NATIONAL DRINKING WATER ADVISORY COUNCIL

MEETING NOTES

JUNE 3-4, 2008

DOUBLETREE HOTEL TUCSON AT REID PARK
445 S. ALVERNON WAY
TUCSON, ARIZONA 85711-4198

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

Gregg L. Grunenfelder, Assistant Secretary, Division of Environmental Health, Washington State Department of Health, Olympia, WA, and Chair of the NDWAC
Nancy A. Beardsley, Director, State of Maine's Drinking Water Program, Maine Center for Disease Control (CDC), Department of Health Services and Human Services, Augusta, ME
Jeff Cooley, Utilities Division Operations Manager, City of Vacaville, CA
Dennis Diemer, General Manager, East Bay Municipal Utility District (EBMUD), Oakland, CA
Dr. Rebecca Head, Health Officer/Department Director, Monroe County Health Department, Monroe, MI
Timothy Kite, Water Superintendent, Long Creek Township, IL
Olga Morales-Sanchez, Rural Development Specialist, Environmental Rural Community Assistance Corporation (RCAC), Santa Fe, NM
Jennifer B. Nuzzo, Senior Analyst, Center for Biosecurity, University of Pittsburgh Medical Center (UPMC), Baltimore, MD
David Saddler, Manager, Tohono O'odham Utility Authority, Sells, AZ
Duane Smith, Executive Director, Oklahoma Water Resources Board, Oklahoma City, OK
Carl Stephani, Executive Director, Central Connecticut Regional Planning Agency, Bristol, CT
Myron (Jeff) Taylor, Deputy Director, Public Utilities Division, City of Houston, Houston, TX
Lynn Thorp, National Programs Coordinator, Clean Water Action/Clean Water Fund, Washington, DC
Brian L. Wheeler, Executive Director, Toho Water Authority, Kissimmee, FL

NDWAC Designated Federal Officer (DFO)

Veronica Blette, Office of Ground Water and Drinking Water (OGWDW)

U.S. Environmental Protection Agency Attendees

Cynthia Dougherty, Director, OGWDW
Nanci Gelb, Deputy Director, OGWDW
Pam Barr, Director, Standards and Risk Management Division (SRMD), OGWDW
Elizabeth Corr, Deputy Director, Drinking Water Protection Division (DWPD), OGWDW
Steve Heare, Director, DWPD, OGWDW

Centers for Disease Control and Prevention (CDC) Liaison

Dr. Vincent Radke, Division of Emergency and Environmental Health Services, National Center for Environmental Health, CDC
Carol Selman, National Center for Environmental Health, CDC

Members of the Public

Cynthia Lane, American Water Works Association (AWWA)
Mitch Basefsky, Tucson Water
Jean Melillo, Tucson Water
Marie Pearthree, Tucson Water
Remy Sawyer, Tucson Water
Caroline Edwards, The Cadmus Group
Naabia Ofosu-Amaah, The Cadmus Group

NATIONAL DRINKING WATER ADVISORY COUNCIL
JUNE 2008 MEETING NOTES

DAY 1 (June 3rd)

WELCOME

Gregg Grunenfelder welcomed the group and introduced himself as the new chair of the National Drinking Water Advisory Council (NDWAC). He noted that one Council member, Doug Owens, was not in attendance.

Veronica Blette then provided an overview of the meeting's agenda (Appendix A), which was focused on water issues surrounding climate change. She noted that Tucson, a water-stressed area, is an appropriate location for the meeting.

WATER RESOURCES – OVERVIEW

Veronica Blette (OGWDW)

Ms. Blette gave a presentation that provided an overview of water resource issues, setting the stage for the meeting. She presented data showing that while drought is not a new phenomenon, climate change will likely exacerbate water stress in the future. On a positive note, water use efficiency has increased over the past few decades, with water use growing less rapidly than population. However, increased water stress in the future will require greater efficiencies.

Water management has evolved from growing the supply to maximizing existing supplies. A challenge for the industry is how to get "more value per drop." Past solutions to these issues may not work in the future, and systems should try to maximize current resources before seeking alternatives.

Cynthia Dougherty added that there are many challenges to meeting future water demands in the United States. These include measuring and accounting for water, developing methods to allow for supply expansion while ensuring that current supplies are used efficiently, and developing and improving predictive water management tools to anticipate outcomes of short- and long-term decisions. She explained that the day's sessions will focus on building strategies for adapting and building resiliency to water-stressed conditions. She asked the Council to think about EPA's role in these issues (e.g., what can EPA and state drinking water programs do to help states and utilities and are there any information gaps that EPA can or should fill?).

Mr. Grunenfelder noted that the issue of water resource management is broader than climate change. This topic is appropriate for the NDWAC to discuss as there are competing demands for water that place stress on resources.

Ms. Blette added that there is overlap between demand and supply management.

EPA NATIONAL WATER CLIMATE STRATEGY
Elizabeth Corr (DWPD)

Elizabeth Corr presented an overview of EPA's National Water Program Draft Climate Change Strategy. Following the Intergovernmental Panel on Climate Change's (IPCC's) 2007 4th Assessment Report, EPA formed a climate change work group, composed of representatives from EPA water program offices, air office, research office and EPA regions, to review climate change information, look at potential impacts and response actions, and develop a climate change strategy for the National Water Program. The work group developed a draft strategy to address the impact of the following climate change scenarios on water resources: air/water temperature increases; changes in rain/snow levels and distribution; increased storm intensities; sea level rise; and changes in coastal/ocean characteristics. In addition to these changes, overall adverse impacts from climate change were considered, including increased extreme weather events, increased pollution, changes in the availability of drinking water, water movement and displacement, biological impacts, and considerations for costal populations.

The climate strategy includes the following five goals and proposes 46 response actions to address these goals.

1. Use core water program to help mitigate releases of greenhouse gas.
2. Adapt implementation of core water programs to maintain and improve program effectiveness in the context of a changing climate.
3. Educate water program professionals on climate change impacts on water resources and programs.
4. Strengthen link between EPA water programs and climate change research.
5. Establish the management capability within the National Water Program to address climate change challenges on a sustained basis.

EPA's Office of Ground Water and Drinking Water (OGWDW) has the lead on several response actions, which assume level funding. The implementation of aspects of the strategy is ongoing. EPA is currently asking for comments on the proposed strategy, and Ms. Corr encouraged the NDWAC to submit comments.

Mr. Grunenfelder asked how the effluent standards in the strategy relate to climate change adaptation. **Ms. Dougherty** responded that the effluent standards for discharging water used in wastewater treatment processes may need to be modified if less water was being treated. **Ms. Corr** added that there are processes under the Safe Drinking Water Act (SDWA) such as the Unregulated Contaminant Monitoring Rule (UCMR) and the Six-Year Review of National Public Drinking Water Regulations (NPDWRs) to address any drinking water regulatory modifications that might be necessary.

Timothy Kite commented that water conservation is an issue of concern in the Midwest. During a large drought last year, the water supply neighboring Mr. Kite's issued mandatory water use restrictions. Mr. Kite's system did the same to support the neighboring system even though his system was not in a drought. Because of these restrictions, his system lost revenue, which was difficult to make up. He added that it is hard to raise water rates and often rate increases are not approved until the situation is at a critical stage. It is a challenge for utilities to survive, but they should be self-sufficient and not dependent on subsidies.

STATE WATER RESOURCE EFFORTS

Nancy Beardsley

Nancy Beardsley presented the work of the Association of State Drinking Water Administrators' (ASDWA's) Water Availability, Variability, and Sustainability (WAVS) project. ASDWA wants to give states the tools to address water resource issues, and the goal of the project was to look at water resource efforts currently underway at the state level. She noted that states differ in terms of their specific climate change concerns. For example Maine, a member of the Regional Greenhouse Gas Initiative (RGGI), has an extensive coastline and is worried about salt water intrusion and freshwater loss.

The WAVS project is guided by a work group (composed of state representatives with some EPA participation) whose first action was to conduct a survey to learn about state efforts. There were 39 responses to the survey, and the results show that states vary drastically in many aspects, including how they allocate water resources. The vast majority of respondents had some regulatory system in place for allocating water and a framework for controlling water withdrawals. The largest water user was domestic uses, followed by commercial and agricultural users. Roughly half the respondents regulate withdrawals for most uses. Water conservation policies vary by state, but the majority of the respondents have policies in place or in development. Most of these policies are in the form of best management practices (BMPs). About half the respondents mandate or broadly oversee water conservation outreach efforts.

The survey also asked respondents to rank the relative importance of different issues. The top three issues were: 1) inadequate state resources and capacity to manage water use; 2) inadequate state capacity to limit growth of water demand; and 3) absence of water quality data.

ASDWA identified the following points of emphasis to help states address these concerns.

1. *Information and tool development needs.* Additional information on the link between ground water and surface water supplies and case studies on creative and tested approaches to water conservation (and funding sources) would be useful to states.
2. *Data collection, database, and software needs.* States would benefit from the collection and interpretation of statewide water use data, baseline withdrawal data, modeling of surface water bodies and aquifers, and projection of future supply needs and availability.

Another survey question addressed climate adaptation/action plans. Some respondents have climate adaptation plans in progress or recommended; other respondents have worked climate adaptation into their climate action plans.

The survey also inquired about collaboration, since states are the link between EPA and utilities. Water utilities are concerned that drinking water is going to be left out of a national climate change strategy. Existing research programs should be used to structure the direction forward.

A draft white paper on these issues will be out in the summer of 2008. More information on the WAVS project can be found on the ASDWA website, or by contacting Deidre Mason at ASDWA.

Mr. Grunenfelder commented that in some states the drinking water program is in the health department, while in others it is in the environmental department and noted that the issue of water resources is more an environmental issue than a health issue. He asked if the survey respondents were answering for their whole state or just for the drinking water program. **Ms. Beardsley** acknowledged this point and said she believes the survey only went to drinking water programs, which did not necessarily pull in state environmental partners.

Olga Morales-Sanchez said she has helped communities develop water conservation plans, but explained that small systems often lack the resources necessary to enforce/implement their plan.

Ms. Beardsley added that ASDWA hopes the paper will be a resource for states, which can learn from the experiences of other states.

Mr. Grunenfelder said that Washington is trying to implement water management and conservation programs, but is struggling to find funding sources. **Ms. Dougherty** replied that EPA has assessed the possibility of states using Drinking Water State Revolving Fund (DWSRF) set-asides for water management and conservation activities. She explained that, in her opinion, Public Water System Supervision (PWSS) grants are to be used to carry out the responsibilities associated with establishing an EPA-approved PWSS program. This can include water conservation plans, which are connected to PWSS activities, although not directly.

Brian Wheeler noted that Florida has a unique situation because water is held in trust by the state. The state's regulatory framework divided the state into drainage basins to manage surface water resources, although most Florida systems rely on ground water. Previously the state gave individuals permits to withdraw water (ground or surface water) from a drainage basin. This practice threatened wetlands, and so the state moved to a system where all users are considered concurrently for permits. Although this is a step in the right direction, the water resource management in the state still needs improvement. One issue is that state does not have an inventory of its water resources, and because the state is concerned about the future, it is rationing water. Managing water resources is a complex, difficult issue, he concluded.

