued, explaining that the district owns roughly half of the watershed. The remainder is owned by timber companies and small cities within the watershed. EBMUD actively works with the timber companies so that their harvesting does not adversely affect water quality or supply.

Mr. Ramaley asked if the rate structure is applied to residential and commercial consumers, and **Mr. Diemer** replied that it is mostly for residential consumers. Large commercial consumers are given "custom water budgets" that tell them how much water they should be using, but there is no mandatory rate differential.

Mr. Gelting commented that CDC is "ramping up" its climate change work, including some work related to water issues, and suggested that CDC and EPA work together on water-related climate change issues.

Ms. Dougherty commented that EBMUD's energy conservation work is fascinating. She noted that according to various estimates, the amount of energy used for drinking water and wastewater-related uses is not an insignificant portion of national energy consumption. However, this energy use does include expenditures related to pumping and heating water in the home, which can be large. She asked if California has researched the energy use related to drinking water and wastewater in their state.

Mr. Diemer confirmed that California has researched the cost of moving water, which resulted in a large percentage of the state's total energy budget.

Mr. Florquist added that many drinking water and wastewater plants were constructed when electricity was inexpensive and, as a result, some plants require lots of pumping.

Mr. Ramaley said that California is an interesting case study because much of the water used is moved a long distance in the state. Water sources tend to be at a high elevation, which generates power, he noted. He is surprised that utilities are just now becoming aware of the climate change impacts on their system. Historically, water supply planning and design has looked to the past as blueprint for the future. This design philosophy no longer works however, as the climate is changing. Many climate change impacts affect drinking water—anything that impacts weather also affects the hydrogeological cycle, which in turn affects surface water and groundwater. Also, saline gradients change in coastal water bodies as the ocean level rises, and more intense weather events could challenge the sustainability of infrastructure. **Mr. Ramaley** emphasized that because each situation is unique, there is no "cookie cutter" response to the issue. He encouraged EPA to adopt a broader perspective to climate change impacts (e.g., demand changes, service level impacts).

Mr. Owen said that the climate change strategy incorporates many elements of a communication dialogue. It is important to provide a very clear and compelling case about what the issues and problems are. EPA should strive to provide clarity in the communications process in order to better reach policymakers with a less scientific background.

Mr. Young stated that the changing weather patterns are affecting the design of water infrastructure. His company is now designing reservoirs around a 100-year drought, rather than a 50-year drought. He commended EBMUD's commitment to reducing its carbon footprint, but noted that, given changes in treatment requirements and the increased need to move water, it is an achievement just to maintain a constant energy use. Given these realities, goals for reducing emissions should not be too aggressive. He also stressed the importance of water conservation in reducing energy consumption.

Ms. Dougherty said that systems's ability to treat water and meet standards may be impacted by climate change due to changes in water quality and availability. Historically, energy consumption has not been factored into the development of drinking water standards, although it may need to be considered in the future.

Mr. Ramaley added that disinfection and membrane technologies are often temperature dependent. There are also microbiological concerns related to temperature changes.

Ms. Nuzzo shared that when she worked for the City of Cambridge in the 1990s, the city was looking at the impact of climate change on a local level. The City performed energy inventories (the majority of emissions were related to electricity use) and developed plans to reduce energy consumption. She encouraged utilities to work with local jurisdictions to create tailored approaches to climate change.

Mr. Baker noted that, in Ohio, there is now more freedom to discuss climate change issues than there had been a few years ago due to an administrative change in the Ohio EPA. He encouraged the environmental community to take advantage of this new opportunity for dialogue. The national focus on climate change can also be used as a driver for other initiatives such as water resources management and sustainable infrastructure (SI). Water resources should be considered when planning development, he added.

Ms. Surgeon told the group that New Mexico has been discussing climate change for some time already. Because the state has been experiencing changes in snowpack, New Mexico is working to move small communities away from surface water and toward groundwater sources (with deep wells). Deeper wells increase energy costs because of added pumping, however. She noted that small communities do not have the resources to implement energy saving programs.

David Saddler said that public utilities should factor effective load management into their programs. He noted that his system is the largest consumer of electricity in his community. In terms of water rights, he recommended working with tribes as the dynamics will change if they begin to exercise their water rights (e.g., if the Navajo exercised their water rights to the Colorado River, it would reduce or eliminate that

source of water in Arizona); this is an issue of particular importance for Las Vegas and Southern California. He thinks the drinking water industry will change in the future (e.g., move toward dual systems), noting that only two percent of the current water consumption is for domestic uses.

Mr. Ramaley told the group that he recently visited Amsterdam with AwwaRF. Dutch residents pay approximately 150 percent more for water (per unit volume) than Americans but typically use 40 percent as much water in the home on a per capita basis.

Ms. Thorpe said that the potential impacts on consumers associated with working to reduce the carbon footprint needs to be considered; it is important to ensure that the water provided continues to meet water quality standards.

Mr. Ramaley noted that fire protection requirements do not decrease with a reduction in per capita consumption. Increased fire protection requirements necessitate pipes with larger carrying capacities, which can increase water holding time, lowering water quality.

Mr. Diemer stated that he has a white paper that coincides with his presentation and offered to distribute copies of the paper and his presentation to those interested. He clarified that EBMUD's goal was to reduce energy to 1990 levels, articulated as a 20 percent reduction over a specified baseline.

EMERGING ISSUES: ADDRESSING EMERGING CONTAMINANTS
Suzanne Rudzinski (OST), Pamela Barr (SRMD), Ed Ohanian (SRMD)

Mr. Ramaley stated that he thinks of emerging contaminants as a constant issue, rather than an emerging one. **Suzanne Rudzinski** concurred that emerging contaminants are both an emerging and constant issue.

Ms. Rudzinski noted that there is no concrete definition of contaminants of concern. However, the problem of emerging contaminants is increasing as more chemicals enter the environment and detection limits decrease, allowing more contaminants to be detected than ever before. Within the large universe of contaminants, contaminants of emerging concern that have been identified include endocrine disruptors, pharmaceuticals and personal care products (PPCPs), pesticides, flame retardants (PBDEs), Perfluorooctanoic Acid (PFOA) (which is in Teflon), prions, and nanomaterials. There have been several federal efforts to reduce the presence of pharmaceuticals in water supplies, including "do not flush" guidelines and pilot studies on drug take-back programs.

OW is coordinating both within EPA and across agencies on the issue of emerging contaminants. OW is continuing to identify potential contaminants of concern and

obtain more information on them. There are three OW studies underway related to emerging contaminants: the National Pilot Study of PPCPs in Fish Tissue, the Publicly Owned Treatment Works Study, and the National Targeted Biosolids Survey. Within EPA, the Clean Water Act (CWA), the SDWA, Resource Conservation and Recovery Act (RCRA), and the Food Quality Protection Act (FQPA) comprise the statutory framework for issues related to contaminants of emerging concern. Under the CWA, efforts are underway to reduce the discharges of emerging contaminants into the environment.

