

# National Drinking Water Advisory Council

## Meeting Notes

July 21 – 22, 2011

EPA Region 9  
75 Hawthorne Street  
San Francisco, CA, 94105

Prepared for:  
United States Environmental Protection Agency  
Office of Ground Water and Drinking Water  
1201 Constitution Avenue, NW  
Washington, D.C. 20004



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## **Attendees**

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### **National Drinking Water Advisory Council (NDWAC)**

Olga Morales, Chair, Rural Development Specialist-Environmental, Rural Community Assistance Corporation, Dona Ana, NM  
Maria Kennedy, Executive Director, Quail Valley Environmental Coalition, Rancho Cucamonga, California  
Sonja Massey, Chief, Groundwater Branch, Alabama Department of Environmental Management, Montgomery, Alabama  
Dennis Diemer, General Manager, East Bay Municipal Utility District, Oakland, CA  
Jessica Godreau, Chief, Public Water Supply Section, North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina  
Jennie Ward-Robinson, President/Executive Director, Institute for Public Health and Water Research, Spokie, Illinois  
Douglas Owen, Vice President and Chief Technology Officer, Malcolm Pirnie, Inc., White Plains, NY  
David Saddler, Manager, Water/Wastewater and Propane Dept., Tohono O'odham Utility Authority, Sells, AZ  
Marcia St. Martin, Executive Director, Sewerage and Water Board of New Orleans, New Orleans, Louisiana  
June Weintraub, Senior Epidemiologist, San Francisco Department of Public Health, San Francisco, California  
Lisa Sparrow, President, Utilities, Inc., Northbrook, IL  
Craig Woolard, Treatment Division Director, Anchorage Water and Wastewater Utility, Anchorage, Alaska  
Hope Taylor, Executive Director, Clean Water for North Carolina, Durham, North Carolina  
Robert Vincent, Environmental Administrator, Bureau of Water Programs, Florida Department of Health, Tallahassee, Florida

### **Centers for Disease Control and Prevention (CDC) Liaison**

Dr. Max Zarate-Bermudez, Division of Emergency and Environmental Health Services, National Center for Environmental Health (NCEH), CDC, Atlanta, GA

### **U.S. Environmental Protection Agency (EPA) Attendees**

Cynthia Dougherty, Director, OGWDW  
Ronald Bergman, Acting Deputy Director, OGWDW  
Pamela Barr, Director, Standards and Risk Management Division (SRMD), Office of Ground Water and Drinking Water (OGWDW)  
Jennifer Orme-Zavaleta, Office of Research and Development (ORD)  
Jackie Springer, Program Specialist, OGWDW  
Alexis Strauss, Director, Water Division, Region 9  
Everette Pringle, Drinking Water Enforcement Officer, Region 9  
Jovita Pajarillo, Water Division, Region 9  
Jill Korte, Drinking Water Office, Region 9



Michelle Moustakas, Drinking Water Office, Region 9  
Sonam Gill, Intern, Region 9

**Designated Federal Officer (DFO)**

Suzanne Kelly, OGWDW

**Members of the Public**

Manouchehr Boozarpour, San Francisco Public Utilities Commission, Water Quality  
Division

Peter Gleick, President, Pacific Institute

Daneen Farrow-Collier, NCEH, CDC

Larry Ladd, Community Advisory Group for Aerojet Superfund Site Issues

Rick Sakaji, East Bay Municipal Utility District (EBMUD)

Steve Via, American Water Works Association (AWWA)

Eric Cole, Pine Point Commodities Group

Karen McBride, Rural Community Assistance Corporation (RCAC)

Andria Ventura, Clean Water Action

Alice Tripp, Clean Water Action

Leah Walker, California Department of Public Health

Jennifer Clary, Clean Water Action

## **Meeting Summary: Thursday, July 21, 2011**

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### WELCOME

**Suzanne Kelly**, Designated Federal Officer (DFO), and **Olga Morales**, Chair, opened the meeting and provided an overview of the agenda. One Council member, **Elston Johnson**, was not in attendance.

### OPENING REMARKS

*Cynthia Dougherty, Director, Office of Ground Water and Drinking Water (OGWDW)*

**Cynthia Dougherty**, Director, Office of Groundwater and Drinking Water (OGWDW) provided the opening remarks and charge for the meeting. She expressed that the fundamental goal of the Drinking Water Program is to make sure every American has access to safe drinking water, and that requires significant coordination between EPA, the States and the public. She mentioned that later in the day, Ms. Barr would discuss ongoing efforts related to drinking water regulations, rule revisions, and the Drinking Water Strategy, which was discussed at the last meeting. Mr. Bergman would also be briefing the NDWAC on a number of EPA efforts, including sustainability.

Ms. Dougherty expressed that EPA is committed to sustainability, and a lot is being done to promote sustainability as an Agency. Some of these efforts were discussed at the last meeting, and a set of recommendations on the Climate Ready Water Utilities (CRWU) Report was provided by the NDWAC to the Administrator. There have been several new developments related to these recommendations. For example, EPA recently created the CRWU toolbox, which helps utilities prepare for quick and efficient response actions. EPA has also developed the Climate Resilience Evaluation and Awareness Tool (CREAT), which allows utilities to evaluate adaptation and threats. The first version of CREAT is currently available online for free download at: <http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm>. In the fall of 2010, there were web-based trainings provided on CREAT. She described that EPA has also developed an Adaptation Strategy Guide for utilities.

At the last meeting, the NDWAC discussed the Adaptive Response Framework, and how implementation might proceed. There are a number of Water Sector associations that are working through numerous follow-up actions from this Report, and looking at how to build resilience. This will support where the Agency is going with regards to all-hazards water security. She stated that EPA's formal response to the NDWAC's recommendations, incorporating these activities, will be coming soon.

Ms. Dougherty also indicated that there have been developments with the Underground Injection Control (UIC) program and hydraulic fracturing. An update was provided to the NDWAC at the December meeting. Since then, EPA has been continuing to assess the impacts of hydraulic fracturing on water resources, as requested by Congress. There

has been extensive outreach to the public, and EPA has asked the Science Advisory Board (SAB) for advice and guidance on the process of finalizing the research plan, including conducting case studies. EPA has also been looking at issues related to the way that the Safe Drinking Water Act (SDWA) applies to this issue. While the SDWA specifically excludes hydraulic fracturing from UIC regulation, the use of diesel fuel during hydraulic fracturing is still regulated by the UIC program. EPA is developing UIC Class II permitting guidance for hydraulic fracturing activities that use diesel fuels in fracturing fluids. The Agency held four technical webinars with different Water Sector associations and state and tribal representatives to receive input on the guidance. Information is being shared with the public in an effort to gain a comprehensive evaluation of existing practices. There is a lot of work going on in this area.

The EPA is also anticipating significant increases in shale gas extraction as part of the President's *Blueprint for a Secure Energy Future*. The Agency needs to ensure that extraction is done in a way that does not cause environmental harm. Ms. Dougherty stated that the Agency is also looking at the Clean Water Act (CWA) in addition to the SDWA related to disposal of fluids associated with shale gas extraction. For example, flow back water in Pennsylvania is disposed of via publicly owned treatment works because injection is not as viable an option. Pennsylvania is a unique situation and EPA has been working with the State on this issue. The EPA, Department of Energy (DOE), and Department of the Interior (DOI) have asked for our input on best practices and recommendations. DOE has held a number of meetings over the last few months and plans to issue a report sometime in mid-August.

Ms. Dougherty also discussed the Agency's anticipated fiscal year (FY) 2012 budget. This budget will start on October 1, 2011. She indicated that currently Congress is talking about a debt ceiling and appropriations for FY 2012. This would cover EPA and DOI among other agencies. According to the current budget that was reported out by the full Appropriations Committee, there were \$2 billion in overall reductions, which included a reduction of \$1.5 billion in EPA's budget. A large portion of this would be taken from the Clean Water State Revolving Fund (CWSRF). These reductions would bring those programs down to FY 2008 budget levels. The Drinking Water Program could see a \$150 million reduction. Historically, the program funding has ranged from \$820 to \$830 million. The Clean Water Program could see a more significant reduction of \$600 million. There would also be a number of reductions across the Agency, including some of the State grants and EPA regulatory program areas. The regulatory program cut backs, which could be \$7.8 million, are partly a result of public perception that EPA has been too intrusive with regulations. The regulatory program cutbacks reduce the budget to 2006 levels.

She explained that the FY 2012 budget is still undecided. The language in the bill itself already restricts regulations. It is not specific to drinking water, but to water in general. The definition of Waters of the U.S., Section 316(b), Cooling Water Intake Structures, and the Air Quality Program are also seeing restrictions. She indicated that there is a lot of discussion in Washington about what will happen with all of these requirements.

There are not just changes to reporting language, but to legislative issues and risk assessment restrictions.

The Nation is operating at a time when Congress is looking to reduce spending, and EPA, like any other Agency, needs to sort through the impacts. The Agency underwent significant funding decreases in FY 2011, and reduced travel for all Agency staff by 40% through three-fourths of the year. She indicated that one of the reasons why this NDWAC meeting is on the West Coast is because it reduced travel needs for many of the Council members.

Ms. Dougherty stated that the U.S. Government Accountability Office (GAO) recently put out a number of reports, two of which she highlighted. The first one looks at the process of how the Agency determines whether to regulate additional contaminants, and makes recommendations under three key areas: criteria for identifying contaminants that pose the greatest health risk; monitoring of unregulated contaminants; and Regulatory Determinations. The report concluded that the EPA does not have a transparent and clear process, and has not published criteria for how Regulatory Determinations are made. The report included 17 recommendations, including criteria for making decisions. EPA responded that the work being done on the Contaminant Candidate List – third edition (CCL3) and with the NDWAC is addressing some of these recommendations. The EPA also stated that it would more explicitly outline the process for how Regulatory Determinations are made, and ensure scientific peer review on that process.

The second report Ms. Dougherty discussed was just released this week, and concerns data quality for enforcement decision making. The GAO Report concluded that EPA's current system is not working. The EPA also feels that this has been a significant issue for a number of years: to make sure states have all the necessary data on violations, as well as linking federal and state systems.

### ***Discussion:***

**Mr. Bergman** stated that, among other recommendations, it was recommended that the Agency go back to the number of State audits that were conducted a few years ago; they had been cut back due to budget constraints. He followed that the DFO will send the GAO's report out to the Council as follow up to this meeting.

**Ms. Dougherty** indicated that Mr. Bergman would be talking later in the day about EPA's efforts to ensure better use of states' data. One of the topics will be improvements to the Safe Drinking Water Information System (SDWIS) over the next few years, which would help states with electronic reporting.

Ms. Dougherty also mentioned that the EPA went through a review of State regulations in the spring of 2011 to make sure that they were cost effective. She indicated that Ms. Barr would be discussing the primary drinking water standards evaluation that takes place every six years. This wouldn't replace anything that is already in place, but would be looking at how the six year review meets the Agency's requirements. The Agency is also

looking at the effectiveness of Consumer Confidence Reports. The statute was written 15 years ago, and the way people communicate has changed since then. A lot of people now use the internet, email, etc. to communicate, but not everyone has access to these tools. This is an issue that is being looked at in the review.

**Ms. Kennedy** asked what process was being used for the regulatory review.

**Ms. Dougherty** indicated that there is a lot of discussion in Congress, and many feel that there may be a number of regulations on the books that are no longer useful and/or effective. As a result, the President decided it was appropriate to take a step back and assess the effectiveness of the regulations that are on the books today across the government.

#### REGULATORY ACTIVITIES UPDATE

*Pamela Barr, Director, Standards and Risk Management Division (SRMD), Office of Ground Water and Drinking Water (OGWDW)*

**Ms. Barr** provided an overview of EPA's regulatory activities. Her presentation included the Drinking Water Strategy Update, SDWA Regulatory Processes, Unregulated Contaminants, Existing Standards, Regulatory and Implementation Assistance Tools, and Research. The update to the Drinking Water Strategy focuses on four goals: (1) address contaminants as groups rather than one at a time; (2) foster development of new drinking water treatment technologies; (3) use the authority of multiple statutes to help protect drinking water; and (4) partner with states to share more complete data from monitoring at public water systems. With regard to (3), Ms. Barr noted that there was a focus on the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA).

Ms. Barr indicated that the first goal of addressing contaminants as groups would be less time consuming and resource intensive, account for risks from multiple contaminants, deal more effectively with an increasing number of emerging contaminants, and provide water systems with an opportunity to make best long-term decisions on capital investments. Two potential groups that she identified were carcinogenic volatile organic compounds (VOCs) and nitrosamines. She then went through each of the potential groups to discuss whether they meet these four factors:

- Common end point;
- Common analytical method;
- Common treatment/control processes; and
- Co-occurrence of data.

Ms. Barr briefly discussed the second goal of fostering new drinking water technologies, and the formation of the Regional Water Technology Innovation Cluster (WTIC) in January 2011 to bring together public and private partners to focus on finding new ways to simultaneously treat multiple contaminants in drinking water. She then went into the third goal of using multiple statutes to protect drinking water. The EPA is identifying regulatory authorities under TSCA and FIFRA that may provide opportunities for better

protection of drinking water. The Agency is currently developing Human Health Benchmarks on Pesticides (HHBPs) that can be used as tools in assessing the occurrence of contaminants in drinking water (when regulatory values are not available). They are not enforceable, but are for advisory purposes. These have also not been formally published yet. The fourth goal is to partner with states to share more complete data from monitoring at public water systems. She indicated that a State-EPA Data Sharing Committee, made up of the EPA, Environmental Council of the States (ECOS), Association of State Drinking Water Administrators (ASDWA), and Association of State and Territorial Health Officials (ASTHO) representatives, signed a Data Sharing Memorandum of Understanding (MOU).

Ms. Barr discussed the SDWA regulatory processes for the Contaminant Candidate List (CCL), Regulatory Determinations, Unregulated Contaminant Monitoring, Regulation Development, and the Six Year Review. The CCL is published every five years. Decisions on whether to regulate CCL contaminants with a drinking water standard are made on at least five contaminants every five years. Also, every six years, the standards are reviewed and (if appropriate) revised. Every revision must maintain or improve public health protection. If they are revised, EPA goes through the regulation development process again and an evaluation of factors.

Ms. Barr explained that perchlorate is the first positive Regulatory Determination that has been made under this framework. The Regulatory Determinations for CCL3 are going on now. A more robust data set is needed for many contaminants in order to determine if they should be regulated. A total of 32 of the 116 contaminants on the CCL3 are expected to have health effects assessments conducted this year. For these, there is national occurrence data or sub-national occurrence data demonstrating that the level of occurrence may be on a national level.

Ms. Barr summarized the Unregulated Contaminant Monitoring Rule 2 (UCMR-2) results to date. There were a total of 25 contaminants, 13 of which have not been detected. The results are posted on the web-based National Contaminant Occurrence Database (NCOD). The UCMR-3 was proposed in March of 2011, and the final is expected by March of 2012. Monitoring is planned for 2013 to 2015, and is proposed to include 28 chemicals and two pathogens. The comment period for UCMR-3 closed May 2, 2011, and comments were submitted by 53 stakeholders.

Ms. Barr discussed the Endocrine Disrupter Screening Program (EDSP). The second EDSP list was published in November 2010 and contained 134 chemicals. After considering comments and information submitted, the EPA plans to refine the list and develop a schedule for issuing test orders (late 2011).

Ms. Barr mentioned that the Total Coliform Rule (TCR) and Lead and Copper Rule (LCR) revisions would be discussed in a separate presentation, but she mentioned the TCR Method Evaluation. The TCR Advisory Committee recommended evaluation of all currently approved coliform analytical methods to determine appropriateness. Stakeholder meetings and teleconferences were held from May to November, 2010. The

Water Environment Research Foundation (WERF) is leading the development of a library of known coliform, *E. coli*, and non-coliform strains to be used for comparison. The EPA is following the library progress and evaluating next steps.

Ms. Barr also discussed EPA's work on fluoride and chromium. EPA sets the maximum allowable concentration of fluoride in drinking water, and the Centers for Disease Control and Prevention (CDC) recommends a level of fluoride to be put in water to help prevent tooth decay. It has been identified that the public gets confused by these two standards. In January 2011, EPA and the U.S. Department of Health and Human Services (HHS) announced steps to ensure that standards/guidelines for fluoride continue to provide the maximum protection to Americans, especially children. The actions are intended to maximize health benefits of water fluoridation while reducing overexposure in children. A date for the finalized review has not been set.

Ms. Barr then discussed chromium, saying the drinking water standard is currently 0.1 mg/L for Total Chromium. EPA has initiated an Integrated Risk Information System (IRIS) toxicological review of Chromium-6 health effects, and when the toxicological review is final, EPA will determine if a new/revised chromium standard is needed. EPA is working with state and local officials to determine prevalence of Chromium-6, and issued guidance to water systems on enhanced monitoring and analysis of Chromium-6. There are now answers to frequently asked questions about Chromium-6 available on EPA's website.

Ms. Barr discussed the Agency's Optimization Program compliance/implementation assistance. Area-Wide Optimization Programs (AWOPs) are active in 21 states, and there have been collaborative efforts between EPA, States, and ASDWA. EPA has been developing new technical tools and implementation approaches. EPA and states are including optimization of Distribution Systems and Groundwater Systems in AWOP. The Partnership for Safe Water has recently introduced a Distribution Systems Optimization (DSO) component to its program. The AWOP meeting held on July 19 – 20, 2011 in Cincinnati was designed to enhance networking and collaboration between EPA and AWOP states.

Ms. Barr concluded with a brief summary of the EPA Office of Research and Development's (ORD's) recent restructuring. ORD's new program will include six programs: (1) Safe and Sustainable Resources; (2) Chemical Safety and Sustainability; (3) Air, Climate, Energy; (4) Sustainable and Healthy Communities; (5) Human Health Assessment; and (6) Homeland Security.

### ***Discussion:***

**Ms. Sparrow** asked how many states require fluoridation.

**Ms. Weintraub** stated that this is done at the local level in some places.

**Ms. Sparrow** asked if chromium changes between Chromium-3 and Chromium-6 during the Drinking Water treatment process.

**Ms. Barr** stated that yes, if the conditions are suitable.

**Ms. Sparrow** asked how you could then test adequately for one or the other.

**Ms. Barr** suggested that systems could test for both Chromium-6 and Chromium-3. EPA is currently trying to get a better understanding of the relationship between the two at the various points of the treatment process.

**Mr. Zarate-Bermudez** thanked Ms. Barr for the presentation. He stated that on behalf of the CDC, there has been a good working relationship between CDC and EPA on the efforts regarding fluoride. He further stated that tomorrow he would be talking about CDC's efforts related to drinking water. He then asked whether nitrosamines were assessed equally.

**Ms. Barr** answered that six or seven were assessed in UCMR 2. The same systems were assessed at the same time. There were just fewer than 4,000 systems.

**Mr. Zarate-Bermudez** asked whether there were any details that could be provided regarding the development of the library.

**Ms. Barr** answered that she could not provide many details. A researcher from the University of Illinois received a grant from WERF to work on that. She stated that she could put Mr. Zarate-Bermudez in contact with a staff person who may know more.

**Mr. Vincent** referenced the Human Health Benchmarks on Pesticides (HHBPs) in drinking water. He stated that his constituency has been monitoring for pesticides at a number of their wells, and have collected a lot of data. He asked whether EPA's information on HHBPs was publicly available yet.

**Ms. Barr** answered that this information was not publicly available yet, but that it hopefully would be soon.

**Mr. Vincent** stated that he could send his data to Ms. Barr.

**Mr. Woolard** stated that there was some discussion on carcinogenic VOCs, and that he would like to hear more about how this was going to work.

**Ms. Barr** answered that there are eight regulated contaminants. Any changes will have to maintain or improve the public health benefit. Some of these have been considered in the past. One approach is to monitor them as a group.

**Mr. Woolard** asked how this would be sorted out.



**Ms. Barr** indicated that EPA was currently working on the health risk assessment. Once the Agency has that completed, the various health effects will be understood more fully. Then, EPA will be looking at analytical methods. The Agency is looking at treatment feasibility, and the cost/benefit analysis to see whether the costs justify the benefits.

**Mr. Woolard** stated that he understood an attempt was being made to allow all of them to be tested with the same analytical method, but if not, then he asked whether they would need to be put into a separate group.

**Ms. Barr** stated that they are working to evaluate this and indicated that it may be possible to adjust the method to include more contaminants.

**Mr. Owen** stated that he recognized this was a relatively active agenda as opposed to the past couple of years. Reflecting on the comments Ms. Dougherty brought up regarding the regulatory mandates, and having the process more transparent, he was curious about whether there was enough budget to manage these goals within the proposed timeframe, or if the Agency was planning to borrow resources from somewhere else.

**Ms. Barr** answered that if the budget cut that was discussed during Ms. Dougherty's opening remarks came to fruition, then yes, this would become a problem. She explained that there would still be the EPA personnel to support the goals, but that technical support via contracts may no longer be funded.

**Ms. Dougherty** followed that the activities presented by Ms. Barr were planned based on the existing budget. If there are budget cuts, then the Agency would have to go back and revise the Strategy.

**Ms. Weintraub** thanked Ms. Barr for the presentation. She said that it is important to learn about the Office's activities and their schedule for completion. It appears that there exists the same enthusiasm as a year ago, and there will be opportunities for the Council to support the good work that is being done.

**Ms. Godreau** referenced Goal 3, Use Multiple Statutes to Protect Drinking Water, and asked, from a source water protection standpoint, whether it would make sense for EPA to protect drinking water at the source water level, and look at where they are introduced into the environment. She mentioned FIFRA, and asked how much involvement EPA had in that. She asked whether EPA had identified anyone to work with, or whether to amend some of their requirements.

**Ms. Barr** stated that the Agency is receptive to using flexibility where it exists in Rules. She stated that States are not as limited as the Federal government in pursuing data collection opportunities. The States have a much easier and timely process for collecting data. EPA does not want to put extra burden on the States, but if they are already in the process of collecting the data, EPA would be interested in obtaining those data. One of the criteria specified by the SDWA for a determination to regulate a contaminant is that it must be based on a finding that the contaminant is known to occur or that there is

substantial likelihood that the contaminant will occur in public water systems with a frequency and at levels of public health concern. The Agency is looking at whether this supplemental data can build that case. The EPA is also looking at how the Office of Water (OW) can better collaborate with the Office of Chemical Safety and Pollution Prevention (OCSPP). The OCSPP has a tremendous amount of data on the perfluorinated chemicals, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). There is a lot of receptivity on both sides for working together to protect drinking water. Staff at OCSPP are very excited about protecting drinking water. There is also some interaction with the Food and Drug Administration (FDA).

**Mr. Woolard** asked about EPA's conversations with the FDA on pharmaceuticals, and the process for including those. He noted that there were quite a few on CCL3.

**Ms. Barr** stated that this is not done through the OGWDW, but through the Office of Science and Technology (OST), who has had a lot of discussions with the FDA. This is still ongoing.

CONSULTATION: TOTAL COLIFORM RULE REVISIONS

*Pamela Barr, Director, SRMD, OGWDW*

*Wynne Miller, Chief, Standards and Risk Reduction Branch, SRMD, OGWDW*

*Julie Javier, SRMD, OGWDW*

*Karl Anderson, SRMD, OGWDW*

*Sean Conley, SRMD, OGWDW*

**Ms. Barr** provided a presentation regarding the revised TCR (RTCR). The objectives of the consultation were to provide background on the TCR, to summarize the proposed RTCR, to summarize the NDWAC recommendations on the proposed RTCR from the 2009 consultation, to discuss public comments received on other issues, and to discuss EPA actions to address NDWAC recommendations and comments received.

She reiterated, as discussed in the earlier presentation, that the SDWA requires EPA to review and revise as appropriate, each National Primary Drinking Water Regulation no less than every six years. Any revision must maintain or improve public health protection. Through the six year review, EPA decided to review and revise the TCR. EPA convened the TCR Distribution System Advisory Committee (TCRDSAC), consisting of 15 organizations in 2007. In 2008, the TCRDSAC deliberations concluded within a signed Agreement in Principle (AIP) that included recommended revisions to the TCR in 2008. In 2010, EPA proposed the RTCR, which has the same substance and effect as the TCRDSAC recommendations in 2010. The Final Rule is expected in spring/summer 2012.

EPA presented a summary of the AIP to NDWAC at a November 2008 NDWAC meeting. EPA also consulted with NDWAC on May 27 – 28, 2009 in Seattle, Washington. During the consultation, questions concerning implementation challenges, guidance, and public notification language were raised by the NDWAC members. EPA then met with a group of NDWAC members to further discuss public notification

requirements in 2009. The SDWA requires that EPA consult with NDWAC again prior to consultation again before publishing the final RTCR.

The proposed RTCR emphasizes investigation and corrective action based on monitoring results, rewards well operated systems with reduced monitoring, and reduces public notification (PN) where there is no imminent public health threat. There is an overall shift in focus for the RTCR from monitoring results informing public notification to monitoring results informing investigation and corrective action. This change benefits are that it is a more proactive approach to public health protection and reduces confusion associated with PN for Total Coliform (TC) violations.

The RTCR eliminates the maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for TC, and instead uses TC as part of a Treatment Technique (TT). It establishes an MCLG and MCL for *E. coli*. There are also changes in the monitoring requirements especially for small systems. Under the RTCR, systems are required to conduct assessments and corrective actions when they are triggered to do so based on the results of their monitoring.

Ms. Barr then talked about the NDWAC comments from the May 2009 consultation. She first reviewed the comments related to education. The NDWAC members commented that EPA should provide utilities and States with tools to help them understand the revised rule provisions and assist with providing public education. In response, some of the actions that EPA has taken included: hosting a stakeholder meeting in Washington, DC in May, 2010, which included discussion on the plans for RTCR guidance; (2) holding public information meetings and a webcast in August 2010, which included discussion of the core elements of the proposed RTCR such as conducting assessment and corrective action, and plans for guidance as topic areas; and (3) developing the draft Assessment and Corrective Action (A/CA) Guidance and making it available by posting the draft for public comment from August to December, 2010. EPA will work with stakeholders from States and PWSs in completing the final A/CA Guidance and other final technical and implementation guidance. Planned education, training and guidance on RTCR will include those activities and products typically prepared for final rules, including: presentations about rule requirements at conferences and meetings; training for EPA regions and State trainers; small systems guidance materials; fact sheets and quick reference guides; sampling guidance; and primacy, implementation, and sanitary survey guidance for States.

Ms. Barr then discussed the NDWAC comments related to monitoring and public notification (PN). In the previous consultation, the NDWAC members expressed concern that the changes to monitoring requirements (i.e., reduction in the number of samples taken) could lessen the opportunity for systems to identify violations. EPA requested comment in the preamble to the proposed RTCR on the cost and benefit of reduced monitoring. Some commenters expressed concern about any reductions in monitoring while others were in favor of the changes. EPA is addressing these comments as the final RTCR is being developed.

Ms. Barr discussed environmental justice (EJ) considerations and small systems. EPA has made efforts to assure consideration of EJ and small systems; for example, the TCR Advisory Committee included groups that represent the perspective of public health and/or the rights of minority, low income, or indigenous populations.

Ms. Barr discussed other comments that EPA received on the proposed RTCR. These included comments on state implementation burden.

There were also comments on storage tank inspection and cleaning. The TCR Advisory Committee recommended additional research and information collection on drinking storage issues. EPA and the WERF convened a Research Partnership that identified storage as a high priority issue with some information and research needs. EPA requested comment on tank conditions, costs, state requirements, and how to better protect public health. Some strongly suggested cleaning and inspection requirements based on outbreak histories and conditions found in tanks. Some said that current sanitary survey requirements and guidance are adequate, and that research and information collection should continue. Ms. Barr suggested that she could provide photos and other information related to the public comments on the RTCR, particularly on tank inspections.

Ms. Barr indicated that the next steps for the RTCR are to continue to evaluate comments and that the final rule is expected to be published in mid-2012.

### ***Discussion:***

**Ms. Weintraub** referenced changes in monitoring, cleaning and inspection. Systems serving 1,000 people or less have new criteria to require a reduction in monitoring if they show they are well-operated. She asked what was in the rule, and whether there was flexibility within the rule to define “well-operated.” She asked whether other criteria were also considered. Related to cleaning and inspection, she asked whether EPA would be able to include well-operated criteria for cleaning and inspection.

**Ms. Barr** summarized the proposed rule that generally for reduced monitoring at a non-community water system (NCWS) serving 1,000 or fewer customers, the system would need an annual review by the State, to be in compliance within the past 12 months, free of sanitary defects, have a protected source, and meet construction standards. Other criteria are encouraged for NCWSs, such as cross connection control, certified operator, meet disinfection criteria, and other equivalent enhancements. For a community water system (CWS) serving 1,000 or fewer customers, the monitoring is reduced from monthly to quarterly. To be eligible for reduced monitoring, a CWS serving 1,000 or fewer customers must be free of sanitary defects, have a clean compliance history, have a protected source, certified operator, and also must meet at least one of the other additional criteria, e.g., cross-connection control program.

**Ms. Weintraub** asked what is required in an annual inspection.

**Ms. Barr** answered that the rule is not specific on what is actually required for an annual site visit.

**Ms. Morales** asked if states have the authority to require what a site visit entails.

**Ms. Javier** answered that it is comparable in comprehensiveness to a Level 2 Assessment.

**Ms. Barr** stated that for a CWS, the system needs to have a clean compliance history, no sanitary defects, a protected water source, be built to construction standards, and use a certified operator.

**Mr. Vincent** asked whether a Level 2 Assessment also includes a storage tank assessment.

**Mr. Anderson** stated that whether it is conducted by State personnel or another party, the entity typically doesn't have the necessary insurance to conduct a comprehensive evaluation, including climbing up the tank and entering it.

**Ms. Morales** stated that right now there are no existing or recommended regulations that require tanks to be assessed, and asked whether this is something being considered.

**Ms. Barr** responded that based on the comments that EPA received on storage tanks, EPA could either do nothing, finalize a regulation for storage tanks as part of the RTCR, or seek more public comments before promulgating requirements regarding storage.

**Ms. Morales** indicated that in her experience 90% of the contamination events end up having to do with an issue relating to storage tanks. This is also where a contamination event can affect the largest volume of water. She noted that she sees value in having something more solid in the regulations regarding tank inspections.

**Ms. St. Martin** asked whether there were an equal number of comments on the pipeline portion of the distribution system as there were on the assessment of storage tanks.

**Ms. Javier** stated that there were not many comments about other parts of the distribution system.

**Mr. Vincent** noted that cross-connections are another significant issue, and asked whether there were comments in this regard.

**Mr. Anderson** stated that there were not many comments, and that this issue was added as part of best available technologies. The comments stemmed from that.

**Mr. Vincent** asked whether there were any comments on cross-connection control.

**Mr. Anderson** stated that there were not, and that comments were not specifically sought for this issue.

**Mr. Vincent** noted that in the past the NDWAC had thought it pre-mature to consider cross-connections, because there weren't enough data or policy research on the topic to effectively regulate.

**Ms. Barr** stated that there was a recommendation to conduct more research. There is an AWWA guidance that has been around for about 20 years, which recommends cleaning and inspections of tanks every three to five years. EPA conducted a survey and asked questions regarding tanks. The information that was received from this effort indicated that tanks were generally cleaned every three to five years.

**Mr. Woolard** mentioned that he thought he recalled that an investigation was required after a positive TC hit. He asked whether there were provisions on what would be an adequate response, and whether the Rule or guidance would address this. He noted that there could be lots of problems.

**Ms. Barr** indicated that the Rule and preamble talk about the requirements of the assessment. The assessment form has to go to the State within 30 days, and needs to indicate what was done for the assessment and also what corrective action was taken. If it cannot be finished within 30 days, then a local utility would need to negotiate regarding allowing more time. The State can determine that the assessment is not sufficient.

**Ms. Javier** stated that the manual that EPA is developing includes guidance on assessments and corrective actions. The TCR talks about common corrective actions.

**Mr. Woolard** stated that he understood that the rule is general in defining assessment and corrective action, and that every state would need to create their own forms.

**Ms. Barr** concurred with this, and indicated that the States did not want EPA to give them forms.

**Mr. Woolard** stated that he would speak against a blanket requirement on tank inspections. He said that there are too many variables: state of distribution system, water quality conditions, etc. Also, the burden would fall onto the State for many systems. He suggested that it constrains utilities, and places the burden on them to pay for the inspections. He stated that he is not suggesting that this is not an issue, but that he did not believe it should be a blanket rule.

**Mr. Owen** stated that in his opinion, whenever a regulation is made specifically around one element, that element becomes the focus of what people do or monitor. State agencies are already indicating that costs are going to be high for smaller systems. He thought it would be counterproductive for EPA to put in requirements specifically for storage tanks. If money is tight, then the only element that systems will look at is tanks, and other components of the system will not be monitored. He suggested including

language that if data support that the most common contamination source is tanks, then it is important to include this in the inspection, but this should not be in the regulation.

**Ms. Morales** stated that she agreed. A lot of times tanks are the problem, but they are not the only problem. The tank inspections can be difficult, because of access issues. If there is something included in the regulations for tank inspections, then that needs to be weighed with all other aspects of the system.

**Ms. Sparrow** indicated that she felt the estimate that was provided regarding tank cleaning was low, and that better research was needed.

**Ms. Barr** stated that in her experience, the numbers can really vary, based on water quality, sediment, etc.

**Ms. Kennedy** referenced the discussion about the dead animals in the tank, and specifically the dead horse. If the public saw the images of a dead horse in the water tank, there would be a public outcry. She stated that this is a concern of hers as a member of the public. Disadvantaged communities have no other way of getting water then depending on public water. Also, it was mentioned that there were no comments from EJ communities. The requests for comments may need to be more culturally appropriate. EPA has an EJ office that regularly communicates with EJ communities. If OGWDW had worked with them, then maybe there would have been a better response rate.

**Ms. Barr** stated that the Agency put in a request for comment to all audiences regarding special EJ considerations. To clarify, the previous discussion was not stating that EPA didn't get any comments from EJ communities. Rather it was that EPA didn't receive any comments regarding special EJ considerations.

**Mr. Saddler** suggested that regulations need to be driven by need and kept in perspective. For example, for cross connection control there needs to be an alternative water source, and some areas do not have that. He stated that if you try to regulate too much, you are going to open up affordability issues and nothing will get done. He further asked what the challenges were to mandate increased monitoring for systems. He indicated that a good number, if not the majority, of systems lack resources for this. He asked whether these aspects have been considered.

**Ms. Barr** indicated that these certainly were considered, and that only NCWSs would be affected. Systems would be going from annual or quarterly to monthly. There would be an increased cost for the monthly monitoring and increased responsibility for the State to oversee and conduct monitoring for those over which they have responsibility. The Agency did its best to factor cost into these decisions.

**Ms. Godreau** asked whether this was better than requiring the five routine samples.

**Ms. Barr** stated that yes it was. This is a reduction of four from what they would have had to do.

**Ms. Sparrow** stated that although there is no doubt that people across the country have different experiences, she has never heard of horses in tanks. She indicated that her company has almost a thousand tanks and she has never seen or heard of anything like that. She suggested that people be careful in how this is used and cautioned against using it to incite “a public outcry.” She stated that she wanted to reemphasize what Mr. Woolard said: that the tank inspection should not be a requirement. Essentially what is being checked is the TC issue. It is the operator’s responsibility to identify whether the tank has been inspected, and he/she will think to look to the tank as a potential source. It is not necessary to force systems down that path.

**Ms. Morales** agreed and stated that tanks should be looked at as part of the system along with the other components.

**Ms. Sparrow** stated that operators will go through the critical path process, and look to the component that is problematic.

**Ms. Weintraub** noted that in San Francisco, they are proud of their TCR compliance, but that about 10 years ago an issue with *E. coli* was identified in roof top tanks under the control of the building owner (not a utility-owned tank). It was a cross-connection and tank problem. This type of tank inspection and compliance issue could be relevant for larger systems even if they are not under utility jurisdiction. With the State implementation comments, cross-over compliance with the Ground Water Rule (GWR) was mentioned. She asked whether there were any examples of conflicts.

**Ms. Javier** stated that some commenters said that EPA should let the GWR take its course, and then after that, overlay the RTCR. However, the GWR only applies to groundwater systems. The universe of other systems is not covered, and this is where the RTCR comes in. Corrective actions are already in the GWR, but, again, this only covers groundwater systems.

**Mr. Vincent** asked whether the guidance would address the GWR and TCR overlap.

**Ms. Barr** stated, yes.

**Ms. Javier** also said yes.

**Mr. Vincent** brought up the plumbing code discussion. He said he wasn’t sure who would be involved with this issue, whether it would be the folks working on the International Energy Conservation Code (IECC), or others. The roof-based storage tanks that Ms. Weintraub brought up earlier are not under the control of the utility, but are important. For example, the *legionella* outbreak in Miami was a plumbing code issue. He asked whether there was any discussion about the link to the plumbing code.



**Ms. Barr** stated that the Agency has compiled as much information as possible about States' plumbing codes and cross-connections.

**Ms. Morales** asked the Council whether there was a formal proposal they would like to make to the Agency.

**Mr. Saddler** put to motion a vote that the Agency follow the recommendations of the TCRDSAC, while continuing to evaluate comments. Ms. Weintraub provided a second motion. All were in favor, and none opposed.

CONSULTATION: LEAD AND COPPER RULE REVISIONS

*Pamela Barr, Director, Standards and Risk Management Division (SRMD), Office of Ground Water and Drinking Water (OGWDW)*

*Eric Burneson, Chief, Targeting & Analysis Branch, SRMD, OGWDW*

*Jeffrey Kempic, SRMD, OGWDW*

**Ms. Barr** provided a presentation on the Lead and Copper Rule (LCR) revisions. She indicated that the purpose of the consultation was to obtain input on key areas of the LCR long-term Rule revisions. She then discussed the LCR background.

Ms. Barr explained that if a system's lead or copper sampling results exceed the action level (AL), then the system must optimize corrosion control treatment. If the lead AL is exceeded, then the system must also conduct public education. If a system with optimal corrosion control treatment (OCCT) exceeds the lead AL, then the system must perform lead service line (LSL) replacement. The utility replaces the portion of the LSL, which the system owns, and offers to replace the customer's portion of the LSL at cost. Lines with service line samples below the AL are also considered replaced. The system must replace 7% of the LSLs each year.

Ms. Barr summarized the key areas for the LCR revisions: sample site selection criteria, lead sampling protocol, public education for copper, measures to ensure OCCT, and LSL replacement requirements. She then went through each of these key areas, summarizing the existing Rule requirements and the key questions for the Council. She stated that currently the Rule is based more on lead, and not as much on copper.

Ms. Barr discussed sample site selection criteria. She clarified that it is not a random sampling; sampling is targeted toward the highest risk sites. She stated that EPA is investigating whether the site selection process developed about 20 years ago best addresses the sites of concern for lead today. The key questions related to this are:

- Do the current tiering criteria for lead accurately represent the highest risk sites? If not, what needs to change?
- How should copper be addressed if there are tiering changes?

Ms. Barr then went through the LCR sampling protocol. The goal is to sample sites that are likely to have the highest lead levels. The samples are to be taken as first draw samples (one liter) from the cold water kitchen or bathroom tap, after the water has been

standing in the pipes for at least six hours. She noted that the water that would have the highest concentration of lead is that coming from the LSL, and this would not necessarily be captured by the first draw. She further explained that under the current Rule, residents may take samples if instructions are provided by the water system; however, water systems cannot challenge results based on sampling collection errors. She also highlighted that sensitive life stages are not considered in site selection. Sites are selected to assess performance of corrosion control treatment, not to assess impacts of adverse exposure. The key questions related to this are:

- Should EPA change the sampling protocols at LSL sites to address these issues?
- What implementation issues will arise from sampling changes?

Public education for copper was discussed. Currently, there are no educational or exposure mitigation materials provided for copper. Key questions for this are:

- Should systems send educational materials to consumers?
- If so, should it be limited to new connections or should the information be distributed system-wide?

Ms. Barr summarized OCCT. Large systems must provide OCCT, and small/medium systems must provide OCCT if they exceed the AL. Key questions for this are:

- Should EPA require systems to re-optimize after an AL exceedence?
- Should the LCR be more prescriptive on evaluating treatment options and monitoring key water quality parameters?

LSL replacement requirements under the current Rule were explained. Key questions for this are:

- Should the requirement for partial LSL replacement continue?
- Should the requirement for partial LSL replacement be eliminated in favor of full replacement?

Ms. Barr also discussed voluntary/infrastructure partial LSL replacement. She indicated that the majority of LSL replacements are actually outside of the Rule, and occur as replacement of the system's portion of the line as either part of a planned maintenance or emergency repair. Key questions related to this are:

- Should there be notification and sampling requirements for these instances?
- How would these requirements be imposed and enforced when the systems are in compliance with the Rule?

Ms. Barr went over the Science Advisory Board (SAB) Review and the charge to the Drinking Water Committee of the SAB. She stated that the draft SAB report was completed on July 1, 2011. The key findings included:

- Partial LSL replacement has not been shown to reliably reduce drinking water lead levels in the short term, ranging from days to months, and potentially even longer.
- Partial LSL replacement is associated with elevated drinking water levels for some period of time after replacement, suggesting the potential for harm, rather than benefit.

- Available data suggest that elevated tap water lead levels tend to stabilize over time following partial LSL replacement, sometimes at levels below and sometimes at levels similar to those observed prior to partial LSL replacement.

Ms. Barr also noted that the SAB also examined the few studies where full LSL replacement could be compared against partial LSL replacement. The SAB concluded that the evaluation periods have been too short to fully assess differential reductions in drinking water lead levels. Nevertheless, for the time periods reported in the studies, full LSLR has been shown to be generally effective and PLSLR has not been shown to be reliably effective in achieving long-term reductions in drinking water lead levels.

Ms. Barr discussed the LCR EJ Stakeholder Meeting, which was held on March 3, 2011 in Washington, D.C. Phone connections were provided for those that couldn't be in D.C. for the meeting. EPA didn't have as much participation as hoped, but they did receive feedback from those participating, e.g., EPA needs more information on the location of LSLs and whether they are associated with disadvantaged communities.

Ms. Barr concluded by summarizing the next steps, indicating that the proposed Rule was expected to be published in Spring/Summer 2012.

### ***Discussion:***

#### **Background**

**Ms. Sparrow** asked what the procedure was if a LSL is partially replaced, and then the test comes back positive for lead.

**Ms. Dougherty** stated that the 2007 revision states that if the "test-out" provision was used to consider a LSL replaced, the sites would have to be revisited again if the system has a future exceedence. It does not relate to partial LSLs where the homeowner did not replace their portion.

**Ms. Godreau** asked for the procedure when there aren't LSL replacements, and the system has already optimized.

**Ms. Barr** stated that the requirements call for public education and re-testing.

**Ms. Taylor** stated that for the purposes of providing a case study, she is aware that D.C. has LSLs. She asked whether there has been partial or complete LSL replacement.

**Ms. Barr** stated that she believes it has been a mixture.

#### **Key Area #1: Sample Site Selection**

**Ms. Weintraub** asked for a hydrologic explanation for why partial LSL replacement leads to spikes in lead levels.

**Ms. Barr** explained that the partial LSL replacement leads to a fair amount of disturbance of the pipe partway down the service line, which directs more lead into the system.

**Mr. Woolard** stated that he understands it takes a while for the corrosion products / biofilm to form on the pipe.

**Mr. Zarate-Bermudez** asked whether the spikes in lead caused by the partial LSL replacement were attributed to soluble or particulate lead.

**Mr. Burneson** indicated that he didn't know if there was definitive evidence, but that it should be particulate lead, which is dislodged by disturbance of the LSL. This could also potentially release soluble lead as well, but the concern is more for the particulate lead.

**Ms. Taylor** noted that recent data also suggest that there is an elevation in lead with full LSL replacement. She asked how this can be the case, unless there is soluble lead in household pipes.

**Mr. Burneson** stated that more recent data have been compiled in the study by HDR Engineering, particularly looking at (no longer) galvanized iron pipe, which results in iron oxide in household pipes. Over time, lead adheres to the iron oxide. The full LSL replacement leads to disturbance of the household pipes, dislodging the lead.

**Ms. Taylor** asked whether temporary filtration systems were a solution.

**Ms. Barr** stated that they could be, yes.

**Ms. St. Martin** referenced partial LSL replacement, and asked how this health risk is communicated – whether it is the utility's responsibility, and how it is written into the Rule. She also asked whether there was a difference in communication for a partial LSL replacement versus a full LSL replacement.

**Mr. Burneson** said that they are not substantially different. The utility must offer to replace the homeowner's portion and also alert them to the potential of increased lead levels. The other requirement is that within 72 hours, the system has to try to get another LSL sample. This helps motivate the homeowner to flush the system and alert them to any high levels they may experience.

**Ms. Barr** stated that these are the existing requirements, and the Agency is looking at a wide array of new options now.

**Ms. Sparrow** referenced the increased health risks of copper to those with Wilson's Disease, and asked if this was based on statistical evidence.

**Ms. Barr** stated that yes it was.

**Ms. Weintraub** asked about the process for the LCR revisions in comparison to the TCR process. For the TCR process, the EPA had a committee that made specific recommendations, and she asked whether this would be the case for LCR.