Jeff Taylor commented that it seems from the survey that some states may be facing challenges that seem so insurmountable that they cannot address them. He asked how water supply issues factor for states in the grand scheme of concerns. **Ms. Beardsley** replied that there is wide variability among the states, noting that states where water resource issues are an immediate concern are further ahead in their planning efforts. One challenge is that states with plentiful water resources have not started to think about water resource management.

Mr. Taylor continued, explaining that in Texas, ground water is governed under a riparian system, while surface water is under a prescriptive water rights process (i.e., the state owns the water and requires applications for a right to use the water). Water supply has always been an issue in Texas, so the state has developed a water supply planning process that has been in place for over 10 years. This is a grassroots effort in which all suppliers are involved and includes defining water needs and planning for future water sources. Mr. Taylor advised EPA that climate change adds a new dynamic to the existing condition of water supply management, which has always been a concern to some areas. He urged EPA to provide leadership on this issue, which at this point has more questions surrounding it than answers, and questioned if uncertainties could be compared to the Manhattan Project. He also asked whether the issue was big enough to warrant EPA taking a regulatory stance,

and stressed that the government needs to provide perspective and define the future of climate change discussions.

Ms. Dougherty said that there are many people in the government who have been engaged with climate change issues for some time. These experts believe the situation is continuing to worsen, and although there is still some possibility for mitigation, there will be climate changes that require adaptation. She explained that the draft water climate change strategy is the first time EPA has acknowledged that climate change will have an impact on water resources. It is not clear at this time if these changes will require regulatory action. EPA is still sorting through the various issues to understand the impacts and how they will affect regulatory programs. Some changes, like the modification of the Underground Injection Control (UIC) program to accommodate geosequestration projects, are already in effect.

Mr. Taylor noted that states with plentiful water need to assess their water resources, and stressed that the public needs information on the direction EPA is heading in regards to climate change.

Rebecca Head stated that frameworks can help address the climate change issue. Two frameworks are land use and water pricing. There is a problem with approaching water as a commodity when what utilities provide is a service, she said. If water is considered a commodity, it will be difficult to implement effective conservation programs.

Vincent Radke asked if saltwater intrusion is threatening ground water resources in Maine. **Ms. Beardsley** replied that the intrusion is a combination of over-pumping ground water and sea level rise. **Mr. Wheeler** added that Florida is also experiencing salt water intrusion.

Mr. Radke observed that the relationship between surface water and ground water is complex and is not fully understood. Water can be a factor in disease outbreaks, and it is important to understand the relationships between water sources. **Ms. Beardsley** agreed, adding that in the Northeast, the aquifers are often connected.

ADAPTATION—ENVISIONING OUR FUTURE

State and Regional Planning

Duane Smith, Carl Stephani

Duane Smith informed the group that he is the chairman of the Western States Water Council, the "water arm" of the Western Governors' Association. The Council is in the process of developing a report to the Association recommending sustainable processes for water use. Mr. Smith is also the director of the Oklahoma Water Resources Board, and he gave an overview of his state's comprehensive water plan.

In Oklahoma, ground water is considered private property that belongs to the overlying surface owner. The state's water policy has been based on maximizing economic development, not on sustainable water management. Like other Western states, Oklahoma is struggling to protect property rights while moving toward sustainable water use.

To develop a comprehensive water plan, Oklahoma borrowed from the plan approach of other states. On the policy side, it was important to understand the consequences of conjunctive use management and develop a long-term plan. On the technical side, it was necessary to consider future water supplies. Oklahoma's plan is unique in that it has a contract with the U.S. Army Corps of Engineers. The plan has mapped out the water supply for each water system in the state for the next 50 years. Climate change needs to be a component of state water plans, but states must recognize that climate change is often not a top priority for small systems.

He also discussed the work of the Water Resources Coalition, which hopes to expand nationwide. The Coalition hopes that the federal government will develop guidelines to help states develop state water plans. The water plans should address climate change, but will need to be different for each state.

Mr. Smith stressed that federal water agencies need to work together and consolidate funding, rather than each agency pursuing its own climate change initiative. The current process is confusing to states. Also, in some areas, like Oklahoma, the public does not believe in climate change. It is a challenge to make it realistic to communities and make them want to move towards sustainability.

There is a need for a "new way of doing business," he said. State and federal partnerships need to be leveraged, and the federal government needs to work with the states to understand their priorities and supply "good science." The federal government needs to prioritize integrated planning for states. There is also a need for more data on the stream gauge program, which has suffered from a lack of centralization and for more water quality monitoring. EPA should to put effort into data collection and analysis on possible climate change scenarios.

Carl Stephani explained that he works for a regional planning agency in Connecticut and was nominated for the Council by the National Association of Regional Councils (NARC). He stressed the importance of "thinking regionally," giving the example of a highway project built with federal money in the 1960s that went unused because the planners did not discuss the project with neighboring communities. As a result, future transportation projects had to be part of a regional plan. In another example, the U.S. Economic Development Association (EDA) gave money to certain communities to encourage economic development, which resulted in industries moving from one town to another, which did not benefit the region overall. EDA realized the mistake and stopped funding economic development unless a regional development plan was in place. The Federal Emergency Management Agency (FEMA) also requires regional plans before funding natural hazard mitigation plans.

NARC wants to encourage regional opportunities for water resource planning and climate change issues, which can help maximize resources similar to sharing other services, such as the 911 service, which can result in significant savings. Climate change is going to occur; the uncertainty is how much change there will be and how quickly it will occur.

Utility Planning
David Saddler

David Saddler told the group that he was coming from a utility perspective and is active in national rural water issues. He has seen many changes in his more than 25 years in the water industry. In the

future, he would like to see water systems improve their efficiency. In addition, he outlined the following considerations.

- *Education.* People generally take water for granted, so public education is essential to help the public see water as the finite resource it is. Political education is also important, and federal representatives need to have a better understanding of the issues before issuing mandates. The water industry also needs to be educated; the key to good operations is responsible operations, but there are systems that operate with same mindset as 25 years ago.
- *New management strategies.* Systems should look to regionalize and consolidate, but this will not work in all areas since some will lack the necessary economies of scale. There are other ways to regionalize, however, through operations and management strategies, but there will always be small systems.
- *Water system design/utilization.* The industry needs to build systems with consideration for the next 20 years. It may be time to revisit how water systems are designed and utilized considering that a very small percentage of treated water is consumed. It also may be time to look at reclamation, raw water use, and alternative treatment options like point-of-entry (POE) and point-of-use (POU) devices.
- *System classification.* System classification also needs to be revisited; right now a community with 5 homes with one woman with seven children could qualify as a PWS.
- *Regional concerns.* Problems vary across the country and there is no one-size-fits-all solution. Federal funding needs to consider regional differences.
- *Enforcement.* EPA's enforcement approach also needs to be revisited; systems will not pay huge fines, but smaller ones are more manageable.
- *Water allocation.* Allocation needs to be rethought as some users (e.g., Navajo tribes) are allocated more water than their waters produce.

Mr. Saddler concluded by encouraging EPA and NDWAC to maintain open and objective dialogue with states and utilities.

Dr. Head suggested using a systems approach to address the issue of climate change and noted that the world is shrinking and has become increasingly interconnected. Utilities need to view themselves as active participants in their communities rather than silent service providers. Utilities will be looking to EPA, which should have a framework that promotes collaboration and relationships in planning. Otherwise, utilities will be disjointed and it will be difficult to make progress.

She continued, stating that from a public health perspective at the local level, attention needs to be paid to wells and septic systems. Ground water and ground water contamination will become bigger issues in the future, and there will be concerns related to water reuse. Gray water usage needs to be addressed nationally, and the NDWAC and EPA can help facilitate this discussion from a collaborative perspective. Land use is another part of the discussion, and the Office of Water (OW) is partnering with other offices within EPA on the issue.

Regional systems can help promote population density and encourage collaboration. Conservation and water pricing are additional concerns, as is the relationship between water and energy.

She acknowledged that the path forward is unclear, but thinking of systems is important, as is implementation at all levels, including local and federal. She mentioned that the American Public Health Association's next meeting's theme is "Water and Public Health: 21st Century Challenge," an

example of the increased realization of the value of water, shifting from the view of water as free resource. Climate change and population growth are leading this shift, but other factors are affecting approaches to water use/reuse.

Mr. Kite agreed that there is a need for water resource plans. He said that there are many privatized water departments in his region and observed that when water systems privatize, the community loses control of rates. In addition, private systems may be less likely to undertake the necessary maintenance on the system in order to maintain profits. Another issue is that it is difficult to fire bad operators, who are not penalized substantially by EPA. Everyone that works at a plant needs to be certified, he said. Regionalization needs to be cost-effective for systems. Also, there is a need for more research on water quality, especially regarding pharmaceuticals.

Jeff Cooley said that consideration needs to be given to succession planning. The water industry can be promoted as a career choice for environmentally conscious youth. He explained that he transferred from managing water and wastewater systems in California to a job in Alabama and experienced very different environments. In California there is an environment of conservation and resource management that is absent from Alabama, where water is taken for granted and it is difficult to raise rates. Conservation is not a high priority in some parts of the country where systems are most concerned with meeting regulations and answering to the public. Other issues such as security and terrorism do not relate to many small communities, but these communities need to protect against community members who may vandalize or inflict damage to the system. It is essential for the local officials to buy in to these initiatives, so we need to speak to what they understand (e.g., how does it affect me?). Responses to climate change need to get to the local level.

Mr. Stephani brought up the issue of POU treatment devices, explaining that he previously managed a 1,200-connection system in Arizona that had too much fluoride. The best, most economical solution was to install POU devices at each house, but EPA required the system to build an expensive treatment plant. He urged EPA to be more flexible about treatment alternatives. He then told the group that he works in a building that has waterless urinals, which he sees as a great way to save water. [Note: Later in the meeting, Ms. Dougherty clarified that POU have been an eligible compliance alternative since the 1996 Amendments, but that states make the determination as to whether to allow their use for that purpose.]

ADAPTATION—SUPPLY MANAGEMENT

Integrating Water Resources

Lynn Thorp

Lynn Thorp informed the group that the U.S. Senate is currently discussing climate change legislation. Energy policy involves doing things that society should be doing anyway, even if there are no disastrous impacts associated with climate change. Water considerations are essential to the climate change discussion, as "climate change is water change." Regardless of climate change, actions should be taken to improve to improve water system efficiency, economic viability, and to help make the systems more sustainable. Water needs to be at the forefront of climate change discussions, and OW and OGWDW need to stay involved.

She continued, explaining that the public supposedly cares about drinking water, and, theoretically, this concern can be leveraged to other, broader issues. In practice, however, this interest in drinking water usually translates into increased bottled water consumption rather than increased concern for PWSs.

Ms. Thorp stressed that energy policy impacts water on many levels, both in terms of responses to climate change impacts and replacement of current energy sources with alternate sources, which will have impacts on water. Water management needs to be integrated, with consideration given to every water use, from managing storm water and waste water to drinking water considerations. Current water uses may need to be reconsidered as well. For example, is conveying waste a good use for water? What water should be used to water the lawn? There also needs to be communication between those dealing with water conservation and those who deal with water consumption and operations. Laws concerning water should be integrated and people who work on water (including advocates, industry, and the government) need to work together. She commended EPA's integration of the Clean Water Act (CWA) and the SDWA, which used to be separate. Previously there has been a perceived conflict between conservation and providing drinking water and protecting public health. This separation will not work moving forward.