Ms. Barr elaborated on the CCL3, a major activity on emerging contaminants under SDWA. Every 5 years, EPA is required to develop a list of unregulated contaminants that are known to occur in public water supplies and may require regulations. EPA must decide whether to regulated five contaminants on the list. A detailed selection process is used to reduce the broad universe of potential contaminants (which must occur in drinking water and have the potential for adverse health effects) to the CCL. Models are developed to examine the severity of health effects of chemical contaminants, while microbial contaminants are scored based on health and occurrence attributes. Through a notice in the Federal Register, the public was allowed to nominate potential contaminants for the third CCL, and 174 nominations were received in total. The preliminary CCL is scheduled to be finished in February 2008; the final contaminant list will be finished in 2009.

Next, **Ms. Barr** discussed the six-year review of the National Primary Drinking Water Regulations (NPDWR), which was established by the 1996 SDWA Amendments. Any revisions as a result of these reviews must maintain or enhance public health protection. The six-year review protocol was developed based on NDWAC recommendations. The review protocol contains a series of reviews, including a health effect review, an analytical method review, a treatment technology review, an occurrence review, and other regulatory revisions. After the review of 69 NPDWRs (completed in 2003), the decision was made to revise the TCR.

EPA also has the authority to establish health advisories based on estimates of acceptable levels for a chemical in drinking water. Although these levels are not legally enforceable, they can provide guidance for states and utilities.

She then gave an update on the Unregulated Contaminant Monitoring Program 2 (UCMR2) under which EPA can collect information on up to 30 potential contaminants. Twenty-five contaminants are included in the final rule, including some emerging contaminants.

Ms. Rudzinski then gave the group a brief update on the White House Committee on Environment and Natural Resources and Interagency workgroups. The Pharmaceuticals in the Environment (PiE) Workgroup involves many different agencies, including EPA, and is working to identify the behavior of pharmaceuticals in

the environment. The Endocrine Disruptor in the Environment Workgroup also involves many different agencies and is tasked with developing a framework for federal research on this topic, including identification of research gaps.

Next steps in the emerging contaminants arena are to fill the many data gaps, define emerging contaminants, and determine research priorities.

Mr. Grunenfelder commented that the CCL process is systematic, but time consuming. He asked if there is pressure to regulate emerging contaminants that receive a lot of press outside of the CCL process.

Ms. Barr replied that the CCL is data-driven, but acknowledged that there are some outside pressures, especially in terms of regulation development. **Ms. Dougherty** added that there is pressure to make decisions outside of the CCL process, stating that there is political pressure to regulate perchlorate and MTBE.

Mr. Baker asked about discharges to groundwater related to on-site disposal and noted that there is some research in Ohio on the incidence of microbial contamination related to on-site disposal. He cited one study of a large manufactured home community that disposed effluent from their plant into a surface lagoon with no surface water discharge; in this case, no microbial impacts on the water supply were found, but pharmaceuticals were found. He stressed that groundwater is a potential pathway for contaminants and asked that it be put on the agency's radar for potential research. **Ms. Dougherty** agreed that this is an important issue and noted that there is some ongoing research on on-site wastewater disposal.

Mr. Florquist asked how many contaminants have been on the CCL historically. **Ms. Barr** replied that CCL1 had roughly 60 contaminants, CCL2 had roughly 50, and she anticipates a similar size for CCL3.

Regarding information gaps, **Mr. Taylor** asked if EPA has considered using other sources (e.g., industry) to fill the gaps. An issue with this, **Ms. Rudzinski** said, is whether EPA has the authority to require this information. FDA can require environmental assessments for new pharmaceuticals, but only if a relatively large quantity is expected to appear in water; almost no pharmaceuticals have triggered this level.

Mr. Taylor encouraged collaboration between FDA and EPA on emerging contaminants, stating that it could improve the data available for drinking water risk assessments.

Mr. Wheeler stated that public health impacts are more pressing than environmental impacts and advocated removing contaminants from the environment before they impact drinking water. He also noted that water recycling is becoming increasingly

prevalent in Florida, which can cause contaminants to accumulate if they are present in the recycled wastewater.

Ms. Dougherty added that the practice of water recycling is another important issue. **Mr. Wheeler** noted that Florida is trying to promote reused water and as a consequence has low standards for recycled water.

Mr. Simon stated that although initial source water assessments have been completed at all systems, reassessments may be necessary to assess emerging issues and contaminants.

Mr. Baker agreed that through assessments states can help identify potential sources of contaminants, though they may not be able to pinpoint the source of PPCPs. Previously, assessments have focused on microbial contaminants, he noted.

Mr. Owen asked how stakeholders outside of federal agencies fit into the workgroup approach. **Ms. Rudzinski** replied that, currently, the workgroup is only a federal effort. She explained that EPA does want to leverage research conducted by outside groups with similar concerns though.

Ms. Barr noted that ORD is updating its plans for research on drinking water, water quality, and human health. EPA is working with ORD to identify the most important research topics. EPA is also working with AwwaRF on ways to incorporate their research.

Mr. Gelting agreed that more research is needed on groundwater issues beyond transport, specifically on the human health effects. He cited preliminary results that found that on-site systems and private wells have higher levels of exposure to contaminants (although those exposed do not always get sick).

Ms. Beardsley asked about the schedule for regulatory determination on perchlorate. **Ms. Dougherty** replied that more research is required before a determination can be made. Data could come from a variety of sources, including biomonitoring studies (which are being conducted by CDC). EPA is moving quickly on this issue and hopes to publish the preliminary recommendation in early fall 2007.

Mr. Baker asked for an update on PFOA, and **Ms. Dougherty** replied that the Office of Pesticides Programs is the lead agency on this. OGWDW considered including PFOA in the UCMR2, but ultimately did not. There is ongoing work on the PFOA risk assessment and determination of action levels. **Ms. Barr** added that ORD is continuing to work on the analytical method. There are issues with cross-contamination that confound measurements.

UPDATE ON MEASURES SUBGROUP
Valerie Blank (SRMD) and Yu-ting Guilaran (SRMD)

Mr. Ramaley introduced the session by reminding the group that the NDWAC Performance Measures Subgroup, which met yesterday (May 23rd), is scheduled to expire in June 2007.

Ms. Guilaran explained that, currently, measures are compliance based, but EPA is trying to move towards health-based measures. SRMD hopes to include a health-based outcome measure in EPA's 2009-2013 strategic plan. SRMD is developing a white paper that frames the issue, approach, and data gaps associated with the development of this performance measure. The measure language, baseline, and algorithm must be finalized by May 2008.

The development of a measure fits into a risk management paradigm that spans from the health outcome goal to regulatory compliance. Available data decreases moving from compliance data to data on national illnesses linked to environmental contaminant exposure. EPA is exploring using total trihalomethanes (TTHMs), arsenic, and microbial pathogens as potential measure of occurrence. Two different approaches can be used to measure occurrence: an aggregate approach and a contaminant-specific approach. These will be explored in the white paper.

Generally, the subgroup supported EPA's work on performance measures and is looking forward to reviewing the paper in August 2007.

Ms. Surgeon commended the diagram that Ms. Guilaran presented, explaining that it is useful for small systems to see the connection between compliance and public health.

