National Drinking Water Advisory Council (NDWAC)

December 6-7, 2016

Location:
U.S. Environmental Protection Agency Headquarters
1201 Constitution Avenue, NW
Washington, DC 20004

MEETING SUMMARY

Meeting Objectives/Desired Outcomes:

- *Update the Council on the National Drinking Water Program, the Drinking Water Regulatory Program and the Implementation of the Safe Drinking Water Act (SDWA)*
- *Discuss emerging contaminants and the development of Health Advisories (HAs)*
- *Provide an update on the NDWAC Working Group's Harmful Algal Blooms (HABs) charge*
- *Learn about efforts to increase transparency in the Office of Ground Water and Drinking Water (OGWDW) through online databases*
- *Discuss and consider ways to reduce contaminants in groundwater*

DAY 1

A. Opening and Welcome

Tracey Ward, the Designated Federal Officer (DFO) for the National Drinking Water Advisory Council (NDWAC) opened the public meeting[1] and highlighted NDWAC's role as an independent expert federal advisory committee chartered under the authority of the Federal Advisory Committee Act (FACA). The NDWAC or "Council" is empowered under the SDWA and provides independent advice to the U.S. Environmental Protection Agency (EPA) Administrator on drinking water and groundwater issues. The NDWAC consists entirely of special government employees appointed to their positions by the EPA Administrator making them subject to all applicable ethics laws and implemented regulations. EPA has determined that advisors participating in this meeting have no financial conflicts of interest or appearance of a lack of impartiality under the ethics regulations[2], as they relate to the topics of this meeting.

FACA and EPA policies require NDWAC meetings to be announced to the public in the Federal Register; any substantive deliberations and interactions with EPA and the public are to be conducted in open sessions where a DFO is present to ensure that the requirements of FACA are met. In accordance with FACA, the public will have an opportunity to provide verbal comments during the meeting, as long as

[1] See Attachment A for a list of NDWAC members and Attachment B for a list of meeting attendees.
[2] The ethics regulations are specified in the Code of Federal Regulations, Title 5, Part 2635.

they have registered in advance of the meeting or registered on-site on December 6. Ms. Ward noted that written comments can also be submitted and will be posted on EPA's NDWAC website and provided to Council members. A meeting summary will be prepared within 60 to 90 days after the meeting and posted on the NDWAC website[3] after being certified by the NDWAC Chair.

Carrie Lewis, NDWAC Chair, welcomed the public, Council members, EPA and Federal officials. She has replaced Jill Jonas as NDWAC Chair and identified Tracey Ward as the new DFO to replace Michelle Schutz. Ms. Lewis thanked Ms. Jonas for her service and also thanked EPA for the opportunity to be NDWAC Chair and for the opportunity to lead the meeting. She acknowledged a new Council member, June Anne Swallow from the Rhode Island Department of Health. Ms. Lewis provided a meeting overview and reviewed the agenda, noting a change to the order of presentations on the agenda for Day 2[4]. Following this overview, Ms. Lewis invited participants to introduce themselves and identify their organizational association[5].

During his introduction, Dr. Peter Grevatt, the OGWDW Director, welcomed the NDWAC members and those attending the meeting in person and by phone. He expressed his thanks to Council members for their time and work to support efforts to protect public health. He noted that the group would be discussing a number of important topics over the two-day meeting. The Council's expertise and perspectives provide valuable insight to assist OGWDW and NDWAC continue their work to ensure clean and safe drinking water and shape the direction of the National Drinking Water Program.

B. National Drinking Water Program Update

Dr. Grevatt discussed the Drinking Water Action Plan[6] or "Plan" that was released by the Office of Water (OW) in November 2016. Drinking water quality has improved significantly since the implementation of the SDWA; however, there are still opportunities to address significant challenges that drinking water utilities have been facing over the past few years. This Plan identifies opportunities EPA and the water sector could undertake to further protect public health, although it does not commit any agency or organization to specific actions. The Plan includes many opportunities for EPA, state and tribal primacy agencies, drinking water utilities, and local communities to work together to address key challenges facing the water sector. The Plan is intended to be the start of a conversation with the new administration. Dr. Grevatt walked through the six priority areas identified in the Plan, which are discussed below.

[3] NDWAC website: http://epa.gov/ndwac.
[4] See Attachment C for the meeting agenda.
[5] See Attachment B for a list of meeting attendees.
[6] The Drinking Water Action Plan can be found at: https://www.epa.gov/ground-water-and-drinking-water/drinking-water-action-plan.

1. Build Capacity for Drinking Water Infrastructure Financing and Management in Low-income, Small and Environmental Justice Communities

There are over 50,000 community water systems in the U.S., all with varying capacity. In some instances, low-income, small, economically disadvantaged and environmental justice communities face significant challenges when making infrastructure investments that are important to building capacity and protecting public health. Opportunities to address these challenges include encouraging partnerships between smaller systems, updating operator certification guidelines and developing an online funding portal. Dr. Grevatt noted that the best solutions are locally driven, not driven by federal mandate, to best suit the community's needs.

Encouraging Partnerships Between Smaller Systems

Partnerships between drinking water utilities can allow systems to leverage expertise from others and allow larger systems to provide support to smaller systems. Partnerships could include consolidating multiple systems into one utility, as well as collaborating on planning decisions and sharing of resources. The Plan suggests discussing how these partnerships can be formed to serve all parties involved.

Updating Operator Certification Guidelines

A large portion of the drinking water operators are of retirement age. There is a need to focus on training new operators and recognizing new technology and opportunities to incorporate into training programs.

Developing an Online Funding Portal

EPA suggests developing a "one-stop shop" for drinking water utilities to easily find information on infrastructure investments. This portal would include information from different funding agencies such as EPA, the U.S. Department of Housing and Urban Development, the U.S. Department of Agriculture (USDA) and others.

2. Next Generation Oversight for the SDWA

Over 150,000 regulated drinking water systems are required to report data under the SDWA. There are many opportunities to improve upon the existing reporting process to reduce the burden on utilities. For example, EPA, in collaboration with states, has recently completed the development of a Compliance Monitoring Data Portal (CMDP) that supports electronic drinking water data reporting. The Plan identifies important targeted opportunities to discuss data reporting, such as EPA programs that could take advantage of the system or the need for developing an electronic reporting mandate.

EPA is also interested in holding discussions on the oversight of drinking water primacy agencies to identify how to strengthen its relationships with states and ensure the highest level of public health

protection to customers.

3. Strengthen Source Water Protection and Resilience of Drinking Water Supplies

Understanding the current state and protection of source waters remains a priority item for all drinking water utilities. Increases in HABs, other algal toxins and nutrients have been seen in U.S. water bodies over the past few years, and pose a risk to surface waters. The Plan proposes updating source water assessments that were completed as a part of the 1996 amendments to the SDWA. Even though many states have already updated these assessments, EPA recommends discussing the benefits of updating them so that drinking water systems across the U.S. can make a unified effort to see the best return on investment.

4. Proactive Strategy to Address Unregulated Contaminants

Dr. Grevatt noted that there is a need to communicate priorities among unregulated contaminants and collaborate on developing and implementing proactive risk management strategies to manage unregulated contaminants, including algal toxins and perfluorinated compounds such as Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS). EPA has released HAs on some of these compounds, which can be of significant concern in some areas of the U.S.

In order to regulate a contaminant under the SDWA, it must undergo a deliberate and thorough analysis. Given the rigor of the analysis, Dr. Grevatt proposed working with the NDWAC to develop a framework to prioritize the main unregulated contaminants of concern.

5. Strengthen Transparency, Public Information and Risk Communication

Dr. Grevatt noted that there is a need for increased public communication and risk communication surrounding HAs. A majority of the public does not understand what an HA is (described below) or the difference between an HA level and a maximum contaminant level (MCL), which can cause unease and concern from utility customers.

The public in general has recently become more interested in the quality of their drinking water and their drinking water infrastructure, following the lead issues in Flint, Michigan. Many utilities have communicated to EPA the number of calls they received from customers inquiring about lead pipes post-Flint. Since drinking water quality information is included in the annual Consumer Confidence Report required under the SDWA, utilities have suggested providing that electronically to their customers to make it easier to access. Some utilities have expressed the need to provide information to their customers on a more regular basis, providing general knowledge and notifying the public of utility activities, such as sampling. Dr. Grevatt noted that increasing public communication practices can strengthen new and existing rules.

6. Reducing Lead Risks through the Lead and Copper Rule

EPA recently released a white paper on the Lead and Copper Rule (LCR)[7], which provides examples of regulatory options to improve the existing rule. The NDWAC provided recommended revisions to the LCR, which are listed in the white paper, and include:

- Sample site selection criteria
- Lead sampling protocols
- Public education for copper
- Measures to ensure optimal corrosion control treatment
- Lead service line replacement

The NDWAC came up with the idea of a proactive service line replacement program and developing a health-based household action level. Any decisions made to update the LCR are consequential. While there is the potential to reduce a public health risk, there is also an investment required to implement the changes to the rule. EPA will carefully consider these recommendations as well as others when revising the rule, which is set to be released in 2017.

7. NDWAC Questions and Comments

Council members provided the following feedback regarding the update on the Plan:

- Jeanne Marie Bruno asked Dr. Grevatt to clarify the term "environmental justice community." In response:
    - Dr. Grevatt explained that the term is used to describe communities that are particularly challenged by the level of environmental impacts they experience and the level of income available to address those challenges. These communities may also have additional disparities that make them more vulnerable to environmental contamination.
    - The City of Cleveland, Ohio was used as an example of a city that experienced significant job losses following factory closures. Industry losses can have economic implications on the communities and can prevent those communities from making investments in infrastructure.