**Ms. Barr** stated that the process used for the TCR has been done for a number of Rules, but not every Rule. She indicated that it is a very time consuming and expensive process. There are benefits, including information sharing, but this is not the process that EPA has taken for LCR so far. There is a workgroup for the LCR revisions, however, which includes EPA offices and some states.

**Ms. Dougherty** added that in the 2004 – 2005 timeframe, EPA tried to conduct a full review of the LCR partly because of what was happening in D.C., and to prevent this from happening in other places. The Agency held public meetings in other parts of country, and discussed issues related to LSL replacement, public education, etc. EPA invited experts, from an array of stakeholders. Based on the information that was received, EPA finalized revisions to the LCR in 2007 on some of the less-complex topics. The more complex topics from the national review are the subject of the current round of revisions.

**Mr. Bergman** stated that there was a sub-group of the NDWAC that provided recommendations on public education for the 2007 LCR revisions.

**Mr. Zarate-Bermudez** asked, in reference to site selection criteria, whether the school sampling bill was passed by Congress.

**Mr. Burneson** stated that he was not aware of any Congressional actions on school water sampling; however monitoring at schools is a different topic. For sample site selection, sites are considered and evaluated depending on the likelihood of elevated lead levels at a site, rather than sensitive life stages.

**Mr. Vincent** referenced the issue of copper exposure on those suffering from Wilson's Disease, and asked what percentage of the population suffered from the disease.

**A Public Participant** stated that the white paper referenced about one in 40,000 people suffered from Wilson's Disease, but that does not include the carriers.

**Ms. Sparrow** asked what the occurrence was for lead after partial LSL replacement. She stated that assuming that the data are gathered, and there is a temporary spike, and assuming that there exist data to put into a curve to determine frequency, she wondered whether it would be 90% after one day, 5% after one month, or something else.

**Ms. Barr** stated that there has been some sampling of homes over time, but that there isn't a tremendous amount of data.

**Mr. Burneson** stated that the SAB struggled with whether the data they had were even sufficient enough to draw the conclusions that they did. They also stressed that they couldn't draw any conclusions on long-term effects, because the data were so limited.

**Ms. Godreau** stated that this is an important discussion point: homeowner sampling and the difficulty in collecting samples. This is an issue that needs to be addressed.

**Mr. Burneson** stated that he understood Ms. Godreau's concern. He indicated that the State can verify that the samples were collected and analyzed in accordance with the procedures outlined in the regulations. There needs to be a balance between allowing systems the flexibility to collect the data they need and not enabling them to misrepresent the data. He stated that he believed the workgroup had been talking about these issues, and are aware of them. It would be appropriate for the NDWAC to make recommendations on this issue.

**Ms. Weintraub** asked whether there was any information regarding how well residents follow the sampling instructions.

**Ms. Barr** stated that her impression was that most utilities ask residents to sample, and she was not aware of any information on how correctly they sample.

**Mr. Burneson** suggested that he was not aware of any studies on how volunteer samplers follow instructions. However, he has heard from utilities that it is often very difficult to retain samplers.

**Ms. Taylor** referenced an EJ issue related to sampling for lead in Durham, NC. She said that the City had offered a free service to residents to sample for lead; however, they needed to pick up and drop off the kits between 9:00 AM and 2:00 PM. This left many families, particularly those with one parent or both working parents, at a significant disadvantage. It was found that those that took advantage of the service were selectively in higher income areas.

**Mr. Vincent** referenced the lead sampling protocol, and particularly the requirement to capture the first draw. He said that if this does not capture the water in the LSL, then the sampling protocol should be changed.

**Ms. Barr** stated that the first draw contains the water that has been sitting in the pipe that is just leading up to the faucet. Typically the sampler would need to go several liters in to get to the LSL portion. This is the issue. It is much easier to ask people to do the first draw, but this does not capture the LSL. There are ways to determine how many liters are needed to discard before taking the sample, but this adds complication to the homeowner.

**Mr. Vincent** asked whether it is inappropriate for utility staff to take samples in their own homes if they happen to be in the right tier.

**Ms. Barr** indicated that for site selection, you are looking for the highest risk homes, so often this doesn't work, but if the utility staff happen to be in the right tier, then she did not believe there was a prohibition.

**Ms. Taylor** referenced the problems that the State of North Carolina has been having with regard to setting State-specific water quality parameters. She said that philosophically it made sense, but that the regulating community does not know how to set the parameters. She asked if anyone knew how to determine the best prescriptive water quality parameters.

**Mr. Woolard** explained that it is different every time. His experience was that when agencies try to deal with simple indices, and small sets of parameters, they end up with the wrong answer, and can make situations worse. He stated that at the end of day, it is a complicated water chemistry problem. He said that he suspected that there could be improvements on what is collected, and that guidelines would be useful, but cautioned against using a simple set of water quality parameters.

**Mr. Diemer** stated that he agreed with Mr. Woolard, and that it is very complicated, and is dependent on time, season, etc.

**Ms. Sparrow** said that there were tools and resources to get homeowners to replace LSLs. She mentioned that she had started thinking about how to sample for lead, and how much water she needed to flush in order to take the sample of the LSL. She indicated that if she had difficulty with this, and she is in the industry, it could be very difficult for the general public who do not have the background knowledge.

**Ms. Barr** stated that there are calculations available based on the length of the service line.

**Mr. Burneson** indicated that there is a range of calculations, including simple calculations based on the typical diameter of the pipes, building setback distances, flow, etc.

**Ms. Sparrow** asked whether the Agency had guidance.

**Mr. Burneson** stated that these calculations are not best made at the federal level, because there are so many variables, and plumbing varies substantially from house to house. One solution would be for water systems to calculate the appropriate flushing times for their communities.

**Ms. Sparrow** asked whether there were any standards based on the type of house, type of service line, etc. She asked that if there is so much uncertainty in the calculation, then how the Agency could propose an alternative sampling approach that would capture the LSL.

**Mr. Burneson** suggested that it is possible to develop guidance for homeowners to sample the LSL. He had thought that the question was more about how to calculate the right flushing time to avoid exposure of lead as a mitigation measure. He said that the Agency believes it will vary based on location, but that based on general guidance, systems should be able to come up with their own protocol.

**Ms. Morales** stated that a few more comments could be taken, but that the NDWAC needed to make a formal recommendation.

**Ms. Godreau** indicated that she understands there have been recent changes to what lead-free means. She also asked whether there was discussion about conducting the testing for lead at the distribution system, or at the plant when conducting LSL replacement.

**Mr. Burneson** stated that that has been something that has been put forward as a potential way to address this concern; however, small systems would not have the ability to do so. Also, getting something that is truly representative is difficult, but it has been an option that has been discussed.

**Ms. Weintraub** referenced the key questions under optimal corrosion control. She asked if there was any way to combine the required site visit with the assessment of optimal corrosion control.

**Ms. Barr** indicated that the annual site visit only applies to CWSs and non-transient non-community water systems (NTNCWSs). Schools served by a CWS and NTNCWs are covered as well. Transient non-community water systems are not covered by LCR.

**Mr. Burneson** stated that Congress took action in the past several months to change the definition of lead free. Congress adopted that as of 2014, pipes and other materials must be less than 0.25% lead to now be referred to as lead free for potable water. The Agency believes that lead must be removed from materials, but there is the reality that a great majority of products still contain lead. Continuing to control the corrosivity of water is the focus of the Rule, and the question is whether this can be further optimized and improved.

**Ms. Morales** asked whether the NDWAC was ready to make recommendations to the Agency regarding the key questions for sample site selection criteria:

- Do the current tiering criteria for lead accurately represent the highest risk sites? If not, what needs to change?
- How should copper be addressed if there are tiering changes?

**Ms. Sparrow** stated that for both questions, the decision should be made based on statistics, and then written accordingly. The Council agreed with this recommendation.



## Key Area #2: Lead Sampling Protocol at LSL Sites

**Mr. Vincent** asked if there was any research regarding whether there is a difference between the first draw, second draw, third draw, etc.

**Ms. Barr** stated that one study revealed that samples that captured the LSL contained statistically higher concentrations of lead than the others.

**Mr. Vincent** stated that if this was the case, then he would change the requirement to capture the LSL.

**Ms. Weintraub** agreed. She said that she would support the Council recommending a change that offers flexibility. She suggested that one option could be to set standards for different home configurations, e.g., if the house is set back 60 feet from the street, or second floor versus kitchen sink. She indicated that she thinks having more than one set of instructions could help address this as well.

**Mr. Owen** stated that he agreed, and in order to reach the goal, the sampling protocol should be different. However, there are other variables, such as differences in water chemistry and equilibrium. He suggested that it was worth discussing these issues with those focused on them. He said he would suggest leaving it to the SAB Drinking Water Committee to determine if it is possible.

**Mr. Woolard** indicated that there is a standard out there already, and that it is hard enough to get the customer to sample the first draw. He said that it is not realistic to think that the homeowner will be able to take more complex samples. He further stated that all kinds of complexity could be added to the sampling protocol, and you still would not get the result you are looking for.

**Ms. Dougherty** stated that she appreciated the feedback, and asked if anyone had specific recommendations on how the sampling protocol should be changed.

**Mr. Woolard** stated that he did not believe the extra layer of complexity needed for the more sophisticated techniques would provide more useful data.

**Ms. Taylor** agreed. She suggested that an improved protocol may be to collect a sequence of samples, which would increase the chances of a hit, at which time the utility could go out and re-sample.

**Ms. Dougherty** stated that what she was hearing is that the NDWAC agrees that the sampling protocols should be changed, but that it is not necessarily clear how they should change.

**Ms. Sparrow** agreed with Ms. Dougherty and suggested she would also add that if anything is changed it should be based on statistical data, which supports that the new protocol will add value.

**Mr. Woolard** agreed, and further stated that unless there is a data driven method to change the protocol, then it shouldn't be changed.

**Ms. Weintraub** disagreed, saying that in many cases the data being collected through the existing sampling protocol do not accurately represent the human exposures, so any change offers an opportunity for improving the usefulness of these data.

**Ms. Sparrow** stated that she disagreed with Ms. Weintraub's statement.

**Ms. Ward-Robinson** indicated that what she was hearing from the discussion was that the homeowners shouldn't be those collecting the samples.

**Ms. Taylor** again stated that the protocol could start with a household sample with the first draw and time sequence, which would increase the chance of detection, and then this could be followed up with a utility sample.

**Ms. Sparrow** asked if there was a study suggesting that there was a statistically significant higher lead concentration in the LSL over the first draw.

**Ms. Barr** stated that there is a study showing that the samples that captured the LSL had higher levels of lead than the first draw.

**Ms. Massey** indicated that, based on the information that there is a definitive difference between first draw and LSL. Time would be better spent not expecting the customer to take the sample, and alternatively developing a protocol for the system to go out and collect the sample. She stated that she understood that there are different circumstances across the country, and guidance would need to be tailored as such describing how the utility could collect the best sample. She summarized that the only way the situation can be improved is by injecting site specific data and having the utility collect the sample.

**Ms. Barr** requested clarification on Ms. Massey's statements, and asked if she meant that the utilities should collect samples in the homes or if the utilities should conduct the calculations to determine a protocol for achieving the best representative samples for the homeowner to collect?

**Ms. Massey** stated that if the homeowner collects the samples, then at the least the utility should provide guidance on how to collect the samples.

**Ms. Kennedy** asked whether or not the onus was on the homeowner to collect the sample.

**Ms. Barr** stated that the utility asks for volunteers, and the homeowner has to volunteer.

**Ms. Kennedy** stated that she thought there was a flaw with this concept, especially in California and in disadvantaged communities. She asked what was typically done when

there was a language barrier. She indicated that she felt this approach placed an undue burden on disadvantaged communities.

**Ms. Barr** explained that the program was voluntary.

**Ms. Kennedy** asked what happened if there weren't any volunteers. She indicated that it would be difficult to get volunteers in a lot of the southern California communities that she works in.

**Mr. Saddler** asked whether there has been any new data since the changes to the Rule in 2007.

**Ms. Barr** indicated that the 2007 changes are just being implemented as of 2010. She suggested that there is good amount of data regarding lead levels in children, although it is hard to decipher whether the source is water, paint, etc. These data suggest that overall, lead levels have gone down significantly.

**Mr. Saddler** stated that it didn't make sense to him to modify something where the data have yet to be seen.

**Ms. Sparrow** stated that she believed the NDWAC agreed that the current method is imperfect at best, and it is not providing representative results. She further stated that she believed the NDWAC could agree that the method can be changed if there are supportive data. However, she did not feel that the NDWAC agreed as to what the proper method should be.

**Ms. Dougherty** indicated that the rule development timeframe is such that EPA would need NDWAC's recommendation prior to the next meeting. She asked if it is correct to interpret Ms. Sparrow's statement to be that the NDWAC recognizes that the current sampling protocol is imperfect and significantly flawed and that EPA should look for new methods so long as they are better than the current approach.

**Ms. Weintraub** suggested that it is more than people improperly collecting samples, since in many situations the public is unable to implement the instructions to collect samples, e.g., when instructions are not provided in the homeowner's native language, or if the homeowner is unable to read, which could be issues especially prevalent in disadvantaged communities.

**Ms. Morales** stated that this issue needs to be front and center. Disadvantaged communities need to be at the heart of this discussion.

**Ms. Kennedy** stated that the Agency needs to ensure that disadvantaged communities are not burdened by this.

**Ms. Dougherty** indicated that what needs to be determined is whether corrosion control is working throughout the community.

**Ms. Kennedy** stated the population affected needs to be taken into consideration in order to make sure that disadvantaged communities are not disproportionately affected. She stated that anecdotally lead is found in higher proportions in children in disadvantaged communities. She further suggested that more research should be conducted in this area.

**Ms. Dougherty** stated that the Agency wants to ensure that sampling will confirm whether corrosion control is working across the community regardless of whether it is a disadvantaged community.

**Ms. Godreau** indicated that she didn't disagree with anything that had been said, but that the ease of implementation needs to be a part of this also.

**Ms. Sparrow** put to motion a vote that the Council make the following recommendations:

- The current sampling system is imperfect;
- A new sampling system should be provided if proved to be better;
- Sampling needs to be representative of the entire system; and
- It needs to be easy to implement.

**Mr. Saddler** provided a second motion. All were in favor, and none opposed.

### Key Area #3: Public Education for Copper

**Mr. Diemer** asked whether there were good data on the amount of copper leaching into the system, and how much.

**Mr. Burneson** stated that the predominant plumbing material is copper. He also indicated that there have been studies suggesting that it has been leaching into systems, although the frequency is not known. He stated that there is a lack of national data.

**Mr. Diemer** suggested that given the lack of information, it would be too confusing for the homeowner, and that the NDWAC should not recommend sending out public educational materials.

**Ms. Godreau** asked whether the public education applied to any new connection.

**Mr. Burneson** answered yes, and said that also, if the system could discern, then maybe only based on the type of pipes.

**Mr. Diemer** stated that utilities are not prepared, and that he doesn't think it is productive to go down that path.

**Ms. Kennedy** said that she didn't see a problem with at least educating new homeowners of what problems may exist. She stated that this could be seen as a disclosure, and that the utility doesn't have to say it is a problem, but that it could be a potential problem.

**Ms. Morales** stated that small systems already have enough burdens, and that it is not up to them to have to deal with materials used in new construction.

**Ms. Kennedy** clarified that she did not feel it had to be the utilities providing the education; it could be the developer.

**Ms. Sparrow** put to motion a vote that the Council recommends that educational materials should not be sent out. Mr. Diemer provided a second motion. Most were in favor; Ms. Taylor abstained.

#### Key Area #4: Measures to Ensure Optimal Corrosion Control Treatment

**Mr. Owen** asked for clarification that the current Rule does not require systems to re-optimize. He stated that based on others' comments earlier regarding the system complexities, there could be a worse situation after the system re-optimizes. EPA could recommend that utilities re-evaluate their optimization approach, but they shouldn't be required to change. The second element is being more prescriptive on evaluating water quality parameters. If these are put into a regulation, given that systems are so unique, it is going to drive non-optimal situations.

**Ms. Dougherty** stated that if a system exceeds the AL, then public education is needed as well as LSL replacement. What happens in reality is that the systems need to figure out how to re-optimize so that they don't have to do LSL replacement. She stated that the NDWAC would be discussing LSL replacement shortly, and that this discussion goes with that discussion. She said that if LSL replacement requirements change, then there is nothing but public education for this requirement. She stated that it is important to look at these two issues together.

**Ms. Barr** further stated that as she mentioned earlier, any changes have to ensure that there is at least the same level of public health protection.

**Ms. Godreau** suggested that the regulations could maintain the six month monitoring requirement.

**Ms. Barr** stated that this is true, but it is not the same as replacing 1/7 of the service line.

**Ms. Weintraub** indicated that everyone is ideally starting from a default of what they think is optimum corrosion control. The next step is to assess this, but she suggested that she agreed with Mr. Owen that it doesn't need to be called re-optimization, depending on whether it is called prescriptive or not. She stated that she didn't think it was useful for EPA to just recommend that the pH should be X or additive X needs to go in at a certain level. She suggested that if there was a way to change the guidance, she would support that.

**Ms. Sparrow** explained that treatment technologies change so quickly, and she didn't think they should be based on EPA guidance, because this gets stale quickly.

**Ms. Barr** stated that the Rules do not include guidance and vice versa.

**Ms. Sparrow** indicated that she didn't like the word re-optimize.

**Mr. Owen** suggested the word re-evaluation.

**Mr. Woolard** asked what would constitute a re-evaluation.

**Mr. Owen** suggested leaving this up to EPA.

**Ms. Weintraub** put to motion a vote that the Council recommend that EPA includes a requirement for systems to re-evaluate corrosion control treatment after an AL exceedence. Mr. Vincent provided a second motion. All were in favor, and none opposed.

#### Key Area #5: LSL Replacement Requirements

**Ms. Weintraub** put to motion a vote that the Council recommend that EPA eliminate partial LSL replacement in favor of full LSL replacement. Ms. Kennedy provided a second motion.

**Mr. Diemer** asked what was meant by "in favor of full replacement." He suggested that the current system is set up that way, because the portion beyond the property line is the homeowner's responsibility. He asked that if there is full replacement, then what is the utility's responsibility, and what is the homeowner's responsibility.

**Ms. Barr** provided a few ideas of how this could be implemented. One approach was to change the definition of the word "control," so that the utility would control the portion now controlled by the homeowner, and then require the utility to do full LSL replacement. This was proposed in the past, but was defeated as a result of a legal challenge; however, it was not defeated based on substance, it was procedural. Another approach would be to find people who are willing to pay for full LSL replacement.

**Ms. Weintraub** stated that she would like to revise her original motion to state that partial LSLs should not be allowed. Secondly, she stated that EPA should write the Rule so that it incentivizes full replacement.

**Mr. Diemer** agreed that it should be all or nothing, but that the NDWAC should not underestimate the difficulty of full LSL replacement, particularly requiring homeowners to pay for replacement. He suggested that if it were a voluntary program, that would work a lot better.

**Mr. Woolard** stated that if the utility is required to conduct full LSL replacement, then essentially the definition of what the utility owns is being changed. This would offer an additional host of issues, and bigger problems than the one at hand. However, if it is

allowed to be voluntary, then there is the problem of what percentage needs to be replaced each year. It could be very expensive to homeowners and/or a significant cost to the utilities. If there is a set percentage, then there needs to be allowances for when the utility cannot reach this. There should be an incentive to get there, but utilities shouldn't be punished if they do not reach it.

**Ms. Barr** clarified that the definition would not need to be changed regarding what utilities own, but instead what they control.

**Ms. Sparrow** suggested that utilities cannot control what they do not own. She further indicated that there are not sufficient data related to partial LSL replacement and spikes in lead levels. She suggested that there needs to be better data before EPA and NDWAC can make decisions. She stated that she didn't think anyone should be required to pay for the portion of the LSL replacement that is within the homeowner's property except the homeowner. It is not the actual LSL replacement that is the most costly; it is replacing the landscaping, driveways, etc. She further stated that she didn't think the definition of what a utility owns should be changed. She said this could get very complicated very fast.

**Ms. Taylor** saw this as potentially being an EJ issue in the absence of reimbursing homeowners to replace their portion of the LSL.

**Ms. Dougherty** stated that the SRF could help fund this.

**Ms. Kennedy** stated that she had done this successfully with disadvantaged communities, and that the SRF will pay for the connection fee.

**Ms. Dougherty** indicated that the State has to determine that this is a priority.

**Ms. Kennedy** stated that she could only speak from her experiences in California, but that EPA Region 9 and the State of California bend over backwards to help with disadvantaged communities.

**Ms. St. Martin** asked that if there is a change to what is owned by the utility, how that would relate to nexus with the Clean Water Act (CWA).

**Ms. Dougherty** mentioned that this was a good point.

**Ms. Weintraub** stated that the Rule could be developed in a way so that it encourages full LSL replacement, and if the homeowner declines to do their portion of the LSL replacement, that there is some way that they are made aware of the increased risk, as well as mitigation measures they can take, e.g., flushing. The only change she recommended was a mandatory approach for addressing increased homeowner risk.

**Ms. Sparrow** suggested that the data do not exist to prove that the full and/or partial LSL replacement helps the homeowner, but there are a lot of financial implications, especially for those who can't afford the replacement, e.g., those in disadvantaged communities.

**Ms. Barr** clarified that the data do exist, but that they are sparse. She quoted language from the SAB Evaluation of the Effectiveness of Partial Lead Service Line Replacements, stating that in studies pertaining to comparisons between full and partial LSL replacements, the evaluation periods have been too short to fully assess differential reductions in lead drinking water levels. Nevertheless, for the time periods reported in the studies, in water distribution systems optimized for corrosion control, full LSL replacement has been shown to be effective and partial LSL replacement has not been shown to be effective in reducing drinking water lead levels. Both full and partial LSL replacement generally result in elevated lead levels for a variable period of time after replacement, but the duration and magnitude of the elevations are generally greater with partial LSL replacement than with full LSL replacement.

**Mr. Vincent** stated that he did not care for the word “encourage” as part of the recommendation, but that he didn’t have an alternative.

**Ms. Sparrow** asked, for this proposal, who would specifically be asked to pay to replace the LSL on the homeowner’s property. Is it the homeowner that owns the property or all of the homeowners as part of their fees toward the water system?

**Ms. Barr** suggested the one homeowner, and then the System can apply for SRF funding.

**Ms. Sparrow** asked, regarding the motion as proposed right now, what happens to partial LSL replacement.

**Ms. Morales** suggested that if partial LSL replacement remains as an option, it should be the responsibility of the utility to educate the homeowner.

**Ms. Weintraub** suggested that full LSL replacement should be required unless the utility cannot meet the 7% requirement. However, she wasn’t sure how this could be implemented. She suggested that one option could be for the regulations to state that if the utility is able to find 5% to do the full LSL replacement, then there is a compliance incentive. She noted that this could have implications, because then you may be setting up a socioeconomic justice issue, because only those homeowners that have the resources to do the replacement would actually be included.

**Mr. Owen** stated that EPA has been looking at a lot of data to help them think through this issue, and he didn’t know if he had enough information to make a statement. He said that it didn’t sound like partial LSL replacement is a good idea.

**Mr. Owen** made a motion that the Council recommend that EPA should look at the data and decide whether partial LSL replacement has any benefits, and if it does not then it should not be included in the Rule.



**Ms. Barr** stated that the data currently available only looks at the time right after the replacement has taken place. It demonstrates a spike in concentration, and then a decrease. There are no data for what happens years after a replacement.

**Ms. Dougherty** suggested that she had two thoughts for the NDWAC. The first option could be that the NDWAC decides to let EPA look at what the SAB recommends. The second option could be that the NDWAC reviews what the SAB recommends, and then checks in with EPA off-cycle as soon as possible regarding any recommendations based on the SAB report. She stated that the NDWAC did not have to weigh in on this now, and that it may make sense to have the SAB look at the data and use what they recommend as a basis for the NDWAC's decision.

**Ms. Morales** asked if the NDWAC had a different approach now based on what Ms. Dougherty has said.

**Mr. Owen** withdrew his motion.

**Mr. Saddler** suggested that the NDWAC wait until the next meeting.

**Ms. Barr** stated that six months was too long, and that any review and recommendations would need to be done off-cycle.

**Ms. Dougherty** stated that the NDWAC did not need a formal motion for this decision; they could say that they would like to wait to have information from the SAB before making a recommendation and that any recommendations will be made off-cycle as soon as they are able to review the SAB report.

**Mr. Vincent** stated that the NDWAC is interested in this issue, but will wait to hear from the SAB.

#### SDWA COMMUNICATION

*Ronald Bergman, Acting Deputy Director, OGWDW*

**Mr. Bergman** provided an overview of SDWA communication, and consumer confidence reports (CCRs). He stated that the Rule where EPA received the most comments was the CCR Rule. He suggested that he would like the NDWAC's feedback on how EPA should review it. He suggested that starting in October, EPA should agree to a procedure for the review.

He stated that CCRs are the centerpiece of transparency and accountability for the Water program. He said the annual report was delivered to each consumer of a CWS starting in 1999. The CCR goal is to provide local water quality information that allows for informed choices and increased dialogue between water systems and their customers. Content requirements include: water system information; sources of water; potential sources of contamination; detected contaminants; violation information; and educational

information. He stated that the original look and feel of the CCRs were developed with support from the NDWAC.

Under the CCR Retrospective Review Draft Plan, and 12-month review period, which starts in October 2011, EPA will look for opportunities to improve the effectiveness of communicating drinking water information to the public, while lowering the burden of water systems and states.

There have been a fair amount of systems complaining that the CCRs don't provide the value that EPA has intended. Other systems have stated that they think that the CCRs are an unnecessary burden. What is indisputable is that the way people receive information today is very different from what it was 10 years ago. For the revisions, EPA wants to consider ideas for how to provide consumers with a better understanding of what is in the water, where it comes from, and connect them to the source of their water.

Mr. Bergman summarized the SDWA and CCR language, including waivers. He also discussed the CCR Review chronology. He then summarized some of the public comments on the CCR. Some members of the public felt that electronic delivery methods would reduce cost and burden on systems. Some stated that State certification puts too much of a burden on states. Others stated that CCR and Tier 3 PN requirements are repetitive. Many members stated that the requirement for using whole numbers in the CCRs is burdensome on small water utilities and misleads the public.

The CCR Retrospective Review Draft Plan includes a comparison of CCR regulation and the SDWA, which has been completed, as well as public meetings, an alternative delivery pilot testing in partnership with AWWA and ASDWA, a response to public comments, and an evaluation of findings. Additional review considerations include environmental justice impacts, environmental steward promotion (CCR "greening"), protecting consumer access to information from shift-of-burden, an examination of whether alternative delivery would improve readership, and primacy agency and system management of alternative delivery methods.

Mr. Bergman concluded with the following NDWAC discussion questions:

- Thoughts on additional information needed to support EPA's proposed review process?
- How can Rule implementation make use of new technology?
- How best to use pilot study findings?
- How to characterize environmental justice impacts?

### ***Discussion:***

The discussion for SDWA Communication was conducted on Day 2, and is included in the Friday, July 22<sup>nd</sup> summary.

## OPEN PUBLIC COMMENTS

**Larry Ladd**, Community Advisory Group for Aerojet Superfund Site Issues, and **Andria Ventura**, Clean Water Action (CWA), made public comments on behalf of their respective organizations.

**Larry Ladd** introduced himself and his organization, Community Advisory Group for Aerojet Superfund Site Issues. He discussed issues related to perchlorate. He explained how the contaminant emerges, and how it is used in the production of rockets, rocket fuel and fireworks. He described how perchlorate leached from Aerojet's California-based missile plant and led to a toxic plume containing perchlorate contaminating groundwater. He discussed studies being done on the population impacted by the plume and the significantly high thyroid cancer rates. He said that they are now working on how to treat the contaminant. He said that they meet with regulators on a monthly basis to discuss these issues. He thanked EPA for taking this issue seriously and for making the determination to regulate perchlorate.

**Andria Ventura** introduced herself and her organization, CWA. She explained that CWA is a national environmental advocacy organization, and that there are about 1,000 members in the San Francisco Bay area. She stated that a big part of CWA's mission is to address local community water issues. She stated that, surprisingly enough, on any given day tens of thousands of Californians do not have access to clean drinking water. She mentioned that this is particularly important in rural communities with small systems that do not have a substantial customer base or infrastructure system. Consolidation of these water systems is a possible solution. She indicated that EPA is behind this concept, but that the State of California is not optimizing this as a strategy. She said that she would really urge EPA to promote consolidation to the states. She stated that these communities are under-represented. She indicated that the other issue she wanted to discuss is related to what Mr. Ladd talked about. She said that she works on drinking water standards, and hexavalent chromium and perchlorate are two contaminants of high concern. She said that she applauds that EPA is looking to regulate them, and that she urged EPA to move forward with regulating these contaminants. She said that she understands that this is hard, but that these are serious contaminants that affect real people. She stated that she knows there will be resistance, but that CWA will support this decision with its one million members. She urged EPA to make the most stringent standards for these contaminants as possible. She stated that a MCLG of 0.02 parts per billion is necessary for perchlorate in order to protect public health.

THE SFPUC'S WATER SECURITY INITIATIVE CONTAMINANT WARNING SYSTEM – PILOT PROJECT

*Manouchehr Boozarpour, San Francisco Public Utilities Commission (SFPUC), Water Quality Division*

*June Weintraub, Senior Epidemiologist, San Francisco Department of Public Health, San Francisco, California*

**Mr. Boozarpour** introduced the SFPUC Water Security Initiative and EPA Security Grant Pilot Project. He gave some background on the SFPUC, and then discussed the EPA Water Security Grant Project. San Francisco was selected through a competitive selection process by EPA for the Water Security Initiative (WSi) program. The purpose of the project was to implement a pilot water security project addressing prevention, monitoring, and response elements.

Mr. Boozarpour noted that the grant project complements the existing SFPUC efforts. The SFPUC existing water security program was formally initiated in 2004. Overall over \$2 million have been spent, excluding physical security enhancements. On-line monitoring instruments have been operational since 2007.

The project focuses on the City of San Francisco, and addresses six critical components: on-line water quality monitoring, sampling and analysis, consumer complaint surveillance, public health surveillance, enhanced security monitoring, and consequence management. The project started in June 2008, and the plan was based on performing the design and installation in the first year, and two years for operation, data collection, and evaluation. An additional six months was proposed for report preparation and close out. The schedule was extended by about six months to account for equipment purchasing delays. He suggested that he anticipated the project to be completed by the middle of 2012.

Mr. Boozarpour then went over each of the project components, discussing the objective, details and status of each. Ms. Weintraub provided details on the public health surveillance component.

Mr. Boozarpour summarized some of the lessons learned from the project. He stated that because of the aggressive schedule they were working under, they decided to reduce the scope to available technologies that had been around for awhile. He said another major issue was related to information sharing and protection. He said that they wanted to share a lot of their information through the project, but they had to be careful, because it was sensitive.

The project has achieved numerous successes. Despite the aggressive schedule, it has stayed very close to the schedule as well as the budget. The project included implementation of numerous useful water security tools. Also, the lessons learned from the project will be very useful for other utilities and for EPA in determining how to evolve the WSi.

***Discussion:***

**Mr. Owen** stated that the project contained many components, and asked whether an integrated platform was used.

**Mr. Boozarpour** indicated that this was the goal, and that they are working towards that.

**Mr. Owen** asked with regard to the instrument and sensitivity, what is the best “canary in the coal mine.”

**Mr. Boozarpour** stated that based on the study, so far the best cost/benefit by far is with consumer complaint monitoring.

**Ms. Weintraub** added that their research focused on the efficacy of over-the-counter drug sales. She stated that the grant request was explicit that this needed to be an included element of the proposal. She said that they didn’t include poison control lines, but that in Cincinnati, they found that to be the most effective. She indicated that this goes hand in hand with consumer complaints, because some people make water quality complaints while others call the poison control line. There is also minimal delay with these types of complaints.

**Ms. Dougherty** asked, following up on dual use/dual benefits, whether any of the components were helping with day-to-day management of the system.

**Mr. Boozarpour** stated that yes, especially the online water quality monitoring. He said that they hadn’t focused on that very much, and that a lot of that is surprising to them. They are monitoring the water every second, and it has been very eye opening. This opens a whole new knowledge base.

**Mr. Zarate-Bermudez** referenced the 311 consumer complaint call-in system. He stated that consumer complaints can be very helpful to surveillance, and asked how this system is working.

**Mr. Boozarpour** stated that most complaints are related to dirty water due to flushing, or milky water. There are sometimes complaints regarding pipe breaks. He indicated that the system has been in place for one and one-half months and they are exploring what route of communication is the best for promoting the complaint service, e.g., radio, T.V., telephone, etc. He stated that this is the next step of the campaign. So far, they are using billboards and newspaper advertisements and they have received compliments on the billboards and other advertisements by email.

**Mr. Vincent** asked if the 311 system was available 24 hours per day, seven days per week.

**Mr. Boozarpour** answered that yes it was, and that they also have water quality inspectors on 24 hours per day, seven days per week.

## Meeting Summary: Friday, July 22, 2011

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### CONTINUATION OF SDWA COMMUNICATION

*Ronald Bergman, Acting Deputy Director, OGWDW*

**Mr. Bergman** continued the discussion from Thursday. To recap, he summarized the Retrospective Review Process. Starting in October, there will be a 12-month review process with stakeholders regarding the CCRs to determine what is or isn't working. Discussions with states and utilities indicate that there is an expressed burden associated with developing the CCRs and the cost of distribution. AWWA and ASDWA were helpful in facilitating the discussion.

Mr. Bergman asked the Council what kinds of things EPA should be asking and who they should be trying to reach.

### ***Discussion:***

**Mr. Woolard** asked if the fundamental questions are focused on deliverables, or on format and content.

**Mr. Bergman** responded that the main issue that has been raised to EPA is that CCRs should not be required. Others focused on the time it requires to put them together and the cost of delivery. There is a concern that customers are not reading them; some of this relates to form and content. He indicated that he would take comments on anything, but noted that EPA went through a two-year process with a NDWAC group and other consultation on content. At the next NDWAC meeting he expects to talk about posting data on the web, which would be the same information that is in the CCR. He suggested that his preference would be to not open up the debate on content right now.

**Ms. Weintraub** asked if the AWWA pilot study was focused solely on delivery methods.

**Mr. Bergman** responded that it focused on email delivery.

**Ms Weintraub** stated that electronic delivery should not be the only method. EPA needs to consider language barriers and asked if that issue would be included in the pilot.

**Mr. Bergman** responded that the scope of the review is part of today's discussion. The regulations require water systems to identify any non-native speaking populations in their service area and they are required to put a paragraph in the report in the appropriate language.

**Ms. Weintraub** stated that the Public Utilities Commission (PUC) translates the CCR in multiple languages. It makes the CCR a cumbersome document for those who do not care about the different languages, but it is really helpful for those that do. Further, she suggested that an alternative delivery method is important, but that it needs to identify who will get missed. Besides content, she states format is a way to address why people

are not reading CCRs. They can look complicated and uninteresting. In some ways this is a tertiary problem. Utilities want to be able to communicate the safety of their water effectively. They have already come to an agreement what needs to be out there, and that's important.

**Mr. Bergman** stated that the fundamental issue is to try to identify why the CCRs are not being read. He indicated that he is looking for comments on how to make this an effective tool.

**Ms. Kennedy** stated that Ms. Weintraub had made some valid points. She does not dispute the content; it is very valuable. However, she noted that she works in the Water Sector and often does not read the CCR she receives from her local utility. She does feel there are different ways to send it. Particularly in California, information needs to be in different language. Utilities need to know their service areas. This is especially important with EJ; it is important to make sure that the delivery is in a way that disadvantaged communities receive it. Most do not have access to the internet; therefore, the website is not the most effective way. She realized that it is cumbersome and costs money, but that these people invest in utilities also and they are owed information in a way that they can understand. She suggested that if she is not reading it, then the average person isn't reading it.

**Mr. Zarate-Bermudez** asked if there were data to support that CCRs are not being read. He also asked if they have an email delivery, will it be read and how many customers have provided an email address. He felt that Ms. Kennedy and Ms. Weintraub made good points to address those that do not have access to the internet.

**Mr. Bergman** responded that the systems in the pilot have e-billing and they would send the CCR with the e-bill. The challenge is how to track what is being sent through e-billing and through the mail. Questions relate to how much time is associated with each and is it saving them money on postage.

Mr. Bergman then asked the Counsel how they define success in the CCR. He felt that looking for universal reading is a pretty high bar and asked if there were any thoughts on how to set measures of success. Alternatively, simply the fact that the water system goes through the process to pull the data and put it in one place is a measure of success. There are two ends to the spectrum.

**Ms. Massey** asked about the notification requirement. She asked if there is a requirement as to the level of technical data that should be included in the CCR or could there be a quantitative statement that could be sent with an e-statement. Examples would be "your water system did or did not have a water quality issue" and "your water system did or did not take corrective action." It could then direct the customer to a website for more information or to ask for more information to be mailed.

**Mr. Bergman** responded that many CCRs begin with such a statement. In the first round of CCRs, most utilities stated "your water is safe." Clean Water Action did a study of

these CCRs and complained of these types of statements in their review. CCR requires other data, including a list of contaminants, the levels, how they stack up next to the national standards, and corrective actions, if done.

**Ms. St. Martin** stated that as they talk about delivery methods, they should be flexible enough to meet new changes in technology so they do not have to keep changing legislation to add new methods. Secondly, no matter how many CCRs go out, only one quarter of them are read. Those are the people that will reach out and ask questions to hold the utility accountable. She suggested that reaching this core group of customers could be considered a measure of success.

**Ms. Weintraub** asked for clarification on how the term customer is defined. Her organization interprets it as anyone using the water. It is not just the rate payer, but also renters.

**Mr. Bergman** replied that the statute defines customer as the bill payer.

**Mr. Diemer** stated that it is the mailing address for the water service.

**Ms. Morales** responded that it is who receives the bill, which is not necessarily the end user.

**Ms. Weintraub** suggested that the Council figure out how to address this issue universally. Some of these EJ issues are related to renters versus rate payers. She then asked if the waiver situation for systems serving 10,000 or fewer customers could be clarified.

**Mr. Bergman** stated that if a state makes such a determination, those systems serving 10,000 or fewer customers do not have to mail CCRs. Systems from 501 to 10,000 customers do have to actively announce that the CCR is available.

**Ms. Weintraub** stated that for follow-up, this is something that should be addressed. The CCR Rule already does not reach small system users and she expressed a concern that they will not receive electronic delivery. Requiring electronic delivery will not impact those that are not receiving the CCR in the first place.

**Mr. Bergman** stated that 20% of CWSs doing CCRs are serving 40 homes or less. If they get a waiver, they can put the CCR in a central location that is not too far away from customers.

**Ms. Weintraub** stated that maybe that is something the pilot can investigate: what is the actual population they are talking about. There may be some communities that go to a local location, like a recreation center, rather than reading it in the mail.

**Mr. Bergman** responded that this is one of his questions to the Council: what questions should we be trying to answer and where should we go to try to answer them?



**Ms. Morales** stated that the population in general is a challenge. You cannot get people to read something they are not interested in reading. She noted that many small systems have limited resources. If the state provides a template, they are just going to fill it out and at the end of the day it is more about compliance. She asked if utilities will be comfortable translating CCRs for customers. It is not necessarily content, but getting them to read it and she is not sure how to help this situation. She asked if they are trying to limit the burden of mailing by sending them electronically.

**Ms. Ward-Robinson** asked what is the target or goal: to define success based on compliance or on whether or not the customer will read it. It is about trust between customer and utility. This has very serious implications. Issues are followed, but misunderstood. She provided an example of what she looks for in her mail, focusing on the summary and what is up front, and if there is any new information that is given. She suggested a similar approach for the CCRs with technical information categorized: issues identified and listed against the national standard/level, pass/fail, and a summary statement. For those that would like more information, she suggested providing them with a number to call or a website to view. She thinks that in order to get to the style, they have to be clear about what they are trying to do and how to categorize information. It cannot be just a question of burden. It's not that simple.

**Mr. Bergman** stated that comments received during the Retrospective Review indicate that they believe that CCRs are not being read by customers. They are trying to figure out a review process to find out the validity of that statement.

**Ms. Ward-Robinson** suggested a sampling of customers to test validity, maybe a cross-section of customers. A survey can be put in the bill with incentives to respond and track responses as indicators of whether or not they are being read. Questions need to be subjective as well, e.g., are you reading the CCR, and if not, why not.

**Ms. Godreau** stated that they first need to remember the SDWA and public health requirements. Statutes are statutes. She states that this is a diversion of resources to a program and Rule that address a national apathy about their drinking water. You are not going to get most people to read the CCR because they do not need it. There are public notification requirements to notify if there is a problem. EPA should consider if CCR should address all Tier 3 issues and not just issues within the last 12 months. On the green issue, EPA should consider allowing systems to put notification in billing. Allow large systems to put something in every bill stating that information is available online. It might be more meaningful rather than once a year and it plugs customers into the process. She also feels they need a way to find out whether there is a benefit to wide-distribution through focus groups or surveys. They do need to have some kind of way to measure success, but surveys may have the same non-response.

**Mr. Woolard** believes that it is a good document to communicate with customers. The requirements for the minimum amount of information are appropriate and there is enough flexibility if a utility wants to expand on this. His utility sent out 55,000 and got five

calls. This does not mean that only five read it, just that five took the time to call. He thinks it is an effective way to communicate. The content works. It is a question of making delivery more effective. It needs to have more flexibility for different means of delivery but utilities should not be required to maintain multiple databases, such as email, Facebook, or mailing addresses. There needs to be some flexibility to communicate in the future because mailing is not the future.

**Ms. Sparrow** stated that it sounds like this discussion is about marketing and marketing research. Marketing researchers know the best way to communicate, whether through bill stuffers or calls. Having the right information and improving the packaging is also about marketing. For the average reader, the standard language can be alarming. Marketers may want to pull back, and health experts want to push, so there may be some negotiating, but both parties should be involved.

**Ms. Weintraub** suggested the pilot study should do a comparison of distributing electronically to one group, and paper to another group or same group. The comparison could be a reference point.

**Ms. St. Martin** stated that if the requirement is the actual numerical data, then you have to let the public know that up-front, e.g. “Your water did or did not have quality issues last year, and the utility did or did not address them.” If they want to read further, provide a location and/or contact where more information can be found.

**Ms. Kennedy** state that she appreciated Ms. Sparrow’s comments on marketing, but also wanted to point out that the majority of marketing firms do not understand how to market to disadvantaged communities. The idea of handing this over to a marketing company without public input is not feasible.

**Ms. Morales** asked Mr. Bergman if he had enough direction from the Council.

**Mr. Bergman** stated that EPA would come back at the next NDWAC meeting to report on progress, and request more information if needed at that time.

#### HUMAN COSTS OF NITRATE-CONTAMINATED DRINKING WATER IN THE SAN JOAQUIN VALLEY

*Peter Gleick, President, Pacific Institute*

*Alexis Strauss, Director, Water Division, Region 9*

**Ms. Strauss** introduced Mr. Gleick to the Council. They were fortunate to have him in the San Francisco Bay Area. He is able to share his thoughtful analysis and recommendations on water quality and water supply. His work on Central Valley issues, such as agricultural water uses and efficiency has had a profound influence.

**Mr. Gleick** introduced the Pacific Institute (PI) as an independent non-profit research institute that does science-based work but has a policy side also. About 90% of their work is on water, 50% of which is international. Mr. Gleick summarized some of PI’s

work, which included Western issues, water availability, and climate change. Last year PI won an EPA Region 9 excellence award.

Mr. Gleick explained that the presentation focuses on nitrate contamination in central California, specifically the San Joaquin Valley (SJV). The study had many authors and a number of groups working on it, though Mr. Gleick noted that he was not the author. This was a small study that did not look at how much contamination exists, but at the economic costs to communities exposed to nitrate-contaminated drinking water. The focus was on nitrate because concentrations are persistently rising in the Central Valley. While groundwater use is not monitored very well, some wells are monitored and monitoring results show a very steady increase in nitrate concentration. Levels are heading toward the MCL limit. While the average has not exceeded state and federal standards, it is rising.

Mr. Gleick continued by stating that significant human sources of nitrate contamination are dairy and animal food industries as well as nonpoint source pollution from fertilizers, which is a problem throughout the US. In the SJV, most are using groundwater for their drinking water. It is home to 10% of the state's population but has two thirds of the population that are served by water systems that exceed water quality standards. It also contains the majority of the state's agriculture. Further, mapping of domestic wells contaminated with high levels of nitrate in the Valley demonstrate an EJ issue.

From the regulatory perspective, Mr. Gleick stated that there have been a series of studies stating that nitrate is a priority for California. Water quality waivers for agriculture exclude groundwater at the regional level and regional water boards issuing the waivers continue to be a challenge.

Mr. Gleick noted that researchers looked at household water users and their perception of water contamination. The overall study goals were to:

- Get a perspective on household water users' actions to avoid nitrate-contaminated water, their perception of water quality, and their means of obtaining water quality information;
- Evaluate costs to households for water service, purchasing water from alternative sources, and treating tap water;
- Evaluate costs of existing and proposed measures by CWSs to mitigate contamination; and
- Facilitate a community-based research process to involve affected water users in setting goals, devising methods, interpreting results, and developing recommendations.

