National Drinking Water Advisory Council
Microbial and Disinfection Byproducts
Rule Revisions Working Group

Meeting 1: May 23, 2022: 11:00am-4:00pm ET

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WELCOME

Elizabeth Corr, Designated Federal Officer, U.S. EPA
Bruno Pigott, Deputy Assistant Administrator, Office of Water, U.S. EPA
Eric Burneson, Director, Standards and Risk Management Division, U.S. EPA

OPENING REMARKS

Lisa Daniels & Andy Kricun, WG Co-Chairs

AGENDA REVIEW & MEETING PROCEDURES

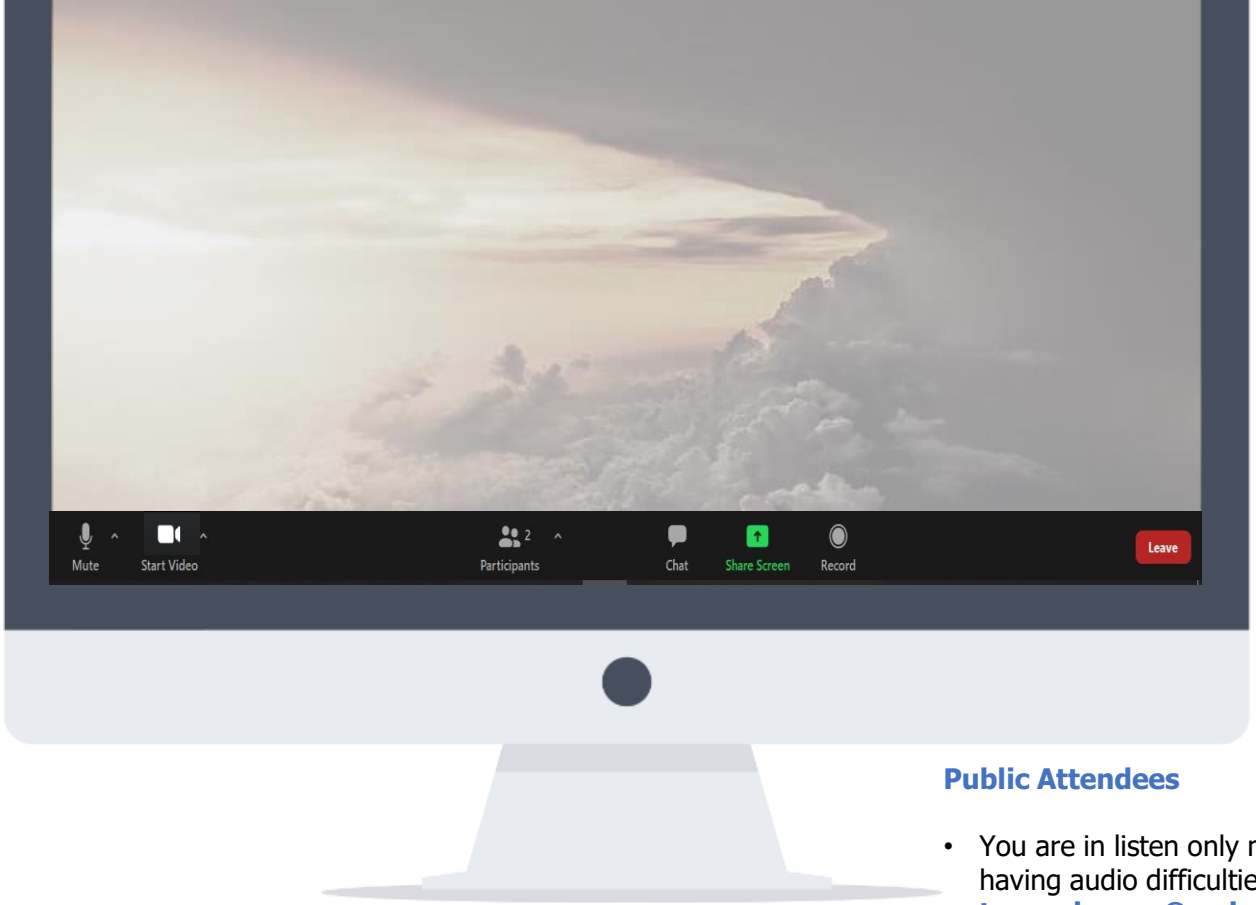
Segment 1

Today's Virtual Meeting: Zoom Controls

This meeting is **not** being recorded

The Zoom menu bar appears at the bottom of the Zoom window once the meeting begins.