Educating the public is also important and can be more difficult than it appears. Educational brochures are not sufficient; there is a need to think of alternative ways to get the public to think about everyday water conservation and the importance of individual actions. Education can help drive people to be involved in local government, where they can help make changes. Climate change and supply management could be an opportunity to break consumers' lack of connection to water they use. EPA can help identify barriers to effective supply management and public communication about conservation and can help break them down. Another consideration is the information gaps (e.g., surrounding the water use of UV treatment). Ms. Thorp urged EPA to stay engaged in the climate change discussion.

Extending/Optimizing Supply
Brian Wheeler, Jeff Taylor

Mr. Wheeler discussed the water supply issues facing his water system and the state of Florida in general. He is heavily involved with extending and optimizing the supply of his utility. The state will allow the system to use its current source until 2013, after which the system will need to find a new source. In response, the system is focusing both on water conservation and on locating a new supply. Half the system's demand is for irrigation, and while the system has not previously focused on irrigation conservation, it should be a consideration moving forward. Another large water use is waste water. The system is trying to partner with customers to store and use storm water runoff for agricultural water uses.

He explained that he is also involved in issues surrounding surface water supplies, which have significant water quality issues in Florida. There are periods of extreme wet and extreme dry, and Mr. Wheeler is talking with the state about capturing water during high water periods.

To promote water conservation, Florida has instituted a green building program called Florida Water Star; which includes water efficiency requirements—all new houses in the state must be Water Star-compliant. There is also a new state policy regulating irrigation that prohibits the use of potable water and limits irrigation to certain days.

Florida needs to optimize its water resources. In some urban areas, all the wells are drilled in the same area. There must be some motivation, a regional solution to relocate water production. Water allocation policies need to be revisited. Ground water and surface water are interconnected, and policies need to consider all the users collectively. Water law evolved through the courts, but legislative initiatives are needed to modify it for the future. Integrated water management is essential, as "everything wet is connected." The environment, water supplies, agriculture, and recreation are all important water considerations for Florida and are interconnected.

EPA needs to be a leader and source of information on the many issues related to water resources. EPA can also support the development of innovative technologies by funding pilot programs. Mr. Wheeler commended EPA's WaterSense program as a good start for conservation and suggested creating a database for states and utilities on conservation efforts that have been successful and the costs of the efforts.

Mr. Taylor described the water supply planning activities for his utility in Houston, TX, which has sufficient ground water and surface water supplies for the next 50 years. This is not a normal situation for Texas. Houston, which relies mostly on surface water, has a large treatment capacity and plans to become a wholesaler. Houston's water plan includes a conservation component and the utility is planning to pursue wastewater reuse and partnerships, and is considering building a canal to link two surface water sources.

He explained that the Texas Water Development Board develops a water plan for the entire state. Texas allocated $10-20 million for a 5-year program to look at water demand, supply, and management strategies for every utility in the state. The state is then divided into planning regions to manage the water plan. The plan assesses water supply demand for the future – has identified $17 billion in needs for 50 years. Developing a water plan forces local communities to assess their status regarding water demand and supply, define their future, and work with other communities in the regulatory planning process. Developing water management strategies for the state is expensive, but the result is that the state knows its demands and knows the issues it needs to resolve.

Regional partnerships are essential to managing future supplies and to allowing systems to afford costly upgrades. EPA needs to force these partnerships and create incentives for systems to partner. In Texas, systems must have, and be implementing, a water management plan to qualify for DWSRF loans. Infrastructure sharing is going to occur, and needs to be framed as a sharing of benefits and outcomes rather than just a sharing of costs.

ADAPTATION—DEMAND MANAGEMENT AND BALANCING TREATMENT DECISIONS

Loss Control, Metering, End Users

Veronica Blette (OGWDW)

Ms. Blette introduced her presentation by observing that it is difficult to differentiate between water demand and supply issues. She then discussed the following water efficiency efforts underway.

- **EPA's 1998 Water Conservation Guidelines** were intended to be informational, and states have used them to develop water conservation programs. They address small and large utilities and provide three levels of conservation measures.

- **EPA WaterSense** is a labeling program for water-efficient products (toilets, faucets, irrigation services, etc.) and is intended to improve consumer conservation. It includes a partnership program with states, utilities, and manufacturers.

- Many states and utilities have **water conservation programs aimed at consumers**, such as rebates, retrofits, and water use restrictions.

- PWSs are trying to save water and reduce costs by **minimizing leakages**. AWWA developed a water accounting approach, which provides a mechanism to measure and address losses. Reducing real losses are a relatively low-cost option for increasing water supplies. Worcester, MA, and Las Vegas, NV, are two communities that have successfully implemented leak detection programs and reduced operating costs.

- There are many state efforts to improve water **PWS water efficiency** as well, including regulatory efforts and standards, water management plans, and integration into state DWSRF programs. Illinois, for example, has had a water conservation plan in place since the 1970s that addresses user conservation and reduction of unaccounted water.

Reducing water loss is a focus for OGWDW. A next step on this issue is to compile and organize the existing information and expertise so that it can be easily referenced.

Mr. Grunenfelder then briefly discussed Washington's water conservation initiatives. He explained that in 2003, legislation was passed to address issues of water rights and barriers, but water system planning requirements have been around in the state since the 1970s. The state requires systems to address their efficiency and established a distribution leakage standard at 10%. The consumer side is another piece of the conservation issue, and utilities in the state established their own goals through a public process, which they then report on. Water efficiency requires a multi-pronged approach with involvement from the various stakeholders. To further improve efficiencies, Washington adopted a new rule in January 2008 requiring service meters for all systems, which were already standard in most states. The legislation has been fairly well-received by water utilities to date.

Technology Choices
Dennis Diemer

Dennis Diemer explained that he is coming from the perspective of a large water/waste water facility (East Bay Municipal District [EBMUD]) and shared trends and observations that he has seen at his utility and in California in general. Water resources are a familiar topic for EBMUD, and the system is currently in a state of severe water shortage and has instituted water rationing. The system also has to contend with California's high population growth and increasing endangered species areas, which restrict the placement of pipes and other infrastructure.

Although EBMUD's population has increased over the years, water use has remained relatively constant. California is interested in water conservation and stretching the supply as much as possible. For example, when a new development wanted to join the system recently, EBMUD

worked with them to minimize their water footprint by 25%. The development also had to pay to offset their water use at a 2:1 ratio (EBMUD used the funds to work with other communities on conservation measures) in addition to a fee of $6,000-7,000 per home.

EBMUD has used the AWWA/International Water Association (IWA) methodology to improve the system's water supply accountability and reporting. This system allows for benchmarking, establishes a consistent measuring system, and is based on the AWWA concept of a well-managed system with a low leak rate. After a drought in the late 1960s-1970s, EBMUD hired two people to search for leaks; initially many leaks were found. These employees are still working for the system. EBMUD is considering installing permanent leak detection technology, which could have additional applications (e.g., as an early warning system).

Mr. Diemer cautioned that there is a potential for "demand hardening." Previously, it was easier to reduce water use, and now there is some backlash from customers that have already reduced their water use and are now being asked to reduce it further. There is an issue with how to differentiate between customers that have made the requested reductions and those who have not. Reduced use also creates revenue concerns, especially since it is difficult to raise rates after a drought. The system was proactive this year and raised rates 10% *before* the drought.

EBMUD currently gets most of its water from the Sierra Nevadas, but this will not be sufficient in the future. The system is looking at options to satisfy long-term needs and is considering quality, cost, and environmental impacts of potential sources. EBMUD uses a Water Evaluation and Planning (WEAP) model to plan for water supply availability. The first step in the model is to quantify the need for water. The model then compares supply portfolios, optimizes phases of projects, and performs an economic analysis. The system is now conducting sensitivity analyses to find the best options in terms of public health, safety, cost, and environmental impacts. Desalination, a reliable, high-quality source, is one supply option. Drawbacks include permitting issues with brine disposal and high energy costs. The system is looking to partner with surrounding systems to spread the benefits and costs. Recycled water is another option and, although drought-resistant, it has high infrastructure and energy costs and other limitations due to public concerns about water quality.

Mr. Diemer concluded by discussing the role of regulatory agencies in these issues. Regulatory agencies can provide funding for and promote water recycling, conservation, and desalination efforts. The promotion could be similar to the government's ENERGY STAR program.

Ms. Blette mentioned a recent article she read that said a challenge with EPA's WaterSense program is although new homes are using the water-efficient features, their benefit is counteracted because the homes have more fixtures in total. **Mr. Diemer** agreed that this is an issue, explaining that spa-style bathrooms with multiple fixtures are popular in California and are contrary to the message of conservation.

In response to a question about rates at EBMUD, **Mr. Diemer** replied that the rates are average for the area—about $25/month for water service only. The system uses a tiered system of rates in which customers that use more water pay more. There are also some fixed charges.

Ms. Blette echoed Dr. Head's previous statement and questioned if rate structures should be based more on the service of providing water rather than on water as a commodity. A low base rate that does not cover cost of providing the service causes the system to have to raise rates as use decreases.

Mr. Diemer explained EBMUD's fixed costs include a meter charge (to cover the costs such as reading meters) and a volume charge (to help keep the system in repair and pay for assets). In California, it is very expensive to connect to a system, with a base rate of $25,000 per house for development in a previously unserved area, and $5,000-7,000 per connection to connect in an area already receiving service.

Mr. Radke asked how EBMUD projects population growth. **Mr. Diemer** replied that they use an extensive land use model that is correlated with the population planning of surrounding cities. EBMUD's population is expected to grow at a rate of roughly 0.75% per year. The system is not anticipating geographic growth.

Mr. Radke then asked about how brine from desalination plants is disposed. **Mr. Diemer** responded that the desalination process is expensive and the system is considering desalinating estuary water, which is less salty. The brine disposal issue is still being discussed in California. **Ms. Dougherty** added that some water systems (e.g., El Paso, TX) that are using desalination to inject the brine underground. El Paso is unique in that it is able to inject the brine into a salt water aquifer, **Mr. Taylor** added. **Mr. Diemer** added that there is a small desalination facility in Monterey, California that injects the brine deep into sand.

Mr. Wheeler commented that his utility is a combination of systems, and as systems were acquired, so were rate structures. The traditional approach to setting rates is to embed fixed costs in the service charge. A concern is that if the commodity charge is too small, then there is reduced motivation to conserve. Balance is necessary with a goal of constant revenue.

Dr. Head stated that she does not believe that EPA should mandate rate requirements, but she believes that the way utilities currently operate encourages consumption. Forward thinking about rates is necessary. The chemical industry moved to service rates, and as a result, people used fewer chemicals. The current system of water rates is set up to fail.

Ms. Morales-Sanchez said that climate change education should be targeted at the younger generations. In New Mexico, there are many regionalization and water conservation initiatives, which work well together as partnering systems "keep tabs" on each other. Her organization is involved in many rate studies that strive to find the break point between fixed and variable rates. Lately, rates have included funding reserves, which has been unpopular. But systems need to plan for the future, and they cannot rely on rates alone. Rates are increasing, and the public is more accepting if they understand the rationale behind the increases. Many systems use historical water use trends to set rates, which can be problematic if use changes in the future. Some small communities are reporting water loss that they will not be able to correct; it is difficult to disconnect a relative or neighbor.