Mr. Gleick stated that the study documented household costs and system level costs, considering the kinds of projects being proposed to deal with nitrate contamination. To evaluate the household costs, a small, focused survey attempted to talk to every household. They looked at three or four of the poorest communities with the worst water quality. Researchers found that not all of the population understood that the water was

not safe. Despite the mailed notices and television reports, 30% of the population did not understand or believe that their water was not safe. Less than half of the population knew that the problem was nitrate.

Mr. Gleick continued by stating that the study also looked at the source of water used for drinking and cooking. This was an important distinction. Research found that more people surveyed did not use contaminated water for drinking, but did not understand that they could be affected by nitrate contaminated water used for cooking.

Additional findings were associated with the actions that were undertaken to avoid exposure. Some used alternative sources of water (such as vended or bottled water), others used manipulated tap water (boiled, frozen, purified, letting the water run before using, etc.), and a small number of people used reverse osmosis. Some people thought that if they boiled the water, it would remove the nitrate, but this is not the case. Another indicator of economic impact is the amount of income spent on trying to have safe drinking water. EPA recommends 1.5% of median household income. One household in the survey was spending 4.9% of their household income. Those spending the greatest percentages were found to be living in the poorer communities.

Findings of the system level cost analysis indicated that it is unknown how many communities or people are drinking nitrate contaminated water. There is a sense of where they might be, but the extent of the problem is not known. There are 100 systems in the SJV with priority needs for improvement related to nitrate contamination. Part of a much bigger problem is that most are in the smaller systems that serve less than 1,000. These system operators do not have the economic resources to address water quality problems. Therefore, researchers asked if consolidating smaller systems with the larger systems will address the costs of running systems. In California consolidation is happening slowly.

It was estimated that the average cost for developing a water system was \$1 million. To address nitrate and other water quality issues more broadly would cost an estimated \$1.5 million. In summary, a broad estimate for addressing nitrate issue in the SJV is \$150 million. Funding is a problem and many of these systems have known for a long time that nitrate levels are too high. Communities were notified five to six years ago. Residents have no recourse and continue to drink water with high concentrations of nitrate. Regulators know there is a problem, but because of limited financial resources, the issue has not been adequately addressed.

There were five major conclusions of the study. First, residents are at high risk of health problems resulting from nitrate exposure. Second, the average cost of water for households exceeds affordability standards and adds substantial economic burden. Third, the health and economic burden disproportionately impacts low-income households and Spanish-speaking residents. Fourth, groundwater nitrate levels are increasing. Finally, public funding for nitrate mitigation in CWSs is inadequate and projects funded may not be providing sustainable solutions.

The study also recommends new or revised policies. There should be more detailed studies in a wider area in more communities. Nitrate-affected communities need to be well-informed about their water quality and appropriate measures to protect their health. There needs to be sufficient and targeted funding for short and long term solutions to ensure that drinking water is safe. Political barriers need to be removed in order to consolidate small CWSs. Finally, sources of contamination need to be prioritized to reduce current exposure and prevent new contamination.

The study has also identified directions for further research. The impact of existing water-quality notification systems on water-user awareness and behavior should be assessed. An epidemiological study on the health effects of nitrate exposure in the SJV should be conducted. There should be a more comprehensive economic study of the costs of nitrate contamination. Finally, the study suggests a review of effects on groundwater quality of nitrate source control efforts in California.

Mr. Gleick concluded his presentation by acknowledging the many partners and funders associated with the study as well as the technical reviewers.

### ***Discussion:***

**Ms. Morales** thanked Mr. Gleick for a wonderful presentation. She asked if the costs presented are capital infrastructure costs or whether they include operating costs as well.

**Mr. Gleick** responded that they were primarily capital costs. Operating costs are a long-term problem. He noted that people in general, even in low income communities, are willing to pay more for quality drinking water.

**Ms. Morales** then asked if he had information on the average depth of the wells. He had mentioned that some do not have nitrate contamination and was this because of different depths.

**Mr. Gleick** stated that they have good information on all wells monitored. Most are more shallow, but not all of them. There are good mapping efforts to understand nitrate concentration contours and determine where nitrate concentrations are more severe. It is possible to have two wells next to each other with one contaminated and the other not. He stated that sometimes it is a depth issue, but sometimes it is not.

**Ms. Kennedy** stated that they did a very modest survey similar to the one he presented in the Santa Ana Watershed. They came to similar conclusions regarding bottled water. There are a lot of myths in the community. They don't worry about water supply. She stated that they were fortunate to not have a drinking water issue, but in the watershed, the runoff from the septic tanks is creating a water quality issue. Children are running through raw sewage. She asked whether this issue has been investigated. She said that nitrate is not a problem in the Santa Ana Watershed, but that surface runoff is creating an equal problem.

**Mr. Gleick** stated that nitrate contamination has many sources, e.g., septic systems, animal feeding, inorganic fertilizers, etc. Septic systems are important. He stated that what is unknown is the relative contribution of those different sources. In their study, it varied throughout the Valley. It would be great to do a detailed source analysis to know which source dominates.

**Mr. Saddler** commented on that there is little regulation regarding private wells and ranches. He asked how much of the study dealt with private wells.

**Mr. Gleick** replied that the study did not address that issue. He stated that the PI does a lot of work in California, and one of the problems is how California manages groundwater withdrawals. Part of the problem is surface water runoff, but also how groundwater is used and recharged. He stated that there is an enormous overdraft of water. The State is not using groundwater in a sustainable way, and over-usage contributes to contamination.

**Ms. Weintraub** thanked Mr. Gleick for sharing his work. As she was reading the report, she was trying to think about the health implication of nitrate, as an indicator similar to coliform. She stated that it is known that agriculture is a source. She asked whether communities are also measuring for pesticides, fertilizers, and bacteria, and what his thoughts are about using nitrate as an indicator of this broader problem. She stated that these communities may have dietary sources of nitrate that far exceed drinking water consumption.

**Mr. Gleick** replied that he did not know the answer to the second question; he had not thought about the nutrition piece. The first question is a great one. Nitrate is an indicator to some degree. It is one of many water quality problems. He said that they measure more than just nitrate. All of the communities are trying to measure for all regulated contaminants. When there are high levels of nitrate, you have other contaminant concerns. He said he didn't mean to minimize other issues, but in these communities, the biggest concern is nitrate, and it is an indicator of a bigger set of problems. If nitrate is addressed without the others, that would be a mistake.

**Ms. Weintraub** asked that if someone could clarify how frequently small systems test for pesticides.

**Ms. Morales** responded that VOCs are tested annually.

**Mr. Diemer** stated that his question was related to agriculture waivers and the problems with respect to impacts on surface water. Waivers do not require monitoring. Mr. Diemer asked if Mr. Gleick could speak to waivers and their impact on obtaining data and what can be done about this issue.

**Mr. Gleick** stated that he did not know much about the agriculture waiver system, but there is pressure to change the system.

**Ms. Clary** stated that the Central Valley Water Board will include groundwater monitoring, but they have not decided what level it will be. The agricultural businesses are not comfortable with having information available. It is yet to be determined how the public will receive this information.

**Mr. Diemer** stated it has been a struggle to get non-point sources to conduct monitoring. It seems that a little more focus in that area could get the data needed.

**Ms. Pajarillo** stated that in addition to the conditional agriculture waiver, the sheer cost of monitoring prevents data collection. The dairy industry is now coming up with a representative groundwater monitoring plan.

**Mr. Gleick** indicated that small CWSs do not have the funds to take care of these water quality issues. The technology can be put in place, but there are also political barriers. This plays out all over the country for small systems. Often it is known that they are in violation, but what is not known is how to finance the improvements.

**Ms. Walker** indicated that these water systems are under compliance orders and have requirements for public notification. They are on the priority list for funding. However, there has been insufficient funding. In the meantime, the same communities are being penalized.

**Mr. Zarate-Bermudez** thanked Mr. Gleick for his presentation. He stated that for his doctoral dissertation, he studied the fate of selenium in an algal-bacterial selenium removal system treating agricultural drainage water in the SJV. He was interested in learning more about monitoring programs.

**Mr. Gleick** stated they did not conduct monitoring. There are monitoring systems in place. Some are annual and not able to provide seasonal fluctuations, which could be a problem in some areas. He stated that someone else might know more about monitoring data.

**Ms. Walker** stated that their requirement is annual monitoring. If levels exceed the MCL, then quarterly monitoring is required, unless results show it goes back below MCL. This is the same whether it is state or county regulated.

**Mr. Gleick** suggested that this brought up a great point: the less monitoring is done, the less that is known about the true exposure of a contaminant in drinking water.

**Mr. Zarate-Bermudez** stated that it is important for the sampling to be taken in the dry season, because it would be less variable.

**Mr. Gleick** stated that the public is worried about the quality of their tap water. They don't understand the difference between a one-time violation versus an overall exposure problem.

**Mr. Vincent** asked whether there were private law suits pending, or if the community was suing the agriculture community.

**Ms. Clary** stated that they are not aware of any yet, but that may change over the next few years.

**Mr. Gleick** stated that it is hard to target a specific source for the contamination.

**Ms. Weintraub** asked Mr. Vincent if they have had any law suits in Florida.

**Mr. Vincent** stated that they had a lot of pesticide use in the 1980s. They passed a tax and put filters in all of the wells and tested 200,000 wells. There is a strong agriculture water board that has best management practices (BMPs) and restrictions that have resolved a lot of the issues, but they are still dealing with the legacy of pesticide use.

**A Public participant** referenced the study's conclusion that Latino populations were disproportionately affected, and asked whether other minority communities were identified to have issues with nitrate in the water.

**Mr. Gleick** stated that their focus was not just the Latino community, but that this was the dominant population where the study took place.

**Ms. Morales** thanked Mr. Gleick for his presentation.

#### NUTRIENTS AND DRINKING WATER PROTECTION

*Ronald Bergman, Acting Deputy Director, OGWDW*

*Ephraim King, Director, Office of Science and Technology, OW*

**Mr. Bergman** opened the presentation by laying out why they had this session before the Council and what they hoped to get out of it. Mr. King talked with the Council a year ago. EPA wanted to get back to the Council to have a discussion regarding nutrient contamination in water, solicit feedback, and talk about how the Council wants to be involved in the future. He stated that Mr. King would be discussing new developments from the EPA; Mr. Wall would talk about data linkages between the CWA and SDWA; and finally, Ms. Strauss would provide a more in-depth presentation on drinking water issues in California.

**Mr. King** began his presentation by stating that in the summer of 2010, EPA talked to NDWAC about program implementation. He wanted to provide a brief update on the new science issues. He wanted to look at the problem implementation and offer a more effective way to collaborate.

In December of 2010, the US Geological Survey (USGS) released a report summarizing nutrients in streams and groundwater across the country. It was an analysis of nitrate occurrence from 1992 to 2004, which found that the nitrate MCL was exceeded in a significant proportion of the drinking water wells sampled. The highest concentrations



were generally in agriculture streams in the Northeast, Midwest and Northwest. This is cause for a public health concern. The USGS conclusion was not dissimilar to the task force conclusion; however, despite collaboration among state, federal, and local governments, progress has been limited. From a drinking water perspective, nitrate is migrating into the groundwater system and into larger aquifers.

EPA is looking at human health research and where to proceed from there. The current MCL for nitrate and nitrite was set in 1991 with methemoglobinemia as an endpoint. More recent studies show other health concerns, including cancer, diabetes and thyroid-related diseases. Canada posted draft drinking water guidelines and endpoints tracking. These are all end points EPA is looking at as it tries to determine health impacts of pollution. Additionally, EPA is looking at harmful algal blooms around drinking water intakes, which require treatment of organic material and increased production of disinfection byproducts (DBPs), in addition to the toxins that result from the blooms. The link between these algal blooms and human health impacts is not as evident as the vegetative blooms on the edges of lakes and streams, and EPA is not sure if there is a causal link to skin, respiratory, liver, and neurological health problems from algal blooms around drinking water intakes. This is being tracked carefully, and is another indication for focusing on nitrogen and phosphorus pollution.

The causal links and the assessment of nutrients and water quality are addressed in nine major reports since 2006 as well as a large body of additional peer reviewed literature. There are millions of tons of animal manure generated each year. Not only are nitrogen and phosphorus issues, but also pharmaceuticals and antimicrobials. Also, there are not just impacts to humans, but also wild animals and domestic herds.

### *Empirical Approaches for Nutrient Criteria Derivation*

Coming into better focus and broad consensus is the development of numeric nutrient criteria. EPA issued its *Empirical Approaches for Nutrient Criteria Derivation* guidance document in November, 2010. The SAB review supports the use of statistical tools as part of the weight of evidence for the approach. SAB's review of the Florida Coastal Methodologies concluded that nitrogen and phosphorus need to be considered at the same time. It encourages EPA to continue to develop three approaches (reference, stressor-response, and numerical water quality models). Also, for the first time, EPA is considering satellite imagery to identify chlorophyll *a* concentrations in coastal waters.

By example, Mr. King stated that in the Mississippi River Basin, OST is preparing a series of white papers and a series of discussions on hydrodynamic modeling and is looking at maintaining coastal levels of dissolved oxygen concentrations. These models will allow them to calculate nutrient loadings and identify targets for given waterways. They expect that the findings will undergo peer review sometime this fall and will be available for public comment. This will help further inform and distill available data between US Department of Agriculture (USDA), National Oceanic and Atmospheric Administration (NOAA), and EPA.

There is a general perception and consensus that advanced technology can reduce nitrogen and phosphorus levels, but existing municipalities will have a difficult time reaching existing numeric values. EPA is relying on pollution prevention and reasonable and cost effective measures for non-point sources. The National Resource Conservation Service (NRCS) has recommendations for reducing sources. In terms of greater water quality monitoring, the EPA needs to find ways to be as responsive as possible and have adaptive management for different sources. The Agency will look at a toolbox of different tools for point and non-point sources.

Nancy Stoner issued a memo in March of 2011 that outlined “Recommended Elements of a State Framework for Managing Nitrogen and Phosphorus Pollution.” These elements included near-term lowering of levels and long-term commitment to developing numeric criteria. In the near-term, EPA is focused on work, such as stormwater monitoring and BMPs. Permitting will also get near-term reductions. EPA is also looking at states that have prioritized the issue and are obtaining those reductions. In the long-term, emphasis will continue to focus on numeric criteria, but EPA will design an approach to address states’ specific conditions to give them the flexibility they need to be effective.

The recommended framework elements include a state-wide assessment of all major loadings of major watersheds and prioritizing a subset of watersheds where significant reductions can be made. States will be encouraged to look at numeric criteria, municipal programs, and non-point sources and identify BMPs. Areas of high opportunity for significant reductions will be targeted. A final point of the framework is that it needs transparency and some system of accountability. Questions to ask are: are the BMPs being implemented, are they working, and what are the monitoring results? The framework continues to focus on numeric criteria, but it should not be a barrier for immediate results.

The framework has relevance to the drinking water community. It is important to ask where groundwater suppliers are most vulnerable and what actions can be taken to reduce nutrient pollution. It is a way to engage and focus resources.

The next steps will focus on pharmaceuticals, microbials, and harmful alga blooms. This framework could become an important tool for drinking water issues and protecting drinking water supplies. EPA is looking at flexibility in implementation and pragmatic, smart ways to make adaptive measures move forward.

### ***Discussion:***

**Ms. Massey** asked if there has been any discussion regarding the potential input of UIC impacts beyond septic tanks, to include decentralized wastewater systems that discharge to the subsurface. These have to be managed. She stated that in Alabama, they permit all Class V wells and know from their monitoring requirements that there are some decentralized wastewater treatment systems that are not meeting the UIC permit requirement for nitrate. Due to the increased volume, these systems can be a much more significant point source of nitrates to groundwater than individual septic tanks. She can

anticipate from the fact that most states do not routinely permit Class V wells, as opposed to decentralized systems which discharge to the surface and are permitted through the National Pollution Discharge Elimination System (NPDES) Program, EPA and most states may not be aware of this. From the increased use of the decentralized concept, it is anticipated that this will be an increasing source of nitrate.

**Mr. King** responded that when you take a look at your high priority watersheds, this will give you a chance to look at those systems and review permits, follow up, and determine what is allowed. This might be something the Council would like to think about with regard to recommendations and next steps. He does not represent the Office of Wastewater Management and others might want to follow up with that office.

**Ms. Weintraub** stated that Mr. King mentioned an ongoing review of animal manure, pharmaceuticals, and microbials. She asked if he thought about how the presence of antimicrobials will impact the bacteriological indicators relied on for safety.

**Mr. King** stated that he had not thought about this, but that it is an interesting thought. He reiterated her question: Will the antimicrobials impact the indicator bacteria? He stated that he would look into this further. He said that they do expect that a certain concentration of antimicrobials will affect ecosystems and human health.

**Mr. Woolard** asked if Mr. King could comment on the regulatory tools that the Agency had to address nitrogen and phosphorus loading.

**Mr. King** responded that they look to the states, but are partnering with USDA to focus NRCS technical support and grant conditions and how they are enforced. They are looking at how effectively BMPs are implemented across the country. That is one tool. Beyond that, the framework envisions working with State agriculture departments to identify specific BMPs and impacts on watersheds, ensuring there is follow up on a regular basis. There is also the assessment tool that Mr. Wall will present. It doesn't distinguish between primary and secondary sources. They'll need to think further about the Section 319 Grant Program funding, and Mr. Wall may be able to talk further about that. The question is: What is the best suite of tools, motivations, and incentives to bring farmers to the table?

#### NITROGEN AND PHOSPHORUS POLLUTION DATA ACCESS TOOL

*Tom Wall, Director, Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds*

*Rosaura Conde, Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds*

**Mr. Wall** thanked the Council for the opportunity to speak. His Office has been working with states to come up with lists of waters that are not meeting standards. For each impacted waterway, the states make a remediation plan. They also have the Section 319 Grant Program, but this may be reduced. They've developed an important tool to help address runoff pollution. Rosaura Conde is here to present it to you.

He also stated that EPA is very interested in helping states develop strategies to address a nitrogen solution. It requires a lot of face-to-face work with communities and states to determine where to focus efforts. This will take resources including the Section 319 Grant Program, and the Water Pollution Control Program. USDA is working hard with them to target resources towards their efforts where they are most needed and applying a suite of comprehensive strategies. This tool is one of them.

The tool will help states move forward. There is a lot of information already available in Federal databases, but it is hard to access if you don't have geographic information systems (GIS) staff and other resources. EPA has compiled the data to make it available in one place in an easy-to-use format via a geospatial view. It was released on July 15, 2011. It will help communities and stakeholders have access and more participation. It will also help set priorities. EPA is in the process of receiving feedback. So far it has been good, but there are some technical issues, as seen with anything.

**Ms. Conde** presented the GIS tool and its many features through a live presentation.

**Mr. Wall** stated that they are working hard to come up with strategies to reduce nitrogen and phosphorus. They want to make it easy for users and provide a tool where the information is available. Those concerned about drinking water supplies can see where priorities are. The Council is in the public health sector and that is very important. Hopefully this is a great opportunity to use this tool and keep water protected.

#### ***Discussion:***

**Ms. Massey** asked about the data layers; she did not see decentralized wastewater systems listed. She realizes it is a new category, and they are Class V injection wells, which aren't regulated by most states, but that they can easily represent 100 homes or more. States are required by EPA to do a Class V well inventory. Even though this is difficult, they are required to do so. She would think that this would be an important data layer. Even with secondary treatment, these sources could still have a significant impact on nitrate concentrations, particularly from those systems that are not properly managed.

**Mr. Wall** responded that this is a good comment and he would see if they could incorporate it.

**Mr. Bergman** asked how easy it is for states to add their own layers.

**Mr. Wall** responded that the data can be downloaded and used with their own systems.

#### DRINKING WATER AND NITRATES IN THE CENTRAL VALLEY

*Alexis Strauss, Director, Water Division, Region 9*

**Ms. Strauss** reported that Region 9 oversees three territories and over 300 tribes. As seen from the discussion today, there is significant groundwater contamination in the

Central Valley that is a result of overdraft problems, competing uses, and drought fluctuations. This affects disadvantaged and rural communities more so. She noted that Ms. Leah Walker is present from the California Department of Health. She is from the enforcement side, but does much more than that, including funding, technical assistance, and guidance.

There are about 118 public systems statewide that exceed standards and the majority is in the SJV. The majority of the systems are nitrate-contaminated. An important area of focus arose as they looked at the data. From the population served, Tulare County is of great concern. The Tulare and Salinas watershed basins are comprised of six million acres of agriculture, and, of that, four million acres are irrigated. The basins are being studied to find sources of contamination and perform source control. These are large physical areas to study and encompass 50% of the agriculture product and dairy for the State of California; therefore, this is not an easy economic engine to address or change in an easy way.

Region 9 is looking at options to reduce loadings and options for drinking water supplies. EPA understands that this is not a problem to solve in the near term. Because there is a federal sole source designated aquifer and the loadings are continuing to increase, options are expensive. Many of the small communities draw on groundwater. Despite the challenges, this is a worthy challenge. While many options have been exhausted, they need to continue to find others.

**Ms. Walker** thanked the Council for the opportunity to talk and for their interest in the topic. When you look at the sources of contaminants, it will take more than just working on a system-by-system basis. For example, they are looking at the effectiveness of point of entry treatment both in the short- and long-term. The California Department of Health (DOH) is working to increase the number of small CWSs to be in compliance. Disadvantaged communities are impacted the most and this becomes an equity issue.

**Ms. Strauss** continued by saying that it is important to look at how they can integrate the CWA and SDWA and make progress on how to distinguish numeric criteria and numeric endpoints. California has done a great job in permitting confined feeding and the dairy industry. As a Federal agency, EPA does not have control over these uses unless they discharge to waters of the U.S. The State of California helps with that. Also in California, total maximum daily loads (TMDLs) have been met in urban areas and the state has done a good job in translating the TMDLs in permitting.

### ***Discussion:***

**Ms. Dougherty** asked how these issues can be examined nationally, and then at the state level, especially with small and medium drinking water systems. It is another issue with CWSs. Small systems have other contaminants other than nutrients, some of which are occurring naturally. There needs to be continued interest from Congress and others on how they are dealing with this issue and the burden this puts on these communities. For the long-term, they will be looking to the Council for help on these issues. When the

Council thinks about these issues and how they want to respond, look again at the types of small systems and what they are doing.

**Mr. Owen** stated that he is trying to get his head around how all the different agencies connect in the broader picture. This strikes him as a system problem and how optimizing each individual sub-system does not give the best overall result. They've been regulating nitrogen and phosphorus on the wastewater side as a point-source discharge, and know that agriculture is a big non-point source contributor to waterways. The fundamental underpinning is that it is difficult to economically reuse fertilizers because producers (livestock) and users (farming) may be thousands of miles apart. So, how do they figure out how to concentrate end users close to producers? How do they address technology that can reuse phosphorus? These are economics issues. Various sources have produced graphics and summarized cycles that attempt to identify all of the inputs and outputs of the nutrient system. What would be helpful is to see all of the agencies that have control over the elements of that nutrient cycle and to what extent they can affect that cycle. He further asked what are the kinds of relationships that are critical to those agencies and how do they manage those nutrients given that interplay. If they go to small systems with a nitrate problem and remove it, the nitrate has to go somewhere. How do they manage it so that it does not become a problem somewhere else? It will be helpful to the Agency and to what Nancy Stoner is trying to do if they look at the big picture and see how all agencies are mapped and work together to connect the dots.

**Ms. Kennedy** stated that she really liked what Mr. Owen was discussing. There is a vast separation between the farming side and the livestock side. California is a great place to explore this issue because of the "foodie" movement. There is also political will. She believes that California could be a model for the rest of the country.

**Ms. St. Martin** responded to Mr. Owen. She stated that the Interagency Task Force is trying to wrap its arms around the CWA data as it relates to the Dead Zone in the Gulf of Mexico. They have had very productive conversations and outputs. They could help them in this effort.

**Ms. Massey** stated that she thinks they need to use the framework in place from the UIC program and Class V well inventory requirement to factor in the potential impacts from decentralized wastewater treatment systems. They are not being integrated into the equation. They need to actively start looking at them as a strong contributor to nitrate concentrations. Her state experienced growth in the number of decentralized systems discharging to groundwater by more than a factor of 10 in the past decade. The new technologies that treat small flows for secondary treatment has led to more such systems and pushed residential growth to a rate they had not seen before. They need to account for this trend over the last 10 to 15 years.

**Ms. Dougherty** suggested that there is a need to determine a more effective way to focus discussions such as Nutrients. There is a lot of work being done to look at this whole issue and the connection between the CWA and SDWA. EPA will work with the Chair to determine how to better focus the discussion for the next meeting.

ORD SAFE AND SUSTAINABLE WATER RESOURCES RESEARCH PROGRAM

*Jennifer Orme-Zavaleta, Office of Research and Development, EPA*

**Ms. Orme-Zavaleta** stated that she spoke with the Council last December, when EPA was launching an effort to realign their research program within EPA. There were a couple of drivers of how they plan their research and program, and the SAB made recommendations as well. They wanted EPA to take a different look at how they do work and provide the Agency with information, taking an integrative, interagency perspective that brought in others. The Administrator asked if the Office of Research and Development (ORD) could assist the Agency in taking a better role of looking down the road.

This process allowed EPA to take a step back and look at the challenges of the program over the years. EPA evaluated how to redesign their programs to better face research in this century given the complexity of issues and challenges. The overarching goal is to protect public health and the environment. Taking a sustainability approach requires looking at societal, economic and environmental issues. Therefore, EPA is taking an integrated approach for research and helping the OW make decisions in the future.

In evaluating Safe and Sustainable Water Resources (SSWR), they asked the Administrator what the needs were, what are the kinds of problems were being faced, and what problems and needs were anticipated over the next decade. Can they look at these contaminants in different ways?

When they looked at the sustainable water resource systems, EPA looked at problems related to agriculture, chemical processes, built infrastructure, watershed protection, climate, etc. and found two overarching themes:

1. Flows and uses of water in a sustainable system; and
2. How to manage water resources within the system.

EPA needs to recognize that to get to the problem they need to look at its origins, including land use management and practices, industrial processes, aging and neglected infrastructure, non-point sources, and agriculture. They evaluate how the origins manifest into problems in water resources. These two points lead to a systems approach to solutions. This conceptual theme will guide research and focus on the three areas of sustainability: economy, environment and equity (public health and community).

Theme 1 relates to flows and uses of water. It has three research questions and all will benefit drinking water: what factors are most significant and effective in ensuring the sustainability and integrity of water resources and watersheds; what approaches are most effective in minimizing the environmental impacts of naturally occurring contaminants and different land use practices leading to sustainable surface and subsurface water resources; and, what are the impacts of climate variability and changing human

demographics on water quality and quantity and what approaches will mitigate these impacts.

Theme 2 focuses on the management of water flows. Research questions ask: what are the most effective and sustainable approaches to maintain and improve natural and engineered water systems in a manner that protects water quality and quantity; how do they effectively manage water infrastructure to ensure safe and sustainable resources from the source to the tap; and what effective systems-based approaches identify and manage the causes of degraded water.

She stated that the next steps will include efforts across all regional offices. They will finalize the framework, which provides strategic direction, and then develop the action plan, which gets at the issues and needs. Then, the research portfolio will be populated.

***Discussion:***

**Mr. Woolard** stated that it struck him that the research agenda relates to the topic the Council was just talking about. The agenda sets up what the Council will need in the long term, combining the CWA and the SDWA. However, in the short term, the agenda outpaces where the CWA and SDWA are right now. There are some research needs now. He asked whether they are still going to have resources to address the regulatory framework now.

**Ms. Orme-Zavaleta** stated that they are committed to provide the Agency with what it needs now. The development research plan includes current work needs, so EPA is still working on the near term while looking down the road. They are going back and forth to make sure things do not fall through the cracks.

**Ms. Dougherty** stated that they mentioned yesterday that this part of the research program is not the only part where work is to be done. There still is the human health part and risk assessment. She asked whether the six areas are still being addressed.

**Ms. Orme-Zavaleta** stated that all six programs are interrelated and research will benefit drinking water resources.

**Ms. Weintraub** thanked Ms. Orme-Zavaleta for her presentation. She said it was nice to hear how things are being thought of in a holistic way. In conjunction with the previous conversations yesterday and today, she asked whether there is a role for NDWAC to think about using lower quality water sources for non-drinking uses. She asked if the Council wants to explicitly address that in Theme 2 (of the presentation) or opportunities to provide less treatment and use degraded sources. What implications does this have for prevention and source control? They don't want to encourage the lack of attention on cleaning up contamination.

**Ms. Orme-Zavaleta** said that is a consideration, and she referenced that a National Academy of Sciences (NAS) report would be coming out this fall. They have talked with



AWWA, WERF and other groups. They are also talking with Australia and Singapore on their efforts on reclaimed water and how it is working. Regarding the second question on Theme 2, they do see that as part of that question. Does it make sense to have a dual delivery system and the use of gray water? It is worth exploring and the Agency will be identifying whether it makes sense.

**Ms. Weintraub** stated that in San Francisco they are developing a strong non-potable water program. There is on-site water reuse and they are developing sources for other uses. In addition, they are thinking about how to use groundwater supplies that are a lower quality and would require significant treatment to be used for drinking, but could be used for other uses.

**Ms. Orme-Zavaleta** stated she would be interested in talking with Ms. Weintraub on how to approach this topic.

**Mr. Zarate-Bermudez** said he was glad to see EPA have commonalities with CDC involving resources management and protection of public health, taking a systems approach. CDC has developed an independent study in the last year. The findings of the water reuse study can be made available in June. He said that they are working in San Francisco as well as New York, North Carolina, and Texas. CDC also has interest in onsite wastewater systems and working with EPA on decentralized wastewater management. CDC was invited to write sections related to the public approach in the National Water Reuse Guidelines. A collaboration of agencies is needed not only at the Federal level, but on all levels, including the private sector. Mr. Zarate-Bermudez further stated that the agenda CDC has laid out is far more than one agency can do. He noted that an upcoming workshop with research foundations in September will determine opportunities to leverage resources, work together and not duplicate efforts. CDC is also looking to work with associations and other agencies such as DOE, USGS, and USDA. He remarked that he would like to hear more about what Ms. Orme-Zavaleta is doing.

**Ms. Morales**, as chair of the Council, thanked Ms. Orme-Zavaleta. She stated that the last time they talked their budget was limited and challenging. It is reassuring to see that they are taking an integrated approach. Priorities seem to be lining up pretty well.

**Mr. Vincent** distributed a handout (§ 62-555.350 Operation and Maintenance of Public Water Systems; See Appendix III). He wanted to follow up with the many questions yesterday on requiring storage tank maintenance. Although the SDWA does not require specifically that storage tanks be addressed, the State of Florida regulates storage tanks.

CDC'S DOMESTIC WATER ACTIVITIES: EHS-NET WATER PROGRAM

*Max A. Zarate-Bermudez, Division of Emergency and Environmental Health Services,  
National Center for Environmental Health, CDC*

*Daneen Farrow-Collier, Division of Emergency and Environmental Health Services,  
National Center for Environmental Health, CDC*

**Ms. Farrow-Collier** thanked the Council for expressing an interest in what CDC does. There are many centers within the CDC framework that work on water, and she noted that this presentation would focus on the National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), National Center for Immunization and Respiratory Diseases (NCIRD), and the National Center for Environmental Health (NCEH).

NCEZID looks at building national surveillance capacity for waterborne disease and outbreaks, improving parasitic and waterborne disease outbreak investigations, and developing and improving access to water-related health and prevention information. The latter has led to the development of the Healthy Water website. CDC is updating the drinking water website also and that should be up at the end of year.

NCIRD looks at preventing disease, disability, and death from enteric viral diseases; responding outbreaks of enteric viral disease, including those involving drinking water sources; improving local, state, and global capacity to prevent disease and respond to outbreaks; and providing laboratory support to internal and external partners. Ongoing research at CDC relates to *legionella*, particularly the link between distribution systems and *legionella*. CDC is responsible for environmental policy around environmental health, and they are responsible for providing resources and technical outreach.

NCEH develops environmental health policy and prevention programs; provides resources and technical assistance; conducts surveillance and epidemiologic investigations; collects, integrates, and interprets data through CDC's Environmental Public Health Tracking Network, the Unregulated Drinking Water Initiative (UDWI) and the Environmental Health Specialists Network (EHS-net); develops and applies advanced laboratory technology to improve the diagnosis, treatment, and prevention of water-related disease.

The UDWI has a provision to provide drinking water to people on private drinking water wells. The current phase of this initiative is the collection and analysis of all data for private wells. There currently isn't one place to get all the information so they are trying to catalog the data in one location. It is a relatively new program and CDC is working with seven states starting last June, 2010. It will close in August, 2011.

The Environmental Health Services (EHS) Branch provides direct support to state and local programs and technical assistance within four areas: recreational water, drought, emergency drinking water, and EHS-net. They work together to look at contributing factors and environmental links to waterborne diseases.

There have been a lot of the waterborne diseases connected to recreational waters. Over the past two to three years, the CDC has been working on a national model aquatic health code. The outcomes have been reduced recreational water illnesses (RWIs), improved standards, training, improved surveillance programs, data-based decision making and system-based approaches to facility design, operation and maintenance. The Branch also has collaborated with EPA, AWWA and NOAA to assist in drought preparation and response.

The Branch has prepared advisory materials and guidance for various groups. The Drinking Water Advisory Toolbox will be available in August, 2011. She noted that communication about drinking water advisories has not been what CDC hoped it could be. The Toolbox provides materials and guidance to help advise the public. It will be available soon. There is also the Emergency Water Supply Planning Guide for hospitals and healthcare facilities, which was available in June. The Guide has information on how to ensure these facilities understand emergency planning and maintain water supplies during emergencies.

**Mr. Zarate-Bermudez** presented specific research activities of EHS-net. The framework for conducting research is similar to the framework EPA has proposed. CDC collaborated with environmental health divisions of local and state health departments. Their goal is to provide capacity building at the local/state level. They are the first responders.

The baseline for EHS-net is systems-based. The first component is a tool developed to help mediate problems with impaired waters (303(d) List). Almost 50% of streams are contaminated or impaired. Not only is this an indicator of the watershed health, it can be used to identify potential sources of contamination. It integrates all components into outbreak notices.

The systems approach allows a holistic view of the problem. The outcome of contamination is an outbreak. For water-related disease outbreaks, CDC reacts first with the epidemiologist, then the lab, and finally environmental compliance and assessment. The last is currently the weakest link for CDC to determine the outbreak, and he mentioned that they are working very hard to enhance the work of CDC in environmental assessments. The system approach for food will be launched in January, and water is currently under development.

EHS-net activities are using the principles of community participation to conduct work at the local level. They are doing a multi-state study with environmental health departments. They do not have much data to help health departments in developing policies or changing policy, and need to build that capacity at the local level to address these issues. CDC decided to develop a methodology to support this. In collaboration with the environmental health departments, they have completed the first objective and are working on the second. At the end of the second year, CDC will develop an assessment to see if the methodology is being implemented in the same way. In the final

year, a scoring system will be developed. It will be very useful for prioritizing interventions.

Internal research activities focus on onsite wastewater systems and decentralized water reuse. The Onsite Wastewater Systems project helped to evaluate the fate of microbial contaminants by looking at a wastewater plume and characterizing the aquifer. The findings were presented in Cincinnati in June, 2011. They are now validating the methodology. The Decentralized Water Reuse project evaluated seven systems with less than 500 gallons per day (gpd).

***Discussion:***

**Ms. Morales** asked if the Council would hold questions until the next meeting.

AGENDA ITEMS FOR FALL 2011 MEETING AND WRAP UP

*Olga Morales, Rural Development Specialist, Rural Community Assistance Corporation, Dona Ana, NM*

*Cynthia Dougherty, Director, OGWDW*

**Ms. Dougherty** thanked EPA Region 9 for hosting the meeting and assisting with the logistics. She also thanks Ms. Springer and Ms. Kelly for all the work they did to prepare for the meeting.

**Ms. Kelly** also thanked EPA Region 9 for their support and requested discussion on two items prior to wrapping up the meeting: the date and potential agenda items for the next meeting.

**Mr. Owen** stated that the Council discussed a lot of important activities, and referenced that they are pressing up against a Congressional deadline on the budget. He requested that at the beginning of the next meeting there needs to be a summary of what has happened to EPA's budget, priorities as a result, and how this is being managed. This will give the Council some background for the Consultations.

**Ms. Taylor** invited the Council to have their next meeting in North Carolina. She stated there were two issues in her state. The first is the nutrient issue and agriculture. There have been discussions within the state. Like California, this is a big economic driver. The second is related to hydraulic fracturing.

**Ms. Morales** stated that there was one presentation on this meeting's agenda that they did not get to: *Small Systems Capacity Development / Sustainability Update* to be provided by Mr. Bergman. This should be prioritized for the next agenda.

**Ms. Kennedy** suggested asking the Office of Environmental Justice to talk about what they do. If not at the next meeting, then they should be invited sometime in the near future.

**Ms. Massey** stated she would like to hear an update on the further development of ORD's research action plan.

**Ms. Dougherty** stated that there would be one or two more things for formal consultation. Once they have received comments from the SAB on the full or partial LSL replacement issue, there will be a meeting by phone. It will be scheduled within the next two months. Also, when the NDWAC discusses small system issues, it may be good to have a more interactive full discussion where they hear from the NDWAC members. This was done a few years ago, and it was a much more interactive discussion.

**Ms. Weintraub** asked how the upcoming expiration of some members' terms would impact a meeting in January.

**Ms. Dougherty** stated that this could be an issue. The NDWAC is no longer on a spring – fall schedule as it was in the past, so this could now affect some members.

**Ms. Morales** asked whether they should set a date with this unknown factor.

**Ms. Dougherty** said that it may be better if Ms. Kelly send out possible dates to the members and then go from there. EPA will identify those with terms that are going to expire.

**Ms. Morales** encouraged getting the date as soon as possible.

**Ms. Dougherty** stated that they would pin down two dates in the next couple of weeks. Travel logistics in January might be difficult. Dates in March will be considered if needed.

**Ms. Morales** thanked the EPA Region 9 staff again for their support in hosting the meeting.

**Mr. Woolard** asked if SRF funds could be included in the budget update for the next meeting.

**Ms. Dougherty** stated that if anything happens on the budget end, Ms. Kelly can send a summary.

**Ms. Kelly** stated that she would put together a list of major action items and major decisions. She will coordinate with Ms. Morales and they will come in advance of the meeting notes.

**Ms. Morales** adjourned the meeting.

## **Appendix I: Agenda**

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**AGENDA**  
**National Drinking Water Advisory Council Meeting**  
**EPA Region 9 Office, 75 Hawthorne Street<sup>1</sup>**  
**San Francisco, CA**  
**July 21-22, 2011**

**July 21, 2011- Thursday**

|                                                    |                                                                                                                                                                    |                                                                                                       |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>8:00-8:30*</b><br><i>*Pacific Standard Time</i> | <b>Registration and Coffee for Members</b>                                                                                                                         |                                                                                                       |
| <b>8:30- 9:00</b>                                  | Welcome<br><br><i>Purpose: Welcome, Introduce new members and Review Agenda</i>                                                                                    | Cynthia Dougherty, OGWDW<br>Olga Morales, NDWAC Chair<br>Suzanne Kelly, DFO                           |
| <b>9:00 - 9:30</b>                                 | Opening Remarks<br><br><i>Purpose: Provide update on EPA activities since the last meeting and follow-up on Council recommendations supporting the CRWU report</i> | Cynthia Dougherty, OGWDW                                                                              |
| <b>9:30 - 10:15</b>                                | EPA Update on Regulatory Activities<br><br><i>Purpose: Provide update on Drinking Water Strategy (VOCs), Reg Det 3 and other regulatory-related activities</i>     | Pamela Barr, SRMD                                                                                     |
| <b>10:15 - 11:00</b>                               | <b>Break</b>                                                                                                                                                       |                                                                                                       |
| <b>11:00 - 12:00</b>                               | Consultation: Total Coliform Rule Revisions<br><br><i>Purpose: Consult with the Council on rule</i>                                                                | Pamela Barr, SRMD<br>Council Members                                                                  |
| <b>12:00 - 1:00</b>                                | <b>Lunch</b>                                                                                                                                                       |                                                                                                       |
| <b>1:00 - 2:30</b>                                 | Consultation: Lead and Copper Rule Revisions<br><br><i>Purpose: Consult with the Council on rule</i>                                                               | Pamela Barr, SRMD<br>Council Members                                                                  |
| <b>2:30 – 2:45</b>                                 | <b>Break</b>                                                                                                                                                       |                                                                                                       |
| <b>2:45 - 3:30</b>                                 | SDWA Communication<br><br><i>Purpose: Provide update on SDWIS Next Gen, Compliance Monitoring Data, and consult on CCR Reg Review</i>                              | Ronald Bergman, OGWDW                                                                                 |
| <b>3:30 - 4:30</b>                                 | <b>Open Public Comments</b>                                                                                                                                        |                                                                                                       |
| <b>4:30 - 5:00</b>                                 | The SFPUC's Water Security Initiative<br>Contaminant Warning System - Pilot Project                                                                                | Manouchehr Boozarpour, P.E.<br>June Weintraub<br>San Francisco Public Utilities<br>Commission (SFPUC) |
| <b>5:00 – 5:30</b>                                 | Small Systems Capacity<br>Development/Sustainability Update<br><br><i>Purpose: Provide update on small system efforts</i>                                          | Ronald Bergman, OGWDW                                                                                 |
| <b>5:30 pm</b>                                     | <b>Adjourn</b>                                                                                                                                                     |                                                                                                       |
| <b>6:00 pm</b>                                     | <b>Group Dinner</b>                                                                                                                                                |                                                                                                       |

<sup>1</sup> Hawthorne Street, located between 2nd and 3rd Streets and Howard and Folsom Streets, is three blocks from the Montgomery Street BART and MUNI Station. You will need to pass through Security (bring a photo id) and then log in with the Regional Receptionist (first floor).

## AGENDA CONT'D

**National Drinking Water Advisory Council Meeting**  
**EPA Region 9 Office, 75 Hawthorne Street**  
**San Francisco, CA**  
**July 21-22, 2011**

**July 22, 2011 - Friday**

|                                                      |                                                                                                                                                                                                                                                   |                                                                                          |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>8:00 - 8:30*</b><br><i>*Pacific Standard Time</i> | <b>Coffee for Members</b>                                                                                                                                                                                                                         |                                                                                          |
| <b>8:30 - 9:00</b>                                   | Recap of Previous Day<br>Council Discussion (if needed)                                                                                                                                                                                           | Olga Morales, NDWAC Chair<br>Cynthia Dougherty, OGWDW                                    |
| <b>9:00 – 10:00</b>                                  | “The Human Costs of Nitrate contaminated Drinking Water in the San Joaquin Valley”<br><br><i>Purpose: Representatives from the Pacific Institute will share their findings and recommendations related to nitrate contaminated drinking water</i> | Peter Gleick, Pacific Institute                                                          |
| <b>10:00 - 10:15</b>                                 | <b>Break</b>                                                                                                                                                                                                                                      |                                                                                          |
| <b>10:15 - 11:45</b>                                 | Nutrients and Drinking Water Protection<br><br><i>Purpose: EPA Update on Nutrient challenges and drinking water protection</i>                                                                                                                    | Ronald Bergman, OGWDW<br>Ephraim King, OST<br>Tom Wall, OWOW<br>Alexis Strauss, Region 9 |
| <b>11:45 - 12:30</b>                                 | ORD Safe and Sustainable Water Resources Research Program                                                                                                                                                                                         | Jennifer Orme-Zavaleta, ORD                                                              |
| <b>12:30 - 1:00</b>                                  | CDC’s Domestic Water Activities: EHS-Net Water Program<br><br><i>Purpose: Provide an overview of CDC’s Domestic Water Activities</i>                                                                                                              | Dr. Max A. Zarate-Bermudez, NCEH (CDC)<br>Daneen Farrow-Collier, NCEH (CDC)              |
| <b>1:00 - 2:00</b>                                   | Discuss Agenda Items for Fall 2011 Meeting and Wrap Up                                                                                                                                                                                            | Olga Morales, NDWAC Chair<br>Cynthia Dougherty, OGWDW                                    |
| <b>2:00</b>                                          | <b>Adjourn</b>                                                                                                                                                                                                                                    |                                                                                          |



## **Appendix II: Presentations**

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| Consultation – Lead and Copper Rule Revisions                                    | Pamela Barr, SRMD                                                                                  | Pg. II-86  |
| Consumer Confidence Reports (CCRs)                                               | Ronald Bergman, OGWDW                                                                              | Pg. II-106 |
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| The Human Costs of Nitrate Contaminated Drinking Water in the San Joaquin Valley | Peter Gleick, Pacific Institute                                                                    | Pg. II-161 |
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| Drinking Water and Nitrates in the Central Valley                                | Alexis Strauss, Region 9                                                                           | Pg. II-215 |
| Update on Safe and Sustainable Water Resources                                   | Jennifer Orme-Zavaleta, ORD                                                                        | Pg. II-221 |
| Domestic Water Activities at CDC                                                 | Dr. Max A. Zarate-Bermudez, NCEH (CDC)<br>Daneen Farrow-Collier, NCEH (CDC)                        | Pg. II-240 |



# Regulatory Tools and Rule Development Update



**NDWAC**  
**July 21, 2011**



**Pamela Barr**

**Director, Standards and Risk Management Division**  
**Office of Ground Water and Drinking Water**  
**U.S. EPA**

# **Overview**

- **Drinking Water Strategy Update**
- **SDWA Regulatory Processes**
- **Unregulated Contaminants**
- **Existing Standards**
- **Regulatory and Implementation Assistance Tools**
- **Research**

# Drinking Water Strategy

## **Focus on four goals:**

1. Address contaminants as groups rather than one at a time.
2. Foster development of new drinking water treatment technologies.
3. Use the authority of multiple statutes to help protect drinking water.
4. Partner with states to share more complete data from monitoring at public water systems.