Mr. Baker, a member of the subgroup, said that EPA's work on this topic is encouraging and reflects the subgroup's recommendations. He motioned that the Performance Measures Subgroup be extended through June 2008, and **Mr. Florquist** seconded the motion

Vote on original motion – 17 yea, 0 nay, 0 absent. Motion carries.

Mr. Gelting commented that outbreaks are underreported. He added that CDC is working on an estimate of the incidence of acute gastrointestinal illness (GI) attributable to drinking water, noting that there are few outbreaks of this type.

Ms. Guilaran replied that EPA is working with CDC on the development of measures. EPA is using data in addition to the occurrence of outbreaks, such as studies on the correlation between treatment changes and illness.

Ms. Nuzzo asked how CDC is separating illnesses attributed to food with those attributed to water. **Mr. Gelting** responded that he is not familiar with the details of the study.

Mr. Ramaley commented that a rigorous methodology is being used to characterize GI illness. EPA is extrapolating data on GI illness attributed to drinking water from a study of a Canadian community conducted by Pierre Payment to estimate the number of illnesses in the U.S. that can be attributed to drinking water. The subgroup agreed that this methodology was scientifically defensible, although it may not be accurate.

Ms. Guilaran agreed that there are uncertainties with this approach; these will be explored in the white paper.

Mr. Ramaley added that there are also significant underlying assumptions. The method may work to develop a performance measure, but it would not suffice for regulatory development.

Mr. Saddler asked if the study differentiates between water system types. **Ms. Guilaran** replied that the study is based on public water systems (PWSs).

BEN GRUMBLES CHAT
Ben Grumbles, Assistant Administrator of Water

Mr. Ramaley introduced **Ben Grumbles**, the Assistant Administrator for OW and asked the Council to briefly introduce themselves.

Mr. Grumbles welcomed the members and said that he has been in a political appointee position at EPA for five years mostly in water programs. He praised the NDWAC's work and expressed his gratitude for their commitment on key issues. He explained that he had just come from a tour of the Fairfax, Virginia water system where he was learning more about water security efforts, treatment enhancements (he visited a new ozonation facility), emerging contaminants, and other issues (e.g., finance). He told the group that he has also been discussing climate change issues with the Minister of the Chinese Environmental Protection Administration. The Chinese government is planning a trip to the U.S. and they are especially interested in source water protection. After their visit and the Beijing Olympics, an international conference focusing on source water protection will be held.

Mr. Grumbles said he was impressed with the range of topics and priority issues on the Council's agenda. The priorities of this Administration in its remaining years are: homeland security, including water security; clean energy/climate change; strengthening the Agency workforce; and water infrastructure, including changing the public perception and value of infrastructure. To further the infrastructure priority, EPA is actively promoting the Four Pillars of Sustainable Infrastructure and

innovative financing. He stressed that priority needs to be placed on working with partners at the utility and state level to advance sustainable infrastructure. There also needs to be a focus on security, as infrastructure cannot be sustainable without security, and an emphasis on the regulatory front. Another focus is on emerging contaminants that may require regulations, such as perchlorate and endocrine disruptors. EPA is working with OST to get more information on these contaminants that can be used to inform decisions. AwwaRF is also investing in research on PPCPs. EPA is constantly pursuing emerging contaminants, he said, and has an overall goal of responding quickly and appropriately to these issues.

Mr. Grumbles referred to the NWP Climate Change workgroup, which can help respond to growing questions and concerns from drinking water utilities about climate change impacts.

Mr. Diemer noted that the Council discussed water conservation tactics during their session on climate change and asked Mr. Grumbles for an update on the WaterSense Program.

Mr. Grumbles said that he is aware of the emphasis that Mr. Diemer's system, EBMUD, places on water efficiency. EPA is utilizing mitigation, adaptation, and research in its approach to climate change. The WaterSense labeling initiative was launched as part of this effort. **Mr. Grumbles** reported that the initiative is growing; he hopes that the WaterSense label will appear on high efficiency toilets (these use less than 1.3 gallons of water and perform as well or better than less efficient competitors) before the end of 2007. The Watersense program is also focused on irrigation, both commercial and residential. The program is working to label sprinkling systems and certify landscape professionals.

Part of the mitigation of greenhouse gas emissions is connecting water efficiency and energy efficiency in the minds of the public. One alarming example of their connection is the fact that a faucet left running for five minutes uses the energy equivalent of leaving a light on for 14 hours. According the EPA's air and Energy Star programs, roughly eight percent of the nation's total energy demand is used to heat, treat, and pump water. Water efficiency is a large part of the climate change discussion, and **Mr. Grumbles** hopes to continue the Agencies efforts to improve efficiency.

Mr. Ramaley commented that the focus of many of the meeting's previous discussions have tied to SI.

Mr. Baker added that he is encouraged by the elevated level of public attention given to climate change. He appreciates the Agency's efforts and research initiatives that build on this momentum. He encouraged EPA to move as quickly as possible to develop regulations within the UIC program on the issue of carbon sequestration,

noting that in some states there is considerable pressure to move forward with this practice.

Mr. Grumbles said that carbon sequestration is one component of the greenhouse gas mitigation strategy and stated that this administration is "intensely interested" in this practice. OW is busy identifying the issues surrounding the practice and charting a path forward. Outreach and the incorporation of input from stakeholders are also important.

Mr. Taylor said that the movement towards health outcomes as performance measures is important. Based on earlier presentations at the meeting he believes EPA is on the right track although it will take time to fine-tune and implement the new measure. He asked that the Agency not lose sight of the importance of this issue, which will set the direction for regulatory approval in the future.

Mr. Ramaley concurred that the new performance measures will have a lasting impact. He thanked Mr. Grumbles for his interest in the Council and his dedication to the drinking water community.

Mr. Grumbles said he is eager to hear the outcome of this NDWAC meeting. He noted that there are additional issues outside of those on the agenda that OW is focused on and grappling with; one of the most challenging of which is affordability. OW is aware of affordability concerns and the unintended impacts of an affordability methodology and is committed to responding to concerns about this issue. He recognized that there are other tools and tactics to addressing affordability, such as consolidation and increasing technical, managerial, and financial (TMF) capabilities. The LCR revisions and the development of the ADWR are other important issues for the Office.

WATERBORNE DISEASE: ACTIVITIES TO IMPROVE OUTBREAK SURVEILLANCE, INVESTIGATION, AND REPORTING

Yu-ting Guilaran (SRMD/SRRB), Richard Gelting (CDC), Rebecca Calderon (ORD)

Ms. Barr introduced this session, mentioning that there are collaborative efforts underway to improve outbreak surveillance. She introduced **Rebecca Calderon**, the acting Director of the Office of Science Policy in ORD, and explained that **Mr. Gelting** will discuss the transition to an electronic outbreak reporting system.

Ms. Calderon began her presentation on the status of the waterborne disease outbreak surveillance system, which is a joint effort by EPA and CDC, by discussing the differences between epidemics, or outbreaks, and endemic diseases. Outbreaks are defined as incidences in which "at least two persons experience a similar illness after ingesting or using water intended for drinking or after being exposed to, or

unintentionally ingesting or inhaling, fresh or marine water used for recreational purposes."