- Randy Moore asked about the mechanisms to provide funding to smaller or disadvantaged communities, if there were any legislative proposals, or if any public/private partnerships were being evaluated. In response:
    - Dr. Grevatt confirmed that there are no proposals for legislation in the Plan but noted that there is already ongoing work at the community and state levels to encourage partnerships addressing issues facing small and disadvantaged communities. For example, in response to drought and water shortage concerns, California has state

[7] The LCR white paper can be accessed on EPA's website at: https://www.epa.gov/dwstandardsregulations/lead-and-copper-rule-long-term-revisions.

legislation that allows the state to require systems to form partnerships under certain circumstances.
    - Dr. Grevatt also mentioned the Water Infrastructure Finance and Innovation Act being proposed in Congress, which may allow the federal government to provide additional assistance.

- Sarah Pillsbury commended EPA for putting the information into an action plan in an effort to increase transparency with the public and confirmed the need for discussions on source water protection and unregulated contaminants. Ms. Pillsbury also noted the need for additional tools and information on quantitative assessments to compare costs for addressing contaminants in drinking water. In response:
    - Dr. Grevatt acknowledged the role of EPA's participation in stakeholder engagement meetings to inform the Plan's proposed activities. Dr. Grevatt also noted that it can be difficult for states or utilities to spend resources to study unregulated contaminants that are outside of their jurisdiction, but tools and information to assess comparative costs of source water protection and advanced drinking water treatment technologies could help states and local entities identify where to take important actions to protect source water.
    - Dr. Grevatt noted that the drinking water treatment plant is frequently seen as the primary location for managing contaminants. However, investments in upstream source waters can provide a great deal of benefit, reduce the burden on the utility, and could be more cost effective in the long run.

- James Salzman asked if there were any lessons learned from the Flint, Michigan crisis related to the financing approach and stated that focusing on the Flint response will not fix all issues and gaps with the LCR. In response:
    - Dr. Grevatt noted that there were many lessons learned, including paying close attention to your customers' ability to pay for treatment options and implementing system improvements through rate increases. Utilities should consider states' Drinking Water State Revolving Fund (DWSRF) programs, which provide low-interest financing to support drinking water infrastructure needs. The interest rates tend to be around half of market rate and many states offer additional subsidization (i.e., grant-like funds that are awarded as part of an overall loan package) that can further reduce citizens' financial burden.

- Vincent Hill asked if changes to the operator Certification Guidelines will specifically be directed towards operators for small and economically disadvantaged communities. Mr. Hill also asked if guidance could be provided to operations staff at different businesses and industries in case of *Legionella* or microbiological contamination events. In response:
    - Dr. Grevatt noted that the updates to the Operator Certification Guidelines will be directed to operators of all sized drinking water utilities.

    - Dr. Grevatt also noted that it would be beneficial for staff at hotels, casinos, hospitals, and other large water users to understand appropriate actions to take in case of a contamination event. EPA published a *Legionella* guidance document this year with input from the Centers for Disease Control and Prevention (CDC).

- Mark Sanchez voiced concerns that some states are requiring developments to retain stormwater instead of treating it, which can cause problems with governments downstream that are required to deliver water as specified in compacts (e.g., between Texas and Mexico). This practice could introduce conflicts between the SDWA and communities. In response:
    - Dr. Grevatt noted that it is important to think about water in an integrated fashion and consider the implications of drinking water regulations on wastewater utilities. For example, some downstream communities rely on wastewater discharges for source water.
    - Dr. Grevatt also noted that it is likely that EPA will be involved in navigating conflicts between drinking water and wastewater utility concerns in the future.

C. Drinking Water Regulatory Program Update

Eric Burneson, EPA Standards and Risk Management Division (SRMD) Director, expressed his appreciation to the NDWAC members for their time in helping EPA shape policies. Mr. Burneson reviewed the process for adding a contaminant under the SDWA and provided information on other ongoing regulatory analyses and rule development. Key points from his presentation are below.

1. <u>The SDWA Process</u>

The general flow of the SDWA Regulatory Process is shown in **Figure 1**.

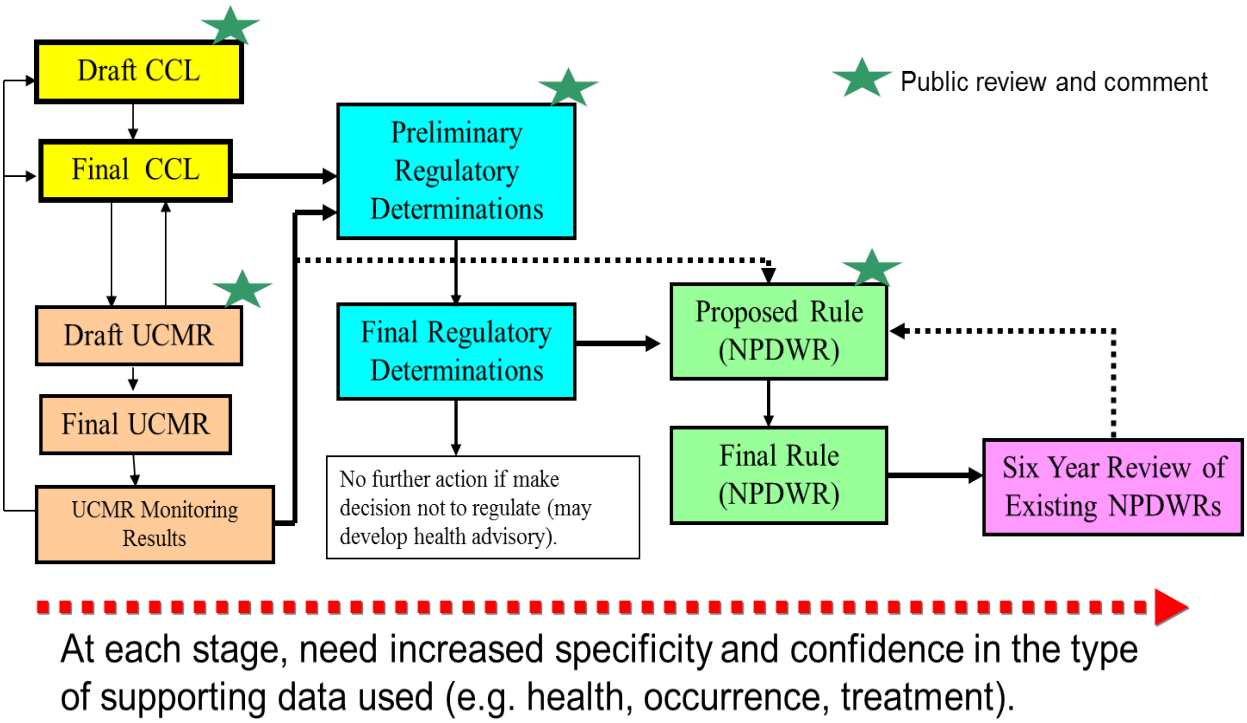

Figure 1. General Flow of the SDWA Regulatory Process

The first step is the Contaminant Candidate List (CCL). The fourth CCL was published on November 17, 2016 and contained 97 chemicals and 12 microbial contaminants. Developing this list begins the process of undertaking an evaluation of unregulated contaminants. The evaluation criteria include responding to the following questions:

- Does the contaminant have an adverse effect on humans?
- Is there a known significant likelihood for a public health concern?
- Does regulation of the contaminant present a meaningful opportunity for health risk reductions for people served by public water systems?

In addition to evaluating those criteria, EPA also collected information on treatability, which will inform regulatory determinations.

The third Unregulated Contaminant Monitoring Rule (UCMR 3) was published on May 2, 2012. Monitoring under the UCMR 3 concluded in December 2015. EPA is currently assembling information from 5,000 water systems required to monitor for 28 chemicals and 2 viruses. Contaminants include perfluorinated compounds (e.g., PFOS, PFOA), volatile organic compounds, metals (including Cr^{+6} and Cr), 1,4-dioxane, chlorate and pathogens. EPA evaluates this data to inform regulator determinations[8].

EPA is currently in the process of promulgating the next round of regulations, the fourth Unregulated Contaminant Monitoring Rule (UCMR 4). EPA published the proposed UCMR 4 rule in the Federal

[8] Reporting data is available on EPA's website: http://www2.epa.gov/dwucmr/ occurrence-data-unregulated-contaminant-monitoring-rule#3.

Register on December 11, 2015 and held a stakeholder meeting on January 13, 2016. The proposed rule contains 30 contaminants, including 10 cyanotoxins. EPA expects to publish the final UCMR 4 within the coming months. The monitoring period for UCMR 4 is expected to begin January 2018 and conclude December 2020.

SDWA requires EPA to review existing national primary drinking water regulations every six years and revise them, if appropriate. EPA completed two rounds of review in 2003 and 2010 and expects to complete the next six-year review in December 2016. This will be the first time the microbial and disinfection byproduct rules are reviewed. Any revision must retain or improve public health protection.

In February 2011, EPA decided to regulate perchlorate under the SDWA. EPA pursued a scientific evaluation to develop a standard for the contaminant. Health effects of perchlorate are of particular concern for infants, as it is a reactive oxygen and nitrogen intermediates inhibitor and can affect hormone regulation that is critical for development. EPA is also evaluating occurrence data; the feasibility of analytical methods and treatment technologies to remove perchlorate; and the costs and benefits of potential standards.

EPA is working with FDA and EPA's Office of Research and Development (ORD) to follow the recommendation of the Scientific Advisory Board to develop the MCLG using physiologically-based pharmacokinetic/pharmacodynamics modeling, as opposed to using the reference dose, in order to better model exposure.

EPA will conduct a peer review of the model, model report, and report of the application of the model to inform the development of an MCLG. The peer review panel will convene January 10-11, 2017. Subsequent peer reviews will be conducted to understand how the model can be used to devise the MCLG.