If you don't see the menu bar, move your mouse slightly and the bar will appear.



Public Attendees

- You are in listen only mode and will not be able to unmute. If you are having audio difficulties send an email to **taner.durusu@cadmusgroup.com**
- Any comments you may have can be sent to **MDBPRevisions@epa.gov** or to Public Docket: www.regulations.gov / Docket ID Number: EPA-HQ-OW-2020-0486

Meeting Purpose

- Make introductions among Working Group members
- Review previous public engagement and interview findings – priorities and challenges
- Describe and discuss approach to sequencing topics and supporting discussions with technical information
- Share individual member goals for Working Group outcomes/impacts

Today's Agenda

11:00-1:00

- Agenda Review and Meeting Procedures
- Introductions
- Public Engagements & Interview Findings

1 Hour Break (1:00-2:00pm ET)

2:00-4:00

- Working Group Process Plan
- Working Group Goals
- Meeting 2 Agenda & Next Steps

INTRODUCTIONS

Segment 2

PUBLIC ENGAGEMENTS & INTERVIEW FINDINGS

Segment 3

Summary of Public Meeting Series to Inform Potential Revisions to Microbial and Disinfection Byproducts Rules

May 23, 2022

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Presentation Overview

- Recap of Public Engagement Meeting Series
- Key Public Input Highlights on Meeting Topic Areas
  - Disinfectant Residual Levels and Opportunistic Pathogens
  - Disinfection Byproducts (DBPs) and Consecutive Systems Considerations
  - Distribution System Water Quality and Finished Water Storage
  - Source Water Considerations and Precursor Removal
  - Sanitary Surveys and Water Safety Plans (WSPs)
- Potential Additional MDBP Topic Areas

Recap of Public Engagement Meeting Series

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- EPA held an initial virtual public meeting in October 2020, followed by six virtual meetings from May to November 2021 to solicit broad input and information on MDBPs in drinking water.
  - An overarching question: What specific priority areas would offer the greatest opportunity to further improve public health protection and implementation of MDBP rules?
- Each meeting in 2021 focused on specific topics identified through public feedback provided in response to the October 2020 meeting.
- EPA is considering the information discussed at all meetings and other stakeholder engagements, along with any public comments, in its determination on how to proceed with any rule revisions.
- Public can continue to provide written input via public docket.
  - Docket ID Number: EPA-HQ-OW-2020-0486 at www.regulations.gov

Recap of Public Engagement Meeting Series

- For each meeting topic area, EPA asked participants questions related to:
  - Available data
  - Nature and scope of the potential public health risks
  - Effective and feasible means to control the risks
  - Actions already undertaken and case study examples
  - Considering solutions within a regulatory or non-regulatory structure
  - Major implementation challenges faced
  - Risk balancing among other MDBP topics
- To date, EPA has provided meeting materials and detailed summaries in the public docket for all virtual meetings in 2020 and 2021.

Key Public Input Highlights: Disinfectant Residual Levels

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- Challenges in maintaining a numerical disinfectant residual level:
  - Water systems have taken actions to meet numerical disinfectant residual requirements, such as lowering water age (e.g., eliminating stagnation zones), increasing the chlorine dose, and/or adding chlorination booster stations.
  - Sampling and monitoring in the distribution system were identified as primary means to assure disinfection residual maintenance.
  - Emphasis should be placed on frequent monitoring at target locations.
- Additional considerations for maintaining disinfectant residual levels:
  - Analytical methods with adequate method detection limits are needed to assure the disinfectant residuals in the distribution system.
- Additional strategies:
  - A system-wide approach, including a focus on decreasing entry point organic carbon, controlling nitrification, and maintaining biofilm stability.
  - A distribution system management plan could include determining response to low residual focusing on water quality and water age and finding low residual locations.

Key Public Input Highlights: Opportunistic Pathogens

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- Considerations in controlling opportunistic pathogens and *Legionella:*
  - Educate the public on strategies to reduce *Legionella* growth in premise plumbing.
  - Shared responsibility between water systems and building owners.
  - Analytical tools for monitoring and quick identification are needed.
  - Optimized corrosion control can help maintain disinfectant residuals.
  - Routine system monitoring is needed for public water systems (PWSs).
  - Building system maintenance is necessary due to exposure locations.
- Additional considerations in reducing *Legionella* growth:
  - Conditions include water age, sediments, disinfectant residual, and temperature.
  - Interventions include optimizing flushing, tank maintenance, monitoring disinfectant residuals, and reducing stagnation.
- Challenges in *Legionella* control:
  - Heterotrophic plate count (HPC) and *Legionella* presence are not correlated.
  - *Legionella* occurrence data could provide greater insight into the relationship between distribution systems and building water systems.
  - Additional investment in distribution system monitoring for opportunistic pathogens.