The current waterborne disease surveillance system is volunteer-based, relying on reporting from the states. This passive system leads to problems of underreporting and inconsistency. Outbreaks are then evaluated based on their epidemiological and environmental components and put through a quality assurance process. Over time, the total number of outbreaks has decreased as contaminants have been regulated. The percentage of reported outbreaks attributed to unknown factors has decreased and a higher percentage of outbreaks are now attributed to individual water supplies.

Several changes were made to the surveillance system for 2003-2004 such as adding "bottled water" as a system type, changing the classification of acute gastrointestinal disease to "unknown," and reporting deaths. The most prominent change was in the categorization of deficiencies, which were expanded to include treatment and distribution system deficiencies and consumption of water not intended for drinking. Outbreaks of legionellosis were added in 2001; this addition has had a significant impact on the bacterial component of the system. Changes to the system are ongoing as EPA and CDC work with the Council of State and Territorial Epidemiologists (CSTE). A joint CDC/EPA workshop on the surveillance system will be held in 2007.

Ms. Surgeon asked for clarification on the meaning of the term "deficiency," to which **Ms. Calderon** replied that deficiency refers to the cause of the outbreak. As outbreaks are reported, they are evaluated and assigned a category. She added that the new reporting forms will ask for environmental information, which will help determine the cause of the outbreak.

Mr. Florquist asked if the deficiencies could be tied to SDWIS. **Ms. Calderon** answered that when the electronic system is implemented, outbreaks will be tied to SDWIS.

Mr. Young asked if it would be possible to add Legionella to the historical data; **Ms. Calderon** confirmed that this is possible.

Mr. Baker noted that the new forms allow for unknown causes and asked if they also allow for multiple causes. **Mr. Calderon** said there is now a category for "mixed" causes.

Ms. Nuzzo asked if information was being captured on the potential exposure of wastewater workers to the flu. **Ms. Dougherty** said that wastewater workers are identified as a high priority population for receiving vaccines. **Ms. Nuzzo** noted, however, that a vaccine is not valid until an outbreak is underway, in which case the workers are likely to already be affected.

Ms. Calderon noted that there could be pilots to monitor sewage as a first indicator of an outbreak. **Ms. Nuzzo** clarified that her question concerned waterborne disease transmission to plant workers, not the general public.

Mr. Ramaley stated that he had received questions from a variety of perspectives about the airborne transmission of contaminants from fecal matter due to the high volume of waterfowl around treatment plants and reservoirs.

Mr. Saddler asked if medical service providers provide data on outbreaks. **Ms. Calderon** responded that this information comes from the state. She acknowledged that there are pitfalls in the system (e.g., it is difficult to determine the cause of an outbreak). Overall though, the system has provided useful feedback for the drinking water industry. She referenced the Milwaukee cryptosporidiosis outbreak, which resulted in increased research on the disease.

Mr. Gelting added that the surveillance system is useful in that it provides health-based outcomes. Currently the process is open-ended, but efforts are underway to improve surveillance. **Ms. Dougherty** added that there are now roughly 30 outbreaks annually that are attributable to drinking water, with two times as many outbreaks attributed to recreational water use.

Mr. Saddler said that health workers need to ask the right questions so that the correct cause of the outbreak is reported. **Mr. Gelting** agreed and explained that the system is heading toward obtaining environmental data on what contaminated the water that caused the outbreak.

Mr. Gelting then gave an update on the Environmental Health Specialist Network (EHS-Net) project. EHS-Net is a collaborative project among CDC, EPA, and the states to improve detection, reporting, investigation, and, ultimately, prevention of waterborne disease. EHS-Net is the next stage in the waterborne disease outbreak surveillance system, which underreported outbreaks. Impediments to the current surveillance system are that it is voluntary, passive, paper-based, and underfunded.

EHS-Net was started in 2005 as a pilot in New York and has since expanded to other states. The program is funded from various sources inside and outside CDC (including EPA OW). In the initial states involved, the implementation of EHS-Net resulted in increased reporting of outbreaks, often resulting in unreported historical outbreaks being "found." Accurate data are contingent on communication and helps ensures that information is reported "up the line." Outbreaks associated with drinking water in the US have decreased over the past 30 years as prevention increases. It is important to acknowledge that there are a number of steps between inputs into EHS-Net to long-term outcomes.

Ms. Nuzzo asked why there has been limited funding for this effort and inquired about incorporating this system with other measures of water protection. **Mr. Gelting** replied that the project was not a priority in the past.

Ms. Nuzzo encouraged the health community to collaborate with the WSP on health outcome measures.

Mr. Ramaley said that increased monitoring will be a useful tool for the future, but may create initial confusion as historical data are pursued.

Mr. Florquist appreciated CDC's efforts to obtain information on waterborne disease outbreaks. He noted that he has experienced firsthand the lack of communication between physicians and health authorities at the county or state level.

Mr. Gelting said it is essential that healthcare clinicians report outbreaks. He noted that their first reaction is often to blame events on food poisoning. Education is needed to change the mindset of healthcare workers.

Mr. Baker asked if data on the occurrence of acute GI illness are available, and **Mr. Gelting** replied that these data are available. CDC is now working on determining the causes of these illnesses.

EMERGING ISSUES: USING BIOMONITORING DATA FOR RISK CHARACTERIZATION
Beth Doyle (SRMD/TAB), Eric Burneson (SRMD/TAB)

Mr. Ramaley said that recently there has been a lot of interest in using biomonitoring data for risk assessments. Although perchlorate is not one of the contaminants under the UCMR2, EPA is conducting a detailed review to determine if perchlorate should be regulated. Biomontoring data may be utilized in the regulatory determination.

Mr. Burneson explained that the Agency is considering utilizing biomonitoring data in rule development.

Beth Doyle then presented an overview of biomonitoring to the group. Biomonitoring is defined broadly as a "method for assessing human exposure to chemicals by measuring the chemicals or their metabolites in human specimens." Historically, EPA has used biomonitoring to provide data on a number of different initiatives, including exposure to lead and nicotine. Key attributes of biomonitoring data are that it provides a direct measure of an internal dose, integrates exposures from all sources, and reflects the exposure pattern of the sampled population.

Mr. Ramaley remarked that integrating exposure pathways could also be perceived as a weakness because it is difficult to determine the source. **Ms. Doyle** agreed, but said

that it is beneficial in that it shows the body's reaction to the exposure. She agreed additional studies are often required to determine the exposure source (e.g., studies utilizing a reference population or a comparison of populations with known exposure differences).

Ms. Doyle continued, explaining that a key issue is how to communicate and interpret biomonitoring data, as exposure does not necessarily have an adverse effect.

Mr. Ramaley asked if the presence of a contaminant varies with the medium examined. **Ms. Doyle** answered that it is difficult to determine the source and timeframe of exposure for chemicals that bioaccumulate. Other chemicals, such as perchlorate, are not metabolized by the body. It is essential to understand the characteristics of the chemicals when analyzing biomonitoring data.