2. <u>Reduction of Lead in the Drinking Water Act and Revisions to the LCR</u>

Congress passed the Reduction of Lead in Drinking Water Act (RLDWA) in 2011, and redefined what constituted lead plumbing and plumbing materials. The rule reduced the amount of lead allowed in these materials from 25% to 8%. The rule was put into effect in January 2014. EPA is currently proposing regulations related to the RLDWA to address concerns identified during previous stakeholder interactions, such as:

- How to appropriately identify plumbing materials that are "lead free"
- How to distinguish materials for potable and non-potable use
- Solicit public comment on those requirements and codify them

As noted above, EPA is currently revising the LCR and is considering recommendations from the NDWAC and other concerned stakeholders, as well as lessons learned from the events in Flint, Michigan. EPA expects that the revised rule will be proposed in 2017. Notable material for the revisions include: a

health-based benchmark for lead, point of use filters, new sampling considerations, improved public understanding and knowledge to motivate customers to take action, targeting systems at greater risk from copper contamination for sampling, and considering other routes of exposure besides drinking water (e.g., paint, dust, soil, air).

3. Cyanotoxin Activities

Cyanotoxins are not currently regulated under the SDWA, but EPA released HAs for two cyanotoxins, microcystins and cylindrospermopsin in June 2015. EPA also developed and published analytical methods for evaluating cyanotoxins (EPA Methods 544, 545 and 546), a recommendations document for public works organizations, and a strategic plan for drinking water. In April 2016, EPA held a public meeting to gain stakeholder input on what continuing cyanotoxin support is needed. In response to the stakeholder input, EPA is developing risk communication tools and resources for water systems and local public health authorities[9].

4. Radiological Emergencies

EPA is currently developing the Proposed Drinking Water Protective Action Guide (PAG) for Radiological Emergencies[10], a guidance document to help water systems make on-site decisions regarding the provision of emergency drinking water in response to major radiological events. A drinking water PAG is a health-based value that defines doses of radiation that should be avoided during an emergency and does not represent acceptable routine exposures. The PAG does not supersede MCLs, but this information is useful when an emergency manager is determining how to deploy resources during a crisis. The public comment period for the PAG ended in July 2016, and EPA expects to finalize it in 2016.

5. Legionella Treatment Technology Document

EPA developed a *Legionella* treatment technology document[11] that characterized the effectiveness of treatment technologies to control for *Legionella* in plumbing based on findings from peer reviewed literature. The document was developed by a multi-agency task force including EPA, CDC, the Association of State Drinking Water Administrators (ASDWA), and state primacy agencies. *Legionella* can grow in the drinking water distribution system, so many drinking water utilities are installing drinking water treatment technologies to mitigate their risk from a contamination event. The treatment technology document helps facility operators identify the most appropriate technology to use based on operational requirements, which can vary state by state.

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[9] More information on EPA's cyanotoxin activities can be found on EPA's website: https://www.epa.gov/nutrient-policy-data/cyanohabs.

[10] Access the PAG on EPA's website: https://www.epa.gov/radiation/information-public-drinking-water-systems-proposed-drinking-water-protective-action-guide.

[11] Access the *Legionella* treatment technology document on EPA's website: https://www.epa.gov/sites/production/files/2016-09/documents/legionella_document_master_september_2016_final.pdf.

6. NDWAC Questions and Comments

Council members provided the following feedback regarding the Drinking Water Regulatory Program:

- Mr. Salzman asked how often the six-year reviews under the SDWA lead to rule revisions. In response:
    - Mr. Burneson explained that during the second six-year review, decisions were made to regulate four potential contaminants. Mr. Burneson noted that identifying a contaminant for regulation is not a final EPA decision; the contaminant must undergo a long process to implement any changes or to update a proposed drinking water standard. He also explained that revisions can be made outside of the six-year review process, such as the LCR which has been revised twice outside of the review process, if opportunities are identified for additional public health protection.

D. Drinking Water Implementation Update

Anita Thompkins, EPA Drinking Water Protection Division (DWPD) Director, welcomed and thanked all members of the NDWAC for their participation. Ms. Thompkins provided an overview of the ongoing activities related to implementing changes to the LCR and to supporting partnerships in order to address the needs of small, economically disadvantaged, and environmental justice communities. Key points from her presentation are below.

1. Activities to Promote the Implementation of the Revised LCR

The EPA Administrator submitted a letter to state governors to encourage state primacy agencies to comply with the implementation of the revised LCR and to increase transparency with customers. Following that communication, the OW Director Joel Beauvais sent a letter to commissioners of public health departments and state primacy agencies that contained more detailed actions to be taken to ensure compliance with the revised LCR. The revisions are expected to be proposed in 2017 and it will take five years for the rule to be fully in place.

EPA has since kicked off activities to take a national look at the implementation of the revised LCR sending clarification memos to states regarding sampling protocols, identifying Tier 1 sites, and ensuring the proper steps are taken when an actual exceedance occurs.

To assist with compliance and understanding of the revisions to the LCR, EPA offered “LCR 101” webinar training for the water sector and EPA staff and had over 1,600 participants to two sessions. The webinar provided an overview of the requirements of the LCR, what actions should be taken before there are any actual exceedances, what happens following an exceedance (e.g., public education, understanding sampling procedures, monitoring, utility and state activities) and understanding how to restore the utility’s compliance. EPA plans to continue to offer the LCR 101 webinar due to high demand.

EPA also developed face-to-face training on the Optimal Corrosion Control Treatment (OCCT) guidance. The training was offered in five regions in 2016; EPA expects to conduct the training in the remaining five EPA Regions in 2017. These trainings would include representatives from water sector associations such as the Rural Community Assistance Partnership (RCAP) and the American Water Works Association (AWWA).

Additional trainings topics include the Drinking Water State Revolving Fund (DWSRF) and a collaborative effort with EPA ORD to develop training on lessons learned from the Flint, Michigan events and revisions to the LCR.

Ms. Thompkins noted that EPA is interested in collecting a set of best practices from utilities and public health professionals responding to lead and copper issues. For example, Massachusetts and the District of Columbia developed an online searchable database that allows customers to enter their address to identify any lead service lines at their location. Alabama also established a rule requiring samples to be taken within 48 hours if there is an exceedance. EPA plans to make these stories available to others to create a community of practice in the water sector.

EPA asked training participants to identify additional needs to enhance the implementation of the revised LCR. Participants noted that training on evaluating and identifying Tier 1 sampling sites, effective risk communication strategies to educate the public, and basic water chemistry would be useful. Participants also noted that tools such as OCCT online templates and decision tools, sampling instructions, and a list of successful residential participation strategies would be beneficial.

2. <u>Water System Partnerships</u>

About 90% of the more than 150,000 public water systems are classified as very small. Many of these systems serve economically disadvantaged communities that face managerial, financial, and compliance issues related to drinking water. Utility partnerships could be an effective approach to helping all systems achieve compliance with the SDWA. Ms. Thompkins noted that partnerships do not necessarily imply system consolidation; however, discussions are needed to develop a strategy or framework that can help all systems.

To explore successful utility partnerships, EPA held a webinar with ASDWA and RCAP featuring speakers from California and New Mexico. The California State Water Resource Control Board takes a legislative approach to partnerships and, in some instances, can compel systems to undergo a physical or operational consolidation to address water shortages. In New Mexico, partnerships are voluntary and are formed at the local level.

Ms. Thompkins explained that in order to form partnerships, three key areas must be discussed:

- Incentives for partnerships
    - Ms. Thompkins noted incentives for partnerships include the ability to use the DWSRF towards consolidation.

    - Also, under certain conditions, if multiple systems consolidate, no enforcement action can be taken with respect to violations for up to two years after the plan to consolidate has been approved. Additional incentives will be identified in the future.
- Funding and financing partnerships
- Outreach and communication

EPA held an in-person strategy meeting on January 31, 2016 to identify actions to address these areas, as well as partners to assist in developing the strategy.

OGWDW and the Office of Wastewater Management (OWM) began consulting with the National Environmental Justice Advisory Council (NEJAC) in October 2016 to discuss matters related to environmental justice and water infrastructure and capacity. EPA charged NEJAC to consider challenges and identify best practices for infrastructure financing and capacity building. The charge addressed three major categories of concern:

- Small, low-income communities
- Economically stressed communities
- Low-income households located within a service area where the community as a whole is not economically stressed

NEJAC will identify priority needs; barriers to establishing water system partnerships; tools for community capacity building and best practices for capacity building, community engagement and education. NEJAC is currently identifying partners for collaboration (e.g., Environmental Financial Advisory Board) and will submit a report to EPA on their findings in 2018.

3. <u>NDWAC Questions and Comments</u>

Council members provided the following feedback regarding the drinking water implementation program:

- Jeanne-Marie Bruno asked about the roster of NEJAC. In response:
    - Dr. Grevatt noted he will share a roster of NEJAC with the group, which includes utilities, members of academia, and staff with financial backgrounds that collaborate with EPA's Office of Environmental Justice.

- Mr. Moore asked how EPA monitors success of their training efforts. In response:
    - Ms. Thompkins explained that success will be measured by the states' abilities to complete OCCT and implement the new water quality parameters within the specified time. Success will also be measured by the capabilities of new utility staff that are taking advantage of the trainings.

- Cathey Kellon asked for more information on the justification for encouraging partnerships. In response:
    - Ms. Thompkins and Mr. Burneson explained that partnerships should be formed to ensure compliance and to help the individual water systems build the capacity required for that purpose.

- Ms. Kellon also asked if one of the products would be a matrix to help small systems identify the most appropriate actions based on their challenges. In response:
    - Mr. Burneson explained that the goal of EPA tools is along those lines. EPA will most likely develop a compendium or online portal of best practices to provide that assistance.

- Mr. Salzman noted that California's concern for consolidation includes legal liabilities in addition to non-compliance. Mr. Salzman asked if there was an enforcement strategy to treat very small systems differently in the event of non-compliance. In response:
    - Dr. Grevatt explained that he is unsure if there is compliance assurance; clarification would be needed from EPA's Office of Enforcement and Compliance Assurance (OECA). He noted that OECA has an Enforcement Targeting Tool (ETT) that attaches a score to different violations to identify what systems may require more assistance.
    - Dr. Grevatt reiterated that the goal of promoting these partnerships is to develop a strategy that advances the protection of public health.