Key Public Input Highlights: DBPs

- Actions to further control unregulated HAA9 and brominated HAAs could lead to unintended consequences and impact THMs and other DBPs, for example:
  - Focus on HAA reduction may cause more systems to form other DBPs.
  - Switching to chloramines can negatively impact corrosion control, nitrosamines formation, and nitrification in the distribution system.
  - Removal of organic precursors and producing biologically stable water can help control DBPs and maintain water quality in the distribution system.
- Additional input:
  - Better understand benefits from further control of HAAs, considering the toxicity in DBP mixtures, including nitrogenous, iodinated, and brominated DBPs.
  - More attention on non-compliant systems under the Stage 2 DBP Rule.
  - Improve understanding of factors affecting DBPs in distribution systems.
  - Need EPA guidance on how to perform DBP formation potential studies.
  - TOC removal may lead to a higher percentage of brominated DBPs.

Key Public Input Highlights: Consecutive Systems

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- Possible actions for EPA to consider to improve consecutive system compliance:
  - Expand EPA's distribution system AWOP.
  - Facilitate mentorship between large systems and consecutive systems.
  - Develop guidance for enhanced collaboration between sellers and buyers.
  - Require wholesale providers to conduct periodic distribution system evaluations for DBPs.
- Possible monitoring requirements at interconnection between wholesalers and consecutive systems:
  - Parameters may include DBPs, residuals, DBP precursors, and others.
  - Require consultation from seller to buyer when exceeding half of DBP MCLs.
- States and water system experience in strategies used to improve compliance:
  - The compliance toolbox exists, but there are no one-size-fits-all tools.
  - A contractual arrangement may be required between seller and buyer.

Key Public Input Highlights: Distribution System Water Quality

- Challenges for distribution system water quality include high water age, main breaks, low residuals, non-optimal pressures, backflow, and nitrification.
- Approaches for EPA to consider in improving DS water quality:
  - Implement a toolbox with corrective actions to address the challenges.
  - Integrate additional testing and data management.
  - Use a find and fix approach.
  - Expand use of Partnership for Safe Water and AWOP concepts.
- Considerations related to building water quality:
  - Building water quality falls under the authority of local agencies and usually only when there's a problem (e.g., Legionnaires disease).
  - Distribution system water quality affects building water system quality.
- Approaches for improving building water quality:
  - Expand the role of PWSs for influencing building owner/operators.
  - Provide additional guidance about treatment in building water systems.

Key Public Input Highlights: Finished Water Storage

- Sanitary risks for finished water storage facilities include excessive water age, inadequate monitoring, depleted residuals, sediment buildup, and elevated DBPs.
- Approaches for improving finished water storage facility water quality include conducting routine and timely inspections, corrective actions for defects, clean-out of tank sediments.
- Considerations for improving finished water storage facility water quality:
  - Include requirements for residual monitoring and mixing in storage tanks.
  - Use online monitoring at inlets and outlets for chlorine and other parameters.
  - Evaluate hydraulics to help identify short-circuiting.
  - Integrate resiliency, climate change, and right-sizing criteria into sanitary surveys and design standards.
  - Consider use of a treatment technique based on a find and fix approach.

Key Public Input Highlights: Source Water Considerations

- Major source water pollution concerns include microbes, nutrients, HABs, organics, elevated conductivity (e.g., from road salts), and DBP precursors.
- Challenges for improving and protecting source water:
  - Utilities have a lack of control over upstream inputs.
  - Climate extremes may cause source water pollution spikes and water quantity issues.
  - Weather stream gage data needed to determine the extent of pollution.
  - Updated GWUDI determination methods needed.
- Highlights of approaches, case studies, and examples:
  - Leverage and link CWA and SDWA authorities (e.g., drinking water designated uses, CWA standards that protect drinking water sources, narrative CWA standards for emerging contaminants in drinking water).
  - Look at additional source water parameters and monitoring tools to evaluate issues.
  - Long-term climate resiliency utility planning that incorporates changing source water, especially systems impacted by drought or natural disasters augmenting supplies.
  - Encourage impactful partnerships such as those between utilities and farmers to leverage Farm Bill funds to reduce pollution.