Mr. Saddler commented that water utilities are selling the service of providing water, not the water itself. Rates are a way of measuring the amount of service the utility is providing. Many utilities do not know the cost of providing service, which creates a gap in rates and operating costs.

Mr. Kite added that electricity bills are increasing not because the cost per kilowatt is increasing, but because the fixed charges are increasing. He proposed adding a distribution charge at the bottom of water bills that would be placed into a fund for infrastructure improvements.

Ms. Thorp said that electricity costs increase even when consumption decreases, and noted that the electricity industry is not struggling with the same revenue issues that the water industry is. The issue is related to decoupling; when electricity was deregulated, utilities made more money when they sold more power, which created a disincentive to conserve. Decoupling meant that survival is not dependent on using more. She supported Dr. Head's idea of water systems charging for the service, not the volume. Rates could be dependent on square footage or number of plumbing fixtures.

Mr. Cooley replied that one key distinction is that electricity companies are very large and consolidated, while public water supplies are typically small, distinct entities.

Mr. Smith mentioned that there are small, electricity co-ops that are member-owned. The fixed costs on electric bills are how these utilities survive.

BRINGING IT ALL TOGETHER—THE EXPERIENCE OF TUCSON WATER *Mitch Basefsky*

Mitch Basefsky gave a presentation on Tucson Water's public involvement programs. Tucson believes it is important to engage the community because the community members own the system, and more knowledgeable consumers will be more willing to invest in the system. Involving the community also helps systems better understand customer needs and allows for proactive planning. If the system does not communicate to the public about water issues, others (the media, alternate suppliers, etc.) will.

Tucson Water's public involvement efforts are focused in three primary areas:

1. **Rebuilding trust in Colorado River water and making use of that resource.** Faced with declining ground water levels, the system decided to supplement its source water with water from the Colorado River as part of the Central Arizona Project. When the system first used this water, water quality problems caused a customer backlash and loss of trust. The system implemented a water quality program focused on looking at water issues from the consumer's perspective and has undertaken several efforts to rebuild the community's trust. The system made an effort to find out what its customers wanted to know about their water and then provided that information. Educating customers about their water and Colorado River Water was important, and the system created a system that allowed customers to access specific information on the water quality in their region.

   Tucson also participated in EPA's Environmental Monitoring for Public Access and Community Tracking (EMPACT) program and through the program provided water quality information to communities to help them in decision-making processes. Continuous monitors were installed and the results were available online to consumers. The system partnered with local groups and figured out ways to target different customer populations.

The system resumed using Colorado River water through the Clearwater Program, consisting of recharge stations where the river water was allowed to percolate into the ground, replenishing ground water supplies. The system was able to manipulate the mix of ground water to river water and turned to its customers for feedback on their preferred combination. The system implemented a series of public outreach activities before settling on a preferred blend, which was then bottled for marketing at local events. The system also established the Ambassador Neighborhoods Program to provide outreach to the communities in proximity to the recharge basin. Through the program, an oversight committee was formed, which met for six years, to further involve these communities. These efforts were extremely successful in getting the surrounding communities on board with the project. When Tucson began supplying the blended water, there were no complaints from the community. The switch has enabled the system to take 80 wells offline and has helped recharge area ground water.

2. **Water quality choices related to renewable supplies.** To plan for the future, Tucson water uses scenario planning in which it is assumed that all possible scenarios are equally likely and looks for commonalities. The goal is to plan so that the utility is in a position to respond to as many future scenarios as possible. When key decision points arise, the water system tries to involve the community. One decision was whether to continue using recharged Colorado River water, which will have increasing levels of total dissolved solids, or to build a new treatment plant to treat the river water. Tucson analyzed all aspects of this decision, including consideration for the triple bottom line, and embarked on an ambitious program to involve the public. One public outreach initiative was a kiosk in local malls that provided samples of water with different mineral levels and asked customers about their preferred water both in terms of taste and potential cost. Ultimately, Tucson decided not to build a new treatment plant.

3. **Increasing drought resistance and planning for the future.** The future service area of Tucson water is unclear, but eventually the system's allocation of Colorado River water will not be sufficient. Conservation can help extend the system's supplies, and Tucson has developed a community conservation task force to identify feasible conservation strategies. The strategies must have a measurable water use. Of 123 potential strategies, the task force selected 48 for further investigation. After a cost-benefit analysis on each strategy, 22 were recommended including rebates, retrofits, and incentives. Combined with leak reduction, these should reduce water consumption by 10%. Tucson also started a Business Incentives Advisory Group to promote water efficiency by developing best management practices and other efforts.

A successful public involvement program requires leadership that tolerates risk (since the public might not say what you want to hear), a desire to build community support, a willingness to honestly engage with the public, an openness to change, a budget that includes public outreach, and a patience to educate and involve the community. The result is a stronger trust between the community and the water system.

Mr. Kite asked about stormwater management in Tucson. **Mr. Basefsky** replied there is a management system, but there is an issue with removing water that others need downstream.

Mr. Diemer asked if Tucson always intended to use percolation ponds, or if it was the result of the backlash against pure Colorado River water. **Mr. Basefsky** responded that the system always intended to recharge the ground water, but the previous plan was to do this only with the excess water that was not being treated and consumed.

In response to a question about how Tucson deals with climate change concerns, **Mr. Basefsky** said that climate change is a big uncertainty in terms of how it will affect water supply and needs. Because of the uncertainties, Tucson tries to look for common elements that will enable it to address any situation. He added that the Colorado River is the biggest driver for the system's future water supply. **Marie Pearthree,** former Deputy Director of Tucson Water, noted that the system factored in climate change considerations (energy usage, carbon footprints, etc.) when it was deciding its future water supply.

Dr. Head said she was impressed that the system used a triple bottom line and that they were able to turn around a bad public relations situation. She asked how the system keeps the community involved now that there is no crisis or planning underway. **Mr. Basefsky** replied that the system is still planning for the future and engages the community in public meetings and other venues. The Business Incentives Advisory Group is still underway as well. The next big decision will be related to effluent and whether to treat it or use it for reclamation.

Dr. Head asked if the system has special initiatives to reach younger generations, and **Mr. Basefsky** replied that the system has been considering new media types and has been working with students from the University of Arizona to identify the best strategies. The system also provides curriculum materials to local schools.

Mr. Grunenfelder commended Tucson Water's public outreach efforts and contrasted the system to many others that consider themselves the "silent utility."

PUBLIC PARTICIPATION

Cynthia Lane stated that she was commenting on behalf of the American Water Works Association (AWWA). AWWA encourages the Council to recognize the need for additional research, which is essential to the Contaminant Candidate List (CCL) process. Ms. Lane distributed AWWA's testimony outlining the key issues related to research needs and told the Council that they play a key role in ensuring that EPA acts on AWWA's recommendations.

Mr. Diemer said that a number of utilities are focused on this issue as well and questioned the most appropriate way for the NDWAC to address the issue.

Ms. Dougherty asked for clarification, and **Mr. Diemer** replied that he sees a disconnect between the research being performed and the research required to support the CCL process. Many contaminants on the CCL are lacking health effects data, which could determine whether they should be regulated. He suggested that the Council discuss this issue further and provide guidance to EPA.

Ms. Dougherty suggested that a Council member draft a proposed recommendation for discussion. **Mr. Diemer** agreed to draft the statement.

Mr. Grunenfelder agreed that this is an important issue and that using the CCL data requirements provides a good framework for discussion.

Ms. Dougherty said that a past NDWAC meeting was held at Research Triangle Park, where many EPA labs are located. EPA lab directors attended the meeting and discussed their work. A subgroup was also established to work with the Office of Research and Development (ORD) and develop recommendations for drinking water research. Despite hard work, the subgroup did not complete its mission and could be reinstated.

Mr. Taylor suggested that the NDWAC's recent work on performance measures could be a vehicle for additional discussions on research needs.

Ms. Thorp added that the discussion of performance measures was limited by a lack of health data. The federal government needs to be pushed to fund this research.

Ms. Barr agreed that the data are important. Since CCL 3 was released, the Standards and Risk Management Division (SRMD) has met with ORD to discuss research needs. Research is dependent on the skills and interest of ORD researchers, however.

Mr. Diemer pointed out that there is an EPA lab, and as such, it should turn its focus to health effects data.

Ms. Dougherty said it is important for the NDWAC to engage in the discussion of research needs and reminded the group that their recommendations should be addressed to the Agency, not her.

Dr. Head agreed, explaining that the NDWAC is in a position to influence all of EPA. She added that the timing of the statement might be important in terms of receptivity.

WHERE DO WE GO FROM HERE?

Mr. Grunenfelder said that the next step for the Council is to consider EPA's role in the issues discussed throughout the day. He asked each member to give his/her preliminary recommendations based on the day's discussions.

Mr. Radke said there is a health effect connected to every climate change strategy related to water. EPA's water climate change strategy would be more powerful if it included consideration for health effects.

Mr. Wheeler stated that the research needs are important. Also, EPA has a role in aquifer storage and recovery, which is an issue for Florida. Membrane reject disposal is another issue that requires EPA's attention. EPA can help frame the discussion on integrated water resources and balancing supply and demand. Affordability is a key issue as well; as utilities raise rates, not all consumers will be able to pay.

Mr. Smith said that the day was very helpful to him in terms of understanding what EPA does in terms of climate change. Coming from a state agency, he previously saw EPA as primarily a

regulatory agency and looked to other resources (e.g., the Corps, USGS, NOAA) for climate change information. He acknowledged that there is a role for EPA related to climate change, but did not know what that role is at this time. EPA's role may have to be reassessed after climate change impacts are defined. Growing communities with limited water resources, like Tucson, are the most sophisticated when it comes to water resource management. Mr. Smith does not see EPA playing a role in water resource issues.

Mr. Taylor commented that while other agencies are focused on water quantity activities, EPA is focused on water quality. There needs to be integration between EPA and other agencies on climate change issues, so that both water quantity and quality are part of the discussion.

Ms. Dougherty responded that EPA works with several other agencies on drinking water and clean water issues at both the regional and national level. EPA worked with other agencies on the draft water climate change plan and is trying to pursue complementary work. EPA is also collaborating with USGS and DOE on carbon sequestration issues.

Mr. Smith stated that most of the discussion has been centered on urban water use, while in Oklahoma 80% of the water use is agricultural. Climate change is predicted to cause more intense rainfall and more extended drought periods, which will increase non-residential loading. EPA has a role in controlling non-point source pollution.

Ms. Dougherty replied that the climate change strategy includes loading as an area to study.

Ms. Thorp said she believes there is a role for EPA OGWDW in terms of how activities impact PWSs. Public health issues related to drinking water need to be in the discussion. EPA needs to ensure that drinking water has a voice in the government debate on climate change. There has been some discussion on why OGWDW is regulating carbon sequestration wells, but Ms. Thorp said she is glad that this is the case since the wells could impact drinking water sources.

Ms. Dougherty commented that a main reason that OW created a draft climate change strategy was to ensure that policy makers considered how climate change will impact water quality and drinking water; these were impacts not being discussed before.

Ms. Thorp added that a lot of attention is being given to biofuels, which have water considerations and impact on PWSs.

Mr. Cooley observed that in the absence of data, all that exists is opinion. There are large amounts of data to support climate change, which has encouraged response actions. With all this information there is a need to battle information overload and misinformation overload. For utilities, there is not one single approach to climate change. Also, water rates are not keeping up with cost of "doing business." Education is essential to get the public to accept higher rates.