- Wilmer Melton, III asked if rate analyses will be encouraged to ensure that water service is affordable in these communities. In response:
    - Dr. Grevatt and Ms. Thompkins noted that rates are an important consideration and must be considered during the decision-making process to consolidate or upgrade infrastructure. The Water Infrastructure and Resiliency Finance Center provides resources that help utilities look at rates and affordability and can provide assistance with setting rates. However, it is public health protection that should be the determining factor in consolidation decisions, not rate affordability.

E. Emerging Contaminants/HAs

Elizabeth (Betsy) Behl, EPA Office of Science and Technology (OST) Director, and Mr. Burneson provided an overview of how HAs are developed and used in the water sector.

1. <u>Developing HAs</u>

Ms. Behl explained that HAs are non-regulatory technical guidance for drinking water contaminants to assist federal, state, and local officials, as well as managers of public or community water systems in protecting public health. HAs convey scientific information to help officials make decisions to protect

public health. HAs provided concentrations at which adverse health effects are not anticipated to occur over specific exposure durations. The HA process predates the 1996 SDWA Amendments.

The HA level is calculated using the equation below.

$$Lifetime\ HA\ = \frac{Reference\ Dose\ \times Relative\ Source\ Contribution}{Drinking\ Water\ Intake/Body\ Weight}$$

The Relative Source Contribution is a value from 20% to 80% and takes into account the exposure path (i.e., ingestion of drinking water), the 90th percentile of drinking water intake is used for each population (e.g., child, adult, other at risk population), and the 50th percentile is used for adult body weight. Exposure durations can be for exposures of one-day, ten-day or a lifetime, or for a carcinogenic effect.

Ms. Behl explained that HAs contain a wealth of information on the toxicity of a chemical. HAs undergo a three- to four-year extensive internal and external review process. An HA includes: the nature of the stressor, problem formulation, including conceptual models and analysis plan, effects assessment, dose-response assessment, health advisory value derivation, quantification of cancer risk, effects characterization (qualitative summary), analytical methods, treatment technologies and references.

EPA has released 214 HAs, including 177 organics, 32 inorganics and 5 radionuclides. This total includes the two HAs released in 2015 for cyanotoxins. HAs are developed as a way to ensure that the community has information about the risk of certain contaminants as soon as possible, since regulating a contaminant under the SDWA can take much longer than developing an HA. Each HA much be supported by robust scientific information and cannot proceed if the scientific support is not yet available.

Ms. Behl explained that there are three drivers to determine if a contaminant should be regulated under the SDWA: (1) the contaminant may have an adverse effect on the health of the persons, (2) there is a known or substantial likelihood to occur in public water systems, and (3) there is a meaningful opportunity for public health risk reduction. In some instances, a contaminant may not meet all of the criteria if it has a limited occurrence, but the frequency and level of concern does not warrant a meaningful opportunity for health risk reduction. If a decision is made not to regulate a contaminant, an HA can still be developed. In some cases, the development of an HA has assisted EPA officials in making a regulatory determination.

The process for developing HAs is shown in **Figure 2**. EPA collaborates with toxicologists and other scientists within ORD, EPA's Office of Pesticide Programs (OPP) and the Integrated Risk Information System (IRIS) program to develop a Health Effect Advisory (HEA) document by reviewing the available information on health effects associated with contaminants and develop a comprehensive assessment of the risks.

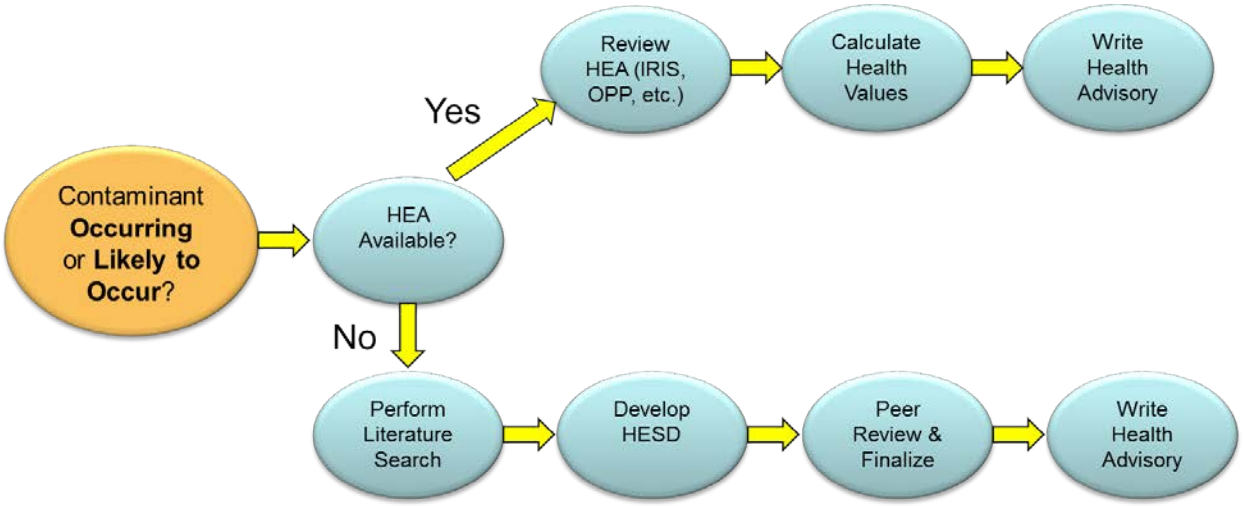

Figure 2. Health Advisory Development Process

2. HA Examples

Dacthal and Degradates

EPA decided not to regulate Dacthal Mono-Acid (MTP) and Di-Acid (TPA) Degradates in 2008 following the results of their sampling assessment. Only 0.03% of the wells sampled detected the contaminant greater than the specified level, affecting less than 0.01% of the population. Therefore, a Health Effect Support Document (HESD) was developed for Dacthal and Dacthal Degradates: MTP and TPA, and an HA was developed for Dacthal based on a risk assessment by OPP.

Cyanotoxins

The HA process for cyanotoxins began in 2012, before there was a serious impact on drinking water, due to an increased frequency of HABs in the Great Lakes, which were causing concerns about source water quality. EPA partnered with Health Canada, who was updating their 2002 guidance on microcystins, which is a comparable process to U.S. drinking water regulations. This partnership accelerated the process for the HA development and was mutually beneficial since the Great Lakes is a boundary between the two countries where these contaminants have been documented.

EPA conducted a literature review and developed HESDs for three cyanotoxins: (1) microcystins, (2) cylindrospermopsin and (3) anatoxin-a. HAs were developed for microcystins and cylindrospermopsin, although peer reviewers determined there was not enough available information to develop an HA for anatoxin-a.

3. Stakeholder Engagement

Unlike other contaminants, cyanotoxins are not persistent in source water; however, from EPA's engagement of the public and stakeholders, it was clear there was a need for public health information regarding HABs and their impact on drinking water. In 2014, HABs overtook the intake of a water system in Lake Erie, and the governor issued a "do not drink" order for the water system until the cyanotoxins could be removed. Following this event, EPA engaged in discussions with state drinking water administrators on the status of HAs and other public health information, analytical methods, and treatment technologies. Using this input, EPA developed a partner document to the HA with recommendations and a stepwise approach to address cyanotoxins. The document included recommendations for surveillance and monitoring processes, identifying the need for modifications to the treatment processes, and how to communicate with the public. EPA held a stakeholder meeting in May 2015 to present this information and solicit input.

Since the development of the recommendations document and the stakeholder engagement, EPA has been looking to refine the tools available related to communication. There currently is not a lot of information water systems can use to explain to their customers what it means to have a contaminant level above the health advisory level. Therefore, EPA is interested in evaluating how to refine the HA process to incorporate additional stakeholder engagement and public education.

EPA worked with ASDWA, the Association of State and Territorial Health Officials (ASTHO) and the Environmental Council of the States (ECOS) to develop recommendations for improving the HA process. Recommendations included:

Process Related

- States need to be involved earlier
- States need to be aware of HAs in development in order to prepare for local implementation and risk communication
- Need for federal agency coordination

Tailoring Messages for Different Audiences

- Information should be presented for each audience (e.g., state officials, public water systems, and consumers)
- The differences between HAs and MCLs should be clarified

Approaches to Communication

- Fact sheets, information graphics, conveying uncertainty, and a risk continuum

Special Challenges/Partnering

- Acute and chronic impacts must be carefully articulated
- Sensitive populations also require unique messaging

- Caution against appearing too similar to a National Primary Drinking Water Regulation (NPDWR)

4. NDWAC Charge

Ms. Behl and Mr. Burneson explained that they would like to charge the NDWAC with questions that will help identify additional recommendations related to the HA process that should be considered. The charge questions are as follows:

- What factors should we consider when prioritizing contaminants for HAs?
- How can EPA best involve federal, state, and local partners in identifying and prioritizing contaminants for HAs?
- How can EPA enhance collaboration with states, other federal agencies, and external stakeholders to support local communities with developing risk management strategies?

5. NDWAC Questions and Comments

Council members provided the following feedback regarding the charge to the NDWAC to provide recommendations on the HA process:

- Ms. Swallow asked for clarification regarding the criteria EPA uses to prioritize contaminants for HAs. In response:
    - Ms. Behl and Mr. Burneson explained that there are two situations when an HA may be issued:
        - When making a determination not to regulate a contaminant that has some adverse health effects but does not meet the other criteria.
        - When the agency is considering regulating a contaminant, that decision can be informed by the development of an HA, assuming there is some occurrence in water systems.