Key Public Input Highlights: DBP Precursor Removal

- Precursors and metrics to consider:
  - Consider a bromide treatment technique.
  - Nitrogenous, iodinated, and brominated compounds have more problematic health outcomes and should be considered.
- Additional suggestions when evaluating current precursor requirements:
  - Supplement TOC removal requirements (e.g., binning utilities based on most prevalent DBPs, disinfectant residual concentrations).
  - Source water specific approaches (e.g., downstream of a wastewater discharge).
- Treatment costs and benefit considerations:
  - Technology cost can be a challenge in achieving a high degree of precursor removal.
  - Small systems may face capacity challenges with precursor removal requirements.
  - Benefits of reducing precursors likely outweigh the costs.
- Additional treatment approaches to consider:
  - Best to control at the source as it is very difficult to remove.
  - EPA should consider using other statutory authorities to address precursors.

Key Public Input Highlights: Sanitary Surveys

- Challenges with sanitary surveys:
  - State inspectors do not always interact with water utilities.
  - Inconsistency in the questions within sanitary survey programs. Defining the high-risk/key items would be an added benefit for consistency.
  - Three or five-year frequency is a limitation. Transient non-community systems need more attention and more frequent surveys.
  - A lack of understanding of how water systems work, what systems should look like, or the risks limits the effectiveness of sanitary surveys.
- Approaches for improving sanitary surveys:
  - Promote conversations and information sharing between surveyors and water utility staff. Standard checklists may not allow for this sharing.
  - Implementation of a program where larger systems, funded by EPA, could help smaller systems, so it's not a resource issue for the larger systems.
  - Provide better trained and more experienced state inspectors, along with more knowledgeable state regulators to improve interactions with water systems.
  - Suggest EPA fund a center for new inspectors to obtain uniform and thorough training.

Key Public Input Highlights: Water Safety Plans

- Approaches for considering Water Safety Plans (WSPs):
  - Incorporate the WSP approach into operator and management training to promote a preventative-minded culture; include WSPs as a risk management tool rather than a compliance measure.
  - Adopt only certain elements of the HACCP program for some systems, rather than adopting the entire framework, especially for small systems.
  - Consider risk registries and WSP applications. Identify how priority risks can be identified and how WSP applications can be applied.
- Approaches for considering WSPs:
  - Utilize WSPs as a complementary approach focusing on an opportunity to educate.
  - Consider expanding EPA's voluntary AWOP to include WSPs since there are similarities.
- Other feedback on WSPs:
  - Implementing WSPs could be very beneficial to any size system. It is a carrot approach.
  - Cultivate WSPs as part of a preventative and proactive culture, starting with training and based around continuous improvement.

Potential Additional MDBP Topic Areas for Consideration

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- Groundwater under the direct influence of surface water (GWUDI) systems
- Seasonal chlorination
- Filter effluent turbidity considerations
- Filtration avoidance considerations
- Initial distribution system evaluations (IDSEs)
- Building water system considerations
- Simultaneous compliance across different drinking water rules
- Optimization approaches and programs
- Training and workforce certification, challenges, and opportunities
- Others?

WORKING GROUP INTERVIEWS

Interviews: Questions

1. Do you have any questions related to the Working Group **Operating Procedures**?
2. What are your **top priorities** for the MDBP Rule Revision Working Group discussions?
3. What do you see as the **key challenges** to achieving the Working Group's objectives (i.e., delivery of a report to the NDWAC as described in the mission), and what suggestions do you have for addressing them?
4. Potential MDBP rule revisions are complex with many moving parts and interdependencies – what suggestions do you have for tackling the **discussions in a stepwise, deliberate manner?**
5. What are **lessons learned** from other stakeholder processes that you believe can help support the success of this Working Group?
6. What are some topic areas where you suggest the Working Group would benefit from additional **technical input** to help support discussion?
7. How can the facilitation team **best support your participation** in the Working Group?
8. What kind of **background resource information** would be helpful for the Working Group to have in advance to aid in discussions?

Q1: WG Operating Procedures

Working Group Members indicated sufficient to full comfort with procedures

Additional Observations:

- Durability of WG recommendations
- Environmental Justice aspect of Working Group mission
- Individual WG member discussions between meetings – not restricted
- Alternates – emergency basis (schedule set well in advance)

Q2: Top Priorities

Top Priorities aligned well with previous stakeholder input and emergent approach to discussion topics

Additional Observations:

- Improve outcomes from and address gaps in existing SDWA regulations
- Improve public health protection while reducing implementation burden
- More comprehensive solutions - address both DBP and microbials in a more holistic way
- Address role of statues other than SDWA (e.g., CWA for source control)