Ms. Doyle continued her presentation, explaining the limitations of biomonitoring data, which include the difficulty involved in extrapolating data across age groups and determining the source of exposure. It is also essential to have a strong biomarker that will be used to measure the presence of a chemical. The strongest type of biomarker is a "parent" that can be measured in terms of presence/absence. Although biomonitoring data can provide the exposure component of a risk assessment, it must be paired with a metric of hazard. In addition to estimating risk, these data can be used to measure the impacts of regulatory activities, monitor emerging contaminants of concern, and identify variations in exposure. She concluded with a summary of the recommendations from a 2006 National Academy of Science (NAS) report on biomonitoring, which encouraged the utilizing biomonitoring data in conjunction with epidemiology studies; collaborating data collection with across states, countries, and agencies; and the development of representative and probabilistic study designs.

Mr. Burneson reported that EPA is in the middle of the comment period on using biomonitoring in a future regulation on perchlorate. He distributed extracted pages from the Federal Register notice on this topic and directed the group to key pieces of information in the notice that relate to biomonitoring.

Mr. Ramaley asked if ingestion is the only significant route of exposure for perchlorate. **Ms. Doyle** confirmed that ingestion is the most prominent exposure pathway, however exposure may also occur through inhalation of the contaminant in the shower.

Ms. Thorpe said that perchlorate seems to be a good candidate for biomonitoring. **Ms. Doyle** agreed, citing that perchlorate does not bioaccumulate.

Ms. Thorpe then asked if the lack a lack of chemicals or nutrients in the body could also signal problems. **Ms. Doyle** agreed that a lack of micronutrients could signal a problem.

Mr. Ramaley followed up, asking if the lack of a biomarker signifies a lack of exposure. **Ms. Doyle** replied that this is not necessarily the case as many factors affect the body's reaction to chemical exposure. **Mr. Burneson** added that this is why other data sources in addition to biomonitoring are required.

Mr. Gelting thanked Ms. Doyle for an excellent overview and asked if it is easy to find native populations to compare to exposed populations. **Ms. Doyle** replied that it depends on the chemical being studied (e.g., it is easier to find populations that have not been exposed to a specific pesticide).

Mr. Owen asked how well the metabolic process within the body is understood for different chemicals. **Ms. Doyle** said that there is considerable variability, although the behavior of perchlorate is well understood.

Mr. Baker referred to a class action lawsuit associated with PFOA exposure in West Virginia that utilized biomonitoring data. Almost 17,000 people participated in this lawsuit, he said. An independent science advisory panel will publish a report on this case, a draft of which will be published in Fall 2007.

Mr. Diemer asked if the metabolization of perchlorate varies with different parts of the population. **Ms. Doyle** replied that there is some indication that the chemical behaves differently in different age groups, although more research is needed.

Mr. Taylor inquired if information was captured on other chemicals during the analysis of perchlorate, noting that this information could potentially used for other purposes. **Ms. Doyle** said that 148 chemicals were analyzed at the same time as perchlorate. The analyses completed to date are posted online with some demographic data.

Mr. Ramaley asked if any studies had looked at the acute effects of contaminants in different populations (e.g., pregnant women). **Ms. Doyle** said that pregnant women were included in the population of one study, but the study was cross-sectional and did not include outcome data. Longitudinal data might be able to be collected through a survey.

PUBLIC PARTICIPATION

There were no public speakers.

DAY 3 (May 25th)

Mr. Ramaley began the meeting by thanking Jackie Springer and Roy Simon for their hard work organizing the meeting.

UPDATE ON SMALL SYSTEMS SUBGROUP
Blanca Surgeon)

Mr. Ramaley introduced this subgroup, which was formed at the December 2006 meeting. The subgroup has since convened and has received additional information on small systems from EPA.

Ms. Surgeon explained that the subgroup participated in a conference call to discuss the plethora of issues related to small systems. The group was surprised to learn that EPA has developed many documents and information sources for small systems. Because the group was unaware of this information, the members concluded that there was a disconnect in that EPA's products may not be getting down to the small systems themselves.

Ms. Surgeon proposed that EPA continue to put small community issues in front of the Council once a year as a fixed part of the agenda. In addition, she said she would like to continue the discussion of small system issues. Small systems still have to comply with regulations but lack the economies of scale that larger systems are afforded, creating many issues around affordability. The affordability discussion also needs to extend beyond compliance to operations, regionalization, and full cost pricing. The aging operator work force is another big issue for small systems.

Mr. Florquist thanked Ms. Surgeon for her work on this subgroup. He said he is encouraged that EPA is moving towards a risk management approach rather than a strictly compliance-based approach. This new approach could be cost effective for small systems.

Mr. Saddler commented that small system issues will not disappear, noting that their problems compound with each new regulation. He suggested revising the definition of a small water system to base it on service connections rather than population. Also, more emphasis should be placed on consumer education about the true cost of water.

Ms. Dougherty asked for clarification on Mr. Saddler's proposed change to the definition of a PWS. **Mr. Saddler** clarified that a new definition should not exempt very small systems from regulations, rather, they could be held to a different standard.

Mr. Gelting commented that outbreaks now more often attributed to non-federally regulated water sources. This demonstrates the effectiveness of the regulations.

Mr. Taylor, a subgroup member, said that the group did not discuss solutions to any small system problems when they convened. He stated that addressing the affordability issue for small systems requires a departure from the status quo.

Mr. Saddler explained that he believes small systems should be regulated but maybe under a different standard than larger systems (e.g., a similar standard as transient noncommunity systems).

Mr. Baker agreed that adding flexibility to SDWA requirements may be a viable option to aid small systems. Simply raising the minimum population that classifies as a PWS would not change the state's workload, as the state would still be concerned about those systems even if they were no longer official PWSs.

Ms. Beardsley explained that the standards are the same for all community water systems (CWSs), but the frequency of monitoring and number of contaminants monitored differ. She emphasized that affordability concerns should not lessen public health protection. EPA and states need to help small systems by utilizing all the available tools. She added that most of the systems in Maine are small systems. It is the very small systems in Maine that have the most problems.

Mr. Saddler suggested that the Council continue this discussion of system classifications and advise EPA on a direction to pursue.

Mr. Grunenfelder stated that this is a complex and challenging issue. The State of Washington regulates beyond SDWA to systems with two service connections or more. Although Washington does not have the resources to credibly regulate all of these systems, **Mr. Grunenfelder** said there would be resistance to dropping regulations completely. It is difficult to determine the proper role of government in regulating and assisting small systems and there are many components involved.

Ms. Surgeon agreed that the discussion of revising the definition of a CWS should continue. In her experience, some systems purposely keep their populations and connections below the level that requires regulation.

SUSTAINABLE INFRASTRUCTURE (SI)—UPDATE ON SI ACTIVITIES & WORKFORCE MANAGEMENT

Jenny Bielanski (DWPD/ProtB)

Mr. Ramaley reminded the group that they received an update on Ms. Bielanski's team's work to help small utilities at the December meeting.