- Mr. Salzman asked about the demand for HAs and who requests them. He also asked if EPA is aware of how the HAs are being used in the water sector. In response:
    - Ms. Behl and Mr. Burneson explained that they do not track the usage of HAs since they are non-regulatory guidance information. They noted that they do hear through stakeholders how the information is being used, but they do not have a good sense of where the demand for HAs originates.
    - Ms. Bruno noted that additional information on how HAs should be used and when they will be released is needed, since HAs do not include or consider costs for treatment options or a timeline for implementing recommendations.
    - Mr. Sanchez noted that utilities need to know which HAs are being released before the public does, since there is a lack of understanding from the public of what an HA is, and the response can be overwhelming.

- Ms. Lewis echoed that the nuance of an HA being a regulation without any enforcement is lost on the public.

- Ms. Pillsbury suggested that EPA look into how the wastewater programs are using HAs, as it may be different compared to how drinking water programs uses them. She also asked if there is somewhere on EPA's website to review which HAs are currently being developed. In response:
  - Ms. Behl and Mr. Burneson explained that there are currently no plans to issue additional HAs in the short-term.

- Ms. Pillsbury asked what dose and exposure information is stressed in HAs. For some contaminants, it is recommended that pregnant or lactating women not ingest the water at all, but a lifetime health advisory level might be provided. In response:
  - Ms. Behl explained a lifetime value might be provided because of the established reference dose, but the endpoint of concern could be a developmental endpoint. Therefore, there is also a focus on the developmental state if a contaminant could be passed through blood and milk during pregnancy or nursing, respectively.

- Ms. Swallow suggested increasing the transparency of HAs and allowing state programs or toxicologists to review the HA prior to issued.

- William Alley asked for clarification on how the state recommendations and the charge questions map to each other.

- Ms. Lewis asked for additional clarification on what is meant by a "risk management strategy" as used in the charge questions. In response:
  - Ms. Behl and Mr. Burneson provided the following examples: options for treatment technologies, communication with customers, monitoring and source water protection.

- Mr. Moore asked if an HA can have multiple health advisory values (e.g., one-day, ten-day, lifetime) and if one was more severe than another. In response:
  - Ms. Behl and Mr. Burneson explained that for an individual chemical, there could be different values but they are used differently.
    - Shorter-term values are used to address spill-type situations.
    - Longer-term exposure values are used to represent longer exposure through the ingestion of drinking water over a lifetime.
  - The value provided depends on the duration of the study underlying the health effects (e.g., chronic or acute exposure).

- Vincent Hill remarked upon the collaboration with CDC, EPA, AWWA, ASDWA, ASTHO and the National Environmental Health Association (NEHA) to release CDC's Drinking Water Advisory

Communication Toolbox (DWACT)[12]. The toolbox provides information on developing "boil water" and "do not use" advisories. It also provides health departments and water utilities with information and resources around contamination events. The toolbox includes downloadable templates, checklists, fact sheets and completed examples of available resources. Mr. Hill asked if there could be an opportunity to develop similar information for HAs and make information easily accessible during emergencies highlighting the need to translate complex scientific documents and guidance to plain language for everyone to use.

- Marilyn Christian asked when EPA would like an answer to their charge questions. In response:
    - Dr. Grevatt explained that this should be a thoughtful process. He explained the importance of developing HAs as a way to provide important information that can improve public health faster than developing an MCL for a contaminant, which can take 10 to 12 years.
    - Feedback on the process has been that EPA is doing this work on the fly. Although HAs undergo extensive peer review, they do not consider cost or feasibility for treatment alternatives and there is no comment period, yet these documents are being used to support decisions.
    - There should be consideration about how much the HA process should mirror the regulatory process, since there are reasons for the differentiation.
    - Mr. Burneson also noted that the charge questions can be modified by the group, and EPA encourages other aspects of the issue to be considered.

- Ms. Kellon asked if HAs should be seen as a stepping stone to creating an MCL for a contaminant or are they categorically different management tactics. In response:
    - Dr. Grevatt noted that there is not a universal answer for this, as some contaminants with HAs will not get the determination from the EPA Administrator that there is a meaningful opportunity to reduce public health risk through national regulation.
    - Dr. Grevatt noted that with respect to algal toxins, it is unclear if they will be included in the next Unregulated Contaminant Monitoring Rule (UCMR) cycle, since there may not be sufficient data in the health system to make a regulatory determination

- Ms. Lewis suggested that the NDWAC form an ad hoc group to discuss the charge questions and present on their recommendations during a future meeting. The following NDWAC members volunteered for the group:
    - James Salzman
    - June Anne Swallow
    - Marilyn Christian

[12] More information on the Drinking Water Advisory Communication Toolbox can be found on CDC's website: https://www.cdc.gov/healthywater/emergency/dwa-comm-toolbox/.

F. Closing Remarks

Ms. Lewis remarked that it was a productive and positive day filled with important discussions.

Dr. Grevatt acknowledged that Ms. Lewis is off to a great start as NDWAC Chair. He also noted that the issues covered as part of this two-day meeting are very important, and he hopes members think carefully about volunteering for the sub-group to further discuss the charge questions relating to HAs for emerging contaminants. He pointed out that in recent years there has been a great deal of back and forth with local authorities, states, and federal agencies on this issue, and it is not an issue to be taken lightly. It is important to continue thinking about this issue.

DAY 2

A. Opening

Ms. Lewis thanked all attendees for contributing to a worthwhile and interesting discussion. She also briefly reviewed the highlights from the previous day, including the following key topics:

- National Drinking Water Action Plan
- Revisions to the LCR
- Addressing unregulated contaminants
- Developing HAs
    - Prioritizing contaminants
    - Intended use and understanding of HAs (e.g., utilities, states, general public)

As part of the review, she noted that Mr. Salzman, Ms. Swallow and Ms. Christian volunteered to discuss HAs further following the adjournment of the meeting. Any other participants interested in taking part in the HAs sub-group should contact Ms. Lewis directly.

Ms. Lewis also discussed a number of key themes that had emerged from Day 1 of the meeting. These themes revolved around NDWAC and EPA's goals to provide clean and safe drinking water to protect public health by:

- Providing assistance to build capacity in small, economically disadvantaged and environmental justice communities
- Using utility partnerships to achieve compliance
- Increasing transparency and communication with the public, state primacy agencies and local, state and federal officials
- Implementing and train on the LCR revisions
- Identifying needs and tools to support communities
- Discussing considerations for prioritizing contaminants and involving partners in the development of HAs

Finally, Ms. Lewis reviewed a number of action items identified during Day 1. These items include:

- EPA to provide roster of NEJAC
- EPA to provide more information on compliance assurance for very small systems and the ETT
- NDWAC to identify members to participate in the HA discussion group
- EPA to provide all meeting materials electronically

B. HABs—NDWAC WG Report Out to NDWAC on HABS Charge

Mr. Burneson opened the session by providing an overview of a guidance document and strategy for addressing HABs in source water released by EPA. Following the November 2015 NDWAC meeting, a Working Group (WG) was formed to provide input on how to work with partners to implement source water protection actions to reduce the formation of HABs (e.g., nutrient reduction strategies). The group, made up of Ms. Pillsbury, Howard Neukrug and Karen Mandulbaum, discussed two charge questions:

- How do we best work with states, drinking water utilities, and other partners to implement effective source water protection practices that can reduce the formation of HABs in source water?
- What other support do drinking water utilities need to address challenges with HABs?

Mr. Burneson then invited the HABs WG to provide the Council with an update on their work over the past year.

1. <u>WG Report Out</u>

On behalf of the WG, Ms. Pillsbury provided an update on WG activities since the November 2015 meeting. She mentioned that the WG did not focus on the charge questions or specifically address the best ways to address source water protection. They chose instead to focus on the broader challenges facing the water sector in addressing HABs.

The WG met once via conference call to discuss the HABs outbreak in Ohio, which has been at the forefront of HABs work at the state level. In the absence of a berth of information on the Ohio outbreak, the WG discussed a number of needs to address HABs:

- Better tools to identify, count, and monitor algae as well as a quick test for confirmation of toxins
- Better predictive models for cyanotoxin outbreaks
- Agreement from all parties on risk communication strategies
- Increased national focus on sources of nutrients and the development and implementation of a national nutrient strategy and better management of nutrient sources in partnership with farmers and USDA
- Research in relation to sequestering nutrients in water bodies

2. EPA Response to WG Report Out

Ryan Albert from EPA OGWDW mentioned that EPA has been working on many of these issues raised by the WG over the past year. He noted that many of the needs identified by the WG were similar to feedback received from states and utilities through public comment, including eight key needs:

- Better understanding of risk communication
- More predictive tools
- More information on treatment and mitigation strategies for HABs
- Better monitoring and analytical methods
- Improved management strategies
- Improved preventative strategies
- Better method comparison

Mr. Albert provided an overview of EPA action taken in numerous areas and provided insight into future EPA HABs work. Each of these key needs, as well as an overview on EPA's work in these areas, are discussed further below.

Risk Communication and Risk Tools

- A risk communication toolbox, created with the Water Research Foundation, AWWA, and other state organizations, that includes a suite of tools utilities can use to communicate about cyanotoxins. This includes information about actions to take when cyanotoxins are found in finished drinking water, found in source water, or when they are not found at all. EPA will also link to the CDC toolbox that was developed.
- EPA is currently working with the Office of Civil Rights to translate these documents into Spanish to provide support to utilities that cover areas with Spanish-speaking populations.

Predictive Tools

- Along with partners in ORD, EPA is working in select states using remote sensing data in small inland lakes to identify higher risk waters and understand where HAB formation is more likely.
- EPA is also working in coordination with the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration and the U.S. Geological Survey (USGS) in the Great Lakes to predict HAB formation one to three weeks out.

Treatment and Mitigation Strategies

- EPA released an optimization document for distribution to utilities outlining factors for consideration before, during, and after cyanotoxin events. This document aims to provide information for those who have not had a cyanotoxin event previously and presents the

information in a clear and straightforward manner. The goal of this document is to help utilities optimize the treatment system to maximize the removal potential.