For more information visit the EPA web site at:

<http://water.epa.gov/lawsregs/rulesregs/sdwa/dwstrategy/index.cfm>

# Purpose of the Strategy

By pursuing these goals, EPA will:

- Provide more robust public health protection in an open and transparent manner
- Assist small communities to identify cost and energy efficient treatment technologies.
- Build consumer confidence by providing more efficient sustainable treatment technologies to deliver safe water at a reasonable cost

## **Goal 1:**

# **Address Contaminants as Groups**

- Evaluating and addressing contaminants as groups during the regulatory process may:
  - Be less time consuming and resource intensive
  - Account for risks from multiple contaminants
  - Deal more effectively with an increasing # of emerging contaminants
  - Provide water systems with an opportunity to make best long-term decisions on capital investments

# Carcinogenic VOCs - Potential Group

## Regulated (8) -

Benzene

Carbon tetrachloride

1,2-dichloroethane

1,2-dichloropropane

Dichloromethane

Tetrachloroethylene

Trichloroethylene

Vinyl chloride

- All carcinogens (MCLG for each is set at zero)
- Common analytical methods (524.3/524.2, 502.2)
- Common treatment (Aeration and GAC)
- Some degree of co-occurrence (based on compliance monitoring data)

(SDWA allows setting MCLs as close to MCLG as feasible; MCL for each of these regulated carcinogens is set at the quantitation limit; consider setting a total carcinogenic VOC MCL for group based on feasibility)

## Unregulated CCL3 (8) -

Aniline

Benzyl chloride

1,3-butadiene

1,1-dichloroethane

Nitrobenzene

Oxirane methyl

1,2,3-trichloropropane (TCP)

Urethane

- All carcinogens (such that any MCLG would likely be zero)
- Common methods (524.2 and/or 524.3) for a few (i.e., 1,2,3-TCP, 1,1-dichloroethane, nitrobenzene and 1,3-butadiene)
- Effective treatment technologies (Aeration and GAC) for most of the 8 except for 2 (oxirane methyl and urethane)
- Degree of co-occurrence with regulated VOCs unknown at this time

# Nitrosamines - Potential Group\*

|                              |                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Four DWS Factors</b>      | <ul style="list-style-type: none"><li>• All are carcinogens so likely MCLG could be set at zero</li><li>• Can measure most using common analytical methods</li><li>• Most have common treatment/control processes</li><li>• Have some co-occurrence of NDMA with other nitrosamines</li></ul>                                                                                |
| <b>Public Health Benefit</b> | <ul style="list-style-type: none"><li>• ~100M people served by systems with at least single detection of at least one of the nitrosamines</li><li>• ~10M people served by systems that have co-occurring nitrosamines; potential for greater public health risk due to additivity of cancer risk</li><li>• Controlling nitrosamines reduces exposure to other DBPs</li></ul> |
| <b>Issues</b>                | <ul style="list-style-type: none"><li>• Exposure from food may be &gt; drinking water for some age groups</li><li>• Regulating nitrosamines could constrain chloramine use and make it more costly for some systems to comply with prior disinfection by-product rules</li></ul>                                                                                             |

**\*Being considered as part of Regulatory Determinations 3**



## **Goal 1 (Cont'd):**

# **Comments from Public Outreach Efforts**

- Public health protection should be of paramount importance
- Consider the following:
  - Health effect endpoints in grouping of contaminants
  - Treatment feasibility to identify/address contaminant groups
  - Analytical methods and/or use surrogates
  - Occurrence and co-occurrence of contaminants
  - Addressing groups of contaminants at their source
- Evaluate approaches used by States and other countries
- Consider non-regulatory approaches (e.g. health advisories)

## **Goal 2:**

# **Foster New DW Technologies**

- Administrators Jackson (EPA) & Mills (SBA) announced formation of the Water Technology Innovation Cluster (WTIC) in January 2011
  - Board of Directors (comprised of stakeholders) & committees formed
- <http://www.epa.gov/wtic/>
- Held May 23, 2011 meeting (Cincinnati) to solicit input from water industry, research, other national stakeholders regarding technology needs & water challenges
- EPA announced a “STAR” grant solicitation that opened 6/23/11 and will close 8/25/11  
[http://www.epa.gov/ncer/rfa/2011/2011\\_star\\_drinkingwater.html](http://www.epa.gov/ncer/rfa/2011/2011_star_drinkingwater.html)

## **Goal 3:**

# **Use Multiple Statutes to Protect DW**

- EPA identifying regulatory authorities under TSCA and FIFRA that may provide opportunities for better protecting DW
  - Collecting, sharing, and assessing data on potential occurrence and health effects
- ID regulatory opportunities to collect information from TSCA/FIFRA reviews to inform DW decisions
- ID co-occurrence, common methods, and treatment
- Developing Human Health Benchmarks for Pesticides (HHBPs); tools for interpreting monitoring data

## **Goal 4:**

# **State / EPA Data Sharing**

- State-EPA Data Sharing Committee (EPA, ECOS, ASDWA, & ASHTO reps) signed a Data Sharing MOU
- Data Sharing Implementation Work Group to develop recommendations for:
  1. Monitoring data elements to collect
  2. How to collect & exchange data
  3. Business needs/applications that must be met
  4. Increasing transparency

# SDWA Regulatory Processes

**Contaminant Candidate List (CCL)** – List of unregulated contaminants that are known or may occur in drinking water; publish every 5 years.

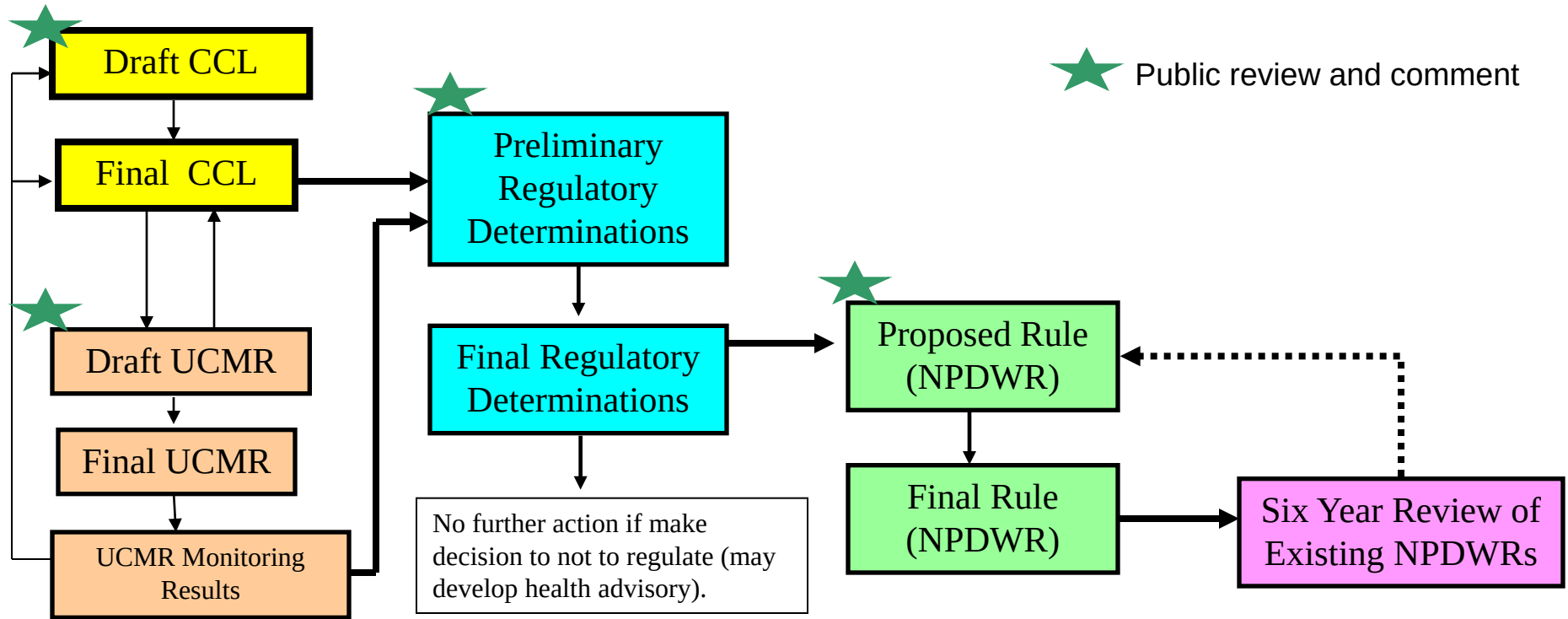
**Regulatory Determinations** – Decisions on whether to regulate CCL contaminants with a drinking water standard; make decisions on at least 5 every 5 years; Must consider 3 SDWA criteria (slide 5). If decide to regulate, SDWA requires EPA to propose in 24 months and finalize in 18 months.

**Unregulated Contaminant Monitoring** – Process to monitor at least 30 different unregulated contaminants every 5 years.

**Regulation Development** - If regulate, SDWA requires that we evaluate/consider a number of factors in the standard setting process (health, analytical/treatment feasibility, costs/benefits, etc).

**Six Year Review** – Every 6 year, review and (if appropriate) revise the standard. Any revision must maintain or improve public health protection. If revise, we go through the regulation development process again and evaluate a number of factors.

# General Flow of SDWA Regulatory Processes



At each stage, need increased specificity and confidence in the type of supporting data used (e.g. health, occurrence, treatment).

# Contaminant Candidate List 3 (CCL 3)

- 1996 SDWA Amendments require EPA to publish a list of unregulated contaminants (the CCL) which may require regulation and are known or anticipated to occur in public water supplies every 5 years
- Published final list in *Federal Register* in October 2009
- Evaluated >7,000 potential contaminants
- Identified 104 chemicals and 12 microbes
- Will evaluate contaminants in groups, as well as individually, to make Regulatory Determinations for chemicals with the greatest public health concern

# CCL 3 Contaminant Categories

- ~ 39 - 40 Chemicals in commerce<sup>\*</sup>
  - PFCs, gasoline additives (MTBE), solvents, used in production, etc.
- ~ 41 Pesticides and/or degradates<sup>\*</sup>
- ~ 11 Disinfection byproducts<sup>\*</sup>
  - i.e., NDMA, aldehydes, halogenated compounds
- 12 Pathogens
  - Identified 12 waterborne pathogens that have known or anticipated occurrence in PWS
- 9 Hormones and 1 antibiotic
- 6 Inorganics
  - cobalt, germanium, molybdenum, strontium, tellurium, vanadium
- 3 Cyanotoxins

<sup>\*</sup>Numbers are approximate. There is some overlap among groups (i.e., a potential DBP may also be a chemical in commerce and used as a pesticide).



# Three Regulatory Determination Criteria

SDWA requires EPA to consider the following criteria in evaluating whether to regulate a contaminant:

- 1) *The contaminant may have an adverse effect on the health of persons;*
- 2) *The contaminant is known to occur or there is substantial likelihood that the contaminant will occur in public water systems with a frequency and at levels of public health concern; and*
- 3) *In the sole judgment of the Administrator, regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.*



**\*SDWA Section 1412(b)(1)**

# Potential Outcome of Determinations

- **No Regulatory Determination**

- Insufficient data to assess contaminant on three criteria

- **Positive Determination**

- Answer “yes” decision for “all three” criteria
- Begin process to develop a drinking water regulation

| # | Outcome |
|---|---------|
| 1 | ✓       |
| 2 | ✓       |
| 3 | ✓       |

- **Negative Determination**

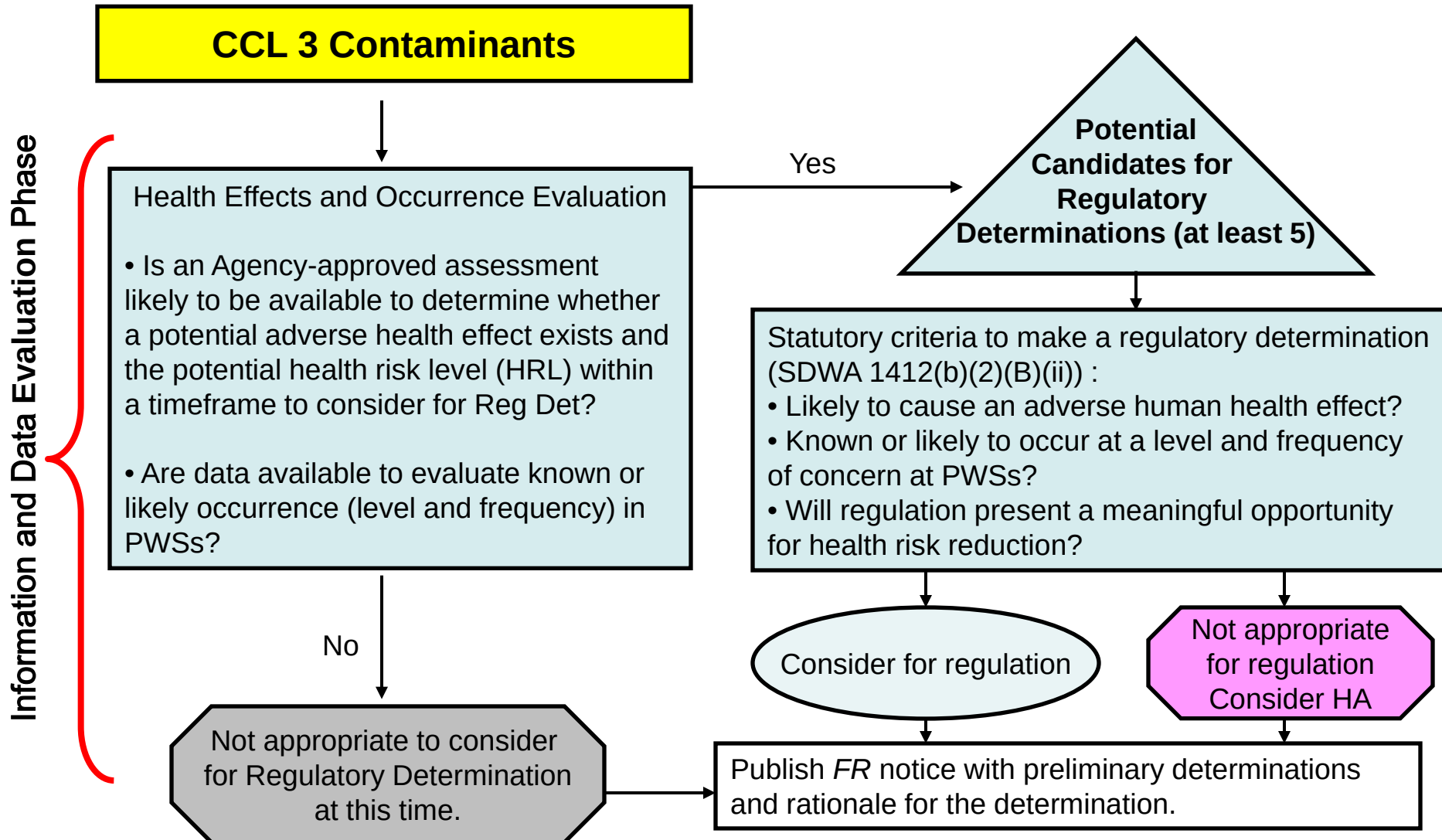
- Answer “no” for “any one” of the three criteria
- Do not develop a drinking water regulation
- Developing a health Advisory is a non-regulatory option

| # | Outcome |
|---|---------|
| 1 | ✓       |
| 2 | ✗       |
| 3 | ✗       |

# Status of Regulatory Determinations

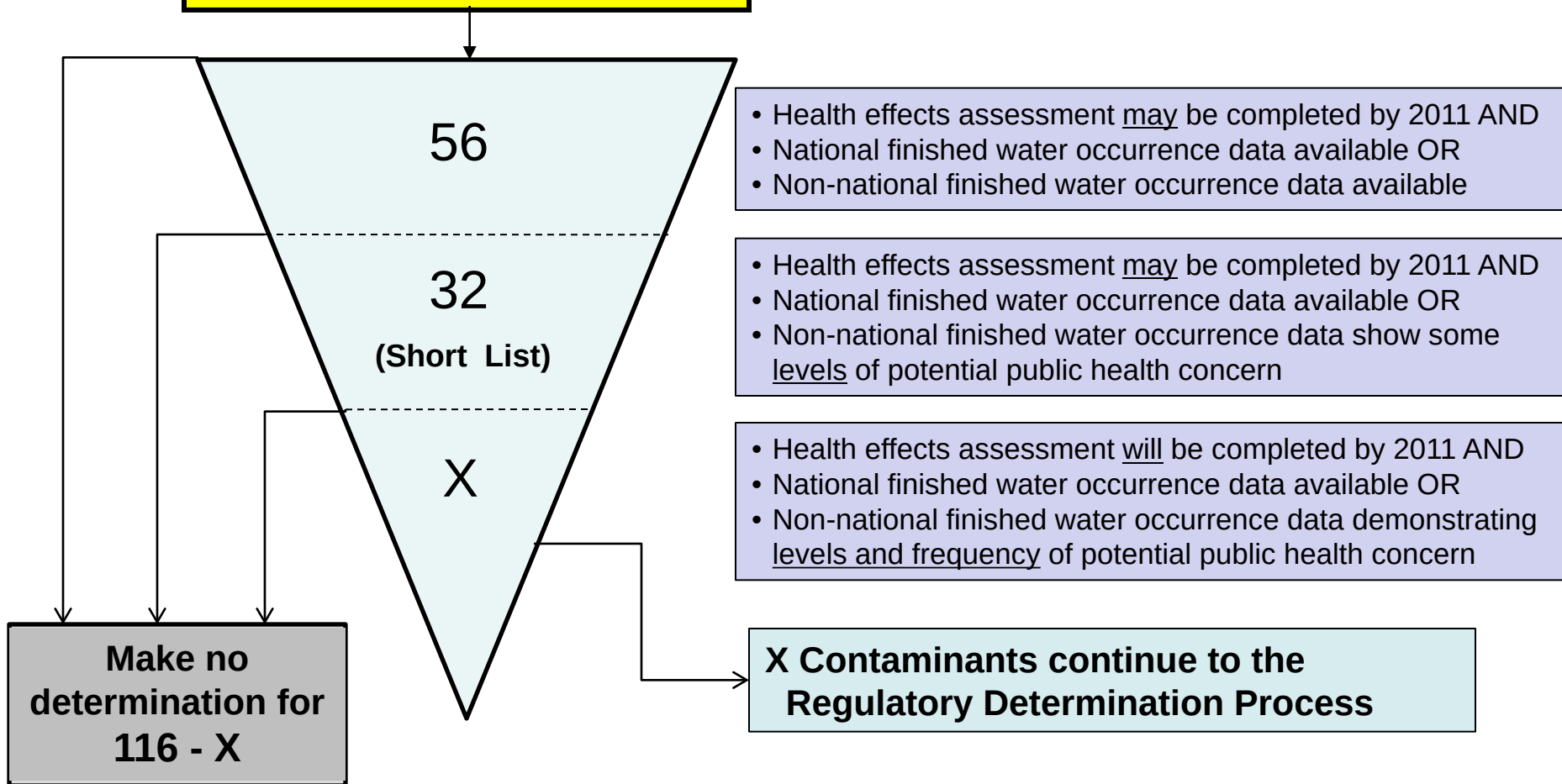
- **Regulatory Determinations for CCL 1**
  - March 1998 - Published CCL 1 and listed 60 contaminants
  - July 2003 - Published final determination “not to regulate” 9 of the 60 contaminants
- **Regulatory Determinations for CCL 2**
  - Feb 2005 – carried forward 51 remaining CCL 1 contaminants onto CCL 2
  - July 2008 – Published final determination “not to regulate” 11 of the 51 contaminants
- **Regulatory Determinations for CCL 3**
  - Currently gathering available health and occurrence information
  - Held Stakeholder meeting on June 16, 2011 to discuss info and short list
  - Expect to publish preliminary Regulatory Determinations ~ mid-2012
  - Final Regulatory Determinations due mid-2013

# Overall Approach Used to Evaluate CCL 3 Contaminants for Regulatory Determinations



# RegDet 3 Prioritization Process

**CCL 3: 116 Contaminants**



## **Short List of Contaminants Being Considered and Evaluated Further for Regulatory Determinations 3**

- 1,1,1,2-Tetrachloroethane
- 1,2,3-Trichloropropane (TCP)
- 1,3-Dinitrobenzene
- 1,4-Dioxane
- Methyl Tertiary Butyl Ether (MTBE)
- Nitrobenzene
- PFOS and PFOA
- RDX
- Molybdenum
- Strontium
- Vanadium
- Dimethoate
- Disulfoton
- Diuron
- Molinate
- Terbufos and Terbufos Sulfone
- Acetochlor & ESA and OA Degradates
- Alachlor ESA & OA Degradates
- Metolachlor & ESA and OA Degradates
- Chlorate
- Nitrosamines (5)
  - N-nitrosodimethylamine (NDMA)
  - N-nitrosodiethylamine (NDEA),
  - N-nitrosodi-n-propylamine (NDPA)
  - N-nitrosopyrrolidine (NPYR)
  - N-nitrosodiphenylamine (NDPhA)

# Regulatory Determination for Perchlorate

- October 10, 2008 – published FR notice seeking comment on the preliminary determination not to regulate perchlorate
  - Received nearly 33,000 comments
- August 19, 2009 – published Supplemental Request for Comment on alternative analyses for the perchlorate regulatory determination
  - Re-evaluation of perchlorate exposure to additional sensitive life stages, including infants, children, and the fetuses of pregnant women
  - Indicated that these alternative analyses may result in a determination to regulate perchlorate
  - Received over 6,000 comments
- February 2011 – EPA published a final determination to regulate perchlorate in DW
  - This is the first CCL contaminant that EPA has decided to regulate

# **Why has EPA decided to regulate perchlorate in drinking water?**

- EPA has determined that perchlorate meets SDWA's three criteria for regulating a contaminant.
  - 1) Perchlorate may have adverse health effects because scientific research indicates that perchlorate can disrupt the thyroid's ability to produce hormones needed for normal growth and development.
  - 2) There is a substantial likelihood that perchlorate occurs with frequency at levels of health concern in public water systems because monitoring data show over four percent of public water systems have detected perchlorate, and
  - 3) There is a meaningful opportunity to reduce risk for 5.1 to 16.6 million people who may be served drinking water containing perchlorate.



# **EPA's Next Steps for Perchlorate**

- Continue to evaluate the science on perchlorate health effects and occurrence in developing a proposed rule
- Evaluate the feasibility and affordability of treatment technologies to remove perchlorate and will examine the costs and benefits of potential standards
- Consult with our Science Advisory Board and with the National Drinking Water Advisory Council
- Publish the proposed regulation and analyses for public review and comment no later than 2/2013
- Consider the public comments and promulgate a final regulation within 18 months of the proposal. (9 month extension possible under SDWA)

# UCMR 2: Results-to-date

- Monitoring Jan. 2008 – Dec. 2010; reporting to be completed imminently
- 25 contaminants, including brominated flame retardants; nitrosamines; explosives; insecticides, pesticides, degradates
- Results are posted on the Web (NCOD) at:  
<http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/data.cfm>
- 13 of 25 contaminants have not been detected
- Detections above method reporting limits:
  - 5 of 6 nitrosamines (predominantly NDMA)
  - 6 of 11 insecticides/pesticides/degradates
  - 1 of 3 explosives

# UCMR 3

- Proposal signed March 3, 2011
- Final expected March 2012
- Monitoring is planned for 2013-15
- Proposed monitoring for 28 chemicals and 2 pathogens
- Proposal includes hormones, perfluorinated compounds (e.g., PFOS/PFOA), VOCs, metals, 1,4-dioxane, chlorate and pathogens; comments also invited on hexavalent and total chromium (see Appendix F)
- Comment period closed May 2, 2011
  - Comments submitted by 53 stakeholders

# **Endocrine Disruptor Screening Program**

- 1996 Food Quality Protection Act required developing validated methods and screening contaminants for endocrine disrupting activity
- EPA developed first Endocrine Disruptor Screening List (EDSP) list and issued test orders for 67 pesticides
- FY10 House Appropriations Report – EPA to publish list of at least 100 chemicals, including drinking water contaminants, for endocrine disruptor screening

# Second EDSP List

- Nov 2010 – EPA published second ESDP list containing 134 chemicals
- Includes regulated & unregulated drinking water contaminants & pesticide registration review chemicals
- Comment period closed Jan 2011
- After considering comments/information submitted, EPA plans to refine list & develop a schedule for issuing test orders (late 2011)

# **Revisions to the Total Coliform Rule**

- Discussed in a separate presentation

# TCR – Method Evaluation

- TCR Advisory Committee recommended evaluation of all currently approved coliform analytical methods to determine appropriateness
- Stakeholder meetings and teleconferences (May - Nov 2010)
  - Identification of options
  - Development of conceptual approach
    - Comparison against a library of known coliform, *E. coli*, & non-coliform strains
- WRF leading development of library
- EPA following library progress and evaluating next steps (objectives, budget, timing)

# **Lead and Copper Rule (LCR) Revisions**

- Discussed in a separate presentation



# Fluoride

- **2003** – EPA requests NAS to review more recent health and exposure information and on fluoride
- **March 2006** – NAS recommended that EPA update health & exposure assessments to account for bone & dental effects & consider all sources of fluoride
- **Jan 2011** – EPA and HHS announce steps to ensure that standards/guidelines for fluoride continue to provide the maximum protection to the Americans, especially children; actions intended to maximize health benefits of water fluoridation while reducing overexposure in children
  - CDC proposed that recommended optimal fluoridation level (to prevent tooth decay) be set 0.7 mg/L, lowest end of the current range (1.2 to 0.7 mg/L)
  - EPA released two science documents (related to health and exposure) and announced plans to review the maximum amount allowed in drinking water (i.e., the 4.0 mg/L standard) to determine whether to take next steps to revise; no set date on when expect to finalize review

# Chromium

- DW standard is 0.1 mg/L (100 ppb) for Total Cr (1991)
- EPA released IRIS tox review of Cr+6 health effects (Sept 2010)
- When the tox review is final, EPA will review conclusions and other up-to-date scientific findings, and determine if a new/revised Cr standard is needed
- EPA is working with state & local officials to determine prevalence of Cr+6
- EPA issued guidance to water systems on enhanced monitoring and analysis for Cr+6
- Frequently Asked Questions about Cr+6 are available online

# **Expedited Method Approval:**

## **Regulatory Tool**

- Allows approval of “alternate” drinking water analytical methods via streamlined publication in *Federal Register*
- Alternative method shows equally effective performance relative to methods previously approved by regulation
- Approval actions published: Jun 08, Aug 09, Nov 09, Jun 10, June 2011
- The latest action includes a number of consensus organization methods and vendor-developed methods

# Optimization Program:

## Compliance/Implementation Assistance

- Active Area-Wide Optimization Programs (AWOPs) are in 21 states
- Collaborative effort between EPA, States, ASDWA
- Developing new technical tools and implementation approaches
- EPA and States are including optimization of Distribution Systems and Ground Water Systems in AWOP
- Partnership for Safe Water has recently introduced a Distribution Systems Optimization (DSO) component to its program (see [www.awwa.org](http://www.awwa.org))
- 2011 AWOP National Meeting (July 19 & 20), Cincinnati. Designed to enhance networking and collaboration between EPA and AWOP states

# Research

- ORD is in the process of re-structuring their research program
- ORD's new program will include 6 programs:
  1. Safe and Sustainable Water Resources
  2. Chemical Safety for Sustainability
  3. Air, Climate, Energy
  4. Sustainable and Healthy Communities
  5. Human Health Assessment
  6. Homeland Security
- OW has played a role in ORD's re-structuring process
  - We've been involved in numerous strategic planning meetings
  - We've communicated our short and near term drinking water research needs to ORD
- June 2011 - SAB/BOSC review of ORD's research strategy
- October 2011 – Implementation of ORD's new programs

# Appendices

# Appendix A. Unregulated CCL 3 Contaminants

## 106 Chemicals and 12 Microbes

|                                      |                                       |                                      |                                |
|--------------------------------------|---------------------------------------|--------------------------------------|--------------------------------|
| 1,1,1,2-Tetrachloroethane            | Cyanotoxins (3)                       | Molybdenum                           | Triethylamine                  |
| 1,1-Dichloroethane                   | Dicrotophos                           | Nitrobenzene                         | Triphenyltin hydroxide (TPTH)  |
| 1,2,3-Trichloropropane               | Dimethipin                            | Nitroglycerin                        | Urethane                       |
| 1,3-Butadiene                        | Dimethoate                            | N-Methyl-2-pyrrolidone               | Vanadium                       |
| 1,3-Dinitrobenzene                   | Disulfoton                            | N-Nitrosodiethylamine (NDEA)         | Vinclozolin                    |
| 1,4-Dioxane                          | Diuron                                | N-nitrosodimethylamine (NDMA)        | Ziram                          |
| 17 alpha-Estradiol                   | Equilenin                             | N-Nitroso-di-n-propylamine (NDPA)    |                                |
| 1-Butanol                            | Equilin                               | N-Nitrosodiphenylamine               | Adenovirus                     |
| 2-Methoxyethanol                     | Erythromycin                          | N-nitrosopyrrolidine (NPYR)          | Caliciviruses                  |
| 2-Propen-1-ol                        | Estradiol (17-beta)                   | Norethindrone (19-Norethisterone)    | <i>Campylobacter jejuni</i>    |
| 3-Hydroxycarbofuran (degrade)        | Estriol                               | n-Propylbenzene                      | Enterovirus                    |
| 4,4'-Methylenedianiline              | Estrone                               | o-Toluidine                          | <i>Escherichia coli (0157)</i> |
| Acephate                             | Ethinyl Estradiol (17-alpha)          | Oxirane, methyl-                     | <i>Helicobacter pylori</i>     |
| Acetaldehyde                         | Ethoprop                              | Oxydemeton-methyl                    | Hepatitis A virus              |
| Acetamide                            | Ethylene glycol                       | Oxyfluorfen                          | <i>Legionella pneumophila</i>  |
| Acetochlor                           | Ethylene oxide                        | Perchlorate                          | <i>Mycobacterium avium</i>     |
| Acetochlor ethanesulfonic acid (ESA) | Ethylene thiourea                     | Perfluorooctane sulfonic acid (PFOS) | <i>Naegleria fowleri</i>       |
| Acetochlor oxanilic acid (OA)        | Fenamiphos                            | Perfluorooctanoic acid (PFOA)        | <i>Salmonella enterica</i>     |
| Acrolein                             | Formaldehyde (formerly)               | Permethrin                           | <i>Shigella sonnei</i>         |
| Alachlor ethanesulfonic acid (ESA)   | Germanium                             | Profenofos                           |                                |
| Alachlor oxanilic acid (OA)          | Halon 1011 (Bromochloromethane)       | Quinoline                            |                                |
| alpha-Hexachlorocyclohexane (former) | HCFC-22                               | RDX                                  |                                |
| Aniline                              | Hexane                                | sec-Butylbenzene                     |                                |
| Bensulide                            | Hydrazine                             | Strontium                            |                                |
| Benzyl chloride                      | Mestranol                             | Tebuconazole                         |                                |
| Butylated hydroxyanisole             | Methamidophos                         | Tebufenozide                         |                                |
| Captan                               | Methyl bromide (Bromomethane)         | Tellurium                            |                                |
| Chlorate (also D-DBP)                | Methyl tert-butyl ether               | Terbufos                             |                                |
| Chloromethane (Methyl chloride)      | Metolachlor                           | Terbufos sulfone                     |                                |
| Clethodim                            | Metolachlor ethanesulfonic acid (ESA) | Thiodicarb                           |                                |
| Cobalt                               | Metolachlor oxanilic acid (OA)        | Thiophanate-methyl                   |                                |
| Cumene hydroperoxide                 | Molinate                              | Toluene diisocyanate                 |                                |
|                                      |                                       | Tribufos                             |                                |

## Appendix B. General Approach for Evaluating the Regulatory Determination Statutory Criteria

| # | Statutory Criteria                                                                  | Information To Consider During Evaluation                                                                                                                                                                                                                                                                                                                                                                                                            |
|---|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Adverse effect on the health of humans?</b>                                      | <ul style="list-style-type: none"> <li>• Potential adverse health effect(s) (e.g. cancer, thyroid, liver damage) and level at which effect occurs (i.e. level of concern)</li> </ul>                                                                                                                                                                                                                                                                 |
| 2 | <b>Known or likely to occur in PWSs at a frequency and level of concern?</b>        | <ul style="list-style-type: none"> <li>• National monitoring data from PWSs and whether it occurs in drinking water at the health level of concern</li> <li>• Other sources of information (e.g. state water system data, levels in source waters, how much is used/produced, etc)</li> </ul>                                                                                                                                                        |
| 3 | <b>Meaningful opportunity for health risk reduction for persons served by PWSs?</b> | <p>Consider variety of factors which include:</p> <ul style="list-style-type: none"> <li>• Number of people who may be exposed to the contaminant from drinking water (served by PWSs)</li> <li>• Sensitive populations (e.g. children, elderly, compromised immune systems)</li> <li>• National versus local occurrence in drinking water</li> <li>• Exposure from water versus other sources (e.g. food, air); primarily for non-cancer</li> </ul> |



# Appendix D

## Key Elements of Six-Year Review Protocol

| Review Element                    | Purpose of Review Element                                                                                                                                                                                                                      |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Health Effects</b>             | <ul style="list-style-type: none"> <li>• Identify potential changes that could impact the Maximum Contaminant Level Goal (MCLG)</li> </ul>                                                                                                     |
| <b>Analytical Methods</b>         | <ul style="list-style-type: none"> <li>• Identify potential changes in “analytical feasibility” - analytes where the Maximum Contaminant Level (MCL) is set at feasible level of measurement or where a non-zero MCLG may decrease.</li> </ul> |
| <b>Treatment Technology</b>       | <ul style="list-style-type: none"> <li>• Identify treatment feasibility for contaminants with potentially lower MCLG/MCL.</li> <li>• Identify whether potential changes for Treatment Technique (TT) contaminants</li> </ul>                   |
| <b>Occurrence</b>                 | <ul style="list-style-type: none"> <li>• Identify extent of occurrence/exposure at current MCL and other potential MCLs</li> </ul>                                                                                                             |
| <b>Other Regulatory Revisions</b> | <ul style="list-style-type: none"> <li>• Identify non-MCLG/MCL or non-TT types of changes that are contaminant-specific and not being addressed through alternative mechanisms. Typically implementation-related issues</li> </ul>             |

# Appendix E - Six Year Review 2 - 71 NPDWRs

|                                    |                                    |                                  |
|------------------------------------|------------------------------------|----------------------------------|
| Acrylamide                         | 1,1-Dichloroethylene               | Methoxychlor                     |
| Alachlor                           | cis-1,2-Dichloroethylene           | Monochlorobenzene                |
| Antimony                           | trans-1,2-Dichloroethylene         | Nitrate (as N)                   |
| Arsenic                            | Dichloromethane                    | Nitrite (as N)                   |
| Asbestos                           | 1,2-Dichloropropane                | Oxamyl (Vydate)                  |
| Atrazine                           | Di(2-ethylhexyl)adipate (DEHA)     | Pentachlorophenol                |
| Barium                             | Di(2-ethylhexyl) phthalate (DEHP)  | Picloram                         |
| Benzene                            | Dinoseb                            | Polychlorinated biphenyls (PCBs) |
| Benzo[a]pyrene                     | Diquat                             | Selenium                         |
| Beryllium                          | Endothall                          | Simazine                         |
| Cadmium                            | Endrin                             | Styrene                          |
| Carbofuran                         | Epichlorohydrin                    | 2,3,7,8-TCDD (Dioxin )           |
| Carbon tetrachloride               | Ethylbenzene                       | Tetrachloroethylene              |
| Chlordane                          | Ethylene dibromide (EDB)           | Thallium                         |
| Chromium (total)                   | Fluoride                           | Toluene                          |
| Cyanide                            | Glyphosate                         | Toxaphene                        |
| 2,4-D                              | Heptachlor                         | 2,4,5-TP (Silvex)                |
| Dalapon                            | Heptachlor epoxide                 | 1,2,4-Trichlorobenzene           |
| 1,2-Dibromo-3-chloropropane (DBCP) | Hexachlorobenzene                  | 1,1,1-Trichloroethane            |
| 1,2-Dichlorobenzene                | Hexachlorocyclopentadiene          | 1,1,2-Trichloroethane            |
| 1,4-Dichlorobenzene                | Lindane                            | Trichloroethylene                |
| 1,2-Dichloroethane                 | Mercury (inorganic)                | Vinyl chloride                   |
| Gross alpha                        | Beta particles and photon emitters | Xylenes (total)                  |
| Radium 226 and 228 Combined        |                                    | Uranium                          |

# Appendix F. Contaminants on the Second Unregulated Contaminant Monitoring Regulation (UCMR 2)

## 10 Assessment Monitoring

- 3 Explosive
  - hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
  - 2,4,6-trinitrotoluene (TNT)
  - 1,3-dinitrobenzene
- 7 Insecticides and Flame Retardants
  - Dimethoate
  - Terbufos sulfone
  - **5 Brominated Flame Retardants**

## 15 Screening Survey

- 9 Acetanilide pesticides/degradation products
  - **Acetochlor**
  - **Acetochlor ESA**
  - **Acetochlor OA**
  - **Alachlor**
  - **Alachlor ESA**
  - **Alachlor OA**
  - **Metolachlor**
  - **Metolachlor ESA**
  - **Metolachlor OA**
- 6 Nitrosamines
  - **N-nitroso-diethylamine (NDEA)**
  - **N-nitroso-dimethylamine (NDMA)**
  - **N-nitroso-di-n-butylamine (NDBA)**
  - **N-nitroso-di-n-propylamine (NDEA)**
  - **N-nitroso-methylethylamine (NMEA)**
  - **N-nitroso-pyrrolidine (NPYR)**

# Appendix G

## UCMR 3 – Contaminants Proposed

- Pharmaceuticals (EPA Method 539)
  - 17- $\alpha$ -Ethinylestradiol
  - 17- $\beta$ -Estradiol
  - Equilin
  - Estriol
  - Estrone
  - Testosterone
  - 4-Androstene-3,17-dione
- Metals (EPA Method 200.8)
  - Cobalt
  - Molybdenum
  - Strontium
  - Vanadium
- Volatile Organic Compounds (EPA Method 524.3)
  - 1,1-Dichloroethane
  - 1,2,3-Trichloropropane
  - 1,3-Butadiene
  - Bromochloromethane
  - Chlorodifluoromethane
  - Chloromethane
  - Methyl bromide
  - n-Propylbenzene
  - Sec-Butylbenzene
- EPA Method 522
  - 1,4-Dioxane
- EPA Method 300.1
  - Chlorate

# Appendix G (cont)

## UCMR 3 – Contaminants Proposed

- Microbials
  - 2 viruses
    - Enterovirus (qPCR & cell culture)
    - Norovirus (qPCR)
  - “Indicator organisms”
    - Total coliform
    - *E. coli*
    - Enterococci
    - Coliphage
    - Aerobic spores
- Perfluorinated Chemicals (EPA Method 537)
  - Perfluorooctane sulfonate (PFOS)
  - Perfluorooctanonic acid (PFOA)
  - Perfluoroheptanoic acid (PFHpA)
  - Perfluorononanoic acid (PFNA)
  - Perfluorobutane sulfonic acid (PFBS)
  - Perfluorohexane sulfonic acid (PFHxS)

# **Appendix H**

## **Expedited Methods - Actions**

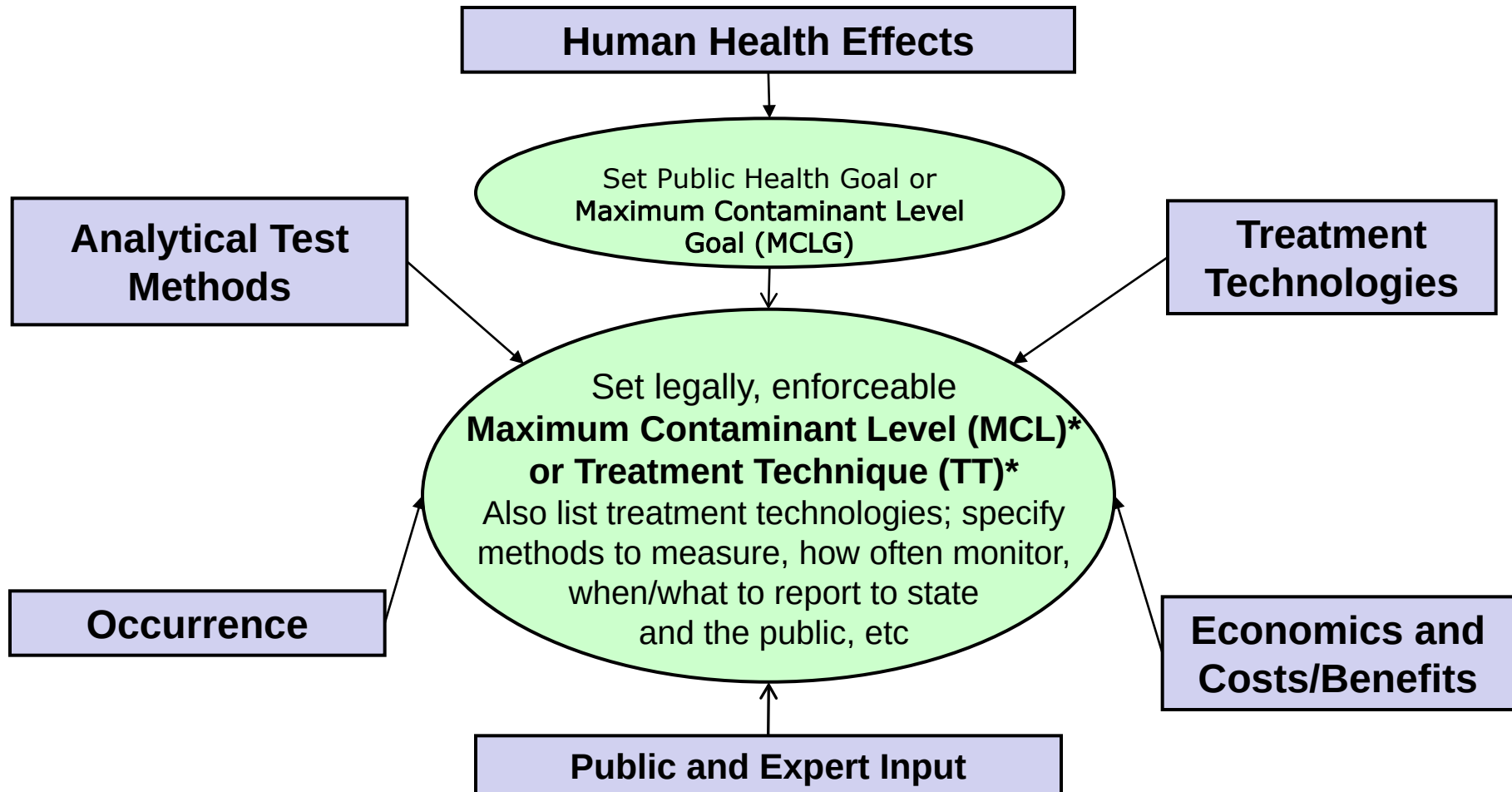
- **June 8, 2008**
  - One EPA method
  - One vendor method
  - 97 voluntary consensus body methods
- **August 3, 2009**
  - One EPA method
  - Five vendor methods
- **November 10, 2009**
  - Four EPA methods
  - Three vendor methods
  - 18 voluntary consensus body methods
- **June 8, 2010**
  - One EPA method
  - Three vendor methods
  - Eight voluntary consensus body methods
- **June 24, 2011**
  - Two vendor methods
  - Nine voluntary consensus body methods

# Appendix I

## Expedited Methods Approvals - Actions

| <u>Methods<br/>Approved</u>    | <u>6 Jun 08</u> | <u>3 Aug 09</u> | <u>10 Nov 09</u> | <u>8 Jun 10</u> | <u>24 Jun 11</u> |
|--------------------------------|-----------------|-----------------|------------------|-----------------|------------------|
| EPA                            | 1               | 1               | 4                | 1               |                  |
| Vendor                         | 1               | 5               | 3                | 3               | 2                |
| Voluntary<br>Consensus<br>Body | 97              |                 | 18               | 8               | 9                |

# Appendix J - What Factors Do We Consider and How Do We Develop Standards?



\* **Maximum Contaminant Level (MCL)** - the highest level or amount of a contaminant that EPA allows in drinking water.