Ms. Beardsley said that she learned a lot during the day, especially from the utility case studies. Her advice to EPA is to involve the implementers (states, utilities, etc.) in developing the Agency's approach to climate change. It will be difficult to insert them after a national approach is formed.

Mr. Grunenfelder noted that in many of the issues discussed, EPA does not have a role because solutions need to be implemented on the local level. However, at the last NDWAC meeting, the

Council discussed EPA serving as a clearinghouse for ideas and programs. The EPA website could be organized so that this information is easy to find. There are efforts underway, but they are not often publicized. Seattle, for example, has been playing ads as part of a marketing campaign for the city's water organized around energy costs and the carbon footprint of bottled water.

Mr. Grunenfelder continued, stating that another major issue is the use of reclaimed water. How to get the public to accept reused water is an emerging issue in the Northwest. EPA could sponsor a meeting on the issue of reclaimed water and work with other groups involved with the issue. The public health component, especially concerning pharmaceuticals, has been lacking but is important to the discussion and will help get the issue off the ground. Incentives can help force the issue. The federal government needs to work with states and utilities on this issue.

Another issue of concern is aquifer recharge areas, **Mr. Grunenfelder** said. Climate change is causing snow packs, which store water for some systems, to decline, and new storage options, such as aquifer recharge, may need to be pursued.

Dr. Head said she agreed that the reuse of gray water is an emerging issue for state health and regulatory agencies. She sees lots of climate change-related issues in which EPA could be involved and said that EPA needs to show leadership and vision. Climate change issues need to be considered holistically, and OW needs to collaborate both within and outside of EPA. There need to be goals related to climate change, and Dr. Head would like to see more action. She suggested revisiting the issue at future meetings, as it continues to evolve. Framing the issues is another aspect of leadership in which EPA should be involved. This would help entities communicate the value of drinking water and the impacts of climate change.

Mr. Saddler stated that public health protection needs to be the basis for climate change discussions, as it is the primary goal of drinking water programs. Governments at all levels (local, state, and federal) need to communicate openly and objectively on climate change issues. Local governments have responsibility for dealing with issues at the individual level, while the federal government is responsible for other levels of government. Different regions of the country will be faced with different climate change issues, so the regions might need more empowerment to understand their unique issues and work within their region. Regional issues are also a concern for the Department of Homeland Security (DHS), so a synergy might be possible.

Mr. Stephani said that he learned a lot during the day. After hearing about concerns with the CCL and research, the most striking issue for him is the need for increased funding of health effects research.

Mr. Diemer commented that there is a great deal of pressure on water supplies and that water supplies are changing. In the future, systems will be looking to nontraditional supplies such as desalination and water reuse. EPA needs to acknowledge this and broaden programs and guidance to include these sources. There are many unanswered questions (e.g., what are safe applications for recycled water?, how do you dispose the brine after desalination?), and EPA needs to provide more guidance.

Mr. Taylor said that EPA has historically played a role in programs like source water protection, and climate change may require the Agency to look at the issues from a source water standpoint, in terms of how raw water is affected by changes. He suggested that the NDWAC articulate the role of

public health and water quality in EPA's climate change discussions so that water quality issues are on par with issues of water quantity. Currently, there is not much attention given to water quality concerns.

Ms. Morales-Sanchez told the group that the impact of climate change and climate change policies will trickle down to the small communities she deals with, and when it does, the impact will be huge. EPA's approach needs to be structured to address small system needs if requirements/guidance are developed..

Jennifer Nuzzo said that initially she perceived the issue of climate change and water resources as outside her scope of work, but she is now seeing similarities. She echoed Dr. Head's previous comment on the need to view the issue in terms of systems. There is a connection between planning for an event, which communities are already doing, and planning for climate change, which is essentially a series of events. There is an evolution of thinking in terms of preparedness, and the end goal is continuity of community during an event. Communities need to work together to plan for the future. EPA has a role in terms of facilitating conversations across jurisdictions and bringing up the water resource issue in terms of continuity planning.

Mr. Kite said it was great to hear the different perspectives throughout the day. Educating the public and building capacity are the main issues. Operators are doing the best they can with the available resources.

Mr. Grunenfelder said that OW needs to stay active in source water protection program and also look to the future and think about alternative supplies and their associated issues. It is important to maintain the public health component in climate change discussions.

Mr. Saddler said the Council should acknowledge EPA's significant role in research activities concerning climate change, public health, and water quality. EPA is on the right track on water issues, but other federal agencies will have to take the lead on other issues.

Dr. Head confirmed that other agencies are working on the issues and are natural partners for EPA.

Ms. Dougherty said she appreciated the Council's thoughts and asked them to consider whether they wanted to make a statement to EPA at this time. **Ms. Thorp** suggested that the group think about this and continue the discussion the next day. Whatever is decided, it is important to include that the Council will be saying more on the issue in the future.

Mr. Wheeler added that as an initial step, the NDWAC might want to say that that EPA should be engaged at all levels of discussion and that the Agency should be more involved in climate change issues.

Mr. Cooley said it would be helpful to compile the activities underway in the water sector related to climate change or water quality concerns.

Ms. Dougherty added that EPA has done a lot of work on sustainable infrastructure and sustainable utility management, which fits into climate change discussions in terms of how resources are managed over time.

Ms. Blette mentioned that there has been an effort over the past few years to identify the features of a well-managed utility. EPA's goal is the help utilities be more resilient. EPA has also discussed alternative water supplies and tried to identify potential barriers to using them.

Mr. Grunenfelder said this discussion will be continued and closed the meeting for the day.

DAY 2 (June 4th)

Mr. Grunenfelder welcomed the group and reviewed the day's agenda, which included updates on regulatory issues, including the carbon sequestration rule process, and follow up on issues brought up during the first day of the meeting.

UPDATE ON REGULATORY MATTERS

Pam Barr (SRMD), Steve Heare (DWPD)

SRMD Updates

Pam Barr briefly described the SDWA regulatory process and then provided an update on OGWDW's regulatory activities.

CCL. On February 21, 2008, EPA published the draft of CCL 3. Producing the CCL is a data-driven process based on recommendations from the National Academy of Science (NAS) and the NDWAC. The public comment period for the CCL 3, which includes 104 contaminants, closed in May 2008. CCL 3 represents a change in the process, which EPA is trying to make more comprehensive and transparent. Ms. Barr discussed the types of contaminants on the list, noting those that were on previous CCLs and covered in the UCMR.

UCMR 2. Under UCMR2, EPA requires monitoring for contaminants suspected to be present in drinking water but not regulated under SDWA. There are 25 contaminants under UCMR 2, including pesticides and their degradates.

Regulatory Determinations. EPA is required to publish a Maximum Contaminant Level Goal (MCLG) and promulgate an NPDWR for a contaminant if:

1. it may have an adverse health effect;
2. it is known to or likely to occur in levels of public health concern; and,
3. in the sole judgment of the Administrator, regulation provides a meaningful opportunity for public health protection.

In May 2007, EPA published preliminary determinations to not regulate 11 contaminants. EPA will issue final determinations during the summer. EPA is in the process of finalizing a proposed preliminary determination on perchlorate.

Six-Year Review. EPA is required to review and, if appropriate, revise existing NPDWRs every six years. During the 2003 review, they decided to revise the Total Coliform Rule (TCR). EPA is currently working on the second Six-Year Review, which will come out next summer. During the review, EPA looks at health effects, analytical methods, new treatment technologies, occurrence, and

other regulatory revisions. EPA also works with ASDWA to determine if states have additional concerns or implementation issues. To help in the review, EPA asked states for monitoring data and received data from most states.

TCR/Distribution System Revision. To revise the TCR, EPA commissioned a Federal Advisory Committee (FAC), which has had 9 meetings since last July. The two main tasks of the FAC are to recommend revisions and consider information on risks for distribution systems. There is also a Technical Work Group (TWG) to assist the committee. Some of the issues under consideration are: appropriate triggers for monitoring, sampling frequency, and elimination of the controversial non-acute MCL violation, which currently requires public notice (PN). The TWG is investigating key distribution system issues in hopes of better understanding the TCR and prioritizing additional research. The new rule should be proposed in 2010.

Lead and Copper Rule (LCR) Revisions. Short-term revisions to the LCR were finalized in October 2007, and incorporated the NDWAC's recommendations on communication requirements. Work is starting on long-term revisions, which will address more difficult issues, such as revised monitoring sites. EPA plans to hold a public meeting this fall to discuss other issues to be addressed, such as customer involvement.

Program Performance Measure Development. The measures of public health impacts of improved drinking water quality were discussed at the last NDWAC meeting. The measures were taken before the Science Advisory Board (SAB) in April 2008 for consultation. The SAB generally had positive responses and supported the recommendations.

State 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR)/Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) Implementation. SRMD is involved with some quality assurance (QA) activities as well as some data collection and technical reviews, but the majority of the implementation is being handled by the Drinking Water Protection Division (DWPD).

Optimization Program. Many states have elected to participate in a voluntary program to optimize performance. EPA has been analyzing data and conducting trainings to support the program. Although previously the program focused on turbidity, it is now expanding to cover other regulatory requirements.

Expedited Methods. Instead of going through a rulemaking process if alternate methods come out, EPA can now publish a notice in the Federal Register, expediting the process.

Ms. Dougherty commented that in most cases, these expedited methods are improvements on existing methods.

Ground Water Rule (GWR). EPA has been developing guidance manuals to support the implementation of the GWR. Four guidances have been published, and two more are likely to be published this summer. Utilities have requested a triggered and representative monitoring guidance as well.

Regarding the UCMR, **Mr. Taylor** commented that while initially the rule seemed like a good idea, the monitoring costs have been higher for his utility than anticipated. Larger utilities are bearing a

big cost, and as a result, utilities are worried about UCMR 3. He agreed that monitoring is an important part of public health protection, but the costs need to be considered.

Ms. Barr responded that UCMR 3 is proposed to come out in 2010. **Ms. Dougherty** added that EPA could discuss with the NDWAC lessons learned from UCMR 2 and ways to reduce costs. However, UCMR is the only way for EPA to collect occurrence data; otherwise EPA would have to collect the data.

Mr. Taylor commented that utilities appreciate the need to monitor, but EPA needs to consider the implementation burden.

Aircraft Drinking Water Rule

Steve Heare discussed the Aircraft Drinking Water Rule (ADWR), which addresses water quality on aircraft. When the NPDWRs were developed, they did not consider aircraft, even though interstate conveyance carriers (ICCs) qualify as PWSs. In response, EPA issued guidance; but later determined that a regulatory approach was needed. An exposé article brought the issue to national attention. As a result, all of the airlines were out of compliance. EPA placed most airlines under Administrative Orders of Consent and began working with them to ensure they did basic things (testing, flushing, etc.) to keep the water safe.

A regulation was necessary because there are several opportunities for the public to come into contact with water from the airplane's holding tank (e.g., from hot/cold water taps in the galley or lavatory). Another consideration is that most planes fly internationally, and given their small holding tanks, will fill up wherever they stop, which means they could be carrying water not subject to U.S. drinking water regulations.

There is a complex regulatory overlay with multiple jurisdictions over the water on planes, including EPA, the Food and Drug Administration (FDA), and Federal Aviation Administration (FAA) at various points. Collaboration was essential to the process, and EPA held stakeholder workshops to work with the FAA and the FDA.