Monitoring and Methods

- EPA recently released an Enzyme-linked Immunosorbent Assay (ELISA) Method for drinking water in fall 2016. Once this method is finalized, it will be used in the next UCMR to help assist in monitoring and characterizing the presence of cyanotoxins in finished drinking water.

Preventative Strategies

- Researching triggers is a complex issue, and there are various nutrient reduction efforts underway on both the policy and research sides. They are working to understand what causes algal blooms to produce cyanotoxins in some cases and not in others.
- Ms. Behl has been working for a year to develop lake nutrient criteria aimed at source water protection under the SDWA. EPA is working to link nitrogen and phosphorus concentrations with the HA value for microcystins to understand the root cause of algal blooms. Mr. Albert noted that this is a long-term effort that will require further research and stakeholder engagement. On top of this work, there is also work being done at EPA regarding source water protection and water nutrients.

Ms. Behl also noted that EPA is developing a cyanotoxin management plan template. This effort is being informed by EPA support to five utilities to help them develop a cyanotoxin management plan, including two utilities in Ohio, one utility in California, one in New York and one in Oregon. The utilities range in size from 3,000 to hundreds of thousands of customers. Through this effort, EPA took source water from various sources at each utility including lakes and reservoirs to understand the commonalities and differences in each of their management plans. Within the cyanotoxin management plan template, there are links to the drinking water mapping tool and other useful resources.

3. <u>NDWAC Questions/Comments</u>

Council members provided the following feedback regarding the WG report out and EPA's discussion of current work on HABs:

- Ms. Lewis noted that the overlap of the recommendations from the independent subgroup and EPA's direction in this area is remarkable.

- Mr. Salzman asked whether or not EPA has gotten involved with the Des Moines source water lawsuit. Mr. Albert clarified that EPA has not gotten involved in this lawsuit.

- Dr. Hill commented that CDC has been working with EPA on the Great Lakes Restoration Initiative which led to the development of the One Health Harmful Algal Blooms System

(OHHABS)[13], which includes data uploaded by public health departments or other local health partners. The goal of this is to capture water testing data to inform how HAB events occur. As this data collection continues, development of a database will help to communicate more about these issues.

- Ms. Lewis asked how EPA and CDC work together when they have areas of mutual concern. In response:
    - Mr. Albert said that they work very closely throughout the year on a number of issues, including alphatoxins, PFOA, PFOS or others. The collaborative effort is important to ensure federal public health agencies are on board with each other's work and public communication is in sync.
    - Mr. Burneson added that they rely on each other's individual areas of expertise for various issues of concern. For example, in their response to *Legionella*, EPA provided subject matter expertise while CDC supported these efforts. The topic guides the collaborative process and ensures it is well coordinated.
    - Dr. Hill noted that the CDC's mission is to support local, state, and federal partners by tapping into other partnerships with healthcare facilities and surveillance.

- Dr. Grevatt asked about NDWAC's perception of how effective EPA and CDC have been in aligning their messages on key areas of concern. In response:
    - Ms. Pillsbury noted that on the state level, the messages seem to be consistent and the tools, resources, and guidance provided at the federal level are helpful.
    - Ms. Lewis commented that in Milwaukee they have a great partnership with the state, which is helpful in developing their messaging. She noted that based on her experience, health departments often find the CDC provides more credible information than the information from the EPA, even though they may be providing the same information and messages.
    - Ms. Kellon noted that the general consensus in Oregon is that small utilities are somewhat ill-prepared to deal with HABs and have a lack of understanding of the probability of HAB events. Their primary needs are resources related to surveillance, predictive modeling, and rapid testing. They do not need as much information related to response and messaging.
    - Mr. Moore noted that in Iowa the communication breakdown is seen when utilities or communities are trying to interpret different rules and regulations. He noted that the further you get way from the source of information, the more diluted the information becomes, which is a concern. It is not necessarily significant yet, but it is important to get out in front of a problem that could occur in the future.

[13] The One Health Harmful Algal Blooms System can be found on the CDC website at: https://www.cdc.gov/habs/ohhabs.html

- Dr. Hill noted that he has been involved in tabletop exercises to discuss response activities related to spills. He asked if EPA offers tabletop exercises for HAB events. In response:
    - Dr. Grevatt noted that EPA has conducted regional trainings and meetings with states to discuss response activities for HAB events, but he is unsure if tabletop exercises have been held. For example, they conducted one in South Dakota and others to work with states on planning response activities and work on the issues raised about predicting when HABs may emerge. Dr. Grevatt acknowledged that tabletop exercises would be good to practice rapid response in the events of a HAB outbreak.

- Ms. Lewis noted that at the last meeting they were asked to give EPA input on this topic and asked if the NDWAC has given enough information to guide future EPA work. In response:
    - Mr. Burneson noted that EPA has received the input and are clear on the direction they need to take. He noted that unless the NDWAC feels there is a discrepancy on actions to be taken, he suggested that there is no need for formal response to the agency.

C. Contaminants in groundwater (e.g., implementation, financing, new technologies, environmental justice)

1. <u>Overview of Key Issues with Groundwater</u>

Dr. Grevatt noted that during this session, he would like to focus on broad perspectives and larger issues in relation to groundwater where it would be helpful to have input from the NDWAC. He noted that groundwater is often a forgotten resource despite being vital for drinking water, agriculture, irrigation, energy development, and other key areas of the economy and infrastructure.

Many small communities have persistent challenges with nitrates and arsenic in their groundwater. Dr. Grevatt explained that they are looking for input on potential opportunities for EPA to attempt additional progress to assist these communities. Dr. Grevatt provided the following examples:

- Equitable access to safe drinking water
- Building better partnerships
- Understanding economic issues and issues of environmental justice
- Developing low cost innovative treatment technologies
- Looking further into point of use devices

Dr. Grevatt also noted various areas of concern related to groundwater, which are summarized below.

Drought

Dr. Grevatt acknowledged that drought is of particular concern for the western part of the U.S., but it also impacts groundwater sources all over the U.S. California is heavily reliant on groundwater resources, which have been stressed during drought conditions. The state is currently working to identify ways to replenish aquifers through injection, while also with saltwater intrusion in coastal areas.

Underground Injection Control and Induced Seismicity

Dr. Grevatt noted that underground injection wells, which under the SDWA, are used in many states to dispose of fluids. The largest two classes of these disposal wells are Class 2 which is for oil and gas and Class 5 which is a catch all for all other non-specified materials. EPA, the U.S. Geological Survey (USGS) and the Department of Energy (DOE) have discovered a strong correlation between underground injection wells and induced seismicity. Seismic activity from the wells can have detrimental effects on groundwater sources. Some states such as Oklahoma, Kansas, Colorado and Ohio have seen significant induced seismicity in recent years due to the use of underground injection wells.

Historically, Oklahoma experienced very few seismic events, but the region has become one of the most seismically active regions of the U.S. Some recent seismic events in Oklahoma have registered over 5.0 on the Richter scale. Dr. Grevatt noted that the public is not overly concerned with the damage to groundwater sources due to seismic activity caused by underground injection wells; they are more aware of structural and property damage and loss of life.

EPA has been working with states and USGS to provide guidance on what can lead to induced seismicity including overpressurization, the presence of a fault, and the connection between an area of pressure and a fault. He noted that faults exist in places they were not aware of previously.

Aquifer Exemption

According to SDWA regulations, waste materials cannot be injected into an underground source of drinking water. Exemptions can be granted under certain circumstances, such as oil and gas and mineral development activities. Records for well exemptions in California were historically uncertain, and waste materials may be being injected in areas that were not exempt. This is of particular concern in states that have significant water stress and where groundwater resources are vital to support local needs. The State of California has been working with EPA and the oil and gas industry to update the records to ensure the injections are occurring in the correct locations and ensure that unauthorized injections cease within a specified time period.

Managed Aquifer Recharge

Dr. Grevatt discussed that some communities conduct Aquifer Storage and Recovery (ASR) activities by infiltration or direct injection into the aquifer. These activities can be useful to utilities in parts of the country that experience periods of drought, as well as periods of high precipitation. These communities can store the water from the wet periods to use during periods of drought. He discussed two communities in particular that have been using ASR:

- El Paso, Texas has the largest inland desalination plant in the world to treat saline groundwater and has a large ASR program. They are also working on direct potable reuse (DPR).

- The state of Florida is also using ASR to sustain their water supply. Dr. Grevatt noted that the quality of the water injected into the aquifer matters to local utilities because it can impact the development of the aquifer over time. Previously when purified water was pumped into the aquifer, arsenic leached out of the rock formation raising arsenic levels in the groundwater.

2. <u>NDWAC Comments/Discussion</u>

Following Dr. Grevatt's overview of groundwater issues, there was a period of discussion. Key points of this discussion are summarized below:

- Mr. Alley discussed the fact that ASR is viewed as only the injection and withdrawal from the same well, so managed aquifer recharge might be a better term.
    - He noted that this is a common practice in California, Florida, Arizona, Virginia, and New Jersey.
    - There is quite a lot of interest in using stormwater to recharge aquifers across the U.S., but the quality of stormwater can vary; there can be long-term issues related to salinity, arsenic, and the production of disinfection byproducts.

- Mr. Alley noted that there are issues with small drinking water facilities in low-income communities in the Central and Salinas Valleys in California, as well as communities along the Texas-Mexico border that have limited water resources and contaminated water from industrial activities.
    - In regards to the drought in California, the issue is not just water quality; Porterville and other small towns ran out of water and had to truck the water in, which is expensive.
    - In many cases poor communities are paying large portions of their salaries to buy water or travel to a water distribution point, raising environmental justice concerns for these communities without affordable access to water.
    - There are groups in California such as the Community Water Center working on issues of environmental justice like these.

- Mr. Alley noted that there are also issues with nitrates, arsenic and Cr^{+6} in California, which led to the development of an MCL for these contaminants. There are also issues with naturally occurring uranium on the side of the valley abutting the Sierra Nevada Mountains that becomes mobilized from agricultural practices. It is not easy to treat these issues, which can be particularly difficult for small communities.