\***Treatment Technique (TT)** – a prescribed process intended to reduce the level of a contaminant in drinking water.



# Appendix K - Examples of Currently Regulated Groups

- **Gross Alpha\*** (essentially group MCLG and MCL)
  - MCLG = Zero (carcinogens); MCL = 15 pCi/L (based on feasibility and risk)
  - Measure “gross alpha” with a single method to determine if exceed MCL
  - If exceed 15 pCi/L MCL, then measure uranium
  - Subtract uranium from gross alpha, if still exceed, then speciate to find culprit(s)
- **Beta Photon/Particle Emitters\*\*** (also group MCLG and MCL)
  - MCLG = zero (carcinogens); MCL = 4 mrem/yr (dose)
  - Measure gross beta/photon emitters (allowed to subtract Potassium 40)
  - If screening level (pCi/L) is exceeded; then speciate to find culprit(s)
- **Haloacetic Acids (HAA 5)**
  - Individual MCLGs for some; Group MCL = 0.06 mg/L
  - Measure and add individually to determine if exceed MCL
- **Viruses**
  - MCLG = zero; Specifies Treatment Technique

Common Health  
One Method

Common Health  
One Method

Common Method  
Common Control Process

Common Control  
Process

•Covers ~ 58 alphas (if don't include the short lived alphas)

\*\* Covers ~179 individual beta and photon emitters; EPA could have established individual MCLGs of zero for each one but concluded that “despite differences in radiation type, energy, or half-life, the health effects from radiation are identical, although they may occur in different target organs and at different activity levels” (56 FR 33050, July 18 1991 at p. 33079).



# **NDWAC Consultation The Revised Total Coliform Rule**



**NDWAC Meeting  
July 21, 2011**



**Pamela Barr**

**USEPA Office of Ground Water and Drinking Water**

# Objectives of the Consultation

- Provide background on the Total Coliform Rule (TCR)
- Summarize the Proposed Revisions to the Total Coliform Rule (RTCR)
- Summarize the NDWAC recommendations on the proposed RTCR from the 2009 consultation
- Discuss public comments received on other issues
- Discuss EPA actions to address NDWAC recommendations and comments received on them

# Background on TCR

- Published 1989, effective 1990
- The only microbial drinking water regulation that applies to all public water systems (PWSs)
  - 52,000 community water systems (CWS)
  - 19,000 non-transient non-community water systems (NTNCWS) – schools, factories
  - 85,000 transient non-community water systems (TNCWS) – restaurants, gas stations, parks
- Rule objectives:
  - Ensure integrity of the distribution system,
  - Indicate effectiveness of treatment, and
  - Indicate possible fecal contamination

# History of RTCR

- **SIX YEAR REVIEW** - SDWA requires EPA to review and revise, as appropriate, each National Primary Drinking Water Regulation no less often than every 6 years. Any revision shall maintain or improve public health protection. EPA decided to review and revise the Total Coliform Rule (TCR).
- **ADVISORY COMMITTEE** - EPA convened the Total Coliform Rule Distribution System Federal Advisory Committee (TCRDSAC), consisting of 15 organizations. (July 2007)
- **AGREEMENT IN PRINCIPLE** - TCRDSAC deliberations concluded with a signed Agreement in Principle (AIP) that included recommended revisions to the TCR. (September 2008)
- **PROPOSED RULE** - EPA proposed the RTCR, which has the same substance and effect as the TCRDSAC recommendations. (July 14, 2010) Comment period closed. (October 13, 2010)
- **FINAL RULE** - Expected Spring/Summer 2012

# NDWAC Consultation Process

- EPA presented a summary of the AIP to NDWAC at a November 2008 NDWAC meeting
- EPA consulted with NDWAC on May 27 - 28, 2009 in Seattle Washington.
  - Consultation questions concerned implementation challenges, guidance, and public notification language (see Appendix).
- EPA met with a group of NDWAC members to further discuss public notification requirements (July 1, 2009).
- The Safe Drinking Water Act (SDWA) requires consultation again before publishing the final RTCR.

# Summary of the Proposed RTCR

- Emphasizes investigation and corrective action based on monitoring results
- Rewards well operated systems with reduced monitoring
- Reduces public notification (PN) where there is no imminent health threat

# RTCR

- Overall shift in focus
  - From: monitoring results informing public notification
  - To: monitoring results informing investigation and corrective action
- Benefits
  - More proactive approach to public health protection
  - Reduction in confusion associated with PN for total coliform (TC) violations



# RTCR Construct

- Uses Total Coliform (TC) as part of an overall Treatment Technique (TT)
  - No Maximum Contaminant Level Goal (MCLG) or Maximum Contaminant Level (MCL) for TC
  - TC threshold exceedance triggers assessment and corrective action (of any defect found)
  - TT violation if assessment or corrective action is not completed
- MCLG and MCL = 0 for E.coli
- Public Notification for TT violations or acute MCL violations

# Changes in Monitoring

- Systems serving  $\leq 1,000$ 
  - New criteria for increased and reduced monitoring
  - Transition with existing monitoring frequency unless primacy agency determines otherwise
  - Decrease in number of additional routine monitoring and repeat monitoring samples
- Systems serving  $> 1,000$ 
  - No changes in routine monitoring
  - Decrease repeat monitoring and eliminate additional routine monitoring (currently applies to systems serving  $\leq 4,100$  only)
- More flexibility in sample siting plans

# Assessments

- Proactively enhance public health
  - Identify sanitary defects
  - Identify incorrect monitoring practices
- PWS is typically responsible for assessment
  - Strengthen capacity to ensure barriers are in place and effective
- Two levels of assessment (Level 1 and Level 2) based on severity of trigger

# Corrective Action

- Systems must correct all sanitary defects found in the assessment
- Sanitary defect defined as
  - “a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.”

# NDWAC Comments – Education

- Education: EPA should provide utilities and States with tools to help them understand the revised rule provisions and assist with providing public education.
- EPA Actions:
  - Hosted a stakeholder meeting, Washington DC (May 2010)
    - Topics included plans for RTCR guidance
  - Held public Information meetings (3) and webcast (August 2010)
    - Topics included core elements of proposed RTCR, Assessments and Corrective Action, and plans for guidance
  - Developed the Assessment and Corrective Action (A/CA) Guidance – Draft posted for public comment (Aug. – Dec. 2010)
  - Final A/CA guidance and other final technical and implementation guidance will be completed working with stakeholders (representing States and public water systems).

# Education, Training, and Guidance

Planned education, training and guidance on RTCR will include those activities and products typically prepared for final rules, including:

- Presentations about rule requirements at conferences and meetings
- Training for EPA regions and State trainers
- Small systems guidance materials
- Fact sheets and quick reference guides
- Sampling guidance
- Primacy, Implementation, and Sanitary Survey guidance for States

# NDWAC Comments – Monitoring

- Reduction in number of samples taken (e.g. repeat/additional routine for small systems): NDWAC expressed concern that this could lessen the opportunity for systems to identify violations.
  
- EPA Actions:
  - Preamble to the proposed RTCR (Vol. 75, No. 134, July 14, 2010, page 40998) included a request for comment:  
“EPA is requesting comment on the cost and benefit of reduced monitoring”
  - Some commenters expressed concern about any reductions in monitoring
  - Most commenters were in favor of the revised rule construct of RTCR and the tradeoffs achieved between the addition of assessment and corrective action and allowances for reduced monitoring.
  - EPA is addressing comments received as the final RTCR is being developed.

# NDWAC Comments – Public Notification

- Public Notification (PN):
  - A NDWAC subgroup met with EPA to discuss PN requirements of the RTCR relating to required health effects language and PN requirements under the Ground Water Rule.
- EPA Actions:
  - Preamble to the proposed RTCR (Vol. 75, No. 134, July 14, 2010, pages 40947 and 40998) included request for comment
  - EPA considered the subgroup comments when drafting the PN requirements of the RTCR.
  - Most commenters were in favor of the reductions in public notification in the proposed RTCR.
  - Most agreed that the health effects language should emphasize the value of total coliforms as an indicator of potential pathways of contamination but not an indicator of imminent health threat.
  - EPA is addressing comments received as the final RTCR is being developed.



# Environmental Justice and Small Systems

EPA efforts to assure consideration of EJ and small systems:

- TCR Advisory Committee offered opportunities for public comment at each meeting. Membership represented 15 stakeholder groups. (see Appendix).
- EPA consulted with Tribal governments through the EPA American Indian Environmental Office, a mailing, and three tribal workgroup conference calls.
- EPA convened a Small Business Advocacy Review Panel to consider and address economic impact of the rule on small entities.
- EPA requested comment on whether there are any specific EJ considerations that EPA should analyze and consider. No specific considerations were identified.

# Other Comments on Proposed RTCR

- 134 rule comment letters
  - AWWA, AMWA, NRWA, ASDWA, 23 states, CWA, NRDC
- Comment period is closed: EPA is reviewing and addressing the comments received in the final rule
- Rule Construct
  - Most comments supported moving from an MCL to a TT for TC and adding assessment & corrective action requirements
  - Some states favored keeping the current rule due to concerns with implementation, possible reduced public health benefit of reductions in monitoring and PN

# Comments on the Proposed RTCR (2)

## ■ State implementation burden concerns

- A few States say they cannot implement the rule as proposed
- 38% of the NCWSs are in R5 states
- They are concerned that all NCWSs will eventually trigger into increased monthly monitoring; monitoring, tracking and enforcement will take state resources from other priorities
- Some states pay for analysis; may not continue. Direct reporting to the State would be jeopardized
- A few States say removing TC MCL and PN will result in delayed action by PWS to correct problems
- Some say complying with both the Ground Water Rule (GWR) and RTCR will be difficult because of multiple requirements
- Many States said revisions to the Safe Drinking Water Information System must be completed in time for implementation

# Comments on Storage Tank Inspection & Cleaning

- TCR Advisory Committee recommended additional research and information collection on storage issues
- EPA and the Water Research Foundation convened a Research Partnership that identified storage as a high priority issue with some information and research needs.
- EPA requested comment on tank conditions, costs, state requirements, and how to better protect public health
- Some strongly suggested cleaning & inspection requirements based on outbreak histories and conditions found in tanks – long periods w/o cleaning, large amounts of sediment, dead animals
  - In some states, surveyors are restricted from climbing tanks
  - Limits on what can be seen from the ground and from outside
  - Guidance does not have the weight of regulation
- Some said that current sanitary survey requirements and guidance are adequate, research & information collection should continue
  - Cost to clean & inspect: \$1,000 - 10,000 depends on tank size & type

# RTCR – Next Steps

- Continue to evaluate comments
- Expect to publish final rule ~ mid-2012

# Appendix

# Public Water System Inventory Data

| System Type                 |                    | 1,000 or less   | 1,001-10,000 | > 10,000    | Total       |
|-----------------------------|--------------------|-----------------|--------------|-------------|-------------|
| Community Water Systems     | # of systems       | 35,517<br>(22%) | 13,017       | 4,100       | 52,634      |
|                             | Pop. served        | 9,235,319       | 43,257,943   | 233,803,382 | 286,296,644 |
| Non-Transient Non-Community | # of systems       | 18,253<br>(12%) | 902          | 23          | 19,178      |
|                             | Pop. served        | 3,651,750       | 1,895,831    | 736,845     | 6,284,426   |
| Transient Non-Community     | # of systems       | 85,397<br>(54%) | 782          | 18          | 86,197      |
|                             | Pop. served        | 8,847,216       | 1,709,623    | 3,293,662   | 13,850,501  |
|                             | Total # of systems | 139,167         | 14,701       | 4,141       | 158,009     |

# Current TCR and Proposed RTCR Monitoring Requirements

| Public Water System ROUTINE Monitoring Frequencies                               |                        |                 |                        |                     |                        |
|----------------------------------------------------------------------------------|------------------------|-----------------|------------------------|---------------------|------------------------|
| Population                                                                       | Minimum Samples/ Month | Population      | Minimum Samples/ Month | Population          | Minimum Samples/ Month |
| 25-1,000*                                                                        | 1                      | 21,501-25,000   | 25                     | 450,001-600,000     | 210                    |
| 1,001-2,500                                                                      | 2                      | 25,001-33,000   | 30                     | 600,001-780,000     | 240                    |
| 2,501-3,300                                                                      | 3                      | 33,001-41,000   | 40                     | 780,001-970,000     | 270                    |
| 3,301-4,100                                                                      | 4                      | 41,001-50,000   | 50                     | 970,001-1,230,000   | 300                    |
| 4,101-4,900                                                                      | 5                      | 50,001-59,000   | 60                     | 1,230,001-1,520,000 | 330                    |
| 4,901-5,800                                                                      | 6                      | 59,001-70,000   | 70                     | 1,520,001-1,850,000 | 360                    |
| 5,801-6,700                                                                      | 7                      | 70,001-83,000   | 80                     | 1,850,001-2,270,000 | 390                    |
| 6,701-7,600                                                                      | 8                      | 83,001-96,000   | 90                     | 2,270,001-3,020,000 | 420                    |
| 7,601-8,500                                                                      | 9                      | 96,001-130,000  | 100                    | 3,020,001-3,960,000 | 450                    |
| 8,501-12,900                                                                     | 10                     | 130,001-220,000 | 120                    | ≥ 3,960,001         | 480                    |
| 12,901-17,200                                                                    | 15                     | 220,001-320,000 | 150                    |                     |                        |
| 17,201-21,500                                                                    | 20                     | 320,001-450,000 | 180                    |                     |                        |
| *Includes PWSs which have at least 15 service connections, but serve <25 people. |                        |                 |                        |                     |                        |



# TCRDSAC Membership (1 of 2)

| Organization                                             | Representative                                            |
|----------------------------------------------------------|-----------------------------------------------------------|
| National Rural Water Association                         | David Baird<br>City of Milford, DE                        |
| Native American Water Association                        | Thomas Crawford<br>Native American Water Association      |
| US Environmental Protection Agency                       | Cynthia Dougherty<br>USEPA, OGWDW                         |
| Environmental Council of the States                      | Patti Fauver<br>Utah Department of Environmental Quality  |
| National Association of State Utility Consumer Advocates | Christine Maloni Hoover<br>PA Office of Consumer Advocate |
| American Water Works Association                         | Carrie Lewis<br>Milwaukee Department of Public Works      |
| National Association of Water Companies                  | Mark LeChevallier<br>American Water                       |
| Council of State and Territorial Epidemiologists         | John Neuberger<br>University of Kansas Medical Center     |

# TCRDSAC Membership (2 of 2)

| Organization                                       | Representative                                                   |
|----------------------------------------------------|------------------------------------------------------------------|
| Rural Community Assistance Partnership             | Harvey Minnigh<br>RCAP Solutions Inc.                            |
| Association of State Drinking Water Administrators | Jerry Smith<br>Minnesota Department of Health                    |
| Clean Water Action                                 | Lynn Thorp<br>Clean Water Action                                 |
| National League of Cities                          | Bruce Tobey<br>City of Gloucester, MA                            |
| National Environmental Health Association          | Bob Vincent<br>Florida Department of Health                      |
| Association of Metropolitan Water Agencies         | David Visintainer<br>City of St. Louis Dept. of Public Utilities |
| Natural Resources Defense Council                  | Mae Wu<br>Natural Resources Defense Council                      |

# **Current TCR vs. Proposed RTCR**

# Rule Construct

| Current TCR                                                                                                                                                                                                                                                                                                           | Proposed RTCR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Sections 141.52 (MCLGs), 141.63 (MCLs )</i></p> <ul style="list-style-type: none"> <li>• TC MCLG of zero. TC monthly MCL based on the number of TC(+) samples in a month</li> <li>• Acute MCL based on Fecal Coliform /EC(+) samples</li> <li>• Public Notification (PN) required for MCL violations</li> </ul> | <p><i>Sections 141.52 (MCLGs), 141.63 (MCLs), 141.859 (TT)</i></p> <ul style="list-style-type: none"> <li>• TC triggers assessment and corrective action (A/CA).</li> <li>• <i>E. coli</i> MCLG of zero and an MCL based on TC/<i>E. coli</i> monitoring results (Fecal coliform is no longer used)</li> <li>• PN required for a TT violation (failure to conduct A/CA)</li> <li>• PN required for <i>E. coli</i> MCL violations</li> <li>• PN not required for only TC(+) results</li> </ul> |

# Level 1 Assessment

| <b>Current TCR</b> | <b>Proposed RTCR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None required      | <p data-bbox="394 432 666 464"><i>Section 141.859</i></p> <p data-bbox="394 501 643 561"><b>Triggers:</b></p> <ul data-bbox="430 582 1750 953" style="list-style-type: none"><li data-bbox="430 582 1750 689">• For a system collecting at least 40 samples per month, more than 5.0% of samples collected are TC(+)</li><li data-bbox="430 711 1750 818">• For a system collecting fewer than 40 samples per month, more than one sample is TC(+)</li><li data-bbox="430 839 1750 953">• The PWS fails to take every required repeat sample after any single routine total coliform-positive sample.</li></ul> <p data-bbox="394 975 759 1035"><b>Assessment:</b></p> <ul data-bbox="430 1056 1721 1239" style="list-style-type: none"><li data-bbox="430 1056 1721 1110">• Conducted by the PWS</li><li data-bbox="430 1132 1721 1239">• A basic examination of the source water, treatment, distribution system and relevant operational practices</li></ul> |

# Level 2 Assessment

| Current TCR   | Proposed RTCR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None required | <p data-bbox="407 422 683 458"><i>Section 141.859</i></p> <p data-bbox="407 486 658 551"><b>Triggers:</b></p> <ul data-bbox="446 572 1769 1200" style="list-style-type: none"><li data-bbox="446 572 1769 629">• Violation of the Proposed RTCR MCL for <i>E. coli</i><ol data-bbox="537 629 1769 1001" style="list-style-type: none"><li data-bbox="537 629 1769 715">1. The system has an <i>E. coli</i> (+) repeat sample following a TC (+) routine sample.</li><li data-bbox="537 715 1769 801">2. The system has a TC (+) repeat sample following an <i>E. coli</i> (+) routine sample.</li><li data-bbox="537 801 1769 886">3. The system fails to take all required repeat samples following an <i>E. coli</i> (+) routine sample.</li><li data-bbox="537 886 1769 1001">4. The system fails to test for <i>E. coli</i> when any repeat sample tests (+) for TC.</li></ol></li><li data-bbox="446 1015 1450 1072">• Two Level 1 triggers in a 12 month period</li><li data-bbox="446 1086 1769 1200">• For NCWS (GW) serving <math>\leq 1,000</math> on annual monitoring, a Level 1 trigger in each of 2 consecutive years</li></ul> |

# Level 2 Assessment (cont'd.)

| Current TCR   | Proposed RTCR                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None required | <p data-bbox="614 565 890 601"><i>Section 141.859</i></p> <p data-bbox="614 629 1205 686">Level 2 Assessment:</p> <ul data-bbox="678 715 1721 1065" style="list-style-type: none"><li data-bbox="678 715 1721 879">•Conducted by the State or a party approved by the State (could be the PWS if qualified and approved by the State)</li><li data-bbox="678 901 1721 1065">•A more in-depth examination of the system and its monitoring and operational practices</li></ul> |

# Assessment Elements – Levels 1 and 2

| <b>Current<br/>TCR</b> | <b>Proposed RTCR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None<br>required       | <p data-bbox="407 389 683 425"><i>Section 141.859</i></p> <ul data-bbox="407 461 1760 1273" style="list-style-type: none"><li data-bbox="407 461 1760 658">• Atypical events that may affect distributed water quality or indicate that distributed water quality was impaired</li><li data-bbox="407 686 1760 883">• Changes in distribution system maintenance and operation that may affect distributed water quality, including water storage</li><li data-bbox="407 912 1760 1039">• Source and treatment considerations that bear on distributed water quality</li><li data-bbox="407 1068 1437 1125">• Existing water quality monitoring data</li><li data-bbox="407 1153 1760 1273">• Inadequacies in sample sites, sampling protocol, and sample processing</li></ul> |



# Corrective Action

| <b>Current TCR</b> | <b>Proposed RTCR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None required      | <p data-bbox="407 375 681 411"><i>Section 141.859</i></p> <ul data-bbox="407 446 1779 1218" style="list-style-type: none"><li data-bbox="407 446 1779 561">• The PWS must correct all sanitary defects found during the assessment</li><li data-bbox="407 596 1779 775">• Sanitary defects and corrective actions must be described in the assessment form the PWS must submit to the State within 30 days of the assessment trigger</li><li data-bbox="407 811 1779 989">• A timetable for any corrective actions not already completed must also be in the form. The State will determine a schedule after consulting with the PWS</li><li data-bbox="407 1025 1779 1132">• The form may also indicate that no sanitary defects were found</li><li data-bbox="407 1168 1779 1218">• The State determines if the assessment is sufficient</li></ul> |

# Violations, PN, and Consumer Confidence Reports (CCR)

| Current TCR                                                                                                                                                                                                                                                                                                          | Proposed RTCR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Section 141.63, Subpart O, Subpart Q</i></p> <ul style="list-style-type: none"> <li>• Violation of EC/FC MCL – acute violation, Tier 1 PN</li> <li>• Violation of monthly TC MCL – Tier 2 PN</li> <li>• M&amp;R violation – Tier 3 PN</li> <li>• PWS must notify State re: single EC/FC (+) result.</li> </ul> | <p><i>Section 141.860(a); Sections 141.202, 203, 204, and Appendices A and B ; Section 141.153 and Appendix A</i></p> <ul style="list-style-type: none"> <li>• Violation of EC MCL – Tier 1 PN <ul style="list-style-type: none"> <li>▪ Failure to take repeat samples following an EC (+) routine sample is also an MCL violation</li> <li>▪ PWS must notify State re: single EC (+) result</li> </ul> </li> <li>• Monthly TC MCL violation is dropped – triggers Assessment and Corrective Action (A/CA) instead</li> <li>• A TT violation occurs when a PWS fails to conduct required A or CA – Tier 2 PN</li> <li>• M&amp;R violations will be tracked separately – Tier 3 PN</li> <li>• PN/CCR Language - TC health effects language changed to reflect failure to conduct A or CA</li> </ul> |

# **State Burden**

# State Burden Decreases & Efficiencies

- Less tracking of PN and responding to inquiries about it
- GWR will lead to correction of deficiencies, and therefore fewer TC(+) and violations
- GWR activities can be used to meet RTCR requirements
- Sanitary survey can be used to review requirements, substitute as a level 2 assessment
- RTCR will result in better system performance over time, leading to fewer TC(+) and violations
- Some assessment and corrective action are being done already; the burden increase from RTCR will not be as great as it might seem

# State Burden Increases

- Tracking increased and decreased monitoring
- One time review of revised sample siting plans for repeat monitoring locations or SOP, as needed
- Reviewing monitoring frequency and storage tank cleaning and inspection at each sanitary survey
- Level 1 assessments: difference between reviewing and tracking PN vs. reviewing and tracking assessment and corrective action (including those taking > 30 days)
- Level 2 assessments: conducting and/or tracking assessment and corrective action (including those taking > 30 days)
- Reviewing and tracking seasonal system requirements
- One time burden of training for the rule revisions (as is associated with all new rules)



# **Consultation: Lead and Copper Rule Revisions**

**National Drinking Water Advisory Council Meeting**

**EPA Region 9**

**San Francisco, CA**

**July 21-22, 2011**

# Purpose & Overview

## **Purpose:**

- To obtain input on key areas of the Lead and Copper Rule Long-term Rule Revisions

## **Overview:**

- Background
- Key areas for rule revisions
- Next steps

# Lead and Copper Rule (LCR) Background

- National Primary Drinking Water Regulation promulgated **June 7, 1991**
  - Addresses corrosion of lead and copper into drinking water
    - primarily from service lines and household plumbing
  - Maximum Contaminant Level Goals
    - Lead – 0 µg/L
    - Copper – 1.3 mg/L [1300 µg/L]
  - Requires tap sampling at sites most likely to have elevated lead levels. Tap sampling results are compared to an action level
    - Lead (Pb) - 15 µg/L
    - Copper (Cu) - 1.3 mg/L
  - Requires a treatment technique (optimized corrosion control, OCCT) rather than a Maximum Contaminant Level
  - Action level (AL) for lead is a screen for optimal corrosion control effectiveness. It is based on treatment feasibility.



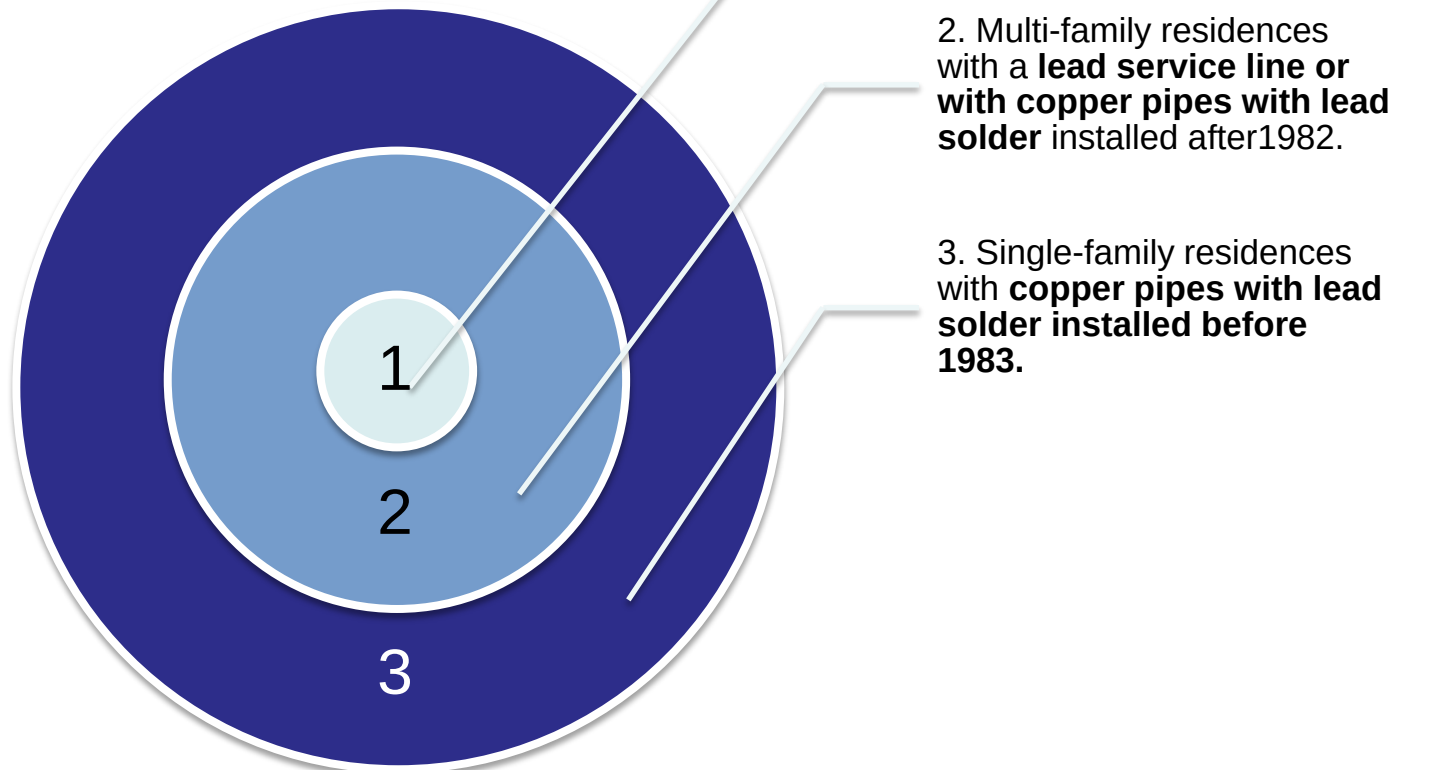
# LCR Background: Actions Triggered

- If the 90<sup>th</sup> percentile of a systems lead or copper sampling results exceeds the action level a system must:
  - Optimize corrosion control treatment,
    - Identify and install optimal corrosion control treatment
    - Comply with State-specified optimal water quality parameters
  - Conduct Public Education
    - Mandatory language for pamphlets and brochures
    - Deliver materials to all bill-paying customers
    - Deliver materials to organizations that serve sensitive subpopulations (e.g., schools, pediatricians)
- If a system with OCCT exceeds the Pb AL, the system must:
  - Perform Lead Service Line Replacement
    - replace the portion of the lead service lines system owns
    - offer to replace the customer's portion of service line at cost
    - lines where samples are below action level are considered replaced
    - replace 7% of the lead service lines each year

# Key Areas for Rule Revisions

- Sample Site Selection Criteria
- Lead Sampling Protocol
- Public Education for Copper
- Measures to Ensure Optimal Corrosion Control Treatment
- Lead Service Line Replacement Requirements

## Current Site Selection Criteria, Lead (Pb) & Copper (Cu)



# Sample Site Selection Criteria

*Where to sample for lead and copper*

- Lead and copper is sampled at homes that are likely to have the highest lead concentrations (older homes).
- Copper corrosion is associated with newer homes, which currently are not required by the LCR to be sampled.

## **Key Questions:**

- Do the current tiering criteria for Pb accurately represent the highest risk sites? If not, what needs to change?
- How should Cu be addressed if there are tiering changes?

# LCR Sampling Protocol

- Goal – To sample at sites likely to have the highest lead levels in 1991
  - Newest leaded solder and lead service lines
  - Collect first draw samples from cold water kitchen or bathroom tap – minimum 6 hours standing time
- 1-Liter first-draw sample
- Residents may take samples, if instructions are provided by the water system
  - Water system cannot challenge results based on sampling collection errors
- Sensitive life stages are not considered in site selection. Sites are selected to assess performance of corrosion control treatment, not to assess impacts of adverse exposure

# Lead Sampling Protocol at LSL Sites

## *How to take a lead sample*

- Water in the lead service line (LSL) is most likely to have the highest concentration of lead.
- The current sampling protocol (first draw sample) does not capture water representative of the lead service line.
- First draw samples would be taken at non-LSL sites
- Some sampling instructions include recommendations to flush the tap prior to the start of the stagnation period. Pre-stagnation flushing may lower first draw lead levels.

## **Key Questions:**

- Should EPA change the sampling protocols at LSL sites to address these issues?
- What implementation issues will arise from sampling changes?

# Public Education for Copper

*How to educate consumers about copper*

- No educational or exposure mitigation materials are currently provided for copper.
- Health effects of copper are nausea and vomiting (short-term).
  - may be liver damage, possible immune system depression in sensitive subpopulations (Wilson's disease and carriers of Wilson's disease gene).

## **Key Questions:**

1. Should systems send education materials to consumers?
2. If so, should it be limited to new connections or should the information be distributed system-wide?

# Optimal Corrosion Control Treatment (OCCT)

## **For large systems and small/medium > AL**

- Currently, systems make optimal corrosion control recommendation to State for approval (State approves or designates alternative)
- Follow-up monitoring conducted for one-year
- State reviews data and designates optimal water quality parameters (WQP) (i.e., min/max pH, alkalinity, inhibitor concentration, etc.)
- Systems maintain WQP, and report to State (in addition to Pb/Cu tap sampling)
- Systems compliance with the treatment technique is based on WQP (not Pb/Cu levels) and on whether they perform the required actions when the AL is exceeded.
- Small/medium can discontinue if they meet AL in two consecutive periods



# Measures to Ensure Optimal Corrosion Control Treatment

## *Water Quality Parameter Monitoring*

- Many States believe they did not have adequate resources\* (time, training, etc.) to effectively set optimal water quality parameter ranges (OWQPs).
  - OWQP ranges may not be set as tightly as originally envisioned.

### **Key Questions:**

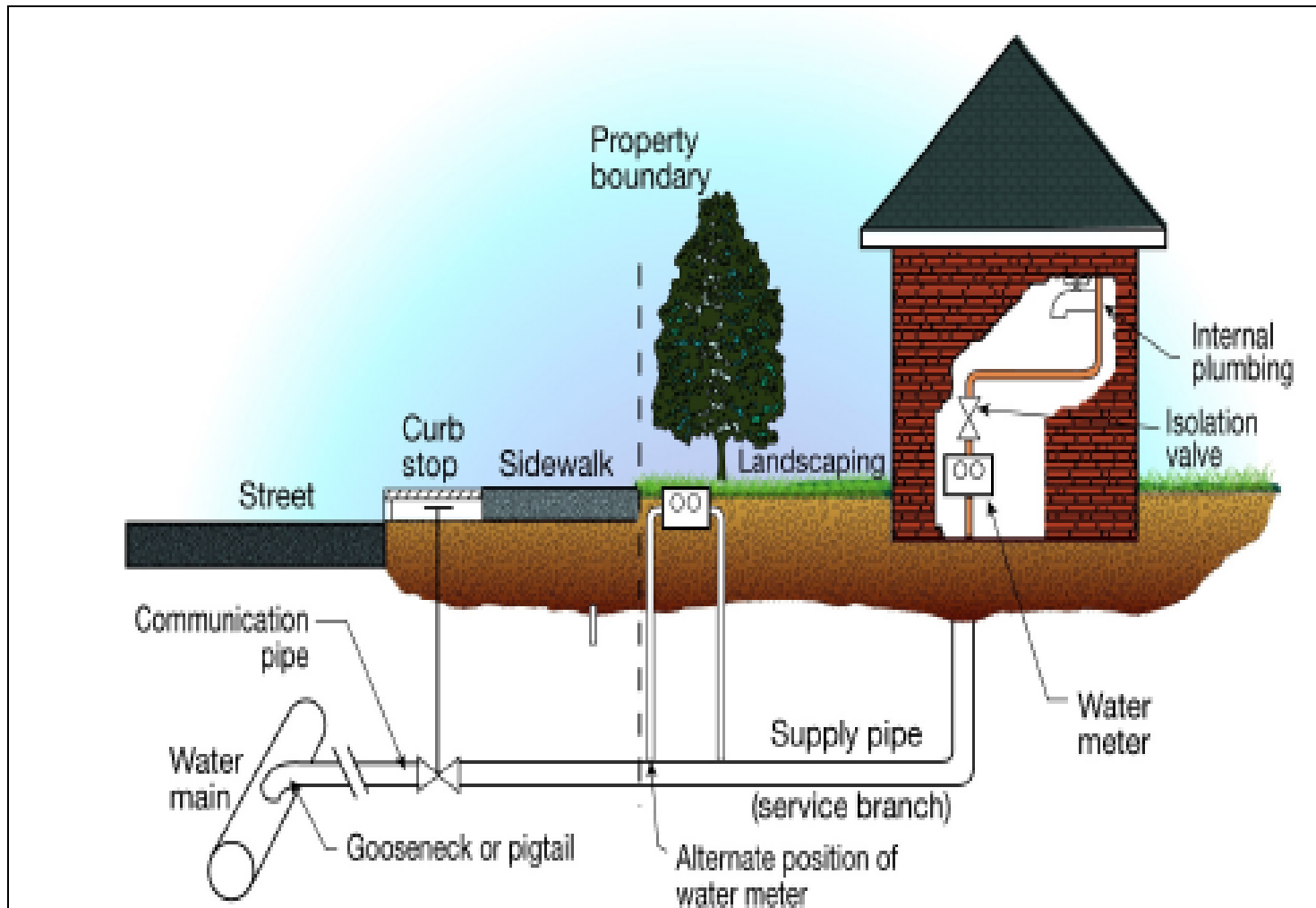
1. Should EPA require systems to re-optimize after an AL exceedance?
2. Should the LCR be more prescriptive on evaluating treatment options and monitoring key WQPs?

\*There is an ongoing effort to develop a guidance manual and training module to help States to set optimal water quality parameter ranges. The first training/review session was conducted the first week of May in Florida.

# LCR Requirements

## Lead Service Line Replacement

- Systems affected – systems exceeding the lead AL after installation of corrosion control treatment (CCT) are in the lead service line replacement program (LSLRP)
- Duration – 15 years or until system meets lead AL in two consecutive 6-month monitoring periods
- What is considered “replaced”?
  - Sites where lead levels from all service line samples are at or below 15 ppb
  - Physical replacement of at least the portion the system owns
  - Full replacement where home owner pays for removal of the portion of the line that they own



**60-67 ft total (utility 20-27 ft.) (Weston and EES 1990)**

**55 ft total (utility 25 ft.) (older areas)**

**68 ft total (utility 27 ft.) (newer areas) (AwwaRF 2008)**

# Lead Service Line Replacement Requirements

- Partial lead service line replacement (PLSLR) occurs when the system replaces the portion of the line it owns, but the homeowner can't replace their portion

**Issue:** PLSLR causes temporary spikes in lead levels, which is an exposure risk for consumers.

## **Key Questions:**

- Continue to require partial lead service line replacement?
- Eliminate the partial lead service line replacement requirement in favor of full replacements?

# Lead Service Line Replacement Requirements

## **Voluntary/Infrastructure partial LSL replacement**

- Systems currently below lead action level
- Replacement of system's portion of the line as either part of planned maintenance or emergency repair
- Replacements are not covered by the rule
- Action level exceedance is a possibility

## **Key Questions:**

- Should there be notification and sampling requirements for these instances?
- How would these requirements be imposed and enforced when the systems are in compliance with the rule?

# Science Advisory Board (SAB) Review

- Charge to Drinking Water Committee of the SAB
  - EPA is seeking SAB evaluation of current scientific data to determine whether partial lead service line replacements are effective in reducing lead drinking water levels
  - Studies comparing blood lead levels versus PLSL replacement
  - Studies comparing water lead levels versus PLSL replacement
  - Studies comparing water lead levels versus full LSL replacement
  - Studies examining procedures to mitigate lead levels after replacement
- Public meeting held on March 30 – 31, 2011
- Follow-up public conference call on May 16, 2011

# July 1, 2011 Draft SAB Report

- Draft Report Key Findings
  - Partial LSL replacement has not been shown to reliably reduce drinking water lead levels in the short term, ranging from days to months, and potentially even longer
  - Partial LSL replacement is associated with elevated drinking water lead levels for some period of time after replacement, suggesting the potential for harm, rather than benefit
  - Available data suggest that elevated tap water lead levels tend to stabilize over time following partial LSL replacement, sometimes at levels below and sometimes at levels similar to those observed prior to partial LSL replacement

# LCR Environmental Justice Stakeholder Meeting

- LCR EJ Stakeholder Meeting
  - Held March 3, 2011 in Washington, DC
- Key Comments
  - EPA needs more information on the location of LSLs and whether they are associated with disadvantaged communities
  - EPA needs to ways to provide more effective tap flushing guidance to all communities, not just EJ
  - EPA needs to determine if there are disproportionate impacts related to partial LSL replacement



# Next Steps

- June to November
  - Develop Proposed Rule Package
  - Hold Small Business Advocacy Review Panel
- Publish Proposed Rule, Spring/Summer 2012

# **Consumer Confidence Reports (CCR)**

**NDWAC Meeting**

**July 22, 2011**

**Ronald Bergman**



# CCR s: Transparency & Accountability in SDWA

**Annual report delivered to each consumer of CWS beginning in 1999.**

**CCR Goal:** Provide consumer local water quality information that allows for informed choices and increases dialogue between water systems and their customers

## Content Requirements:

- Water System Information
- Source of Water
- Potential Sources of Contamination
- Detected contaminants
- Violation Information
- Educational Information



# CCR Retrospective Review

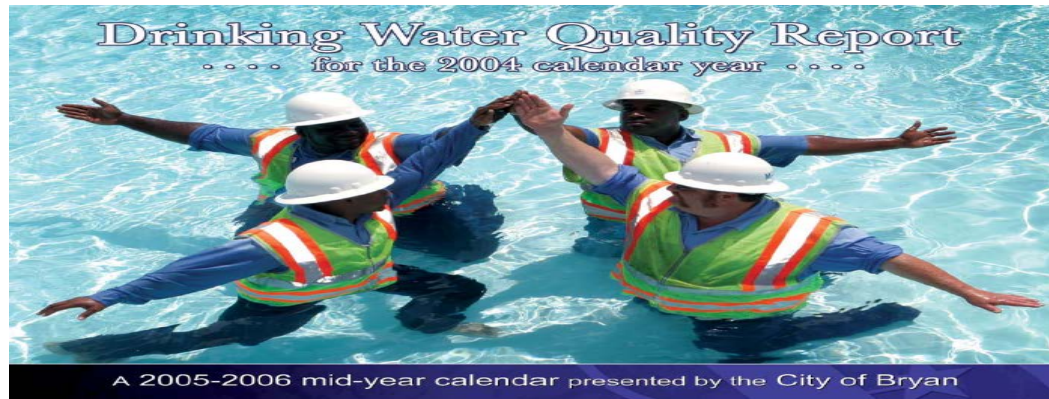
## DRAFT Plan

A 12 – month review starting in October 2011

***Under the Draft Plan and in response to the public comments, EPA will consider reviewing the Consumer Confidence Report Rule to look for opportunities to improve the effectiveness of communicating drinking water information to the public, while lowering the burden of water systems and states.***

# NDWAC Feedback Requested

- Proposed review process?
  - Thoughts on additional information needed to support our review?
- How can rule implementation make use of new technology?
- How best to use pilot study findings?
- Characterizing environmental justice impact?



# SDWA & CCR Language

| SDWA                                                                                                                                                                                                                  | CFR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Burden Reduction                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b><u>Delivery:</u></b><br/>Require each CWS to mail each customer of the system at least once annually a report on the level of contaminants in the drinking water purveyed by that system.<br/>1414(c)(4)(A)</p> | <p><b><u>Delivery:</u></b> Each CWS must mail or <b>otherwise directly deliver</b> one copy of the report to each customer<br/>141.155(a)</p> <p><b><u>Certification:</u></b> Each CWS must mail a copy of the report to the primacy agency, followed within 3 months by a certification that the report has been distributed to customers, and that the information is correct and consistent...<br/>141.155(c)</p> <p><b><u>Whole Numbers:</u></b> For detected regulated contaminants, the table(s) must contain the MCL [and MCLG] for that contaminant expressed as a number equal to or greater than 1.0.<br/>141.153(d)(4)</p> | <p><b><u>Delivery Waivers:</u></b><br/>Waivers for CWS serving fewer than 10,000 systems<br/>SDWA 1414(c)(4)(C)<br/>CFR 141.155(g)</p> <p><b><u>Delivery Waivers:</u></b><br/>Waivers for CWS serving fewer than 500 systems<br/>SDWA 1414(c)(4)(D)<br/>CFR 141.155(g)(2)</p> |

# Implemented Burden Reduction

- Resource Burden Reduction
  - Waiver provisions\*

|                                           | Waiver Provisions |                 |              |
|-------------------------------------------|-------------------|-----------------|--------------|
|                                           | Both              | <10,000 pp only | <500 pp only |
| Number of States Utilizing the Provision* | 16                | 4               | 3            |

- Additional state elected activities
  - 16 states prepare CCRs for a portion of their systems\*
- Resource Burden Tools
  - EPA's CCR iWriter
    - 73 average visitors per day
  - State CCR iWriters and templates

\*37 of 50 states responded to inquiry

# CCR Reviews Chronology

## **AWWA Report: Understanding and Enhancing the Impact of CCRs (2004)**

- On average, consumers who received CCRs more trusting of their systems and more satisfied
- No significant difference in consumers' ability to understand whole numbers versus decimals
- Most of the utilities (80%) in one study agreed somewhat or completely that CCRs are a good way to inform customers about drinking water quality

## **CCR Workgroup and Alternative Delivery Subgroup (2010)**

- Began in response to state and utility requests for CCR review
- Members include EPA, States, and drinking water associations

**Alternative Delivery**

- Considering receipt, readability, and logistics
- System surveys of e-delivery capability
- Plan and implement e-delivery pilots

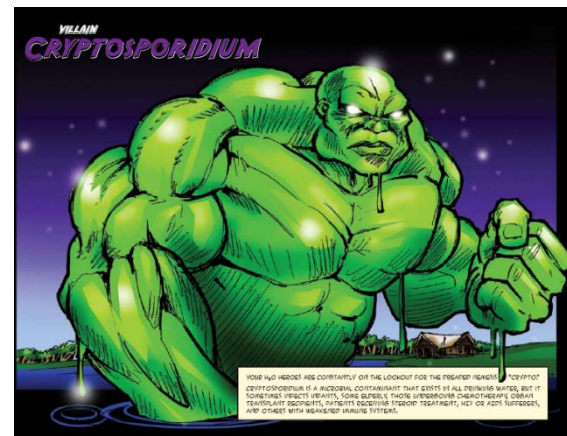
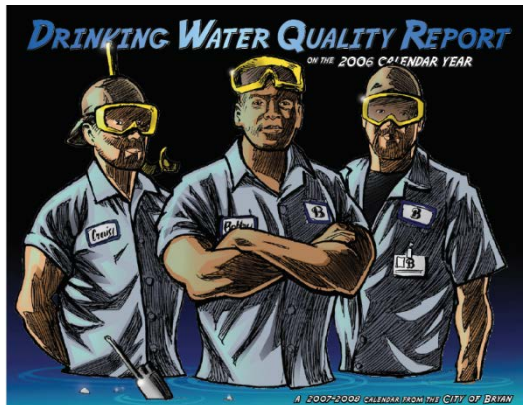
## **EO13563 and Retrospective Reviews DRAFT Plan (2011)**

- EO13563 calls on Agencies to review regulations in order to reduce unnecessary cost and burden
- Public comment docket



# Public Comment CCR Summary

1. Electronic delivery methods would reduce cost and burden on systems
2. State certification puts too much of a burden on states
3. CCR and Tier 3 PN requirements are repetitive
4. Use of whole numbers is burdensome on small water utilities and misleads the public



# CCR Retrospective Review

## **DRAFT Plan**

- ✓ Comparison of CCR regulation (40 CFR 141.151 – 141.155) vs. SDWA 1414(c)(4)
- Public Meetings
- Alternative Delivery Pilot testing
  - In partnership with AWWA and ASDWA
- Response to public comments
- Evaluate Findings

# Additional Review Considerations

- Environmental Justice Impact
- Environmental steward promotion
  - CCR “greening”
- Protecting consumer access to information from shift-of-burden
- Would alternative delivery improve readership?
  - Can we track improved readership via alternative delivery?
- Primacy agency and system management of alternative delivery methods

# Discussion Questions

- Proposed review process?
  - Thoughts on additional information needed to support our review?
- How can rule implementation make use of new technology?
- How best to use pilot study findings?
- Characterizing environmental justice impact?