The rule was proposed in April 2008, and the comment period ends in July. The rule should be finalized in January 2009 and will require maintenance, monitoring, and notification of the public in the event of contamination. EPA wants to give airlines flexibility in terms of the monitoring, cleaning, and flushing requirements. Hopefully, this rule will be embodied in the FAA maintenance manuals, which means it will require little implementation from EPA.

Mr. Radke asked how DWPD has addressed foreign carriers. **Mr. Heare** responded that international carriers are typically not in the U.S. long enough to meet the definition of a PWS. EPA has worked with international organizations, however, such as the International Civil Aviation Organization to establish protocols for all aircraft water systems. DWPD has also worked with the World Health Organization and Environment Canada.

Mr. Radke then asked where samples are analyzed. **Mr. Heare** answered that samples must be tested at approved, certified labs.

Dr. Head asked about the practice of filling up used water bottles with water from the plane holding tank and serving it to passengers. **Mr. Heare** replied that airlines occasionally do this on long flights and there is no barrier to the practice, although the water should be safe to drink since it should be meeting EPA standards.

Ms. Beardsley told the group she received a call from a reporter asking about new regulations on perchlorate and asked about the status of the regulation. **Ms. Barr** responded that Ben Grumbles testified to a Senate committee that EPA was going to have a regulatory determination on perchlorate by the end of the year.

Ms. Dougherty added that at that hearing it was indicated that the determination could be negative, which was picked up by the media. EPA is currently sifting through the data from FDA on occurrence in food. EPA needs to make a preliminary determination very soon if they want to make a final determination by the end of the calendar year.

Dr. Head asked if the rule needs to be proposed by June 1st to be valid. **Ms. Dougherty** responded that because it is a determination, not a rule, it can be proposed later.

Ms. Thorp then inquired about the options for a regulatory determination. **Ms. Dougherty** answered that EPA has tried all the options for perchlorate and is now working on a preliminary determination, which leads to a final determination on whether to regulate. **Ms. Blette** added that there is an additional option of not making a determination and waiting for more information.

Mr. Kite asked how EPA is addressing water on other ICCs such as cruise lines and trains. **Mr. Heare** responded that EPA Region 3 was involved with Amtrak when a water hose was dropped and resulted in *E. coli* contamination. As a result, EPA is starting to think about regulating water on trains. International carriers like cruise lines have their own set of regulations, although EPA could cover interstate ferries. EPA is beginning with aircraft and may then move to other forms of transportation. **Ms. Dougherty** added that the existing rules apply to all ICCs that meet the definition of a PWS. **Carol Selman** noted that cruise ships are regulated under CDC's Vessel Sanitation Program.

Ms. Nuzzo then asked whether there is any provision for information about water quality to be available to airline passengers. **Ms. Dougherty** responded that the water on planes is supposed to be up to EPA standards, and bottled water does not have any more stringent standards, so it should not be a significant issue.

Mr. Heare stated that the biggest issue concerning serving aircraft water from water bottles is the violation of the bottle's trademark.

Ms. Nuzzo then asked if airlines could distribute information about their monitoring and testing. There are two issues, she said: knowing where the water you are drinking is coming from and obtaining information about the monitoring of that water. **Ms. Dougherty** stated that the best thing to do in that scenario is ask.

Ms. Nuzzo said passengers may want to know in advance so that they can bring water on the plane if necessary.

Mr. Heare added that tap water is typically served from water bottles only on very long flights.

CONSULTATION: CO_2 SEQUESTRATION RULE

Steve Heare (DWPD)

Mr. Heare presented the proposed rulemaking for the geologic sequestration (GS) of CO_2, which could be an important tool for stabilizing climate change. This is the initial consultation with the NDWAC, but there will be another consultation as the rule moves forward. Most of the EPA expertise on climate change is in the Office of Air and Radiation (OAR), which has partnered with OW in this effort.

GS is a way to store CO_2, helping to mitigate climate change. Scientists estimate that there are 3,900 gigatons of potential storage under the U.S., which is equivalent to about 1,000 years of storage at current emission rates. Coal fired power plants are the largest stationary source of CO_2, and Integrated Gasification Combined Cycle (IGCC) power plants are the best candidates for GS. However, there are only two of these plants in the U.S. at this time.

The best storage locations are in the middle of the country and include old oil and gas reservoirs, deep saline aquifers, and deep coal seems. To avoid transportation of CO_2, it is preferable to build the injection wells close to the facilities. At the plants, CO_2 is compressed into a substance with the properties of both a liquid and a gas, and is then transported and stored. The capture and separation process is energy-intensive and very expensive. The cost and changes in climate change policy (e.g., the adoption of a cap and trade policy) will affect the popularity of GS. The underground portion of the process will be regulated by EPA's UIC program, but other aspects of the process will be regulated by different entities.

There are many technical challenges and risks related to GS, including CO_2's corrosivity, mobility, potential to react with materials around it, and buoyancy (creating the possibility that CO_2 may rise up though abandoned wells and other concerns); the high pressure of the injected CO_2; the lack of understanding of the long-term behavior of CO_2; and the potential threats to underground sources of drinking water (USDWs). EPA is learning about these issues from large-scale GS projects around the world.

The UIC program regulates any liquid that is injected underground and distinguishes wells using classes. Using the framework of existing rules for industrial wells and the unique considerations of CO_2, EPA developed basic requirements in terms of:

- *Site characterization*. Injection zones must accept fluids and have a confining zone.
- *Area of review (AoR)*. The AoR must be delineated and all features that allow for upward migration identified and sealed. There may be additional issues if the AoR is large and crosses state and international boundaries. The timeline for these requirements is another concern, and remediation and reevaluation may be additional requirements.
- *Well construction*. Wells must be cased and cemented to prevent movement of fluids into USDWs. Because CO_2 may corrode certain materials, there will be special considerations for performance standards and well design.

- *Operation and monitoring*. Requirements include monitoring the pressure of and the nature of the injected CO_2 as well as integrity tests on the well materials. Atmospheric monitoring could also be required (although EPA might not have the authority under the SDWA to do this).
- *Well closure/post-closure*. Wells must be closed in a way that protects the USDW, and the owner/operator must demonstrate financial insurance and retain liability for the well. Additional requirements may be added. There is an issue related to who "owns" the CO_2 once it is underground, and how long it takes for the CO_2 to stabilize.
- *Public participation*. Public notice is required for pending permits and there must be an opportunity for public input. There is some concern that stakeholders need to be engaged earlier.

OW is working with many stakeholders on GS including federal agencies and advisory committees (including NDWAC), states, non-governmental organizations (NGOs), water utilities, and industry groups. There is also a work group of states and DOE representatives.

Steve Johnson's schedule has the rule being proposed July 1, 2008, but EPA is slightly behind schedule. The proposal was given to OMB, and the turnaround time will determine when the rule will come out. The final rule should be promulgated in 2010 or 2011, although this may change with the upcoming election and data from early pilot projects.

Ms. Dougherty commented that if EPA does not get the data from the early pilot projects, then the rule could be finalized even sooner.

Mr. Heare explained that EPA is trying to balance flexibility and specificity with the proposed rule. It is important to reassure the public that EPA is monitoring this practice and taking its responsibilities under SDWA seriously.

Ms. Thorp stated that GS is not necessarily accepted and some interest groups believe it should not happen. Some projects (such as FutureGen) have fallen apart, and some believe that the cost, technological challenges, and potential for high energy and water use related to GS will hamper its success. It will take time for GS projects to get underway, and Ms. Thorp is concerned that the rulemaking process is being rushed. She advised EPA to ensure that the rule is as strict and protective as possible. More time might allow some uncertainties to be resolved and help EPA better define the regulatory requirements

Mr. Grunenfelder noted that the NDWAC has discussed this issue before, and has recognized that under current laws, a GS could happen today. This new rule is necessary to place controls on GS, and he hopes that EPA moves forward with caution.

Mr. Grunenfelder then asked about the closure requirements, which seem narrow in that they only address the well site. He has seen other comparable examples, such as landfill closure sites and low-level nuclear waste disposal sites.

Mr. Taylor stated that in other areas of water and sewer regulation, the utilities retain ownership of the treatment byproducts, and he expects the same from this regulation. CO_2 is a byproduct of the energy generation process, and in the chain of custody, the liability should remain with those who generated it. He believes the federal government as opposed to states should regulate this issue.

Ms. Dougherty said that under the SDWA, fluids remain the property of whoever injects them, but future laws could change this.

Mr. Heare added that industry is pushing for some form of state or federal indemnification after the CO_2 is injected.

Ms. Selman asked why another entity would own the CO_2 after it has been injected. **Mr. Heare** responded that this was a concern in the FutureGen project (a government-sponsored IGCC plant with on-site CO_2 sequestration) and, to attract the project, states (Illinois and Texas) passed regulations that indemnified the owner, passing ownership to the state. Although Illinois was picked as the site, DOE subsequently announced that the project would take another form.

Ms. Thorp commented that another reason that one might not want responsibility for the CO_2 after injection is because CO_2 may be considered a pollutant in the future. **Mr. Heare** added that there are also issues regarding ownership of pore space and the movement of plumes, which raise a number of legal and policy questions.

Mr. Smith inquired about the water use associated with GS. **Ms. Thorp** responded although there are no carbon capture projects at this time, in theory large amounts of water will be necessary to get carbon into the required "supercritical" form. Water may also be used in the transport phase. **Mr. Heare** added that water may not be used in the transport process, and that IGCC plants use steam in the capture process.

Mr. Kite commented that he lives near Mattoon, IL, where the FutureGen project was proposed to occur. The project was proposed to use wastewater, rather than potable water. He added that his utility uses CO_2 in treatment (about 7 tons a month), and encouraged alternative uses for CO_2 emissions. Although CO_2 is a byproduct, it is very expensive.

Mr. Cooley asked who is going to have oversight of the regulation. **Mr. Heare** answered that states will probably take primacy of the rule, which will likely add a new class of wells to the existing UIC framework. **Ms. Dougherty** clarified that the GS regulation will be implemented under the state UIC programs.

Dr. Head said she agrees with the need for a strong regulation and no owner indemnification. If a business fails, there should mechanisms in place to take care of future issues.

Mr. Radke commented that he is scared about the unknowns related to GS. He assumes that monitoring of the ground water will take place. A next step is finding a trigger to stop injection if there is a problem.

Mr. Heare responded that monitoring is currently required in the UIC programs not only in the injection zone, but inside the wall between casings. Other precautions include soil and gas monitoring, automatic shut-offs, and plume monitoring. EPA is trying to tailor the regulation to CO_2 and ensure that if leaks are detected, injection will be stopped.

Mr. Saddler said there are issues around long-term liability and gave examples of Superfund sites being remediated with tax dollars and contaminated mines that "open" to avoid clean up requirements imposed on inactive mines.

Ms. Dougherty said that the NDWAC could make recommendations to EPA now regarding the upcoming GS proposal, or the Council could convene after the proposed rule is made public.

Ms. Blette remarked that a conference call at a later date may be a better option, because the Council would have a chance to review the proposed rule in detail.

Ms. Dougherty stated that the NDWAC could make formal recommendations before the conclusion of the meeting or at a later date.