Jenny Bielanski gave an update on EPA's SI initiative. Communications and outreach strategies include a resource guide for practitioners, revised Web pages, and partnerships with AWWA, Water Environment Federation (WEF), and other

organizations. Several conferences have also been planned or taken place since December 2006, including a watershed forum for utilities, a conference on paying for SI, and five regional SI forums. The recent SI forum in Groton, CT focused on energy efficiency, financial innovation, and communication strategies.

She then gave updates on efforts related to three of the Four Pillars of Sustainability (the full cost pricing pillar was discussed by Peter Shanaghan in the next session). To further the Better Management pillar, a report was published in May 2007 outlining the building blocks for the successful management of a water utility. A pamphlet on Environmental Management Systems (EMS) and Asset Management was also released, and the National Capacity Development Workshop will be held in the fall of 2007.

Water efficiency efforts include the expansion of the WaterSense program and outreach efforts to promote conservation. Efforts in support of the watershed pillar include source water protection pilots, a National Advisory Council for Environmental Policy and Technology (NACEPT) report on promoting watershed approaches to infrastructure decision making, and the continued development of tools and partnerships to foster the adoption of green infrastructure.

Mr. Simon elaborated that EPA has been very involved in figuring out how to reduce costs and energy use over time for drinking water and wastewater utilities. EPA is now responding to feedback from the recent SI forum and is working with NACEPT.

Mr. Ramaley said that the sustainability of small systems is where "the rubber meets the road." He commented that his utility is developing ongoing cooperative relationships with three neighboring utilities: a small system, a medium system, and a large system. The discussion of critical mass is important and has implications in his scenario—the medium neighboring system is at a crossroads and needs to choose a path forward. There are constant struggles related to small systems and no easy solutions.

Ms. Surgeon asked if there was discussion on the rates that are required to pay for SI and noted that in order to apply for funding from US Department of Agriculture (USDA), rates must average at least $33/month.

Mr. Grunenfelder suggested that EPA consider marking products with low lead levels in a similar manner to the WaterSense labels for water efficient products. This consideration for labeling low lead fixtures was recommended in the final report of the Working Group on Public Education Requirements of the Lead and Copper Rule.

Mr. Wheeler said there is a big water conservation movement in Florida now. A water conservation software program that analyzes usage and provides information on BMPs will be available statewide shortly.

Mr. Florquist noted that some low flow toilets do not work, which creates frustration and leads people to remove them from their homes. **Ms. Dougherty** responded that AWWA has conducted many tests on low flow toilets with the conclusion that some work better than others.

Ms. Bielanski concluded her presentation with a discussion of utility workforce issues. Recently, EPA co-sponsored a workshop with the Association of Boards of Certification (ABC) to begin dialogue on the shortage of operators, recruiting and retention issues, and planning for succession. The workshop was well attended and well received. It concluded that workforce issues are industry wide issues, not just EPA issues. EPA's next step is to develop a plan to define EPA's role in resolving workforce issues.

Mr. Ramaley said that his utility has struggled with workforce issues and acknowledged that the operator of tomorrow is not the same as the operator of the past or today. Utilities need to keep ahead of the skill sets that operators will need in the future (e.g., computer skills). Funding is a critical issue as employees go where the money is. For example, in the past, EPA provided funding for many people in the industry to attend graduate school.

Ms. Bielanski said that these issues came up at the workshop. Operator apprenticeships were also discussed.

Ms. Surgeon added that one key is to elevate the professionalism of jobs in the water industry. Being the operator of a small system is sometimes not even considered a job.

Mr. Young said that American Water grapples with workforce issues also. There is a need to offer operators a career path and provide education so that they can advance. Another issue is operator reciprocity across states; it is difficult for operators to take jobs in other states because of a lack of common requirements.

Ms. Bielanski noted that this issue was not discussed at the workshop; many states are reluctant to enter into reciprocity agreements, but operators support it.

Mr. Ramaley agreed that some states prefer to have autonomous certification processes.

Mr. Saddler said that decision makers need to understand the complexities of being an operator, so they will approve salary increases. Also states tend to view operator certifications and exams as a revenue source, which contributes to their reluctance to implement reciprocity.

Ms. Dougherty said that there has been an ongoing discussion about educating decision makers on these issues with little success.

Mr. Saddler commented that Arizona has a training program to educate decision makers about water utilities. The program discusses liability and financial issues, among other things.

Mr. Baker said that efforts have been made to reach out to local officials and urge them to consider water utility needs when making budget decisions. Even more so than fire and police protection, water management impacts community members on a daily basis.

Mr. Taylor added that municipal government officials and politicians do not interact much with the drinking water industry. He suggested bringing drinking water issues to the political arena, through the Council of Mayors, for instance.

Mr. Owen said that the broader issue is that the water profession is not exciting. However, at a conference for elected officials last year there was a session called "Water 101" that provided basic information on water issues. The session was very well received and the group was interested in expanding the session at future meetings. There is still a need to create interest at the local level, however.

Mr. Wheeler said that the country as a whole has moved away from science education. Young people want a career path, and "go getters" want to be able to advance quickly rather than being stuck at each level for a set amount of years. He encouraged the use of Web-based training, which can be very cost effective.

Ms. Beardsley asked if there was discussion at the workshop about training small system operators to respond during emergency situations, and **Ms. Bielanski** replied that this was not discussed, as the meeting only covered high-level issues. More specific issues will be addressed at the 2008 conference.

Mr. Gelting noted parallels between the drinking water work force and the environmental health work force. He suggested broadening the discussion to incorporate both fields, which could help raise the profile of the issue. Public health has a credible voice in communities that could be used to spread the message that water system operators are crucial components to every day public health.

Mr. Ramaley noted that public health concerns command attention, but not necessarily money.

Ms. Nuzzo said that she is involved with the reauthorization of the Bioterrism Act. One of the critical issues in the reauthorization process was the public health work force. In the proposed bill, local and state health department workers are eligible to receive money for loan repayment. A vibrant public health workforce is a security issue as these personnel are the responders to emergencies. She encouraged broadening

the perspective on the importance of these professionals and thinking "outside of the box."

Mr. Ramaley agreed that a suite of responses is necessary.

Mr. Florquist told the group that the American Public Works Association (APWA) put together a public works academy in which all elected officials had to take a class on public finance and infrastructure before they could take their seats.

Ms. Bielanski said that unfortunately this practice was not well enforced.

SUSTAINABLE INFRASTRUCTURE—FULL COST PRICING

Peter Shanaghan (DWPD/InfB)

Peter Shanaghan began his presentation with the full cost pricing concept model, which describes the progression from a chosen level of service to the development of full cost pricing rates and charges. The key drivers of the cost of service are level of service provided, which includes reliability, fire protection, product quality, among other considerations, and the structure and management of the utility required to provide the desired level of service.

Water system demographics and management structures are diverse and impact the ability of a system to provide the desired level of service. One option to improve service is for systems to partner with or consolidate with other systems.

A key component of full cost pricing is the recognition of full business costs now and in the future. Pricing cannot be based on historical costs as the cost to replace capital assets will be higher in the future.