Q2 Continued: Top Priorities

- Cost Consequences for Utilities and Communities
- Disinfectant Residuals and Opportunistic Pathogens
- Disinfection Byproducts
- Distribution Water Quality Management
- Environmental Justice
- Groundwater Systems
- Premise Plumbing
- Simultaneous Compliance
- Small Systems
- Source Water Quality

Q3: Key Challenges

Convergence of perspectives across WG Members

Additional Observations

- Data/Science Variability/Gaps
- Variability of Water System Operating Contexts
- Parallel Regulatory Processes
- Different WG Member Vantage Points
- Unfunded Mandates
- Timeline Constraints
- Virtual Format Consensus Building

Q4: Discussion Approach

Reasonable to strong level of comfort with framing and high-level topic sequencing approach for discussions

Additional Observations

- Drinking Water Value Chain/Contaminants Framework Logical
- Common Understanding Early
- Vetting of Intervention Options
- Track and Work Through Interdependencies
- Need for Big Picture, Multi-Benefit, Cross-Cutting Thinking

Q5: Lessons Learned

Substantial emphasis on the role of technical support and an appeal to patience and sufficient time to absorb and respond to technical material

Additional Observations

- Role Of Technical Experts
- Standardized Risk Assessment Framework & Outcome Mapping
- Cultivate Relationships & Sense Of Common Purpose
- Balanced Participation
- Sufficient Time Between Meetings
- Build Understanding Before Pursuing Agreements
- Interim Consensus Checks
- Small Group Breakouts
- Independent, Third-party Facilitation

Q6: Technical Support Needed

Strong emphasis on creating a baseline of common understanding among WG members, strong interest in the specific link between occurrence in the DS and public health outcomes/impacts

Additional Observations

- Contaminant Profiles
- Disinfection Byproducts
- Distribution System Dynamics
- Economics
- Ability to Implement
- Hands On Experience Perspective
- Monitoring and Testing
- Opportunistic Pathogens
- Profile Current Conditions
- Public Health Estimate Science
- Simultaneous Compliance
- Underserved and Underprivileged Community Considerations

Q7: WG Support Needed

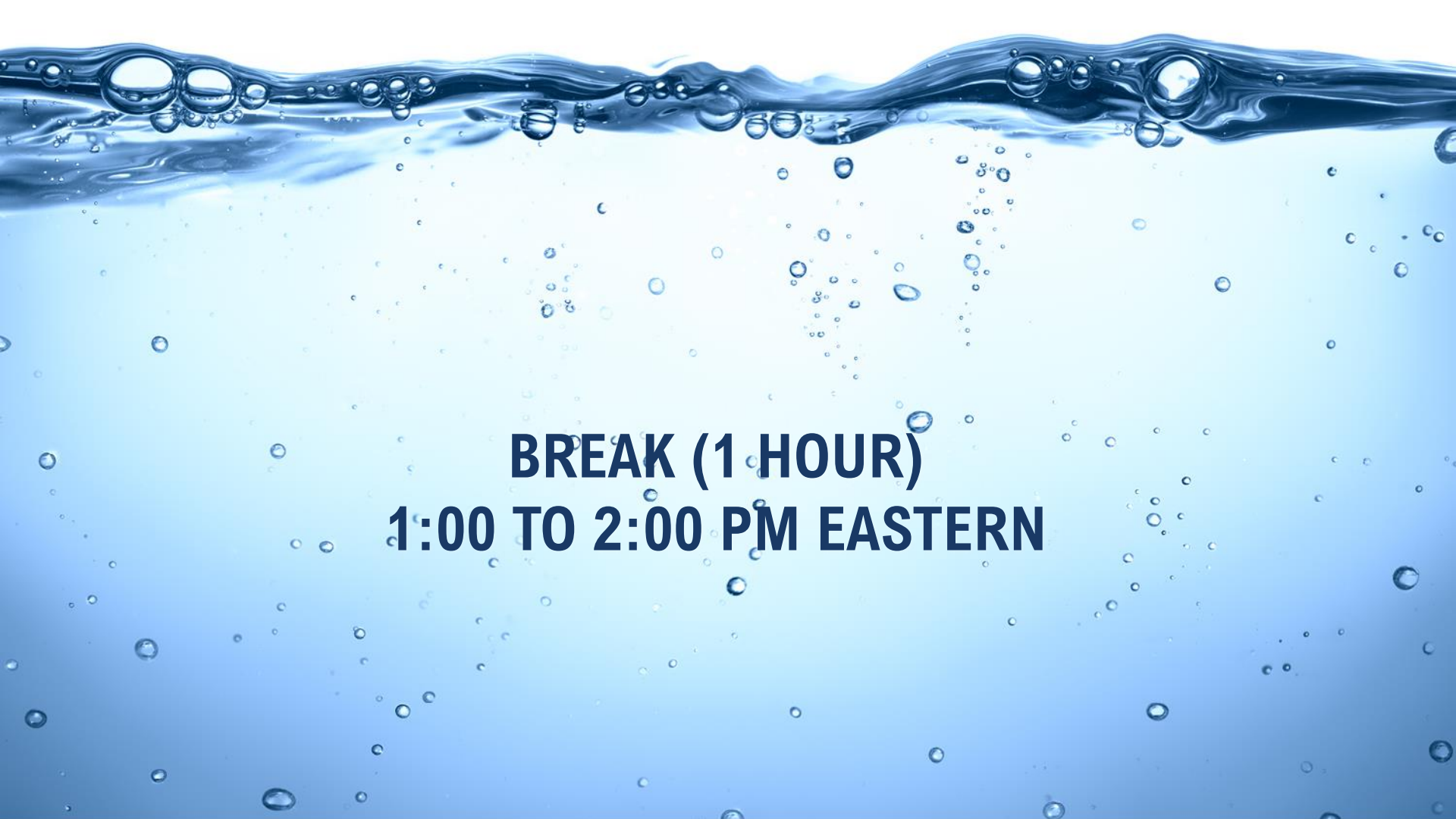
Emphasis on ensuring scheduling of meetings and material distribution is done well in advance of subsequent WG meetings