# Overview of SFPUC Water Security Initiative EPA Security Grant Pilot Project

**Manouchehr Boozarpour, P.E.**  
**San Francisco Public Utilities Commission**

**June Weintraub, Sc.D.**  
**San Francisco Department of Public Health**



**National Drinking Water Advisory Council  
Meeting in San Francisco  
July 21, 2011**



# Presentation Outline

- ❖ **Overview of SFPUC & Water System**
- ❖ **EPA Water Security Grant Project**
  - Scope, Budget, Schedule
- ❖ **Project Component Review**
  - Component Objective
  - SFPUC Implementation Approach
  - Progress To Date
- ❖ **Lessons Learned**

# San Francisco Public Utilities Commission

❖ **A department of the City of San Francisco**

❖ **Services include:**

- Water
- Power
- Wastewater

❖ **Water system:**

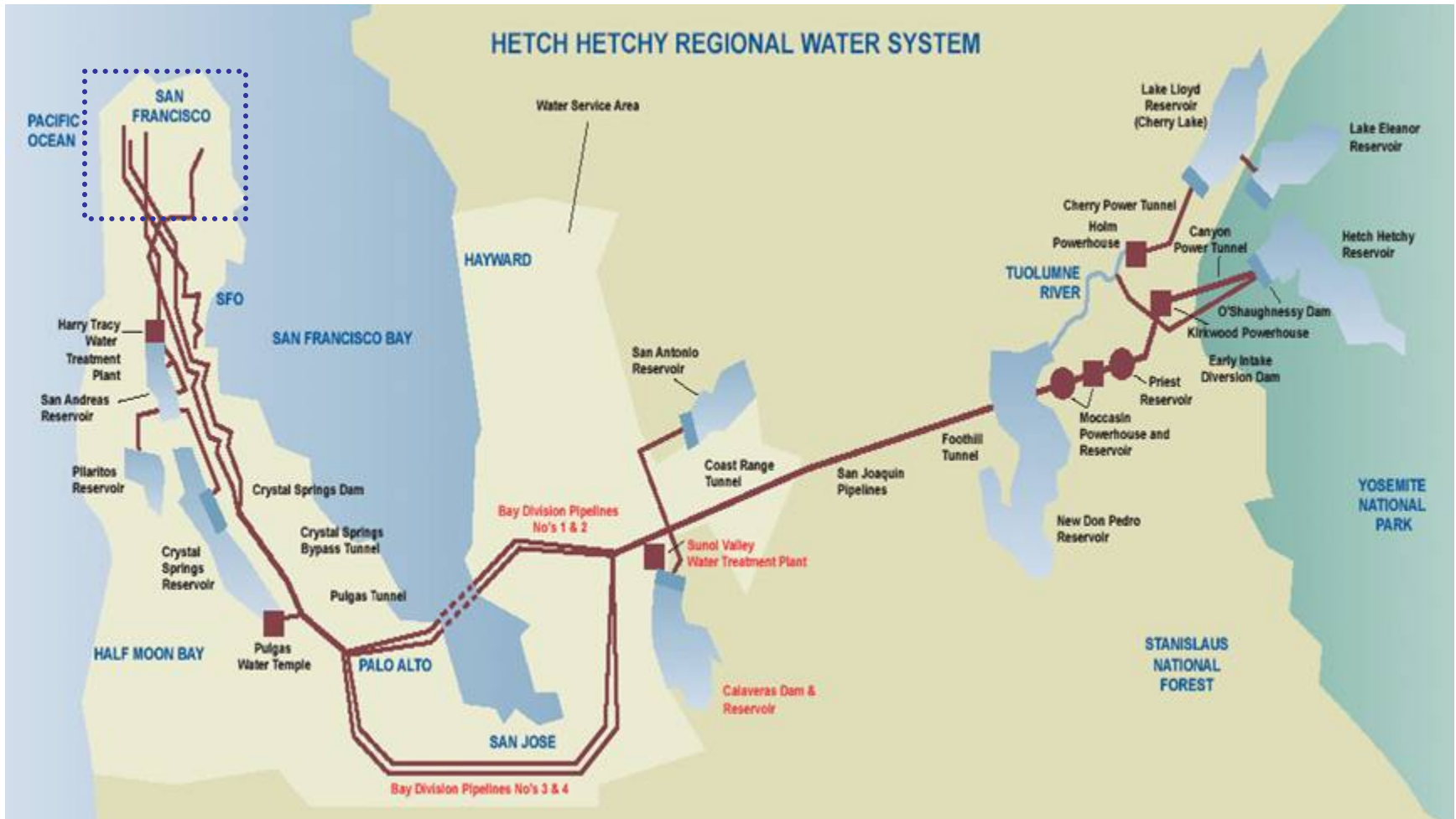
- Local Retail – City of San Francisco
- Regional Wholesale – 28 agencies in San Francisco Bay Area
- Serves 2.5 Million People with an average 220 MGD



Services of the San Francisco Public Utilities Commission



# SFPUC Water System





# San Francisco Water System

- ❖ **Average Day Demand: 80 MGD**
- ❖ **1200 miles of mains**
- ❖ **23 pressure zones**
- ❖ **Reservoir sizes: 1 to 177 MG**
- ❖ **400 MG storage within City (5 days)**



# Presentation Outline

## ❖ Overview of SFPUC & Water System

## ❖ **EPA Water Security Grant Project**

- Scope, Budget, Schedule

## ❖ Project Component Review

- Component Objective
- SFPUC Implementation Approach
- Progress To Date

## ❖ Lessons Learned

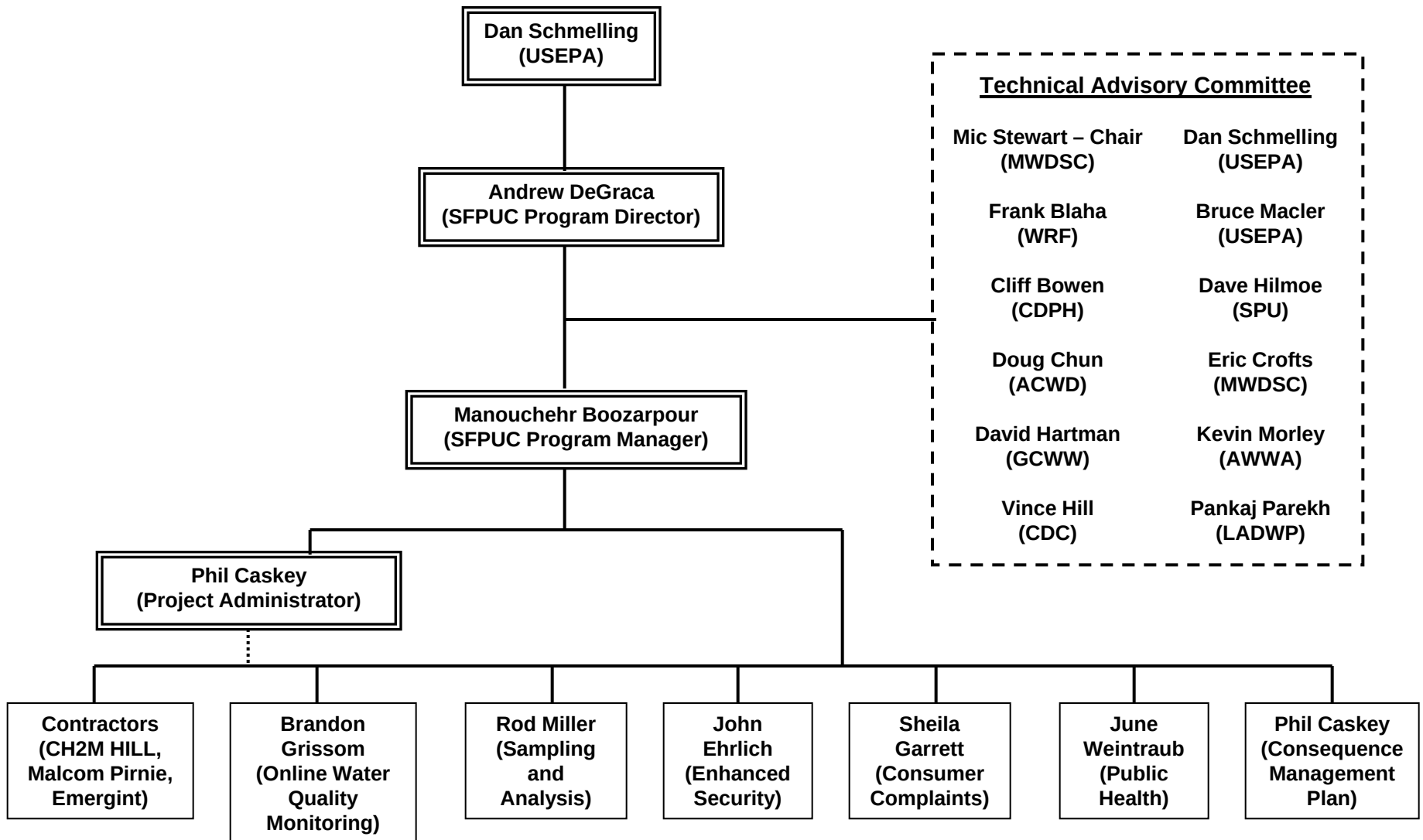
# EPA Grant Project

- ❖ **San Francisco was selected through a competitive selection process by EPA for Water Security Initiative (WSi) program**
- ❖ **Purpose is to implement a pilot water security project addressing prevention, monitoring, and response elements**
- ❖ **Grant project complements existing SFPUC efforts**
- ❖ **SFPUC existing water security program:**
  - Formally initiated in 2004
  - Overall spent >\$2 M (excluding physical security enhancements)
  - On-line monitoring instruments operational since 2007

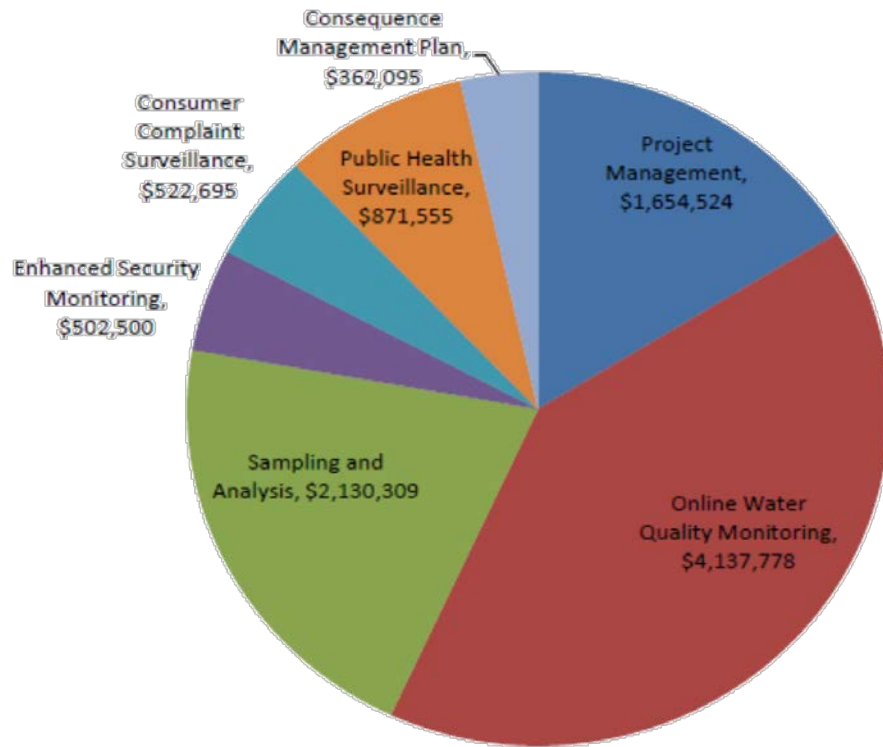
# Project Scope

- ❖ Focuses on City of San Francisco
- ❖ Addresses six critical components
  - On-line water quality monitoring
  - Sampling and analysis
  - Consumer complaint surveillance
  - Public health surveillance
  - Enhanced security monitoring
  - Consequence management

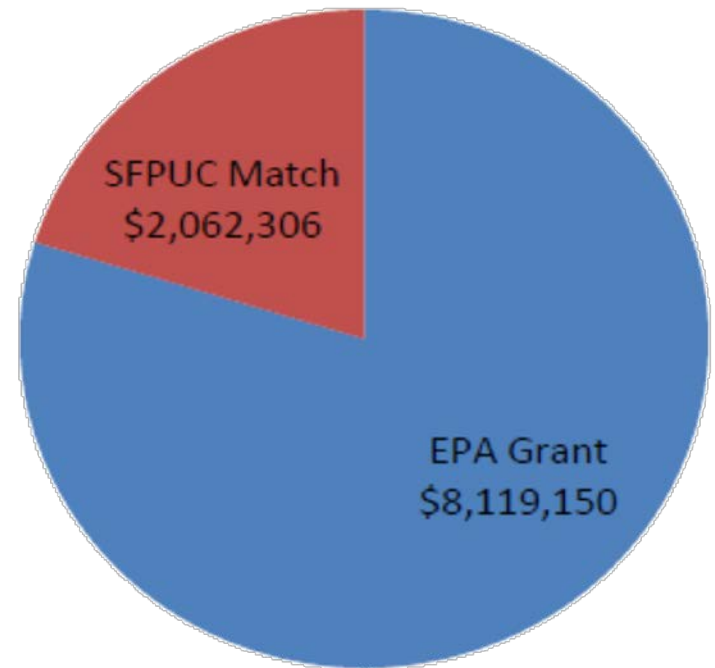
# Project Organizational Chart



# Project Budget



**Total Budget = \$10.2 M**



**SFPUC Match = 20%**

# EPA Grant Project Schedule

- ❖ **Project started June 2008**
- ❖ **Project plan based on:**
  - 1<sup>st</sup> year for design and installation
  - Two years for operation, data collection, and evaluation
- ❖ **Additional six months for report preparation & close out**
- ❖ **Extended the schedule by about 6 months to account for equipment purchasing delays**
- ❖ **Anticipate project completion by middle of 2012**

# Presentation Outline

- ❖ Overview of SFPUC & Water System
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  - Progress To Date
- ❖ Lessons Learned



# On-line Water Quality Monitoring

## ❖ Objective

Design, deploy, and evaluate a network of water quality monitoring stations with centralized event detection

## ❖ Implementation Approach

- Focus on two pressure zones and a high value target
- Phase I – pre-determined OWQM equipment and sites
- Phase II – optimum sites based on hydraulic modeling, and consider various monitoring and event detection technologies



# On-line Water Quality Monitoring (cont.)

## ❖ Progress To Date

- Phase I:
  - Completed installations
  - Operation and evaluation is underway
- Phase II:
  - Completed all technical TMs for equipment selection
  - Completed all site selection activities
  - Completed installations
  - Operation and evaluation is underway

# Laboratory Water Quality Monitoring (Sampling & Analysis)

## ❖ Objective

Establish capability for rapid target contaminant analysis in routine and triggered monitoring



## ❖ Implementation Approach

- Continue development, evaluation, and optimization of experimental methods
- Upgrade & enhance existing lab and field instruments
- Enhance radiological contamination monitoring
- Evaluate and deploy additional field rapid toxicity screening assays & site characterization tools

# Laboratory Water Quality Monitoring (cont.)

## ❖ Progress To Date

- All lab instrument acquisitions, upgrades and enhancements completed; final installation and training pending for radiation monitoring instrumentation
- New methods for PCR and Organics were incorporated into baseline monitoring at 14 sites system-wide
- Deployed additional EWQSKs (15 total kits)
- Improved site characterization by expanding field testing capabilities (e.g., added MultiRAE Plus instrument for VOC ambient air monitoring)



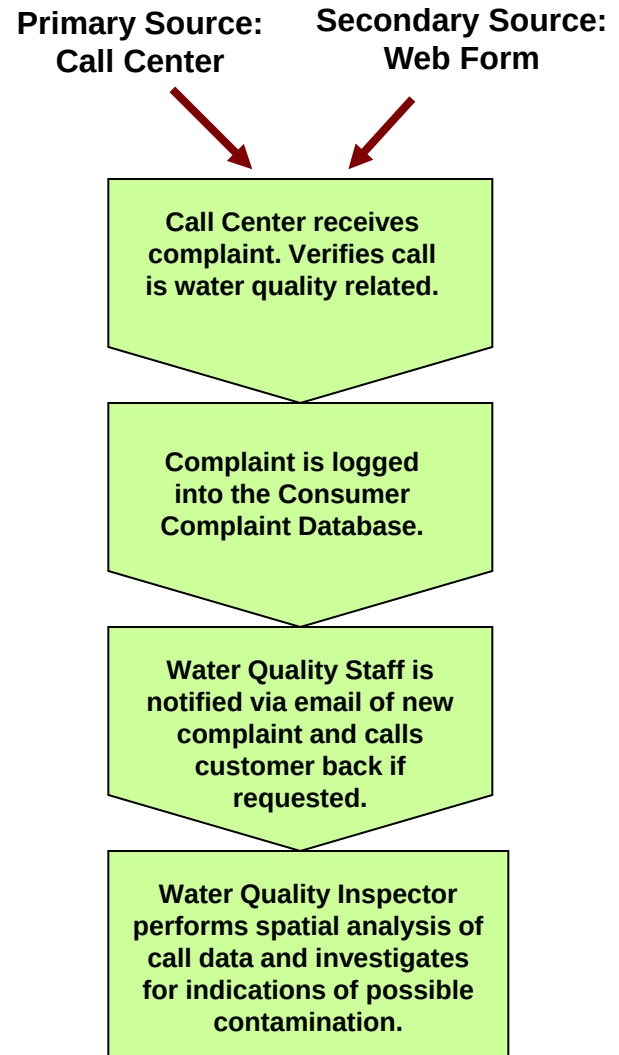
# Consumer Complaint Surveillance

## ❖ Objective

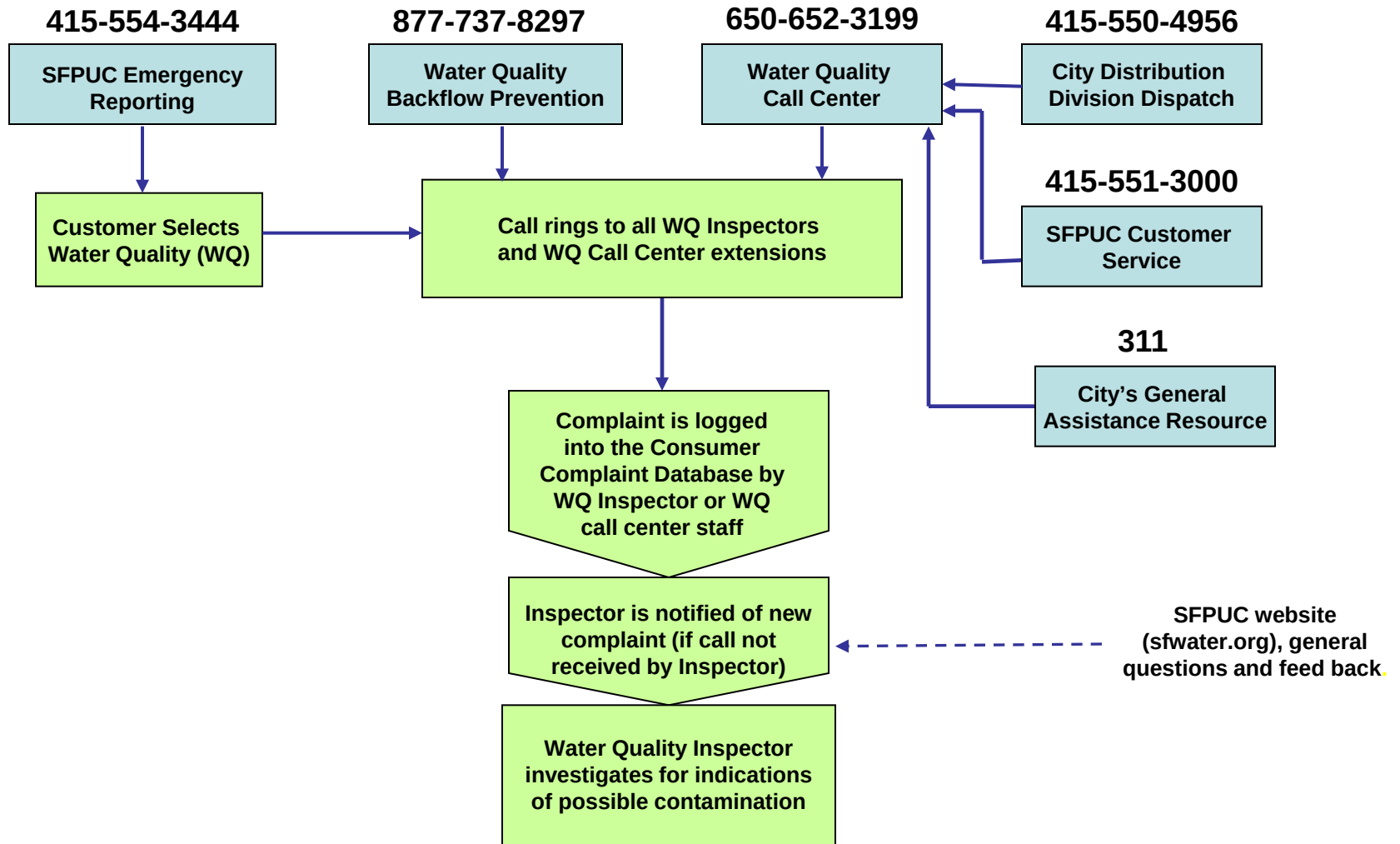
Enhance the existing call management system to provide early indication of possible contamination

## ❖ Implementation Approach

- Install comprehensive complaint collection system
- Improve data management & response using mobile communication technologies and Web-based GIS tools
- Conduct public outreach campaign



# Consumer Complaint Surveillance



# Consumer Complaints Surveillance (cont.)

## ❖ Progress To Date

- Established 311 as the single point of contact for consumers
- Fully implemented data collection and wireless technologies
- Kicked off public outreach campaign



# Consumer Complaints Surveillance (cont.)





# Public Health Surveillance

## ❖ Objective

Leverage, enhance, and integrate existing public health surveillance capability



## ❖ Implementation Approach

- Assess syndromic surveillance alarm thresholds
- Develop rapid query system to enhance ability to respond to and investigate waterborne contamination
- Promote cross-jurisdictional coordination for responding to water contamination

# Public Health Surveillance (cont.)

## ❖ Progress To Date

- Completed syndromic surveillance alarm threshold analysis
  - Published in BMC Medical Informatics and Decision Making  
<http://www.biomedcentral.com/1472-6947/10/39>
  - Accepted for publication in *Journal AWWA* (August 2011 issue)
  - Completed one-page fact sheet
- Established collaboration with MIS and attorneys to address technical and legal issues
- Continuing negotiations with two hospitals on implementing Rapid Data Query system
- Continuing discussions on Data Sharing Agreement with the partner hospital

# Public Health Surveillance (cont.)

## ❖ Progress To Date

- Exercised data query system for San Francisco General Hospital data using GI symptoms
- Conducted clinician and hospital administrator outreach for recognizing and responding to waterborne contamination events
- Finalizing protocols for convening conference calls for decision making after contamination events
- Completed white paper on Mutual Aid Agreements (published to web: [http://www.sfphes.org/water/water\\_security.htm](http://www.sfphes.org/water/water_security.htm))
- Participated in multiple emergency exercises and drills

# Enhanced Security Monitoring

## ❖ Objective

Enhance physical security at distributed water facilities to detect intrusion and delay perpetrators



## ❖ Implementation Approach

- Focus on facilities within the targeted pressure zones
- Install additional physical security equipment for up to five critical facilities
- Improve partnership with local law enforcement through *educational awareness training videos* for water resource facility monitoring

# Enhanced Security Monitoring (cont.)

## ❖ Progress To Date

- Completed police officer training video, submitted it to SFPD for officer training, training completed in April 2010, training put into re-occurring training cycle
- Security enhancement design completed for most sites, but construction has been delayed

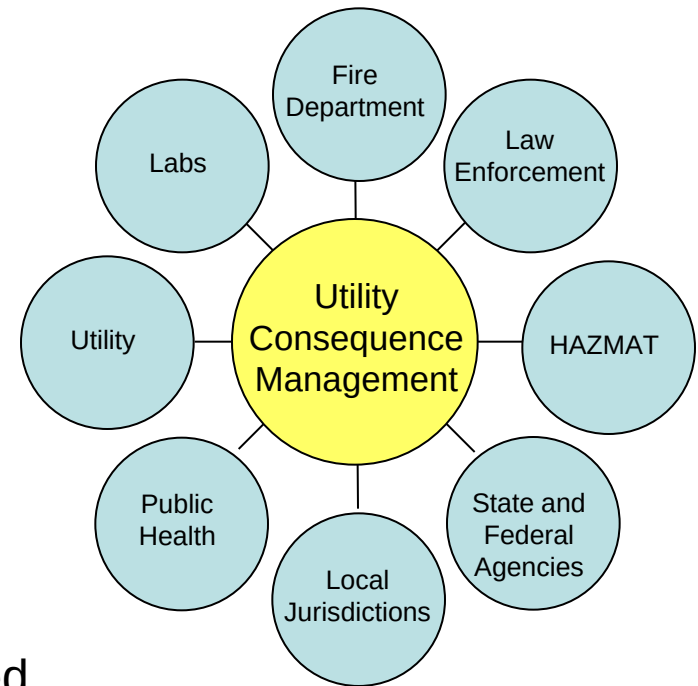
# Consequence Management Planning

## ❖ Objective

Develop an effective plan for responding to alarms and triggers that is integrated with local response and support agencies

## ❖ Implementation Approach

Refine current CMP, and improve existing response partner network and develop new partners through training, drills, and exercises, and incorporating lessons learned



# Consequence Management Planning (cont.)

## ❖ **CMP/Response Plan**

- Defines roles and responsibilities necessary to respond to a contamination warning
- Procedural response guidelines
- Decision trees, forms, and checklists
- Notification protocols and contact lists

# Consequence Management Planning (cont.)

## ❖ Exercises

- Exercises were planned in a progressive manner. Each subsequent exercise escalates in scale and complexity.
- The type of exercises include
  - Table Top Workshop/Exercise
  - Functional Exercise
  - Full-Scale Exercise



# Consequence Management Planning (cont.)

## ❖ Progress To Date

- Conducted first training & tabletop exercise 2/11/09 and later the CMP based on lessons learned
- Conducted 2<sup>nd</sup> training & functional exercise 4/21/10 and produced After Action Report (AAR) June 2010
- Revised CMP based on AAR recommendations and lessons learned April 2011
- Established Planning Committee for Full-Scale Exercise, to be held in February 2012

# Presentation Outline

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  - Progress To Date
- ❖ **Lessons Learned**

# Lessons Learned

- Experimental vs. available technologies
- Vendor reliability
- Purchasing issues
- Resources/staff
- Schedule
- Stakeholder involvement
- Information sharing & protection

# Final Project Report

## ❖ Review and Evaluation Criteria

- Operation: ability of equipment and systems to function as designed
- Performance: ability of the system to reliably detect contamination incidents
- Sustainability: ability to maintain the system in light of changing priorities, objectives, and advances in technology

# Summary

## ❖ **Project has achieved numerous successes**

- Stayed close to schedule and on budget
- Developed, evaluated, and implemented numerous useful water security tools
- Lessons learned will be very useful for other utilities and for EPA in determining how to evolve the Water Security Initiative

# Questions?

**Manouchehr Boozarpour, P.E.**  
**San Francisco Public Utilities Commission**

**June Weintraub, Sc.D.**  
**San Francisco Department of Public Health**



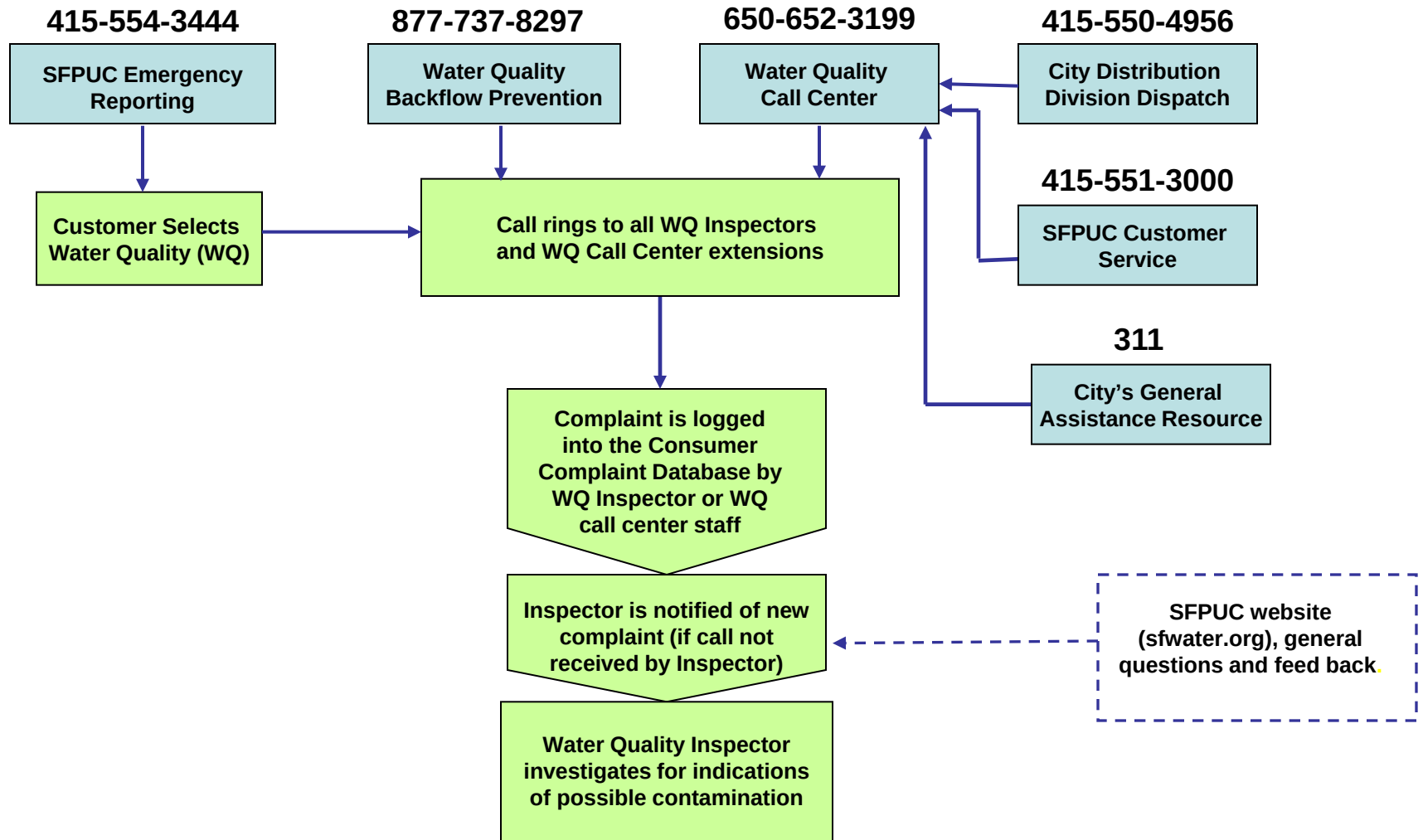
San Francisco  
**Water**  
**Power**  
**Sewer**

Services of the San Francisco Public Utilities Commission

**National Drinking Water Advisory Council**  
**Meeting in San Francisco**  
**July 21, 2011**



# Previous Consumer Complaint Management



# Summary

## ❖ **Project has achieved numerous successes**

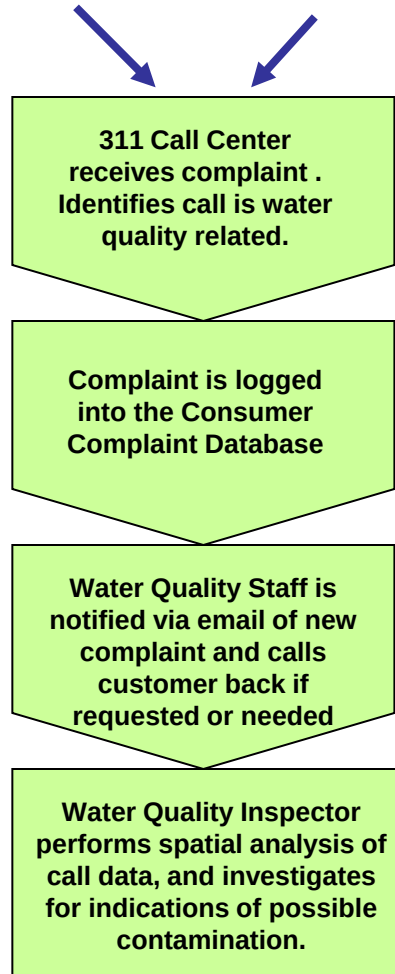
- Stayed very close to schedule and budget
- Implemented numerous useful Water Security tools
- Lessons learned will be very useful for other utilities and for EPA in determining how to evolve the Water Security Initiative



# New Consumer Complaint Management

**Primary Source:**  
**311 Call Center**

**Secondary Source:**  
**311 Web Form**



# Electronic 311 Reporting Form

 **SAN FRANCISCO Public Utilities Commission**

Water Quality 311 Complaint Form

Address of problem: **(required)**  Complaint address and cross street.

Cross-street: **(required)**  Complaint address and cross street.

City:

Time of Problem:

Additional comments that might help locate the problem:

Type of problem customer is experiencing

You must select at least one problem from the checkboxes below: **(required)**

**WQ**

☒ Dirty water ☐ Odor in water ☐ Bad taste ☐ Illness ☐ Seepage

☐ Discolored ☐ Cloudy/milky appearance ☐ Sand in water ☐ White particles ☐ Black particles

☐ Oily/greasy water ☐ Other WQ

Additional information about any checked water quality problems:  Indicates that customer would like to be contacted by a Water Quality Inspector

Description of other water quality problems:

Submits complaint to consumer complaints data base.

**Contact information:**

Return call: ☒ Yes ☐ No Indicates that customer would like to be contacted by a Water Quality Inspector

First name:  Submits complaint to consumer complaints data base.

Street address:  Submits complaint to consumer complaints data base.

State:

Zip Code:

Telephone number:

Email:

# SFPUC CCS Database

Query tools

**SAN FRANCISCO Public Utilities Commission**

**All Complaints** [new complaints](#)

Search for a complaint

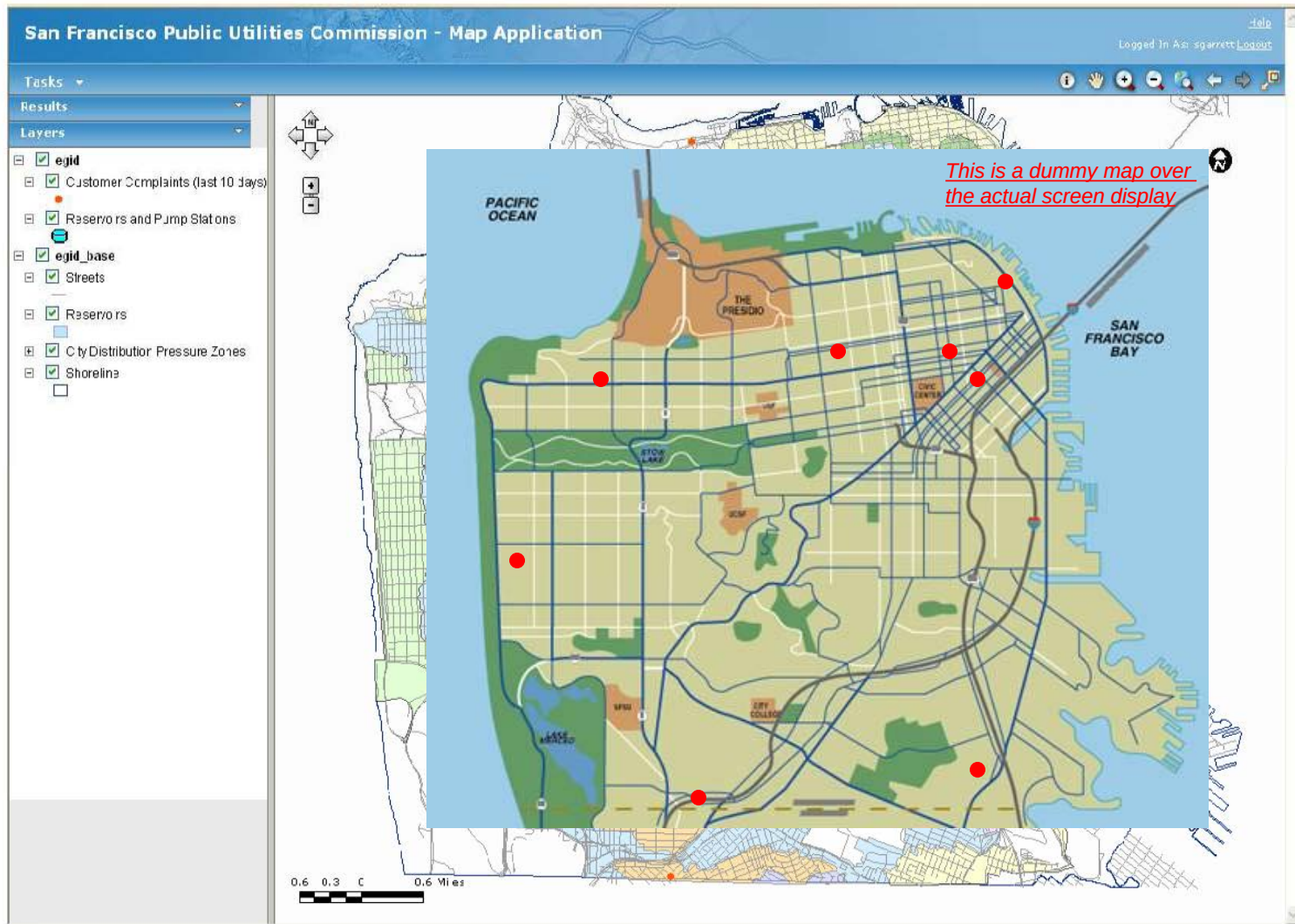
Month:  Year:  Start Date:    End Date:

Show:  Streets:  Cross Street:  Problem Description:  Action:

**Complaints**

| Complaint ID         | Further action | Complaint location          | Cross street           | Problem descriptions                                        | Problem cause | Complaint date | Time received | Logged by           |
|----------------------|----------------|-----------------------------|------------------------|-------------------------------------------------------------|---------------|----------------|---------------|---------------------|
| <a href="#">5424</a> | No             | ██████ Mariposa             | De Haro                | Discolored                                                  | Unknown       | 07/12/2010     | 07:57 AM      | <a href="#">311</a> |
| <a href="#">5423</a> | No             | ██████ Vallejo St           | Lyon and Baker Streets | Other CDD<br>Bad taste<br>Oily/greasy water                 | New main      | 07/12/2010     | 05:54 AM      | BKAZ                |
| <a href="#">5422</a> | No             | ██████ York                 | 24th St.               | Discolored                                                  | Unknown       | 07/11/2010     | 12:02 PM      | <a href="#">311</a> |
| <a href="#">5421</a> | No             | ██████ Clipper Street Apt#4 | Church                 | Black particles                                             | Unknown       | 07/09/2010     | 09:01 AM      | 311/LD              |
| <a href="#">5420</a> | No             | ██████ GREENWICH ST         | OCTAVIA                | Odor in water<br>Cloudy/milky appearance<br>Black particles | New main      | 07/08/2010     | 02:36 PM      | <a href="#">311</a> |
| <a href="#">5419</a> | No             | ██████ 16th st              | harrison               | Bad taste                                                   | Unknown       | 07/08/2010     | 12:54 PM      | <a href="#">311</a> |
| <a href="#">5418</a> | No             | ██████ Lydia                | Newhall                | Cloudy/milky appearance<br>White particles                  | Unknown       | 07/08/2010     | 11:46 AM      | <a href="#">311</a> |
| <a href="#">5417</a> | No             | ██████ Silver Ave           | Edinburg               | Black particles                                             | Unknown       | 07/08/2010     | 10:02 AM      | <a href="#">311</a> |
| <a href="#">5416</a> | No             | ██████ Downey               | Waller                 | White particles                                             | Water heater  | 07/07/2010     | 11:48 AM      | mfong/BKAZ          |
| <a href="#">5415</a> | No             | ██████ Victoria St          | Sargent St             | Odor in water<br>Discolored                                 | WQ Analysis   | 07/07/2010     | 06:45 AM      | KP/WQD              |
| <a href="#">5414</a> | No             | ██████ Filbert St.          | Broderick St           | Seepage                                                     | City Water    | 07/06/2010     | 02:32 PM      | RDF                 |

# SGID Interface



# Lessons Learned

- ❖ **Get interdepartmental commitment from project inception**
  - Include IT, and Public Communication
  - Make sure everyone understands the impact on their department
- ❖ **Establish notification requirements and protocols early**
  - Maintenance crew deployment
  - Operational changes
  - System emergencies (i.e., main breaks, fire flows)
- ❖ **Establish data collection and recording needs early on**

# Lessons Learned

- ❖ **Utilize existing infrastructure as much as possible**
- ❖ **Carefully plan weekend and after hours response**
- ❖ **Get professional help for public outreach campaign**
- ❖ **Have realistic timelines and deploy changes in steps**

# Consequence Management Planning (cont.)

- Four-tiered system
  - Tier 0 Routine monitoring – trigger or alarm detected/investigation
  - Tier 1 **Possible** contamination event – trigger or alarm unexplained – investigation/consultation
  - Tier 2 **Potential** – notifications/field testing/corrective action
  - Tier 3 **Credible** – laboratory testing/corrective action
  - Tier 4 **Confirmed** – corrective action/public notification/recovery and remediation







# The Human Costs of Nitrate Contaminated Drinking Water in the San Joaquin Valley

Pacific Institute

July 2011

Community Strategies Program

Pacific Institute

## Report Participants

Pacific Institute

Community Water Center

Clean Water Fund

California Rural Legal Assistance Foundation

## Lead Authors

Eli Moore, Pacific Institute

Eyal Matalon, Pacific Institute

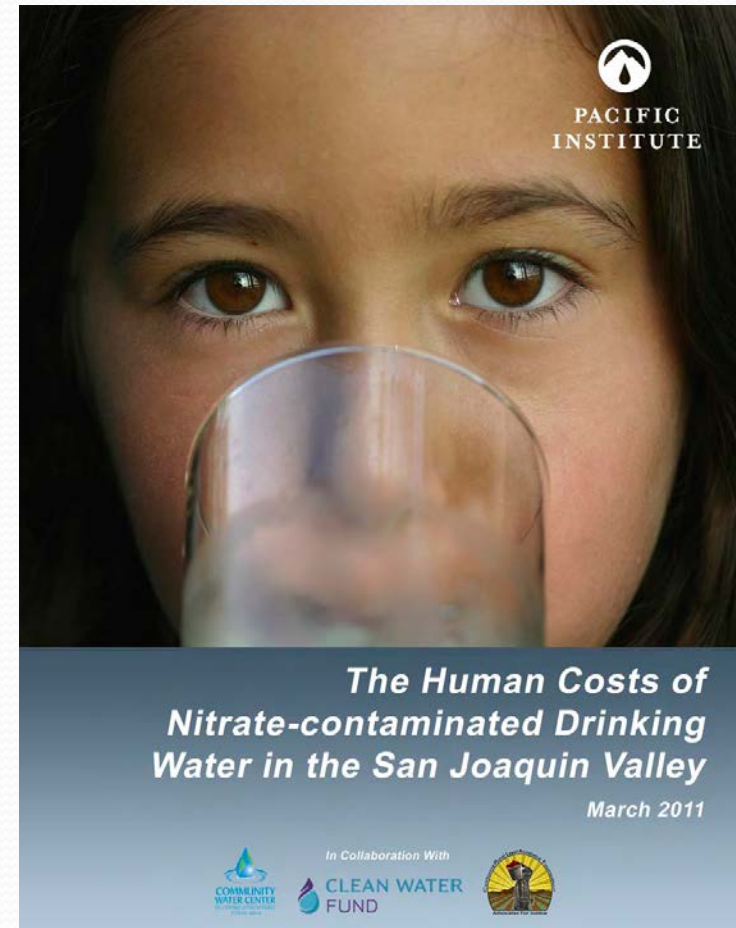
## Contributing Authors

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Laurel Firestone and Susana De Anda, Community Water Center