Dr. Head motioned to have a conference call once there is more detailed information on the rule is published to give the Council an opportunity to provide feedback to EPA. **Mr. Taylor** seconded the motion.

All members were in favor.

PHARMACEUTICALS
Veronica Blette (OGWDW), Pam Barr (SRMD)

Ms. Blette explained that pharmaceuticals have received a lot of media attention recently, although they have always been a concern. These contaminants have always been in water, but detection capabilities have increased. Pharmaceuticals and personal care products (PPCPs) are designed to have effects on humans, and EPA is concerned with identifying the health effects of these contaminants at the levels they are found in water. In addition to pharmaceuticals, EPA is also investigating other emerging contaminants such as pesticides and endocrine disruptors.

EPA's strategy for addressing emerging contaminants is based on four components and associated challenges:

1. *Strengthen the scientific knowledge.* There are many current EPA research efforts that are looking at PPCPs, but more information on the effects of dose and timing of exposure is needed. The research efforts are described in detail on EPA's website. Analytical methods are lacking for many emerging contaminants, so methods development is essential. Because there are a plethora of contaminants, methods development must be prioritized and developing a screening approach is essential. EPA is also trying to understand the occurrence of these contaminants and is currently reviewing existing research and conducting studies. EPA and other research organizations are looking into treatment technologies for contaminant removal as well.

2. *Improve public understanding and risk communication.* EPA has a general website devoted to PPCPs, but this could be improved. A challenge EPA faces is how to develop consistent, simple messages to convey information to the public while there is still uncertainty about the issue.

3. *Build partnerships for stewardship.* EPA worked with the Office of National Drug Control Policy to develop drug disposal recommendations. EPA believes that, contrary to what many people believe, "the toilet is not a trashcan." After the guidelines were released, FDA made a

statement that they still advise flushing of certain medications that have a high potential for abuse. This created confusion and the disposal recommendations may need to be revisited. Another issue is how to disseminate information on proper disposal of pharmaceuticals.

A work group was established to coordinate federal research efforts and will publish a report in December 2008 that will help target research efforts to agencies with specific expertise. EPA is supporting many stewardship activities, such as medicine "take-back" programs, at the local and state levels. A challenge to these programs is how to collaborate with the DEA and meet their standards. EPA is asking states for more information on their stewardship activities and is actively engaging stakeholders to learn their concerns and recommendations for the agency. One suggestion was to have FDA include an environmental review during the drug development stage.

4. *Regulatory tools*. EPA is using regulatory measures (e.g., CCL 3, UCMR, Six-Year Review) to address contaminants for which sufficient information exists.

Ms. Barr then discussed drinking water issues related to emerging contaminants. Her presentation focused on the following areas.

1. *CCL 3 development*. When EPA presented the CCL 3 to the SAB, the Board asked many questions about emerging contaminants as well as more well-known contaminants. When creating the CCL 3, EPA considered pharmaceuticals (along with other contaminants) that may have adverse health effects. Health effects data came from a range of sources including the FDA's Maximum Recommended Daily Doses, IRIS, and ATSDR. For occurrence data, EPA used data from USGS, the Toxics Release Inventory, and chemical production data (these data were more limited because they are proprietary). EPA investigated roughly 1,300 pharmaceuticals, and had health effects and occurrence data for 237 pharmaceuticals. Twenty-nine of these made it to the Preliminary CCL (PCCL), although 28 occurred at levels at least 10 times lower than the health effects level. Only one, nitroglycerine, which has applications in addition to pharmaceutical uses, made it through further screening to the CCL.

   EPA knew that these findings would be significant and asked for comments and additional data. Although the comment period is not over, Ms. Barr gave an overview of the comments addressing pharmaceuticals received to date. These comments came from environmental groups, drinking water associations, other associations, state health or environmental agencies, the City of Peoria, and one consulting firm. Many comments discussed the need for additional research on the health effects. They also stressed the need for standardized analytical methods and additional occurrence data. Pharmaceutical Research and Manufacturers of America (PhRMA) sent EPA two studies and commented that there is a significant amount of existing data that indicate that pharmaceuticals in water are not a concern because they are found at such low levels.

2. *Methods development*. EPA is working to develop a method to test for 10 pharmaceuticals at the same time.

3. *UCMR*. There are no pharmaceuticals on UCMR2. EPA hopes to have new methods for pharmaceuticals in place as they begin to develop UCMR 3. Monitoring for UCMR3 would start in the beginning of 2012.

Ms. Blette asked the group to discuss the highest priority issues for PPCPs, any activities their organization is working on related to emerging contaminants, and potential roles for EPA or opportunities for collaboration on this issue.

Mr. Grunenfelder stated that pharmaceuticals in water is not a drinking water issue; this thought process is like focusing on the symptoms of a disease rather than the cause. He asked if the NDWAC could encourage the EPA Administrator to take a broader view of the issue. Europe and California are more proactive in dealing with proactively with chemical contaminants. The State of Washington has banned products containing certain chemicals, but he cautioned against dealing with the issue on a state-by-state basis, as it will make commerce difficult.

The federal government needs to show more leadership on the issue. Also, the national policy on disposal of pharmaceuticals needs to be revisited, as disposing of pharmaceuticals in landfills has its own related issues and does not prevent the chemicals from ending up in the environment. Pharmaceuticals are also the number one cause of accidental poisoning, and pharmaceuticals companies have denied any responsibility. The pharmaceutical industry also presents weak arguments to not engage in take-back programs (e.g., the carbon footprint of the process). More research is needed on issues associated with minute levels of these contaminants and how to address the treatment issues. The discussion needs to move past drinking water and look at all the associated issues.

Mr. Cooley said that as a utility manager he was taken aback by a recent article with the headline "Drugs in Your Drinking Water" and was concerned about how his community would react. The article did not include a response from the local perspective. After the article was published, one nearby utility responded by saying that they do not test for pharmaceuticals because they are not required to do so (this message was not favorably received). Mr. Cooley's utility told the community that, without testing methods and water quality data, the system could not address potential pharmaceuticals in the water at the time. They also highlighted the preventative measures they are taking, such as a medicine drop-off program, and told the public that they perform over 20,000 tests a year to ensure that their water is safe.

This will become a wastewater issue, **Mr. Cooley** continued. In his community there are several pharmaceutical companies and prisons, which could have concentrated discharges. His utility also told citizens that when information comes out, they can be assured that the water system will act. The system is involved in the "no drugs down the drain" program and they may be included in a study on wastewater discharge. The system is looking at new treatment methods now as it considers expansion and hopes to include future treatment requirements in the expansion plans to lessen future costs on ratepayers. EPA could help disseminate information to utilities and develop testing methods.

Mr. Radke stated that along with agricultural associations, EPA may want to work with veterinarian associations, since they also use pharmaceuticals. Local health departments receive calls about what to do with left over drugs, and some will collect the drugs. Medicine collection could be coordinated with hazardous waste collection days, he said. **Mr. Grunenfelder** responded that some solid waste

programs did not want to accept pharmaceuticals. He noted that to get around DEA requirements, at some hazardous waste collection days the collectors have residents place the drugs in a barrel and avoid contact with them.

Mr. Diemer believes that this issue needs a broader approach than the traditional water or wastewater regulation. He has seen studies that show that traditional treatment is relatively ineffective at removing pharmaceuticals. The issue is a source control issue. In his experience, take-back programs have had a good response, but they are expensive and take a lot of time, effort, and collaboration with police and NGOs. We need a national model for disposal with a broader perspective so that people can act in a consistent, sustainable manner.

Ms. Blette stated that there are some international models where when you get your prescriptions, you are given a package to send it back. Take-back programs are not enough, since the largest source of pharmaceuticals in water is from passing through people; only 10 or 20 percent is removed from take-backs. This is a challenging issue and take-back programs are not a "silver bullet" solution.

Ms. Nuzzo said she agrees that more comprehensive research is needed. EPA should consider not only primary health effects but also secondary and tertiary effects in terms of microbial resistance. She would suggest conversations between EPA, pharmaceutical companies, and FDA.

Dr. Head stated that there are issues with animal runoff and antibiotics going into water from farms. A precautionary approach is essential to addressing this issue. Green chemistry is another option, and incentives could help encourage the practice. On the local level, collection days can be effective public education tools. EPA can help promote these programs and can partner with local partners on education and outreach initiatives. EPA also needs more efforts to address vulnerable populations. Giving local medical officers the authority to take back drugs could also help with disposal concerns.

Ms. Thorp commented that she found it interesting that the Associated Press (AP) report Mr. Cooley referred to took so long to be made public. She stated that her organization sees pharmaceuticals as more of a chemicals, manufacturing, and use issue. To address the issue, policymakers should look to Europe as an example and to preventative measures. There is a potential role for green chemistry, as well as assessing which medications are truly necessary. These issues can be yet another opportunity to get people to think about the bigger picture of water and where it comes from.

Mr. Grunenfelder asked whether this should be an issue on which the NDWAC should formally comment to EPA. **Ms. Dougherty** responded that it would be fine for the NDWAC to say something to the Agency about how the pharmaceuticals issue is broader than drinking water, but urged the Council to consider how far they wanted to take the statement. EPA has historically focused on this as an ecological issue, but it is bigger than EPA.

Mr. Taylor stated that perhaps FDA needs to share some of the research on this issue or request it from the pharmaceutical industry. **Ms. Dougherty** said that EPA is working with FDA to understand their policies.

Ms. Blette stated that she does not think there is pressure on the NDWAC to make a recommendation, but it might be useful to frame the issue in terms of priorities for EPA.

Mr. Grunenfelder noted that the AP article focused on drinking water. **Ms. Blette** responded that it was previously considered a wastewater and source issue.

Mr. Smith commented that EPA seems to have taken a broad approach to the issue. Research on the long-term health effects is still necessary and may impact drinking water.

Mr. Grunenfelder said that EPA does not need to take immediate action. An overall concern is that other major players are not acting on the issue. **Ms. Dougherty** noted that groups are involved in the issue and that OST has the lead.

Mr. Saddler recalled a lyric from a children's song: "yesterday is history, tomorrow's a mystery, and today is a gift, that's why it's called the present." He does not want to see history repeat itself and cautioned against making policy and regulation changes before all of the health effects are known and the analytical methods are readily available. It was a problem when EPA brought MDL levels below what labs could test for.

Mr. Cooley agreed and said this is an issue of source control versus treatment. He asked if the health effects vary depending on how the chemicals enter water sources (e.g., through flushing or through human excretion, which accounts for about 80%). Testing for pharmaceuticals is very expensive, and he encourages source control as a first action.

Mr. Grunenfelder stated that he wants EPA to continue moving forward on the issue and conducting more research. He suggested adding the topic to the agenda for the next NDWAC meeting.

FOLLOW-UP FROM DAY 1

Health Effects Research

Mr. Diemer presented a letter he drafted to the EPA Administrator expressing the need for additional health effects data specifically to support the CCL and UCMR processes. The letter requested that the Administrator realign research efforts to focus on health effects data.

Ms. Thorp asked whether a contaminant would be on the CCL if there was no occurrence data. **Ms. Barr** responded that all the CCL contaminants had some occurrence data, although the data were of varying qualities. A contaminant could be on the CCL if it had strong health effects data and weak occurrence data.

Mr. Diemer added that he intended the letter to focus on those contaminants on the CCL for which the lack of health effects data is holding up a regulatory determination.