Additional Observations

- Follow-up after each meeting
- Maintain a shared document repository with clear structure
- One-day and two-day meeting duration formats as proposed supported

Public Engagement & Interview Findings
Discussion – Focus on Priorities and Challenges

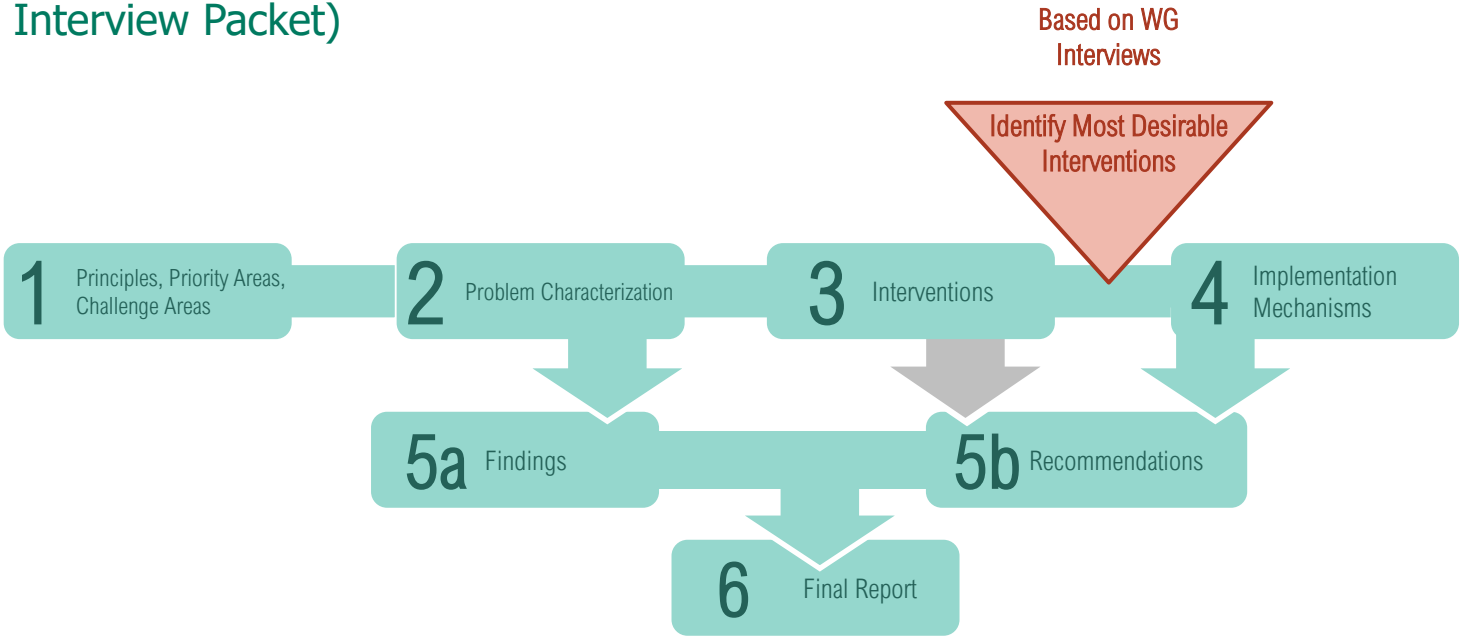
- Are there clarifying questions?
- Are there additional priorities or challenges the Working Group should be aware of/consider?
- What are the elements of common purpose we see in the priorities and challenges?