In November 2006, a Full Cost Pricing Expert Workshop was held. The workshop was attended by experts representing a variety of perspectives. Although the workshop did not seek consensus, there was considerable agreement among the attendees on the issues. The key finding from the workshop was that full cost pricing will only be possible and successful in effectively managed and structured water and wastewater sectors. The workshop concluded that significant inefficiencies are embedded in the current structures of these sectors and that eliminating these inefficiencies will free up resources. The group advocated that comprehensive social reform is needed, and EPA should initiate and inform a national dialogue among stakeholders on how to achieve public health and environmental protection goals in the least cost and most socially acceptable manner.

Mr. Shanaghan asked the group if they agreed with the workshop's conclusions.

Mr. Taylor stated that he agrees that there are some inefficiencies in the water sector but was unconvinced that addressing these inefficiencies would free up resources.

Mr. Shanaghan said that solutions are region-specific. It can be cost-effective for larger utilities in older parts of the country with sufficient capacity to absorb smaller communities and provide the necessary investments to bring these systems into compliance. It is more expensive to bring small systems into compliance individually.

Mr. Young stated that until the desired level of service is defined, it is difficult to determine inefficiencies. Consolidation can reduce some inefficiencies, but the level of service needed is not the same in all communities; this can create inefficiencies if some customers are receiving a higher level of service than they need.

Mr. Shanaghan noted that the level-of-service discussion needs to become a more explicit part of public dialogue.

Mr. Saddler commented that for some medium and small systems, the issue is not inefficient management but a lack of any management.

Mr. Shanaghan said that he is struck by rural systems that provide large amounts of water for agricultural uses but do not distribute the cost of this service appropriately. Providing this high-volume service requires additional infrastructure, which impacts the cost of service.

Mr. Wheeler said that inefficiencies and new small systems should not be subsidized. As water supplies become more critical, small systems will not be able to survive. The marketplace can bring communities and utilities together.

Ms. Surgeon added that some inefficiencies have been created unintentionally. Not requiring metering, for example, is a significant inefficiency that has created a management handicap for systems.

Mr. Grunenfelder said he does not believe large systems are inefficient. Sectoral reform may be needed for medium and small systems, but it is a large undertaking.

Ms. Nuzzo said that business sectors are now thinking of inefficiencies as a form of insurance plans. In contrast to an initial trend to streamline processes to improve efficiency, there is now a reverse trend in business to diversify and maintain some "fat in the system," so businesses will be prepared for unforeseen circumstances.

Mr. Taylor stated that there is a distinction between operating a utility as a business versus a regulated public health entity. Moving utility operation to a business model can lead to more efficient decision making, but it comes at the cost of introducing risk. Systems need to balance regulation and business interests.

Mr. Shanaghan noted that there was discussion at the Full Cost Pricing Workshop on changing the risk profile of utilities.

Mr. Saddler agreed that the ultimate public health impacts of moving the water industry to a business model must be considered. Aspects of the business model are already being incorporated into system operation through requirements for systems to demonstrate that they have the necessary financial and managerial capacity to effectively manage infrastructure.

Mr. Gelting reiterated that public and policy maker education is important. All the inefficiencies cannot be removed from water systems; some redundancy allows for safety factors to ensure that public health is protected.

Mr. Diemer said that in his experience large systems sometimes overestimate the level of service needed, which creates inefficiencies. Through surveys his system was able to evaluate the desired level of service. He was surprised to learn that customers will tolerate a loss of service so long as they are given warning. Reducing the level of service freed up resources that could be put towards infrastructure projects.

Ms. Thorpe said that she does not believe that there is innate tension between public health and business interests; public health protection and efficiencies can go hand-in-hand. Decisions made by elected officials can breed inefficiencies, however.

Mr. Wheeler commented that the evolution of technology is helping to merge the interests of business and utilities.

Mr. Florquist added that although the water industry is one of the largest in the country, there is no media interest in the industry. The media can help get information out to the public.

Mr. Ramaley said he believes the conclusions of the workshop "missed the mark." Full cost pricing does not necessarily equal sustainable pricing, which is required for sustainable infrastructure. The conclusions presented only skim the surface of the issue, which needs to be explored more in-depth. Inefficiencies are just the "tip of the iceberg," and the focus on them is misleading, as they exist in all sectors. The bulk of the issue is in connecting the full cost (including value and benefits) to the appropriate sources. This requires value judgments.

Mr. Shanaghan disagreed that the workshop "missed the mark." He urged the Council to read the entire report from the workshop. The workshop was framed around the concept that at there is a decision to be made jointly by the utility and customers about the level of service. This service must be provided in the most efficient way possible. Who bears the costs is a policy decision.

Mr. Ramaley reiterated that the focus for medium and large utilities needs to go beyond inefficiencies to connecting costs and services and figuring out sustainable pricing structures.

Mr. Young said that the issue of risk is important. American Water wants to grow its business, but they must first focus on delivering a high quality product. Because one incident could bring down the whole company, American Water tends to be more conservative. This does not mean, however, that management inefficiencies cannot be addressed. He added that money spent on high-tech treatment plants is money that cannot be used to address inefficiencies.

Mr. Saddler said that it is necessary to determine the true cost of a specific service to be able to make informed decisions that can improve efficiency.

Mr. Diemer said he thinks full cost pricing equals sustainable pricing. He identified three components to full cost sustainable pricing:

1. Development pays their "fair share"
2. Rate classes are determined based on cost, not politics
3. Consideration is given to long-term infrastructure needs.

Mr. Ramaley agreed in theory with the second component, but noted that no system can apportion cost exactly in relation to who specifically benefits, and that local input or guidance (political or otherwise) is needed, particularly in public systems. Rates can be influenced by a local desire to encourage conservation, maintain affordability for lower and fixed income residents, facilitate economic growth, or to slow population growth, among other reasons. He reiterated his belief that full cost pricing does not necessarily equal sustainable pricing but that both aspects are important.

Mr. Taylor said that American Water is not a prototype business because it is within the water sector. In the electricity sector, customers accept some disruption of service. The water industry has not taken this approach because of the public health component and must bear costs associated with the electric companies' decisions (e.g., by installing backup power and water storage).

Another reality of the water sector that results in inefficiencies is the 75-90 Rule on treatment plants (once a plant is operating at 75 percent, the system needs to plan for expansion; when the plant is operating at 90 percent the system needs to start building the expansion). By definition, this mandate ensures that there is always 10 percent of embedded capacity that will not be used.

Mr. Ramaley added that who benefits from reliability and redundancy of service and how this can be transferred to pricing structures are questions that need to be

discussed. He concluded that the water industry must be viewed as a unique business sector.

Mr. Shanaghan asked for the Council's recommendations on the future of this issue.

Ms. Thorpe asked to read the materials that came out of the full cost pricing workshop so there can be a more informed discussion at the next meeting.

Ms. Surgeon agreed that there needs to be more discussion on this issue.

Mr. Ramaley commented that full cost pricing ties to the need to communicate the value of water to the public.

Mr. Saddler motioned that the small systems subgroup continue its work, with Ms. Surgeon as the chair, and provide an update to the council at the next meeting.

Mr. Young seconded the motion and asked that the subgroup define the scope of small system issues and present a few key issues on which the Council should focus at the December meeting.