- Mr. Salzman discussed a lawsuit in California; Dick Wolf purchased a ranch above Galena and attempted to sell groundwater from the ranch to Montecito. He was then sued by the Galena Water District. He noted that California passed a law requiring the legal right to water; however, in some cases the only way this law is carried out is through the delivery of water to communities, which is not a long-term solution. He asked if EPA engagement could add value to

the issue and asked if there is funding available to help communities. He also asked what role EPA can play in helping to support this regulation. In response:

- Dr. Grevatt mentioned that EPA is participating in ongoing conversations with the State of California regarding ways in which they can support them.

- Mr. Sanchez brought up the issue of high arsenic levels found in groundwater in the West. He noted that people are increasingly diluting the groundwater with surface water and putting it through the system, which poses many challenges.
  - He mentioned the case of the Kirkman Air Force Base in Albuquerque in which 24 million gallons of jet fuel into the aquifer over the course of 30 years. They used to be reliant on groundwater, but since they diverted the Colorado River that now accounts for 70% of their supply, the aquifer is rising. As it rises, the jet fuel is floating on top of the water.
  - Initially, nothing was done, but the Air Force eventually agreed to pump and treat the water for $500M over 20 years.

- Mr. Sanchez also noted that there was a managed aquifer recharge pilot project that injected excess surface water into the aquifer for a drought reserve in the future.

- Mr. Alley noted that there is quite a lot of deep brackish water that accounts for about three quarters of the groundwater in New Mexico and can be found in Texas as well. This is sometimes viewed as a separate resource, and it is increasingly being accessed in the U.S., which will raise its own set of issues for regulation. Developing the resource could have impacts on shallow groundwater as well as shallow surface water. He also noted that extracting brackish water also relates to aquifer exemption. Given that we are currently uncertain of water resource needs in the future, it is difficult to identify whether it should remain untapped or not.
  - In response to this comment, Dr. Grevatt noted the importance of thinking about brackish water and other groundwater sources that were previously untapped, since they were viewed as inaccessible and costly resources. The areas experiencing the most rapid population growth are arid areas. The projections of water stress in 25 years point to areas in Colorado, New Mexico, Arizona, and Texas that are increasingly dealing with drought and reductions in water. Extraction methods and new resources are being identified over time, as exemplified by El Paso.

- Ms. Kellon mentioned that ASR is a big deal in the interior Columbia Basin in Oregon and Washington and is increasingly used as a management tool. Many utilities are looking to capture winter water from rivers and streams to put in underground reserves for irrigation and municipal use during other times of the year. She noted that EPA can help with understanding and streamlining the terminology because different terms are used in the West. She added it would be useful for EPA to set standards about what those terms mean, outline a methodology, and discuss end use.

- Dr. Grevatt asked if the precipitation is falling but running off as rain as opposed to snow and if ASR would be used more if snowpack runoff is not occurring in the summer.
- Ms. Kellon responded by saying they are losing their natural reservoirs due to reduced snowpack. She noted that ASR allows you to defer difficult decisions relating to water availability.

- Mr. Sanchez brought up the topic of brackish water, noting that many developers are highlighting the abundance of water availability in brackish water. He stated that it is not as reliable or renewable as groundwater and that EPA should provide some guidance on this issue. He noted that an ASR lessons learned toolkit would be helpful in outlining best practices.
  - Dr. Grevatt requested that Mr. Sanchez define what he means about brackish water not being renewable.
  - Mr. Sanchez noted that he sees brackish water as distinct from groundwater given the high cost of extraction.
  - Mr. Alley noted that most of the brackish water in the country emerged thousands of years ago after the last ice age and does not have the same recharge rate as other groundwater. Therefore, it is not renewable in the sense that there is a finite supply.
  - Mr. Sanchez responded that brackish water is not regulated by the state engineer and anyone has access to it without restriction as long as they can cover the cost to access it. This may vary by state, driven by cost and feasibility.

- Ms. Swallow noted that the Central Valley in California cannot afford centralized treatment and point of use devices and asked if EPA is hoping to support this in the future, since it is economical and easy to maintain. In response:
  - Dr. Grevatt stated that EPA is not encouraging development of point of use systems, but is looking for utilities' perspectives on the issue in regards to affordability and capacity of treatment for smaller systems. He acknowledged that some small systems have intractable challenges with treating water and are looking for more information about addressing those issues.

- Mr. Salzman noted that one of the key aspects of ASR is direct potable reuse. Given that Santa Barbara does not have an aquifer, DPR will become increasingly important. Mr. Salzman inquired about EPA's involvement in this issue in the absence of California regulations on DPR. He noted that EPA could be beneficial in developing a regulation or guidance in this area. In response:
  - Dr. Grevatt noted the importance of thinking about the costs and benefits of regulation, as well as the application of resources. San Diego is developing a DPR system and California put together a working group to look into DPR. He added that there is currently one DPR system in operation in the U.S. in Texas and plans are under development for many others. He highlighted the importance of thinking about where EPA places their energy and resources.

- Dr. Grevatt also noted that EPA is actively engaged with California and Texas to explore DPR. They are also engaged with the Water Reuse Association and took part in an advisory council for a white paper they developed on DPR practices.
- He noted that EPA is developing a compendium of best practices on DPR which will be released later in 2017.
- He added that EPA asked ASDWA about whether or not states want regulation or guidance on DPR. Many states do not want regulation or guidance, while it is very important for other states.

- Mr. Sanchez asked if DPR is another area where the SDWA and the Clean Water Act conflict. In response:
  - Dr. Grevatt stated that this is not an issue, but recognized the growing interest in DPR or indirect reuse. He noted that many communities are interested in raising the bar in terms of the quality of wastewater; this is an ongoing discussion.

- Ms. Lewis thanked Dr. Grevatt for leading the discussion on an engaging topic.

- Dr. Grevatt recognized that this is a complicated issue and requires focus by EPA. He noted the importance of discussing this with the NDWAC in the future to further identify next steps. As an initial next step, he noted the importance of discussing refining definitions of key issues, discussing problems and concerns with point of use, and issues in relation to the growing practice of managed aquifer recharge in communities that have not done this previously.

D. Transparency—Drinking Water Regulations

1. <u>Technical Presentation</u>

Ms. Thompkins provided a presentation on the need for transparency in drinking water regulations. As an introduction to her presentation, she noted that the word "transparency" is used quite often in conversation, but it is not always possible to define what this means specifically in each context. She mentioned that in an age where people have everything at their fingertips and want information quickly, it is vital to be transparent in all phases of the drinking water regulation process.

Ms. Thompkins noted that this presentation would focus on where EPA is currently with building transparency with regards to drinking water regulations and would discuss EPA's new online resource that launched recently as well as the future of transparency efforts within the Agency. Key points from her presentation are provided below:

- The Safe Drinking Water Information System (SDWIS) Federal Reports Search was initially launched in 2013 for EPA staff and states for use in program oversight for pulling data and information for Freedom of Information Act requests.

- The tool was launched to the public in 2015, but its use has increased more recently. The SDWIS Federal Reports Search allows the public to look up their state and their particular water system

to understand any violations their utility has experienced. Through this search, anyone can look up the particular violation, the contaminant of concern, and any actions that have been taken to address the violation. At present, this database does not include compliance monitoring information.

- EPA's OW is working to modernize SDWIS to make it more user-friendly and to include other data that may be useful for utilities and the public.
    - EPA anticipates that by October 2017, they will have a prototype of the modernized SDWIS to launch for some pilot users. By March 2018 they hope to have the core version of the modernized SDWIS complete with most of the rules in the database for public consumption.

- The CMDP was released on September 30, 2016 as part of the first phase of the SDWIS Modernization Effort. It includes the first phase of e-reporting of data samples from the labs that support the state primacy agencies. The CMDP has a number of benefits for users, including:
    - It reduces the burden on states by eliminating the need for states to pay for and maintain their own electronic reporting systems and servers. States that use the CMDP will also not have to spend time hand entering sampling data.
    - The CMDP will include automatic data validation and will identify errors early in the data entry process. This will reduce the burden on utilities and labs and reduce number of reporting errors from labs and utilities, which will improve overall data quality and reliability. Better quality data makes compliance determination faster, which will lead to a reduction in resubmittals of data post-submission and have a positive benefit to public health. It is estimated that over 780,000 hours of manual data entry will be saved when states start using the CMDP.

- The CMDP is currently being piloted with six states. Twelve more states are in the queue, and six more will be added in January 2017. By 2017, more state primacy agencies will be transitioning to CMDP as well.

- EPA is working to launch a CMDP help center that will include the following components:
    - Knowledge base with all technical documentation, manuals, and application files for state primacy agencies
    - Training center with videos and scripts of how to use every module
    - Technical support desk for any technical issues or errors
    - Community forum to share lessons learned and other important information.

- Ms. Thompkins noted that it is important for this information to be out in the public realm to increase transparency, but it does bring up an important point about how risk is communicated. This challenge needs to be discussed further.

2. NDWAC Questions/Comments

Council members provided the following feedback regarding Ms. Thompkin's presentation:

- Dr. Hill commented that this is a great development for the water sector. From a public health standpoint, it is important to have more data and information to use in communicating with communities. He also asked if the public and other users can download monitoring data and information about violations from the website or if they can only observe what is posted. He also asked for further information regarding the states that took part in the pilot study. In response:
    - Ms. Thompkins mentioned that at this time, it is not possible for the public to download the monitoring data. If an individual were interested in that data, they could contact the state primacy agency. EPA still has work to do on the website before this can be considered an option. It was also noted that it is not always best to have all the information available to the public because it can be misconstrued. It is often best for this information to be communicated through utilities or the state primacy agency. She also mentioned that EPA would provide a list of the pilot states following the meeting.