BREAK (1 HOUR)
1:00 TO 2:00 PM EASTERN

WORKING GROUP PROCESS PLAN

Segment 4

Potential Topic Sequencing
(From Interview Packet)



Example of Framework

Drinking Water Value Chain	Microbials	Interdependencies	DBPs
 Source Water			
 Treatment			
 Distribution			
 Premise			

Intent is to build out three tables: current requirements, problem characterization, and potential interventions.

Topics

1 Principles, Priority Areas, Challenge Areas

2 Problem Characterization

3 Interventions

4 Implementation Mechanisms

5a Findings

5b Recommendations

6 Final Report

Tentative Meeting Series

1 Introductions, Priorities, & WG Goals

2 Problem Characterization Areas

3 Problem Areas in More Detail (Part 1)

4 Problem Areas in More Detail (Part 2)

5 Stepping Back – Wrap Up of Problem Characterization

6 Intervention Scoping & Evaluation Approach

7 Intervention Characterization (Part 1)

8 Intervention Characterization (Part 2)

9 Connect Preferred Interventions to Implementation

10 Translate Interventions to Recommendations

11 Draft Recommendations

12 Final Refinements to Recommendations

13 Final Report

Technical Support

- The NDWAC Working Group will have support from a technical support team.
- The technical support team will provide targeted analyses requested by the Working Group to support the Working Group in providing input to the NDWAC recommendations on potential revisions to the MDBP rules.
- The technical support team will consist of core drinking water experts, with specialists on specific topics included as needed.
- The technical support team will conduct the targeted analyses and present the results of the analyses at subsequent meetings.

Working Group Process Plan Discussion

- Are there additional areas that the Working Group could/should address during its deliberations?
- Do you have any feedback on the proposed sequencing of topic areas?
- Do you have feedback on which topics areas may benefit from some additional technical support, time and resources allowing?

Are there additional areas that the Working Group could/should address during its deliberations?

- [to be generated during the meeting]

WORKING GROUP GOALS

Segment 5

Working Group Goals Discussion

- How will the Working Group measure success in providing recommendations to the NDWAC?
- Mindful of time and resource limitations, what are the needs and interests the Working Group will have considered to reach a successful outcome?
- What other principles do the Working Group members hold that can guide this path to success?

MEETING 2 AGENDA & NEXT STEPS

Segment 6

Topics

- 1 Principles, Priority Areas, Challenge Areas
- 2 Problem Characterization
- 3 Interventions
- 4 Implementation Mechanisms
- 5a Findings
- 5b Recommendations
- 6 Final Report

Tentative Meeting Series

1	Introductions, Priorities, & WG Goals
2	Problem Characterization Areas
3	Problem Areas in More Detail (Part 1)
4	Problem Areas in More Detail (Part 2)
5	Stepping Back – Wrap Up of Problem Characterization
6	Intervention Scoping & Evaluation Approach
7	Intervention Characterization (Part 1)
8	Intervention Characterization (Part 2)
9	Connect Preferred Interventions to Implementation
10	Translate Interventions to Recommendations
11	Draft Recommendations
12	Final Refinements to Recommendations
13	Final Report

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Topics

1 Principles, Priority Areas, Challenge Areas

2 Problem Characterization

Tentative Meeting Series

1 Introductions, Priorities, & WG Goals — Today's Meeting

2 Problem Characterization Areas

3 Problem Areas in More Detail (Part 1)

4 Problem Areas in More Detail (Part 2)

5 Stepping Back – Wrap Up of Problem Characterization

Meeting 2

Problem Characterization Areas – July 2022 (Date TBD based on scheduling poll)

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Current Regulatory and Performance Baseline

Presentation: Current Regulatory Landscape

- How the rules work together in an ideal world
- Goals for outcomes in drinking water system and building water systems
- Understanding of current reality

Working Group Discussion: Perspectives on current regulatory context + performance baseline