Martha Guzman, California Rural Legal Assistance Foundation

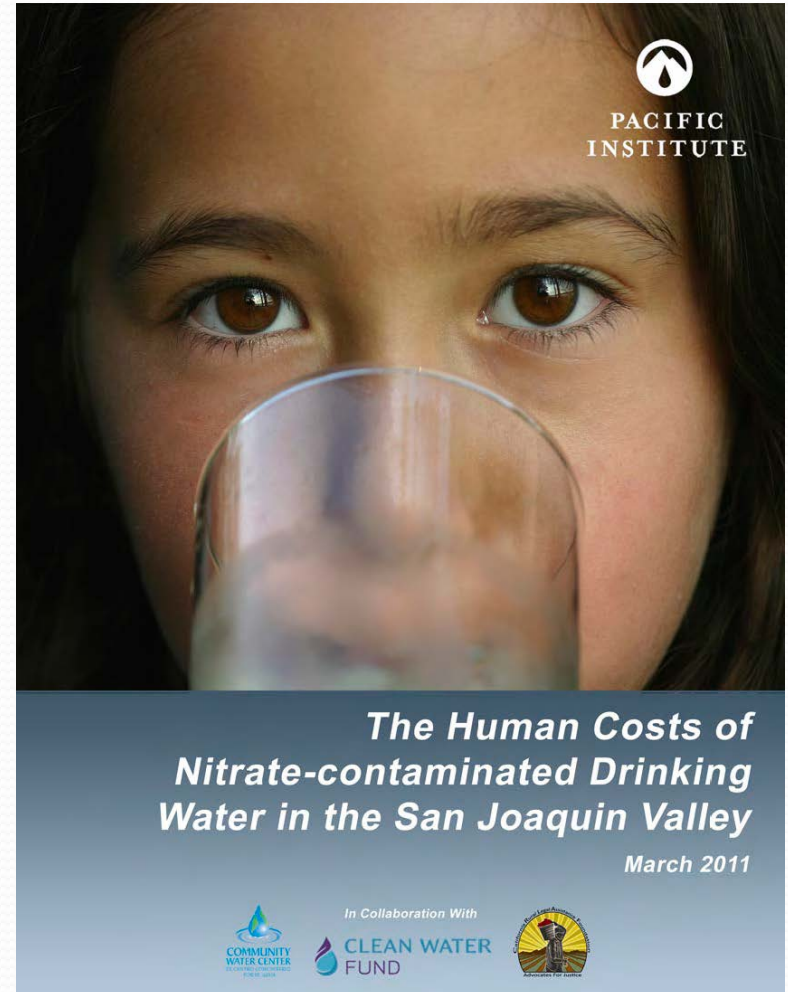


# Outline

- Why focus on nitrates?
- Prevalence and known impacts of nitrate contamination
- Conceptual framework and research design
- Costs to affected households
- Costs to affected systems
- Discussion and recommendations

# Why the focus on nitrates?

- There are many contaminants of concern, but we see:
- Persistent and rising nitrate levels in groundwater and drinking water
- Strong and growing evidence of health impacts
- Need for research to document social and economic impacts





# Known Health Effects

## Acute:

- Methemoglobinemia – “Blue Baby Syndrome” (children < 6 months)
- Severe gastroenteritis

## Chronic:

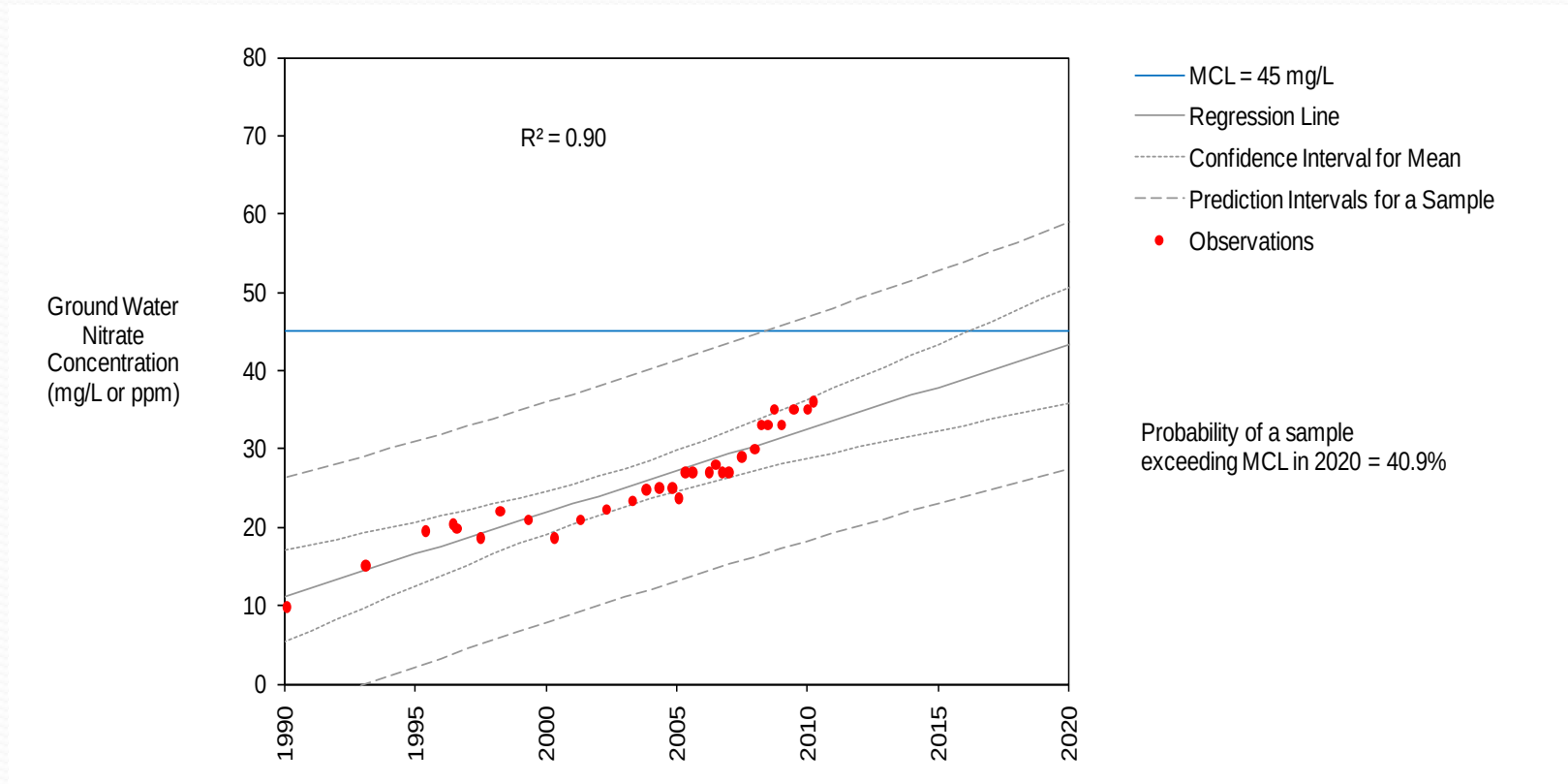
- Cancer (thyroid, stomach, colon, others)
- Impaired *in utero* growth, pre-term birth
- Birth defects
- Pancreatitis
- Nervous system defects





# Projected Increase in Nitrate Levels

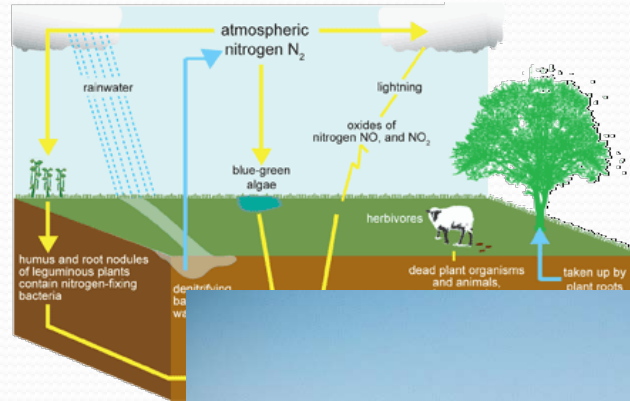
## Trend of Nitrate Levels in Monitored Wells Kern County (1978-2010)





# Known Sources of Contamination

- Occurs naturally at *low* concentrations
- Anthropogenic sources
  - Septic systems
  - Confined animal feeding operations
  - Inorganic fertilizer

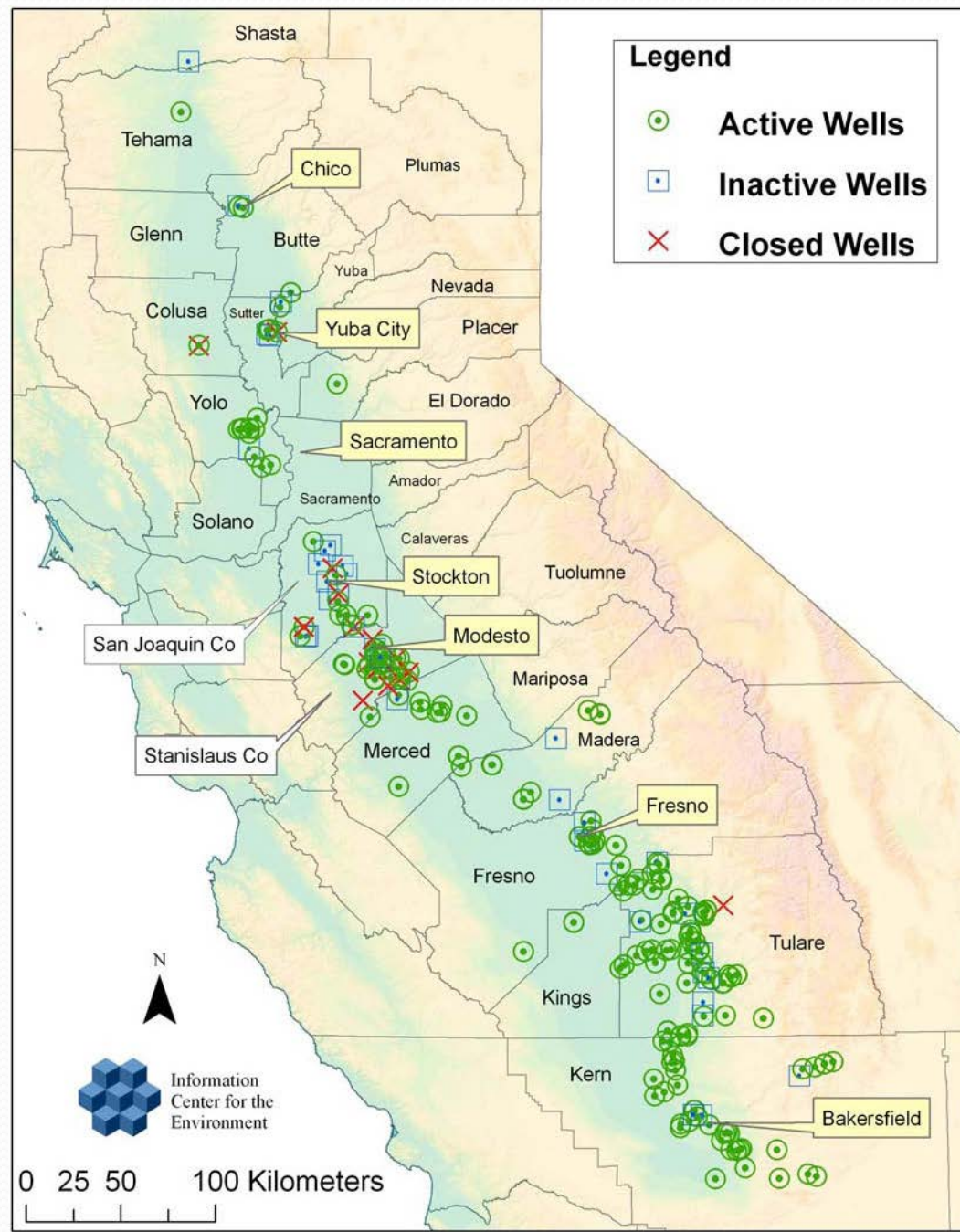


# Nitrates and SJV Drinking Water

- 90% of San Joaquin Valley residents rely on groundwater as their primary source of drinking water
- San Joaquin Valley is home to 10% of CA pop., but 67% of Californians supplied by water systems that exceed MCL, 2003-07

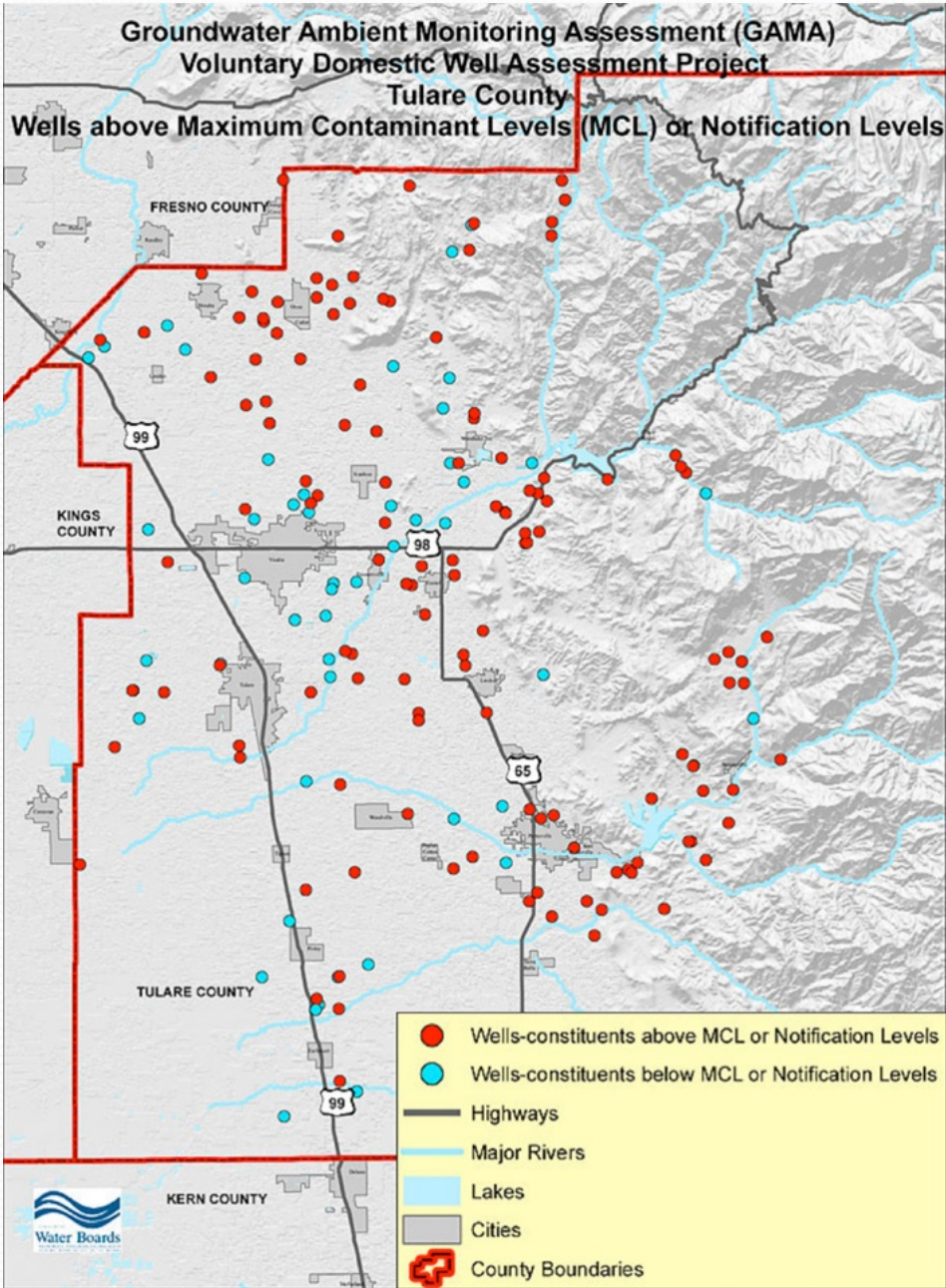




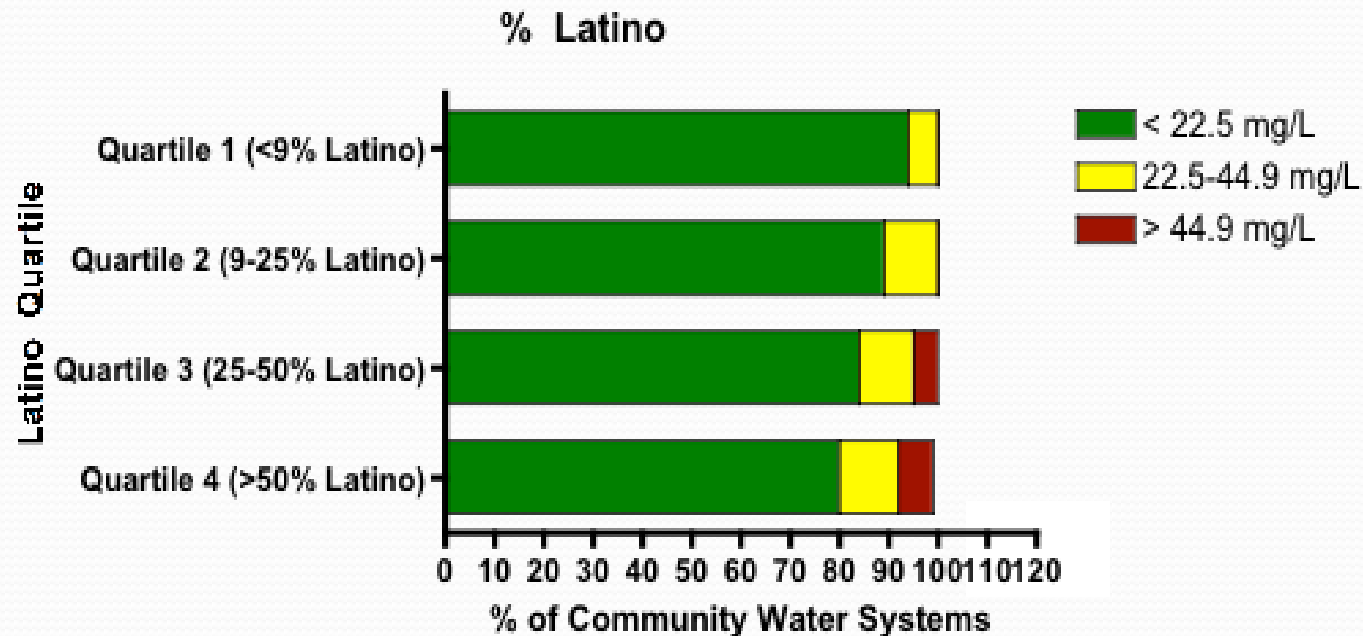


Source: Presented at a public workshop at the Central Valley Regional Water Quality Control Board in 2009 as part of a larger presentation entitled "Nitrate Effects on Public Water System Wells" by Leah Godsey Walker, P.E., Chief Sinking Water Technical Programs Branch, California Department of Public Health.

*State Water Resource Control Board mapping of domestic wells with high levels of nitrate contamination (2006).*



# Environmental Justice and Nitrates



- People of color disproportionately exposed to high nitrate levels (Balazs et al, in review)



## Regulatory Context

- Various state-sponsored studies point to nitrates as high priority, for example LLNL: “the number-one contaminant threat to CA drinking water supply”
- Waivers enacted in 2004 excluded consideration of groundwater contamination
- Regional Water Boards now considering program to replace waiver
- 2008 CA SB x21 committed funding to study the problem and develop recommendations.



# Study Goals

- Household water users' actions to avoid nitrate-contaminated water, perception of water quality, and means of obtaining water quality information.
- Costs to households for water service, purchasing water from alternative sources, and treating tap water.
- Costs of existing and proposed measures by community water systems to mitigate contamination.
- Facilitate a community-based research process to involve affected water users in setting goals, devising methods, interpreting results, and developing recommendations.



# Documenting Household-Level Costs

**Question:** What are the social, economic, and potential health impacts of nitrate-contaminated drinking water on affected households?

- Perception and avoidance of tap water
- Added water costs and financial burden

**Approach:** “Avoidance Cost” Method

- Survey of people living in communities with nitrate-contaminated drinking water



# Documenting System-Level Costs

**Question:** What is the cost to San Joaquin Valley community water systems of having to deal with nitrate contaminated ground water?

- Costs of treatment, sourcing new wells, consolidation with nearby systems

**Approach:** Analysis of Agency Data

- Analyze information on projects to address nitrate contamination, collected from state agencies providing loans and grants to these systems.





# Household Survey Methods

- Door-to-door bilingual survey interviews of 37 households in four small community water systems with current nitrate violations in Tulare County
- Survey focused on water quality perception, water use, and household expenses

|                                                                                                                                        |                                                           |                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------|
| <b>Vended:</b> Does your household buy vended water (that comes out of a machine)?                                                     |                                                           |                                                     |
| Frequency<br>How many times _____<br>do you go in a<br>month?                                                                          | Location:<br>Where do you<br>usually go? _____            |                                                     |
| I have a visual aid that shows different-sized jugs people refill. <i>[Show visual aid]</i>                                            |                                                           |                                                     |
| Size                                                                                                                                   | How many of each size do<br>you refill every time you go? | How much does it cost to<br>refill a x- gallon jug? |
| 5 Gallon                                                                                                                               |                                                           |                                                     |
| 3 Gallon                                                                                                                               |                                                           |                                                     |
| 1 Gallon                                                                                                                               |                                                           |                                                     |
| <b>SUMMARIZE:</b> So in a typical month, you refill:<br>_____ x- gallon jugs at \$ _____ each<br>_____ y- gallon jugs at \$ _____ each |                                                           |                                                     |

Excerpt from survey instrument documenting households expenditures on vended and bottled water



Surveyors interviewed 21 households connected to the Beverly Grand water system



# Household Survey Findings

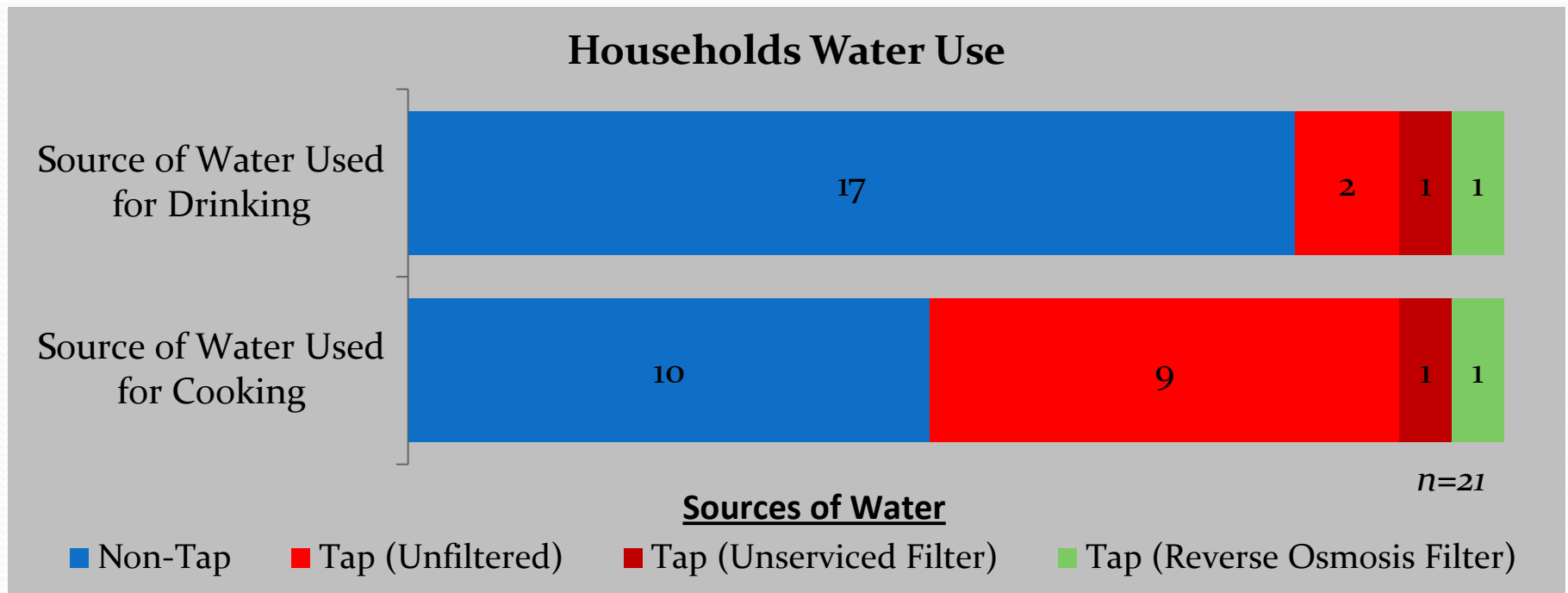
## *Lack of awareness about nitrate contamination*

- Over one quarter of residents (29%) did not believe their tap water was unsafe
- Less than half (43%) of households were aware of the nitrate contamination
- Spanish-speaking households less likely to perceive unsafe tap water or nitrates

# Household Survey Findings

## *Exposure to nitrate-contaminated water*

- Nearly half (48%) of households are ingesting nitrate-contaminated tap water



# Household Survey Findings

## *Costly measures to avoid contaminated water*

| Monthly Household Cost of Measures<br>In Response to Contaminated Tap Water                                                                                                                                                                                                                                               | Prevalence<br>(% of households)                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Obtain water from alternative sources:</b> \$31.63 (mean)<br><b>Mean Cost of Vended Water:</b> \$0.26 per gallon<br><b>Mean Cost of Bottled Water:</b> \$1.27 per gallon                                                                                                                                               | <b>95%</b>                                                                                                                                                       |
| <b>Install/Maintain Reverse Osmosis Filter:</b> Variable (\$7.76 – \$18.42)<br><b>Range of reported upfront costs:</b> \$100-\$300<br><b>Range of reported servicing costs:</b> \$80-\$150 per year                                                                                                                       | <b>10%</b>                                                                                                                                                       |
| <b>Manipulate Tap Water*:</b> (Assumed \$0.00)<br>Do one or more of the following: <ul style="list-style-type: none"> <li>•Boil the tap water</li> <li>•Add lye, soap, bleach, or chlorine to tap water</li> <li>•Let tap water run for a moment after turning it on</li> <li>•Freeze or refrigerate tap water</li> </ul> | <div data-bbox="1136 1115 1630 1329"> <b>Does not actually<br/>help to avoid<br/>exposure!</b> </div> <div>           14%<br/>10%<br/>29%<br/>14%         </div> |

# Household Survey Findings

## *Financial burden to low-income households*

- Average expenditures on vended and bottled water, household filters, and tap water service constitute 4.6% of median household income in Beverly Grand.



*This is three times greater than the EPA-recommended threshold for drinking water affordability (1.5% of MHI)*



# System-Level Cost Analysis

We don't know how many communities, or people, are drinking nitrate-contaminated water, but there are:

- 100 Community Water Systems in SJV with priority needs for nitrate-related water improvement projects
  - 27% for treatment
  - 33% to drill a new well
  - 25% to consolidate with another system
- Average cost for projects for nitrates alone: \$1 million
- Average cost to address nitrates and other issues: \$1.5 million

# System-Level Cost Analysis

- Total cost for nitrate-related projects currently needed: \$150 million
- 90% of systems with nitrate violations between 2005-2007 had not received needed funding as of 2009
- Funding provided by CDPH and USDA (2005-2009) amounted to 13% of funding needed for projects on waitlist



# Research Conclusions

- Residents are at high risk of health problems resulting from nitrate exposure.
- The average cost of water for households exceeds affordability standards and adds a substantial economic burden.
- The health and economic burden of nitrate contamination and potential health risks due to exposure disproportionately affect low-income households and Spanish-speaking residents.
- Groundwater nitrate levels are increasing.
- Public funding for nitrate mitigation in Community Water Systems is inadequate and projects funded may not be providing sustainable solutions.

# Policy Recommendations

- Do more detailed studies; wider area; more communities.
- Ensure nitrate-affected communities are well-informed about their water quality and appropriate measures to protect their health.
- Provide sufficient, targeted funding for short- and long-term solutions to ensure safe drinking water.
- Remove political barriers to consolidating small community water systems.
- Prioritize source control to reduce current and prevent new contamination.



# Directions for Further Research

- Assess the impact of existing water-quality notification systems on water-user awareness and behavior.
- Conduct an epidemiological study of the health effects of nitrate exposure in the San Joaquin Valley.
- Carry out a more comprehensive economic study of the costs of nitrate contamination.
- Review the effects on groundwater quality of nitrate source control efforts in California.



# Acknowledgments

- Project Partners
  - Community Water Center
  - California Rural Legal Assistance Foundation
  - Clean Water Action Fund
  - Carolina Balazs, UC Berkeley
- Funders
  - California EPA EJ Small Grants
  - David and Lucille Packard Foundation
- Technical Reviewers
  - James Shortle, University of Pennsylvania
  - Ann Lewandowski, University of Minnesota
  - Isha Ray, UC Berkeley
  - Paul English, Environmental Health Investigations Branch, CDPH

# A note about our process...

## The importance of community engagement

### Survey Process

Set Goals



Develop Survey Instrument, Methods



Conduct Survey



Interpret Survey Results



Publish and Distribute Report



Project Evaluation

### Community Engagement

Collaborative Goal Setting



Focus Group; Community Review



Survey Training and Support



Focus Group



Community Education



Collaborative Evaluation





# Nutrients Update

NDWAC Meeting

July 2011

Ephraim King, Director  
Office of Science and Technology

# Outline

- New Science
- Program Implementation
- State Accountability Frameworks
- Opportunities and Challenges

# 2010 USGS Report

## Nutrients in Streams & Groundwater

- Analysis of occurrence data from 1992 to 2004
- Nitrate MCL exceeded in 7% of 2,400 DW wells sampled
- Nitrogen concentrations generally highest in Ag streams in Northeast, Midwest, & Northwest
- Despite substantial Federal, State and local efforts, limited national progress during this period
- Nitrate concentrations likely to increase in drinking water aquifers over next decade as nitrogen moves downward into the groundwater system.

# Human Health Research

- Current MCL for Nitrate (10 mg/L) and Nitrite (1 mg/L) set in 1991 with methemoglobinemia as endpoint of concern
- More recent studies on possible cancer, diabetes, and thyroid related endpoints
- Health Canada draft drinking water Nitrate/Nitrite guidelines
- Research from U.S., England, Slovakia, Spain, Hungary, and Italy under review
- Freshwater Harmful Algal Blooms
  - *Scientific Assessment of Freshwater Harmful Algal Blooms* (CDC, NOAA, USGS, NASA, FDA, NSF, MMC, NIEH, USDA, USEPA)
  - Cyanotoxins are some of the most toxic substances known
  - Can cause skin, GI, respiratory, liver, and neurological health problems

# Causal Links and Assessment

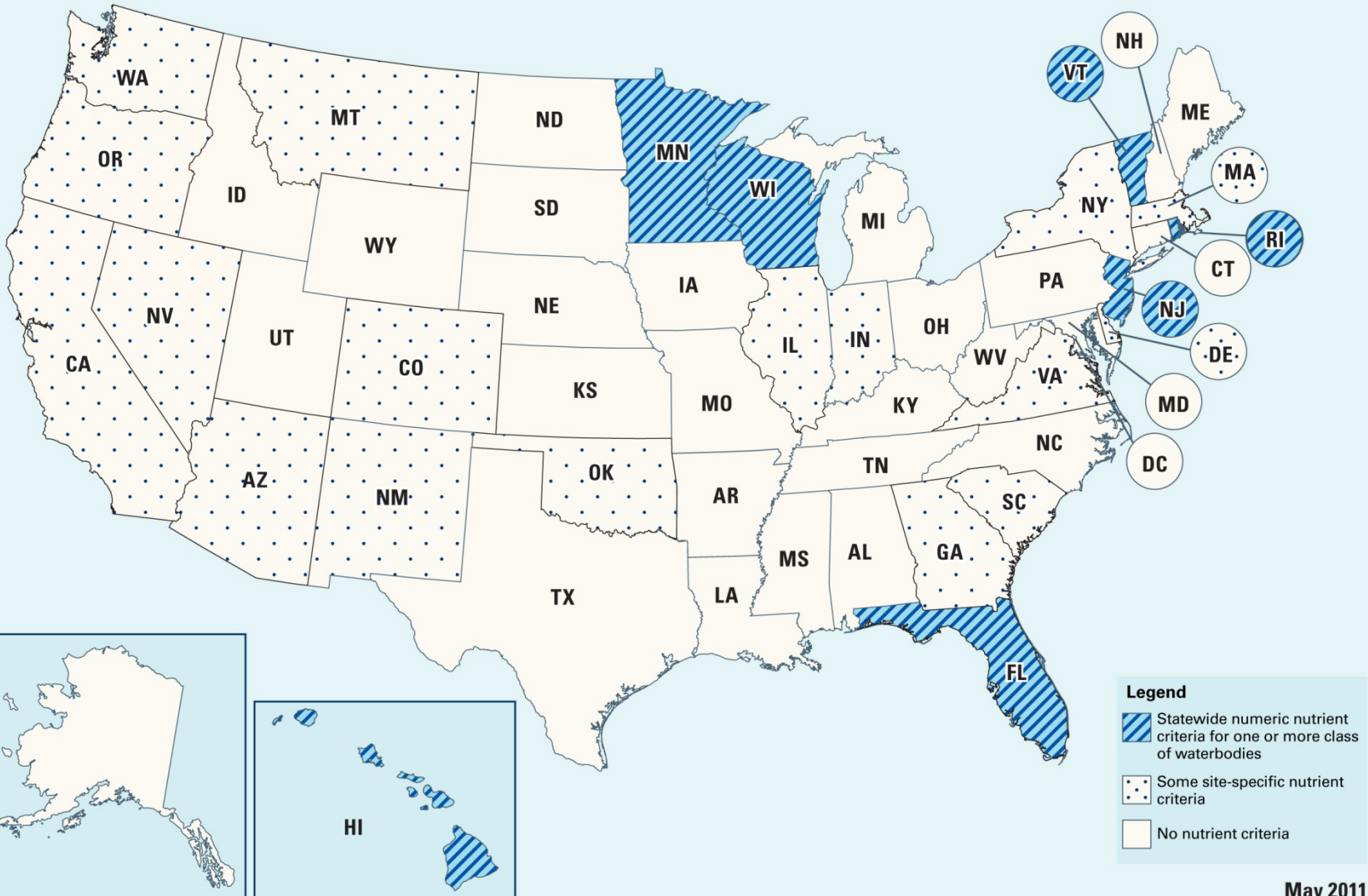
- Nine major reports since 2006 on nutrient occurrence and impacts (e.g., NOAA, NAS, SAB, EPA, USGS)
- Large body of additional peer reviewed literature address the cause-effect relationship of nutrients and WQ impacts (e.g., more than 365 peer-reviewed references in FL inland rule with over 200 addressing cause and effect issues)
- Ongoing review of animal manures, and related veterinary pharmaceuticals and antimicrobials



# Methodologies for Developing Numeric Nutrient Criteria

- Empirical Approaches Guidance – SAB review supports use of statistical tools as part of weight of evidence approach
- SAB review of FL Coastal Methodologies
  - ✓ Encourages EPA to continue to develop all three approaches (reference, stressor-response, and numerical water quality models)
  - ✓ Supports “dual nutrient (N and P) strategy”
  - ✓ Supports the use of satellite imagery for coastal waters chlorophyll a concentrations
- WQ and hydrodynamic modeling methodologies for calculating Mississippi River loadings and impacts to coastal waters scheduled for peer review Fall 2011 (MS River Science Plan)

# Progress Toward Clean Water Act Adopted Numeric Nutrient Criteria



# Range of TN & TP Numeric Values

| Source                                  | Waterbody Type       | Nutrient | Minimum (mg/L) | Maximum (mg/L) | Median (mg/L) |
|-----------------------------------------|----------------------|----------|----------------|----------------|---------------|
| EPA Eco Regions                         | Lakes and Reservoirs | TN       | 0.01           | 1.27           | <b>0.45</b>   |
|                                         |                      | TP       | 0.008          | 0.038          | <b>0.016</b>  |
| Sub-sample of TMDLs with TN/TP Targets* | Lakes and Reservoirs | TN       | 0.09           | 3.00           | <b>0.60</b>   |
|                                         |                      | TP       | 0.008          | 0.405          | <b>0.030</b>  |
| State Criteria                          | Lakes and Reservoirs | TN       | 0.10           | 5.00           | <b>0.63</b>   |
|                                         |                      | TP       | 0.010          | 1.000          | <b>0.030</b>  |
| EPA Eco Regions                         | Rivers and Streams   | TN       | 0.01           | 2.18           | <b>0.63</b>   |
|                                         |                      | TP       | 0.010          | 0.128          | <b>0.032</b>  |
| Sub-sample of TMDLs with TN/TP Targets* | Rivers and Streams   | TN       | 0.29           | 3.00           | <b>0.76</b>   |
|                                         |                      | TP       | 0.007          | 1.000          | <b>0.092</b>  |
| State Criteria                          | Rivers and Streams   | TN       | 0.10           | 5.00           | <b>0.67</b>   |
|                                         |                      | TP       | 0.010          | 1.500          | <b>0.070</b>  |

\* Based on recent OWOW evaluation of nutrient-related TMDLs for 142 impaired waters, where numeric TN/TP water quality targets (not EPA approved) were used. Evaluation included 2-10 nutrient-related TMDLs for each of 29 states. Evaluation not meant to be statistical inference of all 8,000 nutrient-related TMDLs.

# Treatment Technologies

| Treatment System              |                     | Description                                                                                               | Practical Effluent Concentrations |                   |
|-------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|
|                               |                     |                                                                                                           | Nitrogen (mg/L)                   | Phosphorus (mg/L) |
| Secondary Treatment           |                     | Treatment to achieve BOD and TSS to 30 mg/L                                                               | 20-30                             | 4-6               |
| AWT                           | BNR                 | Nitrification/denitrification + chemical phosphorus removal (chem add + residence time)                   | 8                                 | 1                 |
|                               | ENR                 | Nitrification/denitrification + chemical phosphorus removal (add methanol + DO cycling)                   | 3                                 | <1                |
|                               | Limit of Technology | Nitrification/denitrification + chemical phosphorus removal + methanol + DO cycling + tertiary filtration | 3                                 | 0.1               |
|                               | RO/Micro filtration | Nitrification/denitrification + chemical + RO or microfiltration                                          | <3                                | <0.1              |
| Comparison to Median Criteria |                     |                                                                                                           | 0.45-0.76                         | 0.016-0.600       |

# Nutrient Management Frameworks

- Nancy Stoner March 16, 2011 Memo
- Guiding Principles
  - ✓ Results, Results, Results
  - ✓ Focus on interested and willing states partnering with stakeholders
  - ✓ Flexible approach for near-term N & P reductions while continuing focus on longer-term numeric criteria development
- Framework applies nationally but designed for State tailoring to regional and local conditions

# Recommended Framework Elements

- State-wide Assessment and Prioritization
- Metrics, Measures, and Practices for Priority Watersheds
- Accountability and Transparency
- Numeric Criteria

# Next Steps

- Continue science emphasis
  - ✓ Assessment
  - ✓ Human health effects
  - ✓ Aquatic life impacts
- Continue state support and broader Stakeholder/Ag collaboration to address both aquatic and drinking water supply issues
- Increase focus on partnering with States to develop nutrient frameworks and broaden implementation flexibility

# **Nitrogen and Phosphorus Pollution Data Access Tool (NPDAT)**

Presentation to National Drinking Water Advisory Council  
July 22, 2011



# Purpose and Status of the Nitrogen and Phosphorus Data Access Tool

## Purpose:

- To facilitate state and local efforts to reduce nitrogen and phosphorus pollution
- Provides information to help in prioritizing watersheds on a statewide basis for load reductions and setting watershed load reduction goals and strategies, consistent with Nancy's March 16, 2011 memorandum ("Working Effectively in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions")
  - Streamlined access to N and P data from multiple websites/databases
  - Easy-to-use geospatial viewer and data files for download in commonly-used formats

## • Status:

- Released to the public on July 15, 2011
- Will consider user feedback as we prepare for scheduled updates in the fall
- Finalizing drinking water source data layers and downloads. Will provide information on density of surface water and groundwater sources by HUC-12

# Linkage to Nutrient Frameworks:

## Assessment and Prioritization

- Prioritize watersheds on a statewide basis for nutrient loading reductions
  - Estimate N & P loadings delivered to waters in all major watersheds across the state at HUC8 scale or smaller
  - ID watersheds that account for substantial portion of urban and/or ag
  - ID targeted/priority HUC12 or similar watersheds for targeted N & P load reduction activities, considering receiving water problems, public and private drinking water supply impacts, nutrient loadings, opportunity to address high risk nutrient problems, or other related factors
- Set watershed load reduction goals based upon best available information
  - Set numeric goals for loading reductions for each targeted/priority HUC12 that will collectively reduce the majority of N & P loads from ID'd HUC8

# Data Layers Available through NP DAT

- **Loadings**

- SPARROW Total Nitrogen incremental yield by 8-digit Hydrologic Unit Code (HUC)
- SPARROW Total Nitrogen incremental yield delivered to Gulf of Mexico
- SPARROW Total Phosphorus incremental yield by 8-digit HUC
- SPARROW Total Phosphorus incremental yield delivered to Gulf of Mexico

- **Water Quality Data and Information**

- Water Quality Monitoring Sites with N/P -- STORET (STORage and RETrieval database)
- Water Quality Monitoring Sites with N/P -- • NWIS (National Water Information System)
- National Aquatic Resource Surveys (NARS) Nitrogen and Phosphorus Ecoregional Thresholds

- **Setting Watershed Load Reduction Goals/Source Control Priorities**

- Facilities likely to discharge N/P
- Concentrated Animal Feeding Operations (CAFOs) -- *Download Only*
- Waters Listed for N/P Impairments
- Waters with Total Maximum Daily Loads (TMDLs) for N/P Impairments
- Land Cover Data
- Active, Nutrient-Related Clean Water Act Section 319 Projects (*Coming Soon*)
- Drinking Water Intake Density (*Coming Soon*)

- **Hydrologic and Political Boundaries**

- 8-digit Hydrologic Unit Code (HUC) Watershed Boundaries
- State Boundaries

# NPDAT Website

The screenshot shows the EPA website's navigation and content for the Nitrogen and Phosphorus Pollution Data Access Tool. Annotations include:

- A box labeled "Links to Data Access Tool" with an arrow pointing to the "Data Access Tool" link in the bottom section.
- A box labeled "Tutorial Link" with an arrow pointing to the "Tutorial (PDF)" link in the Quick Links section.

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You are here: [Water](#) » [Science & Technology](#) » [Surface Water Standards & Guidance](#) » [Water Quality Standards](#) » [Water Quality Criteria](#) » [Nutrients](#) » [Nitrogen and Phosphorus Pollution Data Access Tool](#)

## Nitrogen and Phosphorus Pollution Data Access Tool

### Data Access Tool to Help States Develop Strategies to Address Nitrogen and Phosphorus Pollution

As described in EPA's March 16, 2011 memorandum, "[Working Effectively in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions](#)," (PDF) (6 pp, 346.6K, [About PDF](#)) EPA will work collaboratively with interested and willing states, other partners, and stakeholders to help states develop effective statewide strategies for reducing loadings of nitrogen and phosphorus while they continue developing numeric criteria for these pollutants.

The first elements in EPA's recommended framework are to: 1) prioritize watersheds on a statewide basis for nitrogen and phosphorus loading reductions and 2) set watershed load reduction goals based upon best available information. To support states, other partners, and stakeholders in this important work, EPA has developed this data access tool, providing downloadable data layers and key information on the following:

- the extent and magnitude of nitrogen and phosphorus pollution in our Nation's waters;
- current quality problems or potential problems related to this pollution; and
- sources of these pollutants.

The data layers in this data access tool are national in scope. In some cases, data sets are available only for the Salaya River Basin (e.g., US Geological Survey (USGS) estimated loadings of nitrogen and phosphorus pollution).

This data access tool and data layers represent the best information currently available, and by making these data layers viewable and downloadable through this data access tool, EPA does not draw any conclusions or make any recommendations or determinations as to sources of nitrogen or phosphorus to our Nation's waters.

**Quick Links**

[Data Access Tool](#) — Access the geospatial viewer and data downloads.

[Tutorial \(PDF\)](#) (17 pp, 726K, [About PDF](#)) — First time users are encouraged to review this brief tutorial to become familiar with the functions of the Data Access Tool.

[Data Access Tool](#) — This tool provides a geospatial viewer and data downloads.