Vote on motion – 17 yea, 0 nay, 0 absent. Motion carries.

ISSUES FOR DISCUSSION AT FALL 2007 MEETING

Ms. Dougherty stated that EPA needs to improve guidance on risk communication so that each state will not have to "reinvent the wheel" every time there is an event. She suggested that EPA work on this issue and report back to the Council at the next meeting. In response to a request for clarification from **Mr. Baker**, **Ms. Dougherty** said this topic could cover the correct way to communicate with populations that only drink bottled water and how to communicate with the public when there is an event that threatens public health. She noted that systems and states have many opportunities to communicate with the public, but they are not always prepared.

Ms. Surgeon agreed that this would be an interesting topic for discussion, noting that there are professionals dedicated to effective public education.

Mr. Ramaley suggested that this topic be given more than 1.5 hours on the agenda.

Other topics suggested were:

- Update on performance measures
- Additional information on the SI initiative, including updates on all pillars of sustainability

- Update on carbon sequestration (OGWDW may come back to the Council on this issue prior to the December meeting)
- Update on CCL3
- Additional discussions on full cost pricing

The group discussed holding the next meeting during either the week of November 12th or December 10th, 2007. The group discussed holding the meeting in either the San Francisco Bay Area or in New Mexico. **Ms. Dougherty** suggested holding the December meeting in Washington DC and holding the Spring 2008 meeting in an alternate location.

Ms. Blette will distribute additional information on the meeting location and dates in June 2007.

WRAP UP
Brian Ramaley

Mr. Ramaley thanked the group for their efforts, participation, and engagement. The productive discussions over the course of the meeting reflect the spirit of cooperation within the drinking water community. Collaboration is important as the community can accomplish more when working together. Although differences exist, there are more commonalities within the drinking water community.

Mr. Ramaley thanked EPA for allowing the NDWAC to conduct these valuable discussions.

Meeting adjourned.

NATIONAL DRINKING WATER ADVISORY COUNCIL MEETING

May 23-25, 2007
Courtyard Marriot
Silver Spring, MD

FINAL AGENDA

Day 1 – Wednesday, May 23, 2007

1:30 - 2:00 p.m	Opening Remarks and Introduction of New Members	Brian Ramaley**,** Chair, NDWAC Roy Simon, Acting DFO Cynthia Dougherty, Director, OGWDW
2:00 – 2:45 p.m.	Consultation: Aircraft Drinking Water Rule *Purpose – discuss regulatory options and development of proposal by end of 2007*	Steve Heare, DWPD Katie Porter, DWPD/ProtB
2:45 - 3:30 p.m.	Consultation: Lead and Copper Rule Revisions *Purpose – discuss comments received, how addressing and next steps*	Pam Barr, SRMD Eric Burneson, SRMD, TAB
3:30 – 3:45 pm	**BREAK**	
3:45- 4:30 pm	UIC Geosequestration Update *Purpose – discuss status of EPA efforts to develop a management framework for injection of carbon dioxide. Highlight efforts to assess potential impacts on ground water quality*	Steve Heare, DWPD Ann Codrington, DWPD/PrevB Bruce Kobelski, DWPD/PrevB
4:30 – 5:30 pm	Water Security Program Update - Contaminant Warning Systems, Measures, Emergency Response *Purpose – discuss status of WSI-ContamWarnSys pilot program, various efforts to develop measures, efforts to develop/revise procedures to respond to incidents (e.g., natural disaster, /pandemic flu)*	David Travers, WSD Debbie Newberry, WSD/PPTC

Day 2 – Thursday, May 24, 2007

9:00 – 9:15 a.m.	Emerging Issues - Overview *Purpose of each session if to find out: What is EPA OW doing now? What are utilities doing? What should EPA do to help utilities?*	Brian Ramaley and Cynthia Dougherty

9:15-10:15 a.m.	Emerging Issues: Adapting to Climate Change *Purpose: Overview of OW activities to develop a strategy to address water/climate issues. Overview of how a western utility is addressing drought events and preparing for the future. Discuss how EPA should work to support utilities.*	Elizabeth Corr, DWPD Dennis Diemer, NDWAC
10:15 – 10:30am	**BREAK**	
10:30-12:00	Emerging Issues: Addressing Emerging Contaminants *Purpose: Overview of OW activities to take the lead on Agency activities related to ECs, including various initiatives to better understand EC occurrence. Overview of how EPA is considering health effects and potential risk management actions. Consider how voluntary actions may reduce loadings. Consider how issues are communicated to the public.*	Suzanne Rudzinski Pamela Barr Ed Ohanian NDWAC members
Noon - 1:30 p.m.	**LUNCH**	
1:30 – 2 :00 p.m.	Update on Measures Subgroup *Purpose: Provide update on effort to revitalize NDWAC subgroup on measures development and integration with EPA effort to develop waterborne disease measures in response to OMB*	Valerie Blank, SRMD/SRRB
2:00 - 2:30 p.m.	Ben Grumbles Chat with the Council	
2:30 - 3:30 p.m.	Waterborne Disease: Activities to improve Outbreak Surveillance, Investigation and Reporting *Purpose: Provide overview of efforts to improve Outbreak Reporting System (ORS), May 30 - June 1, 2007 Workshop on WBDOs, and Water-Net initiative managed by CDC.*	Yu-ting Guilaran, SRMD/SRRB Rick Gelting, CDC Rebecca Calderon, ORD
3:30 - 3:45 p.m.	**BREAK**	
3:45-4:45 pm	Emerging Issues: Using biomonitoring data for risk characterization *Purpose: Provide overview of potential to use biomonitoring data to assess risk exposure and discuss options for considering biomonitoring data as part of the regulatory determination process for perchlorate.*	Beth Doyle, OST Eric Burneson, SRMD/TAB
4:45 pm -5:45 pm	**PUBLIC PARTICIPATION**	
6:45 p.m.	GROUP DINNER	

Day 3 – Friday, May 25, 2006

8:30 - 8:45 a.m.	Update on Small Systems Subgroup *Purpose: Discuss post December 2006 NDWAC meeting findings on small systems.*	Blanca Surgeon, NDWAC
8:45 – 9:30 a.m	Sustainable Infrastructure – Update on SI Activities & Workforce Management *Purpose: Provide brief update on recent SI activities. Provide info on outcome of Jan 2007 workshop on workforce issues at ABC conference and developing a strategy to determine how EPA can assist utilities in maintaining an educated workforce.*	Jenny Bielanski, DWPD/ProtB
9:30-10:30 a.m.	Sustainable Infrastructure – Full Cost Pricing *Purpose: Provide info on outcome of November 2006 workshop on full-cost pricing and potential follow-up actions by EPA and the Council.*	Peter Shanaghan, DWPD/InfB
10: 30 - 11 a.m.	Issues for Discussion at Fall 2007 Meeting	All (Council and EPA)
11:00-11:15 am	Wrap Up	Brian Ramaley, Chair
ADJOURN		

These issues will be addressed as an update if time allows:

Update on Regulatory Activities

- Affordability, CCL2 Regulatory Determinations, Six Year Review, CCL3, TCR Revisions