Mr. Radke asked whether EPA sends out grants to conduct their research. **Ms. Dougherty** responded that most of the research is done in-house, although some research grants are given. She is not sure how much health effects research is conducted with these grants. **Ms. Barr** stated that there are only a few health effects studies being conducted.

Mr. Radke then asked if EPA is working with other agencies on research efforts. **Ms. Dougherty** responded that they do work with other agencies and have an agreement with the National Toxicology Program (NTP).

Ms. Nuzzo said that if most of the research is performed in-house, EPA needs to work to develop expertise for the next generation of researchers in this area. She encouraged EPA to support research at the university level. **Ms. Dougherty** responded that EPA has funded universities in the past, but they did not produce research that was helpful to the regulatory process. It is a challenge to balance the types of research and institutions funded.

Ms. Nuzzo stated that if the NDWAC is recommending more research they should also focus on developing expertise as well. **Mr. Grunenfelder** stated that if the NDWAC makes a small recommendation on the type of research, hopefully the rest should fall in line.

After the group made minor modifications to the letter's wording, **Mr. Taylor** put forth a motion to approve the letter, and **Dr. Head** seconded the motion.

All members were in favor.

The group asked that the letter be sent to the EPA Administrator, the OW Assistant Administrator (AA), the ORD AA and Deputy AA, and the OGWDW Office Director.

Water Resources and Water Management

Mr. Grunenfelder presented his notes on the key concepts related to water resource issues and said he hopes these can be transformed into a more formal letter. Topics include issues related to technology, source protection efforts, alternative supplies (removing barriers and conducting more research), and water quality considerations in climate change initiatives.

Ms. Thorp and **Dr. Head** asked to include more examples of these key concepts.

Mr. Wheeler said he would like to add a sentence on keeping the NDWAC informed of EPA's water resource and climate change efforts. **Ms. Blette** suggested that the letter state that EPA should update them on the status of its activities annually. She also suggested that the letter mention the OW water strategy. **Ms. Corr** noted that OW will be tracking EPA's actions on the strategy and can update NDWAC.

Mr. Grunenfelder stated that this letter could also be submitted as a comment on the OW strategy. **Ms. Blette** asked whether the letter would be ignored if it were to arrive after the comment period closed on June 10, 2008. **Ms. Corr** responded that it would not be ignored, but it would be preferable if it arrives before the deadline.

Mr. Grunenfelder reiterated that he only presented general ideas, which will be put into a more formal format and then distributed to the Council for review and comment.

Mr. Smith stated that he would feel more comfortable if the letter said that EPA should be responsible for issues within its core authorities instead of taking a "significant leadership role on

these issues." A statement about partnerships and enhanced collaboration with authorities could be added as well. He suggested drafting a report defining the roles of the various agencies in climate change. **Dr. Head** said these were good suggestions, but cautioned against being too prescriptive since this is a preliminary letter.

In response to a question, **Ms. Corr** responded that the water strategy is focused on OW's core programs. She added that Ben Grumbles is hoping to move forward quickly on the strategy, so if the letter can be sent soon, it would be helpful. **Mr. Grunenfelder** reiterated that it is preliminary letter and thus hopes that it be broader that just climate change and include issues like total water management.

Ms. Blette presented two additional bullets dealing with the importance of including public health protection and water quality considerations in climate change discussions and the need for EPA to collaborate with other agencies that deal with water resource issues (e.g., the Bureau of Reclamation).

Mr. Smith responded that these additions are helpful, but he is concerned about how agencies are going to address the health effects of climate change if they do not know what the consequences of climate change will be. He does not see EPA in the role of figuring out what is going to happen with weather patterns, etc., so he would like to see how the various agencies envision their role in climate change.

Ms. Thorp stated that although she was pushing the health research issue, she thinks they may be going too far in highlighting public health protection. She hopes that the issue of drinking water does not get ignored, but is concerned because the health effects are still uncertain. **Mr. Grunenfelder** added that it is important to consider both issues of drinking water quality *and* quantity.

Mr. Diemer stated that he had similar concerns as Mr. Smith with respect to the various federal agencies involved. He suggested adding a statement about ensuring that federal agency roles and responsibilities are clearly defined and understood.

Mr. Wheeler stated that climate change is only one part of broader water quantity issues.

Mr. Grunenfelder said the goal is to send the letter by June 10, 2008. Based on the Council's feedback, he and Ms. Blette will revise the letter and e-mail it to the Council for review and feedback. The letter will be finalized and sent after gaining approval from all Council members.

Ms. Blette added that this is just an opening statement on the issue; it is not the last opportunity for the NDWAC to comment on this issue. **Mr. Grunenfelder** agreed that it is just an initial letter and stated that the Council can revisit the issue in the future.

Mr. Stephani stated that POU and alternative supplies need to be allowable treatment alternatives. **Ms. Dougherty** responded that these have been allowed since 1996, although some states may have their own regulations.

Carbon Sequestration

Ms. Thorp stated that she hoped the Council could add to their previous recommendation on the topic of GS. She is concerned that if the Council waits until the proposed rule comes out, it will be too late to make an impact. She suggested a statement to the effect of, "the NDWAC reiterates its previous recommendation, but EPA should think about liability and indemnification issues and about ensuring public health protection in the carbon sequestration rule."

Ms. Blette suggested that Ms. Thorp e-mail her suggested recommendation to the Council even though some of the issues she raised might be outside the scope of the rule. Ms. Blette also stated that it might be more helpful to send suggestions after the rule comes out and comments can be specific.

Dr. Head stated that she thinks the Council should wait until they are able to review the proposed rule to make additional comments. **Ms. Dougherty** agrees that without specifics, it will be difficult to make suggestions.

Ms. Thorp agreed and offered to withdraw her proposal if the Council's input would be more meaningful later. **Mr. Grunenfelder** agreed that the input would be important later.

Ms. Blette added that the Council can comment to EPA that they are concerned about issues outside the scope of the rule. She noted that the letter on water resources could include a comment highlighting the Council's continuing interest on GS and a request for a conference call after the rule is proposed.

Mr. Grunenfelder reminded the group that a motion was needed to move forward with drafting a letter to EPA on water management and climate change issues. **Dr. Head** stated that she would accept Mr. Grunenfelder's language, and made the motion. **Mr. Taylor** seconded the motion.

All members were in favor.

ISSUES FOR DISCUSSION AT FALL 2008 MEETING

Mr. Grunenfelder informed the group that the fall meeting will likely be scheduled in November. **Ms. Blette** suggested having the meeting the week before or after Thanksgiving.

Ms. Barr raised a concern about having it in November because EPA will be busy with the administration change. **Ms. Dougherty** agreed, stating that she would prefer to have the meeting after December because of the transition. **Ms. Blette** suggested holding the meeting during the week of November 17th in Washington, D.C.

Mr. Grunenfelder then asked for agenda topics, and the following suggestions were offered:

- Climate change and geologic sequestration.
- Small systems issues.
- Sustainable infrastructure and utility management.

- TCR revisions.

Ms. Dougherty reminded the group that the final consultation on the ADWR will be held via a conference call.

WRAP UP
Gregg Grunenfelder

Mr. Grunenfelder thanked everyone for coming and said the meeting resulted in several good steps forward.

Meeting adjourned.

APPENDIX A

FINAL AGENDA
National Drinking Water Advisory Council Spring Meeting
DoubleTree Tucson Reid Park
445 South Alvernon Way
Tucson, AZ

June 2008

Tuesday, June 3, 2008 ~ Theme of the Day is Water Resources!

8:30-8:45 am	Welcome to Existing and New Members	Gregg Grunenfelder, NDWAC Chair, Veronica Blette, DFO
8:45 – 9:00 am	Water Resources in a Water Constrained World - Overview *Purpose: Set the stage for discussion for the day*	Gregg Grunenfelder, Cynthia Dougherty, OGWDW Office Director
9:00-9:30 am	EPA National Water Climate Strategy	Elizabeth Corr, DWPD
9:30-10:00 am	ASDWA Survey on Efforts to Address Water Availability, Variability and Sustainability (WAVs)	Nancy Beardsley
10:00 – 10:15 am	**BREAK**	
10:15 -11:15	Adaptation – Envisioning our Future *Purpose: When it comes to water resources, where do we want to be in 25 or 50 years? Understanding that will help us to determine what needs to be done to get there. Planning is critical and bringing the public into the decision-making process can build public support for the work that will need to be done. What are experiences from the state to the regional to the local levels? What can the NDWAC and EPA do to help facilitate this process?*	
	State and Regional Planning	Duane Smith, Carl Stephani
	Utility and Community Planning	David Saddler, Rebecca Head
11:15-12:15	Adaptation – Supply Management *Purpose: Adapting to changes in water resources may necessitate a different way of looking at supply. What are creative ways of stretching supply? Do we need to revisit how water is allocated? Do we need to move towards integrated or total water management? Are there barriers at the state or federal levels? What role should EPA play in water quantity issues as it relates to drinking water?*	
	Integrating Water Resources	Lynn Thorp
	Extending/Optimizing Supply	Brian Wheeler, Jeff Taylor
12:15 -1:15 pm	**LUNCH**	

1:15 - 2:15 pm	Adaptation – Demand Management and Balancing Treatment Decisions *Purpose: Once a utility has access to a supply of water, it is important to manage it efficiently through the plant to the customers. Can utilities do more to better manage water loss and consumer use? Today people understand how to conserve water and are successful at doing so. But in the future, we need to ask more. What can EPA and others do to inform/support efforts? Also, some treatment technologies needed to remove contaminants at ever decreasing levels use more energy or water. When selecting treatment technologies, how should utilities and regulatory agencies balance treatment needs vs. the energy/water costs? Does one side have to give?*	
	Loss Control, Metering, Educating End Users	Veronica Blette, et al.
	Technology and Treatment Choices	Dennis Diemer
2:15-2:30	**BREAK**	
2:30-3:30	Bringing it all Together – The Experience of Tucson Water *Purpose: Over the past few years, Tucson Water has gone through a very public process to determine how it will provide water to a growing population in years to come. How did they do it? What worked and what didn't? What other activities is the utility undertaking to address current drought conditions and future shortages?*	Mitch Basefsky, PIO, Tucson Water
3:30-4:30	**PUBLIC PARTICIPATION**	
4:30-5:45 pm	Where do we go from here? *Purpose: Discuss issues raised during the day. The Council may or may not choose to make formal recommendations to the Agency.*	
6:45 p.m.	**GROUP DINNER**	

Wednesday, June 4, 2008

8:00 - 8:45 am	Update on Regulatory Matters *Purpose: Update on CCL3, Six Year Review, and TCRDS FACA, Performance Measures, Aircraft Drinking Water Rule*	Pam Barr, SRMD Steve Heare, DWPD
8:45 – 9:30 am	Consultation: CO2 Sequestration Rule	Steve Heare, DWPD
9:30-9:45 am	Break	
9:45-11:00 am	Pharmaceuticals *Purpose: Provide an update on EPA activities related to assessing pharmaceuticals in water. Members are asked to discuss activities they are aware of within their organization/state.*	Veronica Blette, Pam Barr
11:00-11:45 am	Issues for Discussion at Fall 2008 Meeting	All (Council and EPA)
11:45 am-12:00	Wrap Up	Gregg Grunenfelder, Chair
ADJOURN		
12:00-5:00	Field Trip	