- Ms. Kellon noted that it looks like the CMDP will focus solely on finished water. She inquired as to whether or not it would include raw water quality data as well. In response:
    - Ms. Thompkins commented that due to the fact that their federal jurisdiction to implement the SDWA focuses only on the quality of finished drinking water, the CMDP will only show finished water quality data. She noted that this is good to keep in mind for future developments and that many states have the raw data available.
    - Ms. Pillsbury contradicted Ms. Thompkins' comment noting that many states do not have a lot of raw water quality data. However, many states can get water quality data and share that information online with the public and public health stakeholders.

- Mr. Moore asked if EPA is collecting data from the pilots to assess user friendliness of the online resources. In response:
    - Ms. Thompkins mentioned that the site just launched on September 30, 2016, so they have not yet received any feedback. They have a strong relationship with the pilot states and will find out lessons learned in the future. She did note that the pilot states have been using the help center.

- Ms. Lewis commented that since Milwaukee Water Works experienced the *Cryptosporidium* outbreak, they decided to post as much data and information on their website as they possibly could to provide public access to that information, although the utility may not know how to interpret it. The utility worked with public health colleagues to interpret the information for those who needed it. Cr^{+6} data was added to the website, since it was an important issue. The release of this information takes courage on the part of the utility, since this information has the potential to scare the public. She noted that she wishes EPA would post more than just a utility's

violations on the CMDP; she would like them to include their successes as well as background data and information about the utility. She noted that only posting violations makes for an easy target for those organizations that are not trying to portray the utility's progress in a positive light.

- Ms. Thompkins thanked Ms. Lewis for this thought provoking comment.

E. Public Comment

During the final session on Day 2, the Council members heard public comments received both in-person and via email prior to the meeting. The three emailed comments would be circulated to Council members following the meeting. The in-person comment is summarized below:

1. <u>David Lovely, Water Quality Association</u>

David Lovely from the Water Quality Association mentioned that along with providing in-person public comment, he also submitted a letter for the public record. Mr. Lovely mentioned that he represents the Director for Government Affairs of the Water Quality Association (WQA) which is based in Chicago. The WQA is an international trade organization consisting of 2,700 companies worldwide, representing manufacturers, dealers, and installers of water treatment equipment. He noted that many of their members work on lead issues and were involved with the crisis in Flint, Michigan. He also noted that the WQA has a certified lab for removing lead, arsenic, and other contaminants.

Mr. Lovely stated that the water industry can play a vital role in infrastructure development. He expressed his wish that EPA will discuss point of use and point of entry equipment for emergencies as a solution to current problems with lead. He noted that it will take many years to replace infrastructure or extend lines, but his organization's products can be used today to reduce lead or other contaminants.

F. Closing Remarks

Ms. Lewis closed the meeting by thanking the Council and EPA for providing meaningful comments and insight on important issues facing the water sector. She noted that the EPA is engaged in serious business in regards to protecting public health, and they are grateful to EPA for giving them a voice in helping to shape how EPA approaches these difficult topics.

Ms. Lewis also thanked the EPA staff for their engaging presentations and recognized Ms. Ward's hard work in organizing the meeting and Paula Mason's effort in organizing the Council members' travel.

Mr. Burneson thanked the Council and all participants for their input provided during the two days. He pointed out that there has been no other time during his tenure working in the Drinking Water Program where input from people directly involved with these issues on the ground is more needed. It was noted that a great deal of attention has been paid to OGWDW over the past few years, making it even more important that they consider the input and advice from the NDWAC and other outside stakeholders. He

thanked the Council for the time they have taken to think critically about these important issues and thanked those who volunteered to provide more in-depth evaluation about HAs for emerging contaminants. He is looking forward to working with this sub-group over the course of the year, particularly in relation to the HA communication process.

Dr. Grevatt thanked the Council members for the significant investment of time they put into the NDWAC. He recognized they all have many issues to manage back home on top of their contributions to the NDWAC. Dr. Grevatt mentioned that he recognizes the magnitude of the issues they discussed during the meeting. He noted that lead and copper, HAs, algal toxins and groundwater contamination are all consequential issues that will be at the forefront of the next administration. He looks forward to working with the NDWAC moving forward in relation to individual working groups, but also in evaluating specific groundwater issues.

Dr. Grevatt concluded the meeting by noting that the EPA and the NDWAC are on a great trajectory, and he is looking forward to the work that will continue in the future.

ATTACHMENT A

NDWAC Meeting

List of NDWAC Members and Liaisons

November 2016

NDWAC Members
Carrie M. Lewis (Acting Chair): Superintendent, Milwaukee Water Works
William Alley: Director of Science and Technology, National Ground Water Association
Jeanne-Marie Bruno: Vice President/General Manager, Central Basin Liberty Utilities
Ann Marie Chischilly: Executive Director Institute for Tribal Environmental Professionals
Marilyn Christian: Manager, Environmental Health Programs, Harris County Public Health and Environmental Services
Cathy P. Kellon: Green Infrastructure Program Director, Geos Institute
James McCauley: Manager, Lower Brule Rural Water System
Wilmer Melton, III: Director of Public Works, City of Kannapolis
Randy A. Moore: President, Iowa American Water
Howard M. Neukrug: Principal, CASE Environmental LLC
Sarah Pillsbury: Administrator, Drinking Water and Groundwater Bureau, New Hampshire Department of Environmental Services
James Salzman: Donald Bren Distinguished Professor of Environmental Law, Bren School of Environmental Science and Management, University of California, Santa Barbara
Mark S. Sanchez: Executive Director, Albuquerque Bernalillo County Water Utility Authority
June Anne Swallow, P.E. (Awaiting Appointment): Chief, Rhode Island Department of Health, Center for Drinking Water Quality
Chris J. Wiant: President and CEO, Caring for Colorado Foundation
Liaisons
Dr. Max Zarate-Bermudez, MS, MPH, Ph.D.: Epidemiologist, NCH/Environmental Health Services Branch, Centers for Disease Control, Department of Health and Human Resources
Dr. Kimberly L. Jones, Ph.D.: Professor and Chair, Department of Civil Engineering, Howard University
Dr. Vincent Hill, Ph.D., PE: Acting Branch Chief, Waterborne Disease Prevention Branch, Division of Foodborne, Waterborne and Environmental Disease, Centers of Disease Control and Prevention

ATTACHMENT B

NDWAC Meeting

List of Attendees

December 6-7, 2016

First Name	Last Name	Affiliation
Ryan	Albert	U.S. Environmental Protection Agency
William	Alley	National Groundwater Association
John	Arnett	Kelley Drye & Warren, LLP
Elizabeth	Behl	U.S. Environmental Protection Agency
Eric	Bisonnette	U.S. Environmental Protection Agency
Miranda	Brannon	Office of the Surgeon General
Jeanne-Marie	Bruno	Central Basin Liberty Utilities
Eric	Burneson	U.S. Environmental Protection Agency
Alexandra	Campbell-Ferrari	The Center for Water Security and Cooperation
Marilyn	Christian	Harris County Public Health and Environmental Services
Larry	Gillanders	Epipe
Peter	Grevatt	U.S. Environmental Protection Agency
Vincent	Hill	Centers for Disease Control and Prevention
Cathey	Kellon	Geos Institute
Carrie	Lewis	Milwaukee Water Works
David	Lovely	Water Quality Association
James	McCauley	Lower Brule Rural Water System
Wilmer	Melton, III	City of Annapolis
Randy	Moore	Iowa American Water
Sarah	Pillsbury	New Hampshire Department of Environmental Services
Jeremy	Pollack	Gephardt Government Affairs
James	Salzman	University of California, Santa Barbara
Mark	Sanchez	Albuquerque Bernalillo County Water Utility Authority
Paul	Schwartz	Campaign for Lead Free Water
June Anne	Swallow	Rhode Island Department of Health
Anita	Thompkins	U.S. Environmental Protection Agency
Tracey	Ward	U.S. Environmental Protection Agency
Gregory J.	Welter	O'Brien & Gere Engineers (OBG)
Christopher	Wiant	Caring for Colorado Foundation

ATTACHMENT C

NDWAC Meeting

Agenda

DAY 1: Tuesday -- December 6, 2016		
9:30 – 10:00	Registration	
10:00 – 10:30	Opening and Welcome Introductions Review Agenda	DFO – Tracey Ward Chair – Carrie Lewis OGWDW Director – Peter Grevatt
10:30 – 11:15	National Drinking Water Program Update	OGWDW Director—Peter Grevatt
11:15 – 11:45	Drinking Water Regulatory Program Update	SRMD Director – Eric Burneson
11:45 – 1:00	Lunch	Everyone
1:00 – 1:45	Drinking Water Implementation Update	DWPD Director—Anita Thompkins
1:45 – 2:45	Emerging Contaminants/Health Advisories	OGWDW Director – Peter Grevatt SRMD Director—Eric Burneson OST – Elizabeth Behl
2:45 – 3:00	Break	Everyone
3:00 – 4:00	Emerging Contaminants, Continued	OGWDW Director—Peter Grevatt SRMD Director—Eric Burneson OST – Elizabeth Behl
4:00 – 4:30	Closing Remarks	Chair – Carrie Lewis OGWDW Director – Peter Grevatt DFO – Tracey Ward

DAY 2: Wednesday -- December 7, 2016		
8:30 – 8:45	Opening	Chair—Carrie Lewis
8:45 – 9:15	HABs – NDWAC WG report out to NSWAC on HABs charge	Chair—Carrie Lewis and NDWAC WG
9:15 – 10:00	Contaminants in groundwater (Implementation, Financing, New Technologies, Environmental Justice)	OGWDW
10:00 – 10:30	Transparency – Drinking Water Regulations	OGWDW
10:30 – 10:45	Break	Everyone
10:45 – 11:30	Public Comment Period	DFO – Tracey Ward
11:30 – 12:00	Closing Remarks	Chair – Carrie Lewis OGWDW Director – Peter Grevatt