Key Problem Areas

Presentation: Problem Characterization Approach

- EPA + Stakeholder Identified Problem Areas
- Proposed Sequence (Opportunistic Pathogens -> Disinfection Byproducts -> Cross-Cutting Considerations)
- Proposed Subtopics & Technical Support

Working Group Discussion: Perspectives on problem characterization scope, sequencing, subtopics, and technical support

Begin Problem Characterization Discussions

Presentation & Discussion: Opportunistic Pathogens

Potential Areas to Cover - Problem Characterization: Opportunistic Pathogens

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Residual Unaddressed or Newly Emergent Health Risks

- Health effects associated with opportunistic pathogens
- Severity and prevalence of illness
- Extent that illnesses and deaths from opportunistic pathogens in drinking water is increasing over time
- Cause of increases (e.g., increased occurrence of opportunistic pathogens, aging of the population)

Occurrence of Opportunistic Pathogens in Drinking Water

- Degree to which opportunistic pathogens occur in public water systems or buildings served by public water systems
- Factors that allow for opportunistic pathogen entry or growth in public water systems
- Relative contribution of various factors to the entry or growth of opportunistic pathogens in drinking water supplies (e.g., deteriorating infrastructure, climate change)

Growth of Opportunistic Pathogens in Drinking Water Value Chain

- Degree to which source water quality (e.g., nutrients) is responsible for the growth of opportunistic pathogens later in the drinking water supply chain
- Degree to which distribution system water quality factors and finished water storage are responsible for the growth of opportunistic pathogens in the drinking water supply chain (e.g., depleted disinfectant residuals, inadequate corrosion control, sediment accumulation, high water age)
- Importance of these factors in the growth of opportunistic pathogens in building water systems

Working Group Post Meeting Input:

- Additions or refinements to characterization of opportunistic pathogen problems
- Additional technical or scientific information needed to further understand the problems
- Working Group perspectives on relative importance of problems

Potential Areas to Cover - Problem Characterization: Disinfection Byproducts

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Residual Unaddressed or Newly Emergent Health Risks

- Health effects of most concern from DBPs (both regulated and unregulated)
- What health effects (e.g., epidemiology studies), exposure, and occurrence information tell us about the current residual national risks from these DBPs

Occurrence

- Extent to which the regulated and unregulated DBPs of most concern occur and co-occur nationally
- Extent to which the major precursors for DBP formation occurrence have changed in the source waters and in finished waters nationally since the promulgation of the Stage 2 DBPR

Challenges and Magnitude

- Challenges of optimizing public protection from both DBPs and opportunistic pathogen risks, including impacts from source waters through the distribution system
- Magnitude of problems faced by consecutive systems (mostly small systems) in meeting the health-based DBP standards under the Stage 2 DBPR
- Major challenges within the existing regulatory structure for DBP precursor management (e.g., treatment requirements, source water protection)

Working Group Post Meeting Input:

- Additions or refinements to characterization of DBP problems
- Additional technical or scientific information needed to further understand the problems
- Working Group perspectives on relative importance of problems

Potential Areas to Cover - Problem Characterization: Cross-Cutting Considerations & Wrap Up

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Fecal pathogens (e.g., Cryptosporidium and Giardia)

- Remaining risks related to these source water pathogens
- Change in incidence of illness from these pathogens over time
- Water system factors that can lead to an increased risk of illness to these pathogens (e.g., source water impacts, treatment efficacy)

Implementation Challenges

- Prevalence of undisinfected ground water systems that should be regulated as surface water systems because they are under the direct influence of surface waters
- The most important implementation challenges with the MDBP rules that may impact disadvantaged communities
- How these implementation challenges impact the livelihoods of those living in disadvantaged communities
- Problems that exist under the current rules that introduce implementation and compliance challenges

Simultaneous Compliance

- Regulatory requirements that exist under other drinking water regulations that may result in challenges in complying with the MDBP rules and vice-versa
- How various parts of the drinking water value chain impact one another with regard to complying with the MDBP Rules (e.g., source water impacts on distribution system water quality)

Working Group Post Meeting Input:

- Additions or refinements to characterization of cross-cutting problems
- Additional technical or scientific information needed to further understand the problems
- Working Group perspectives on relative importance of cross-cutting problems
- Reflections on overall scope and relative importance of identified problems

Meeting 2 Discussion

- Do you have additions or refinements to the proposed topics?
- What background materials, presentations, or other resources will be helpful to you to prepare for the Meeting 2 discussions?
- Mindful of time and resource limitations prior to the next meetings, what supplemental technical analyses would be helpful to inform discussions for the first three or four meetings?


NEXT STEPS


MEETING CLOSURE