# Getting to know the N & P Pollution Data Access Tool (Viewer)

Go To: Address or Location State, zip, or full address Go Search by address or HUC8 Forward

Latitude: 28.4616 Longitude: -62.8683

Navigation Bar

Data available for viewing (zoom in to make all data layers active)

Map Layers (zoom in to view all layers)

**Nitrogen/Phosphorus (N/P) Layers**

- ☐ SPARROW N Incremental Yield
- ☐ SPARROW N Delivered Incremental Yield
- ☐ SPARROW P Incremental Yield
- ☐ SPARROW P Delivered Incremental Yield
- ☐ Water Quality Monitoring Sites with N/P (STORET)
- ☐ Water Quality Monitoring Sites with N/P (NWIS)
- ☐ Ecoregion N/P Thresholds for Streams
- ☐ Ecoregion N/P Thresholds for Lakes
- ☐ Facilities that Discharge N/P to Water
- ☐ Land Cover Data
- ☐ Waters Listed for N/P Impairments
- ☐ Waters with TMDLs for N/P Impairments
- ☐ Drinking Water Intake Densities

**Boundary Layers**

- ☒ States
- ☐ Hydrologic Units (HUC8)
- ☐ Mississippi-Atchafalaya River Basin

Data Download

1000 km 500 mi

bing

Done

Internet 100%



# Getting to know the N/P Pollution Data Access Tool (Download)

The screenshot shows the N/P Pollution Data Access Tool interface. A map of the Boston area is displayed on the left. A text box labeled "Access data download function" with a blue arrow points to the "Data Download" section on the right. Another text box labeled "Go here for all other data layers" with a blue arrow points to the "Layer Details" button on the map. A third text box labeled "Go here for monitoring data" with a blue arrow points to the "Data Download" section. The "Data Download" section contains text about downloading Nitrogen and phosphorus datasets, a "Pick one" dropdown menu, a "Clear" button, and a "Selected HUC8s" list. Below this, there are buttons for "STORET" and "NWIS" with options for "Excel", "Comma Separated Values", and "KML". At the bottom, there is a table with columns for "LAYER NAME", "ATTRIBUTES", "GEOSPATIAL", and "METADATA".

Layer Details

Access data download function

Go here for all other data layers

Go here for monitoring data

Streets Imagery Topography

Map Layers (zoom in to view all layers)

Data Download

Nitrogen and phosphorus datasets, except for water quality monitoring data, are downloaded from the [viewer download page](#). Water quality monitoring data for N/P are downloaded by HUC8 using the map as described below. These monitoring data were sampled for lakes, streams, estuaries, spring, reservoir and impoundment from 1995 to present.

First, select one or more hydrologic units (HUC8s) by picking an action, then click on a HUC8 on the map to Add or Remove it from the list of selected HUC8s.

Action: Pick one Clear

Selected HUC8s:

STORET Excel Comma Separated Values KML

NWIS Excel Comma Separated Values KML

To change parameters to run your own query, utilize the [NWIS](#) and [STORET](#) miniportal sites.

U.S. ENVIRONMENTAL PROTECTION AGENCY

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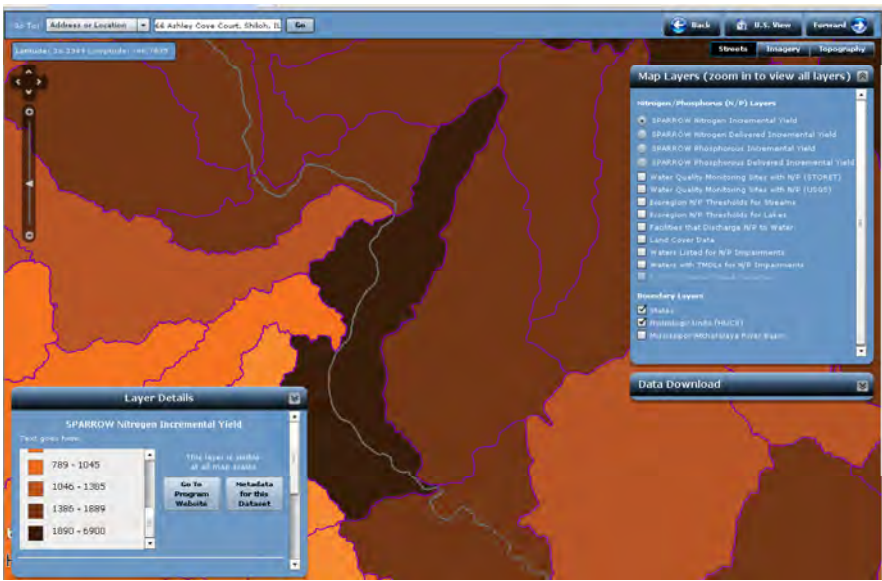
Nitrogen and Phosphorous Pollution Data Layers

| LAYER NAME                                               | ATTRIBUTES                  | GEOSPATIAL | METADATA |
|----------------------------------------------------------|-----------------------------|------------|----------|
| Hydrologic Units (HUC8) Summaries (including Boundaries) | Excel Comma Separated Value | Shapefile  | Metadata |

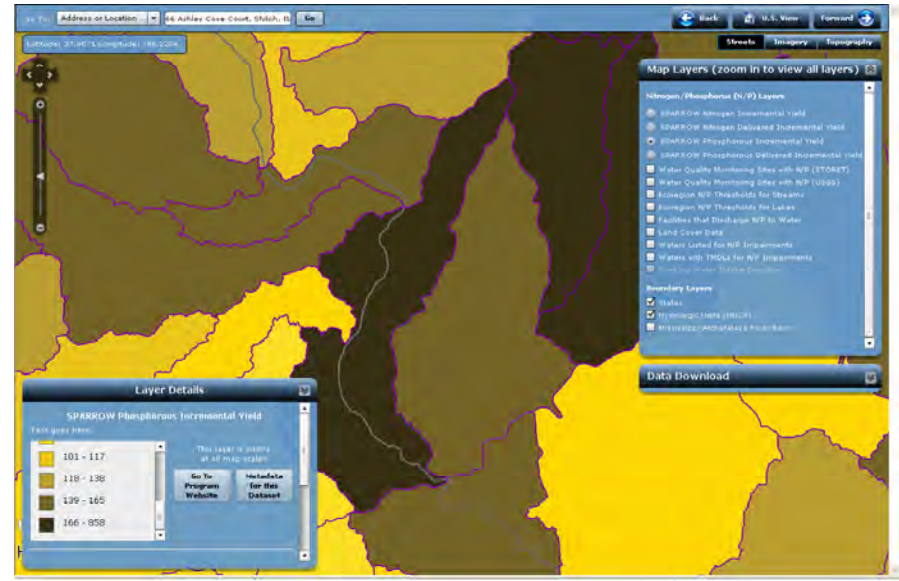


# Loading Data (MARB Specific)

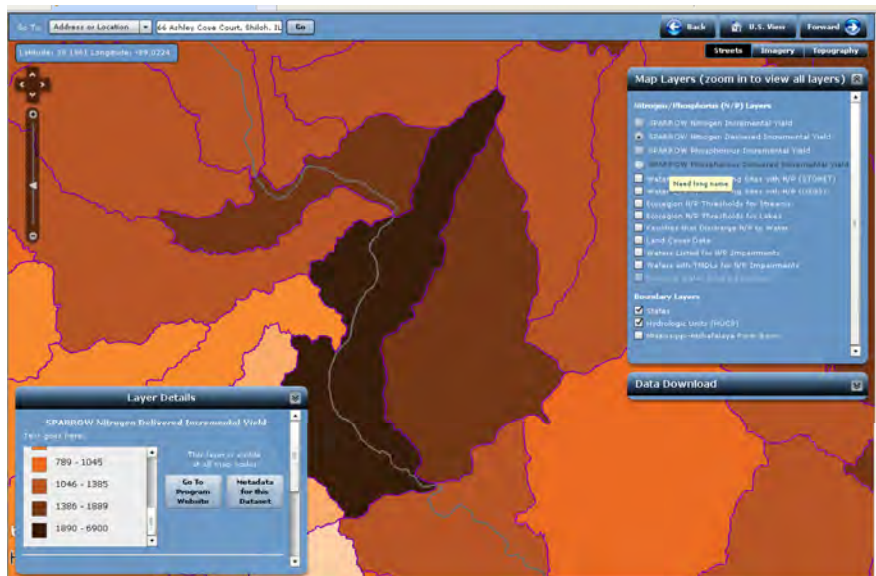
## SPARROW N Incremental Yield



## SPARROW P Incremental Yield



## SPARROW N Delivered Incremental Yield

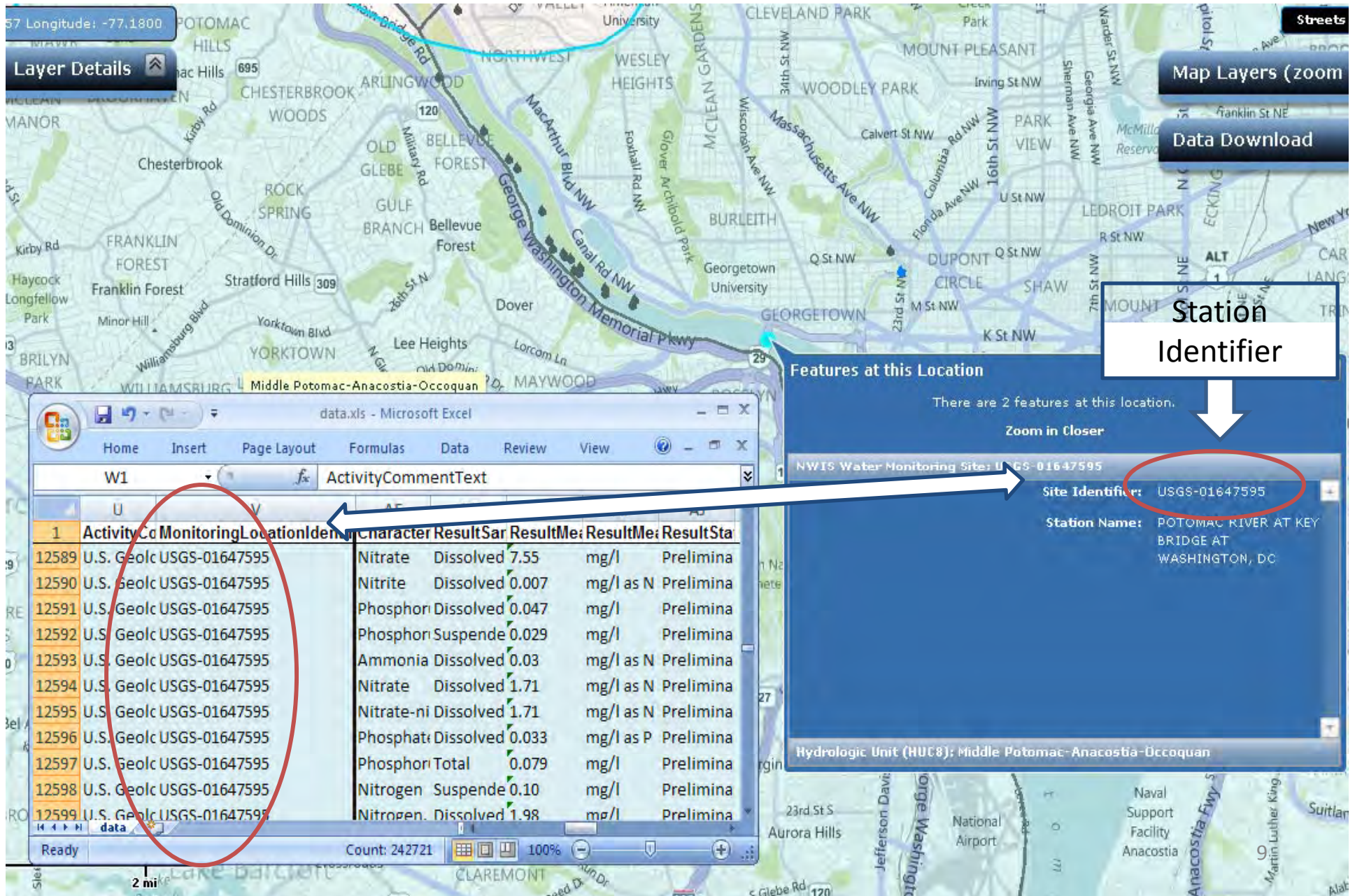


## SPARROW P Delivered Incremental Yield



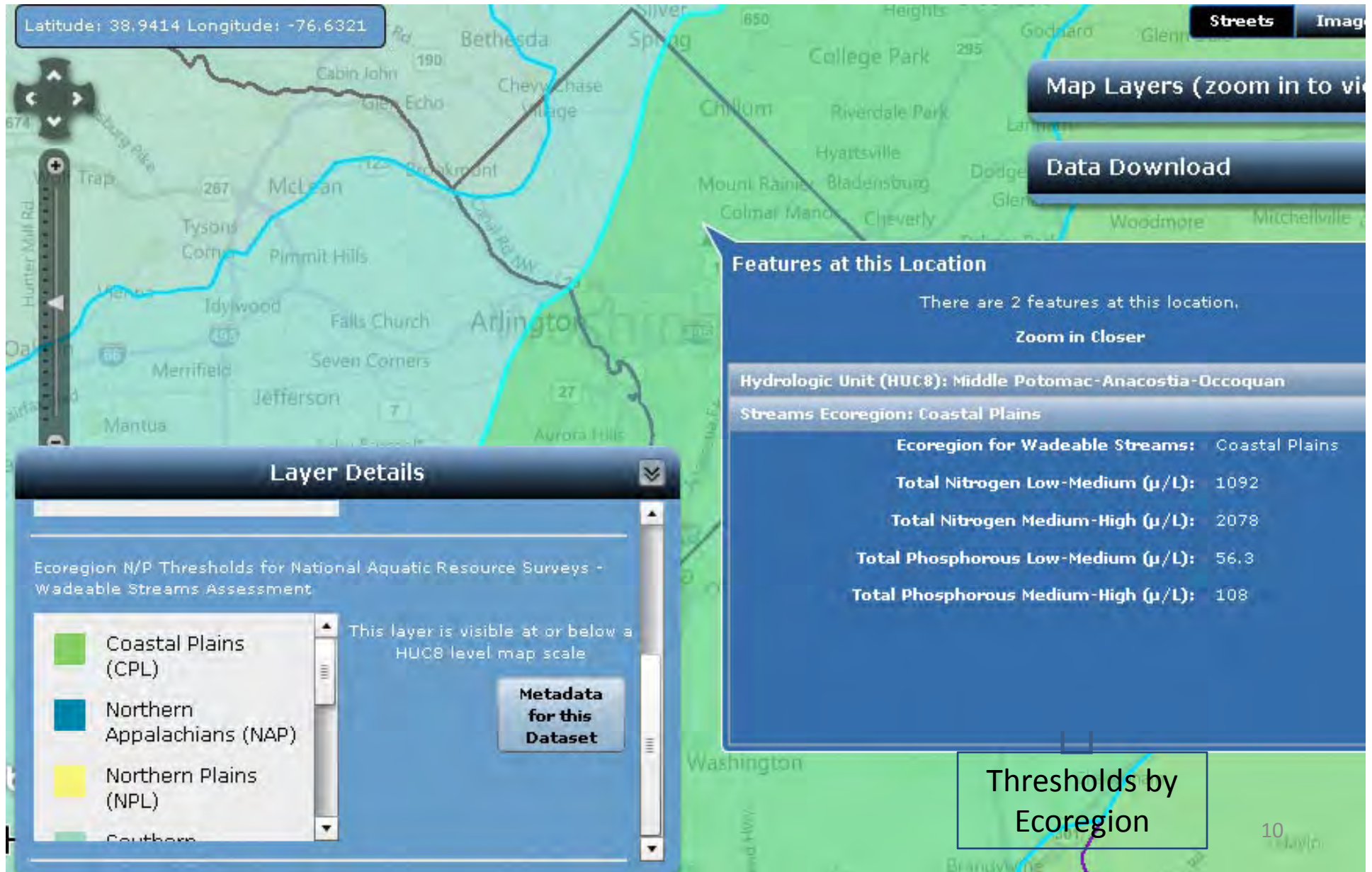


# Water Quality Monitoring Data for N/P





# Ecoregion N/P Thresholds – Streams



# Facilities Likely to Discharge N/P to Water

The screenshot displays a web application interface. At the top, a table lists various facilities with columns for permit number, address, and discharge limits. The facility with permit number VA0025143 is highlighted in orange. A callout box points to this facility on a map of Arlington County. To the right, a summary data panel provides details for this facility, including its permit number, industry classification, and discharge status.

|      | A                    | B            | C       | AU                | AV                | AW                  |            |
|------|----------------------|--------------|---------|-------------------|-------------------|---------------------|------------|
| 1    | external_permit_nmbr | uin          | siccode | total_p_min_limit | total_p_max_limit | total_p_limit_units | facility_d |
| 3493 | MD0025089            | 110008484666 |         |                   |                   |                     | http://cfp |
| 3494 | VA0024724            | 110000736080 | 4952    | 2.721088435       | 2.721088435       | KG/DAY              | http://cfp |
| 3495 | VA0087891            | 110010844514 | 4952    |                   |                   |                     |            |
| 3496 | VA0090221            | 110010131534 | 4952    |                   |                   |                     |            |
| 3497 | VA0025101            | 110001887860 | 4952    | 12.24489796       | 12.24489796       | KG/DAY              |            |
| 3498 | VA0025143            | 110001886335 | 4952    | 20                | 227               | KG/DAY              | http://cfp |
| 3499 | VA0020460            | 110001934300 | 4952    |                   |                   |                     |            |
| 3500 | VA0023299            | 110026170569 | 4952    |                   |                   |                     |            |
| 3501 | VA0024678            | 110000737793 | 4952    | 2.721088435       | 2.721088435       | KG/DAY              | http://cfp |
| 3502 | VA0088579            | 110001886335 | 4952    |                   |                   |                     |            |

**Summary Data for facility**

**Features at this Location**

There are 3 features at this location.

**Zoom in Closer**

**Facility Discharging to Water: ARLINGTON COUNTY WATER POLLUTION CON**

**Permit Number:** VA0025143

**Primary Industry Classification (SIC):** 4952

**Likely to Discharge N/P:** True

**Has Nitrogen Limits:** True

**Has Phosphorous Limits:** True

**Nitrogen Monitoring Requirement:** True

**Phosphorous Monitoring Requirement:** False

**Nitrogen Discharge Monitoring Report Data:** True



# Facilities Likely to Discharge N/P to Water

Top Pollutants by Pound (2007)

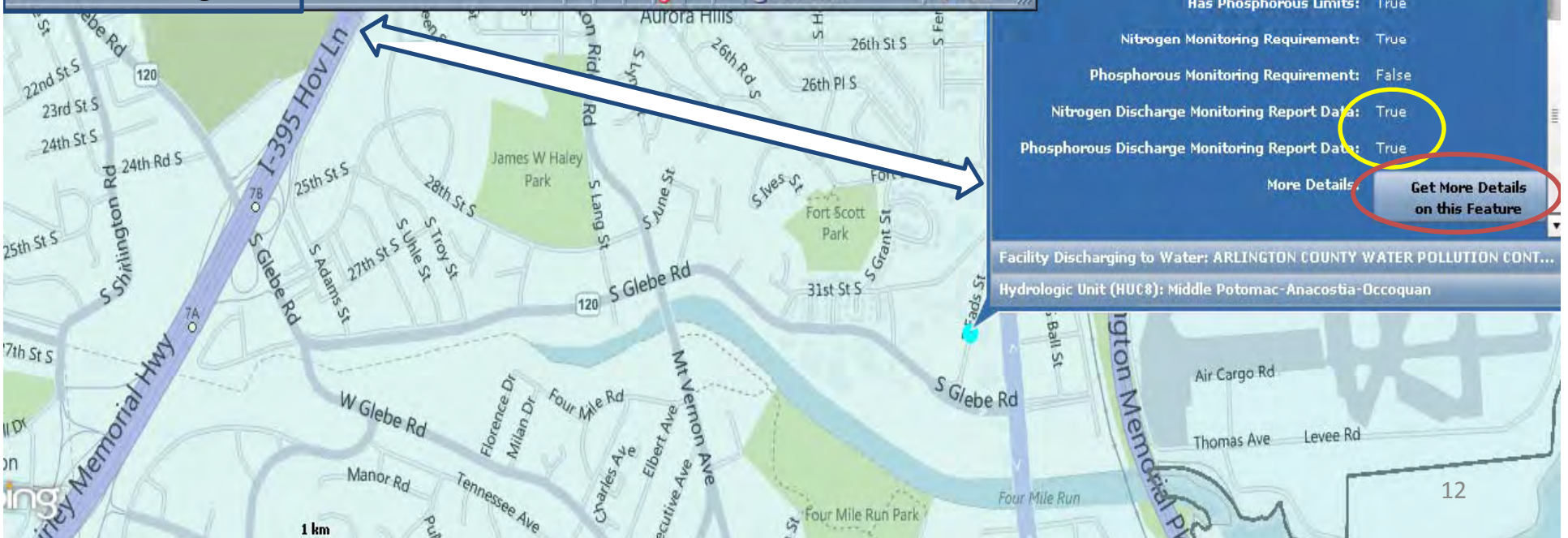
| Pollutant Name                     | Total Pounds |
|------------------------------------|--------------|
| Nitrogen                           | 619,899      |
| Nitrogen, nitrate dissolved        | 475,932      |
| Total Kjeldahl Nitrogen (TKN)      | 128,256      |
| Solids, total suspended            | 86,385       |
| Ammonia                            | 60,583       |
| Nitrite nitrogen, dissolved (as N) | 14,059       |
| Phosphorus                         | 4,962        |
| BOD, carbonaceous, 05 day, 20 C    | 3,076        |

Top Pollutants by Toxic-Weighted Pounds (2007)

| Pollutant Name                     | Total TWPE |
|------------------------------------|------------|
| Nitrogen, nitrate dissolved        | 355        |
| Ammonia                            | 67.2       |
| Nitrite nitrogen, dissolved (as N) | 44.9       |
| Chlorine                           | 6.71       |

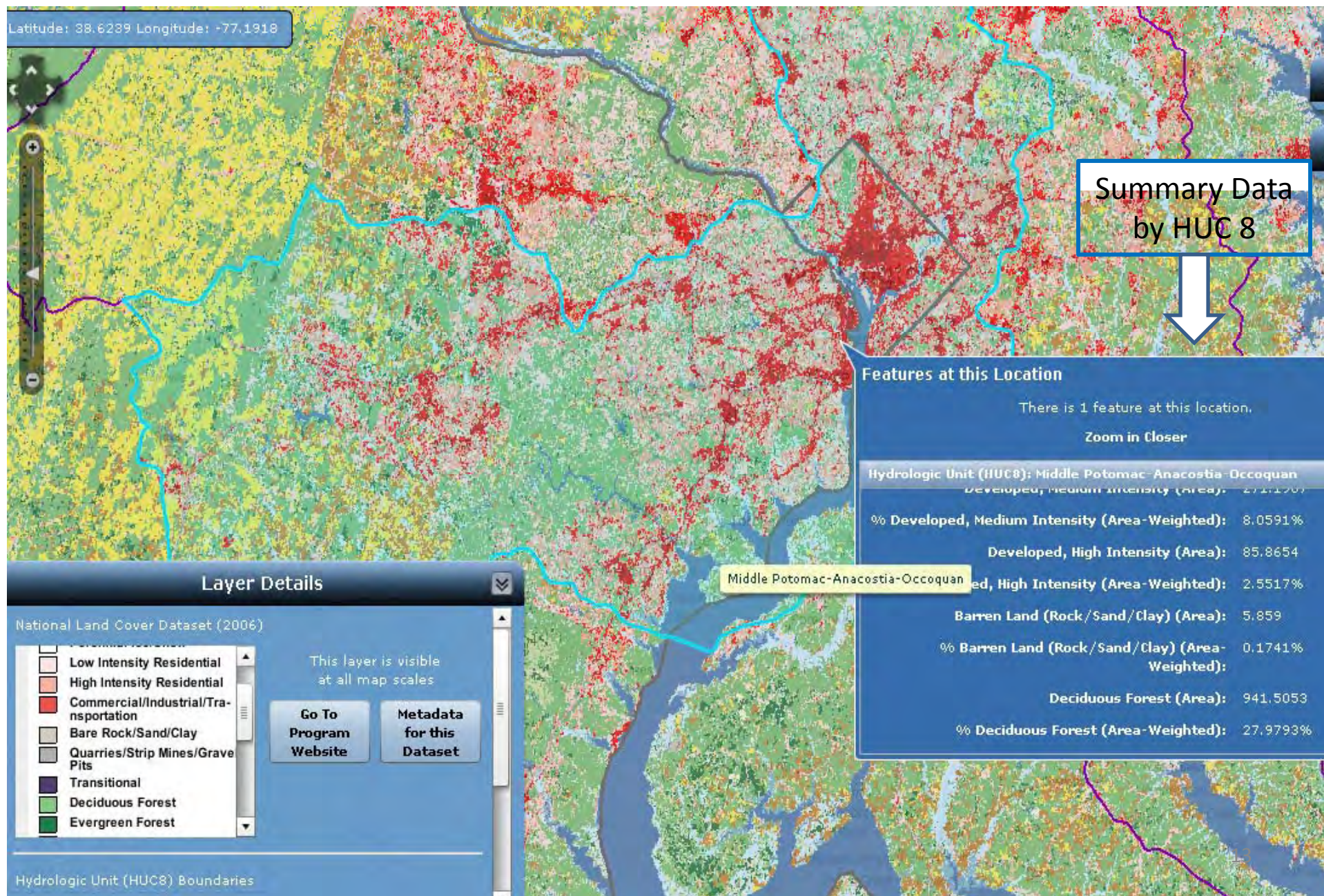
 [Download All Data](#)

DMR Loading Tool



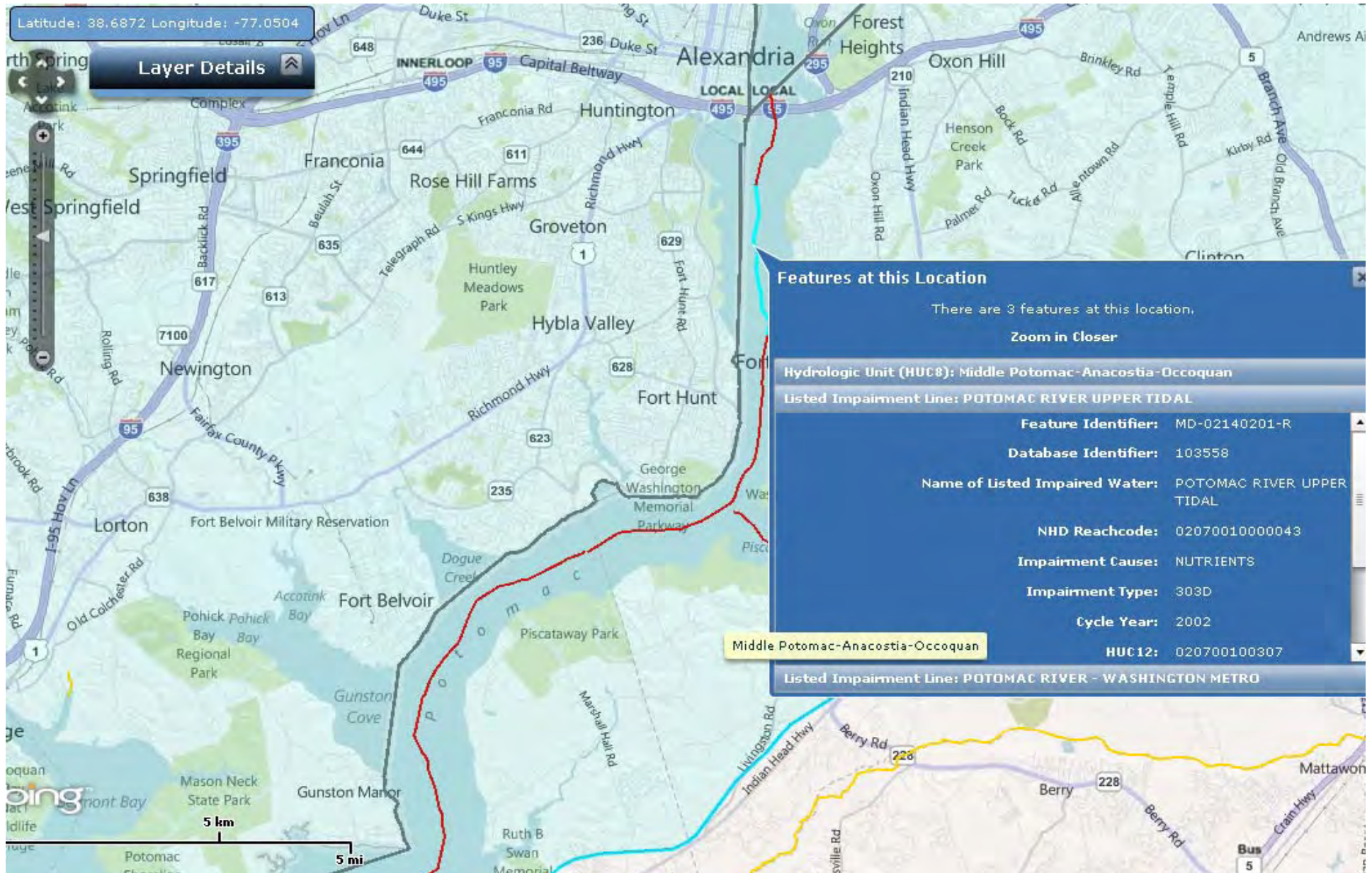


# Land Use Data





# Waters Listed for N/P Impairments and Waters with TMDLs for N/P Impairments



# NPDAT and NDWAC/State Drinking Water Agencies/Public Water Systems

- Opportunity for State Drinking Water Agencies/Public Water Systems and the public to better understand and nitrogen/phosphorus pollution in sources of drinking water
- Tool to access data that states/local governments/public can consider as a state sets priorities in a state-wide strategy for reducing nitrogen and phosphorus pollution
- For more information:
  - Rosaura Conde, Team Lead for NPDAT project – [conde.rosaura@epa.gov](mailto:conde.rosaura@epa.gov)
  - [http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/npd\\_index.cfm](http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/npd_index.cfm)



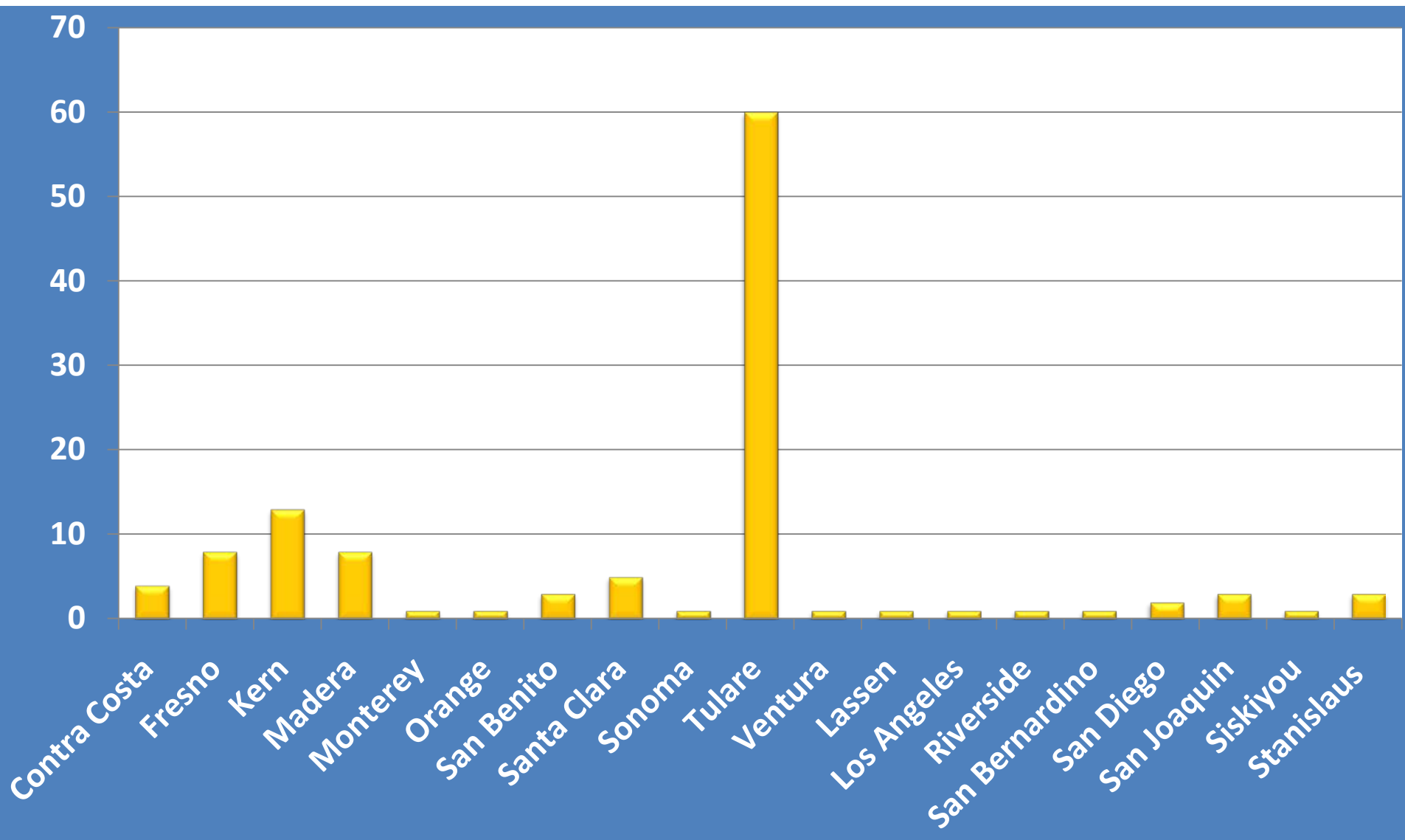
# Drinking Water and Nitrates in the Central Valley





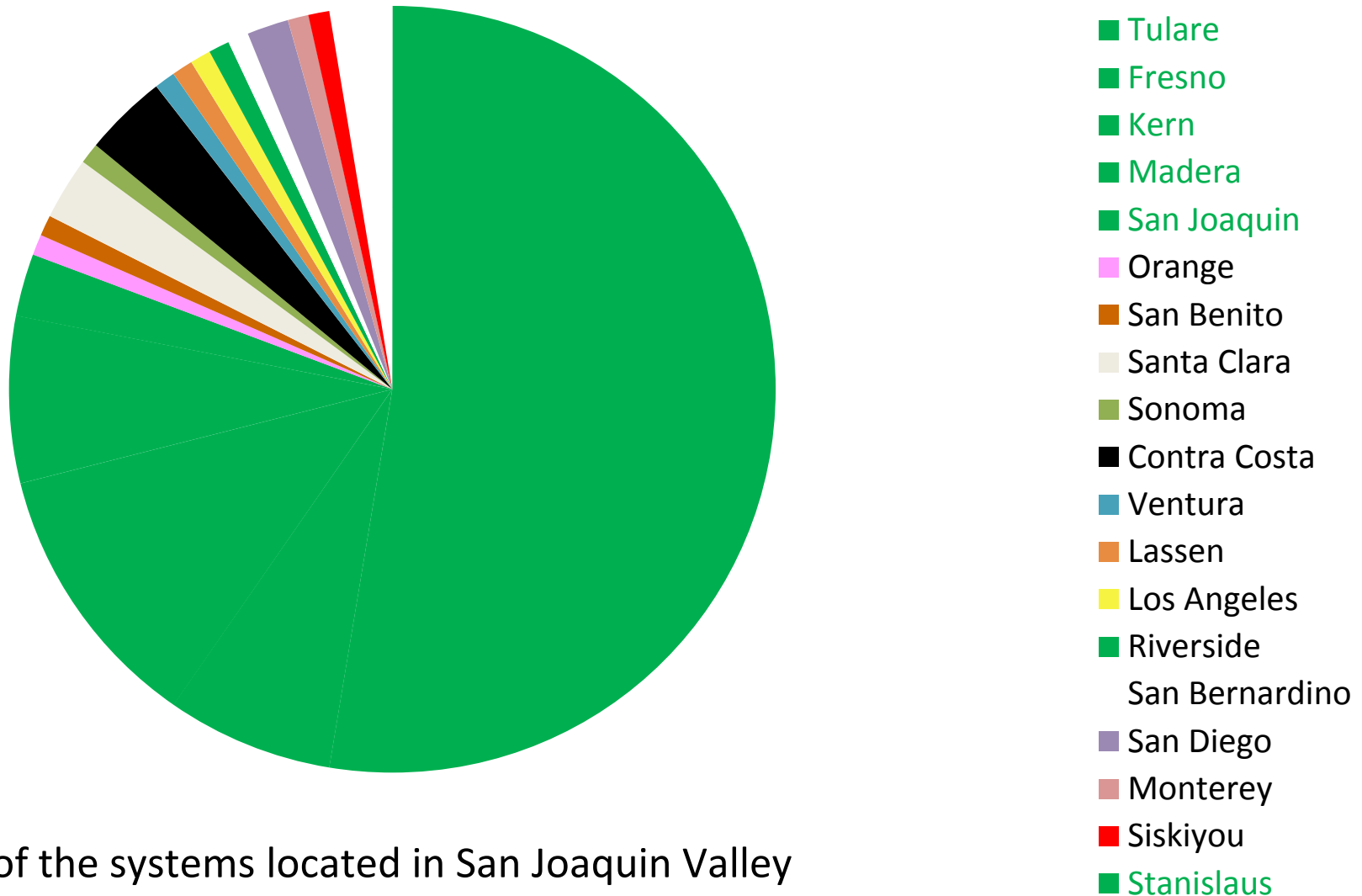


# California Systems with Nitrate MCL Violations by County (118 total)



# Water Systems with Nitrate Violations by County

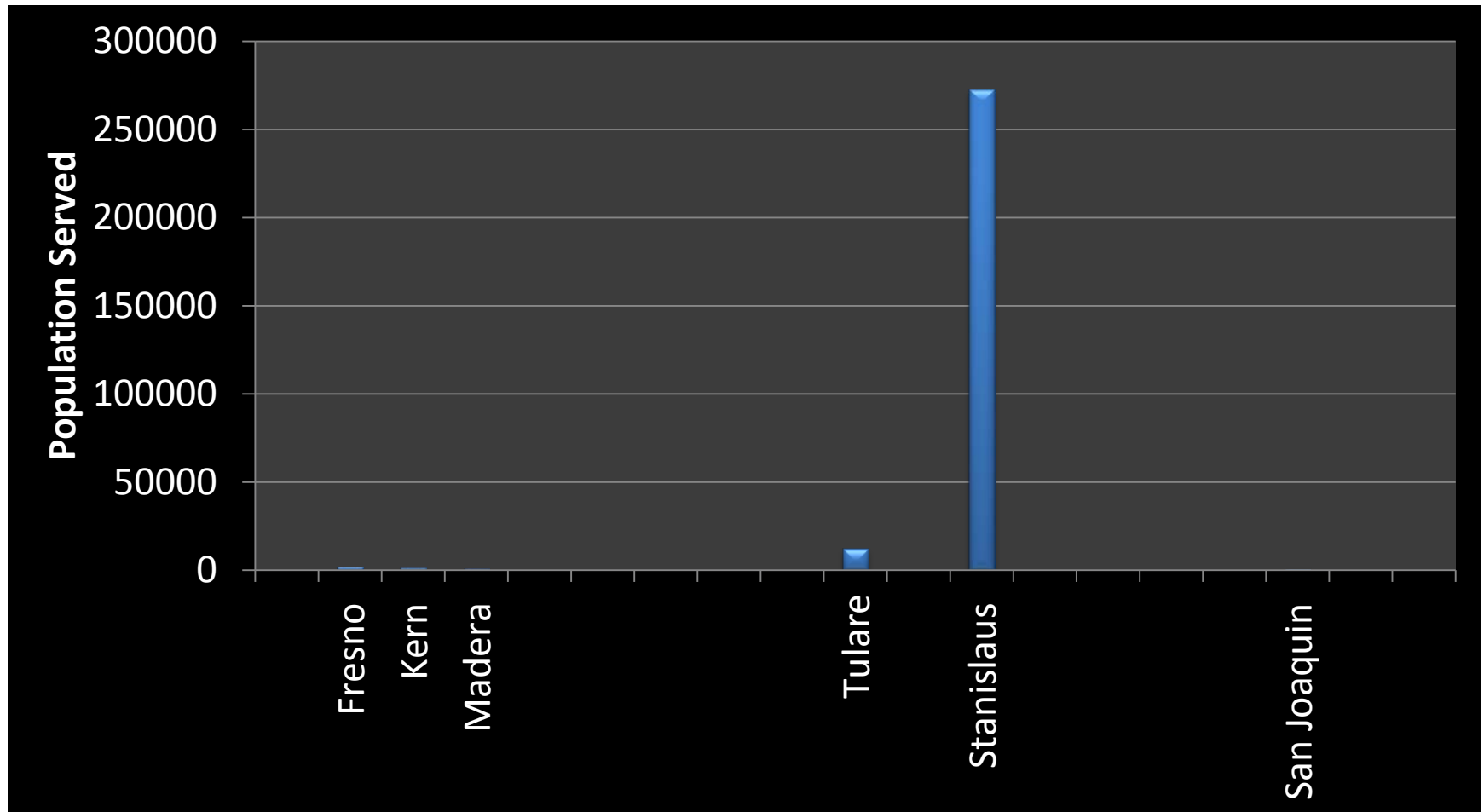
## May 2011



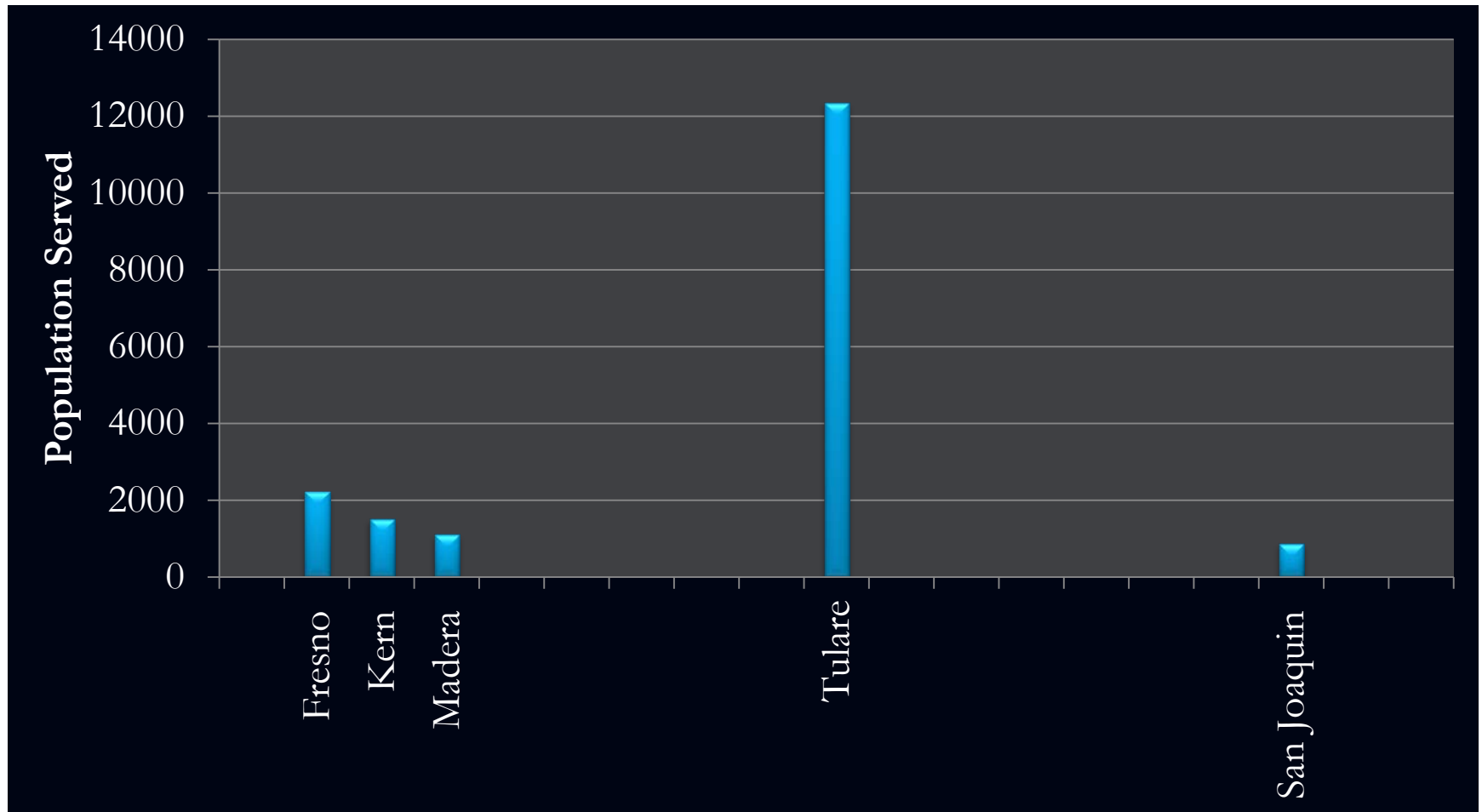
80% of the systems located in San Joaquin Valley

# San Joaquin Valley Water Systems with Nitrate Violations

## Population Served by County



# San Joaquin Valley Water Systems Without Stanislaus County Population Served by County



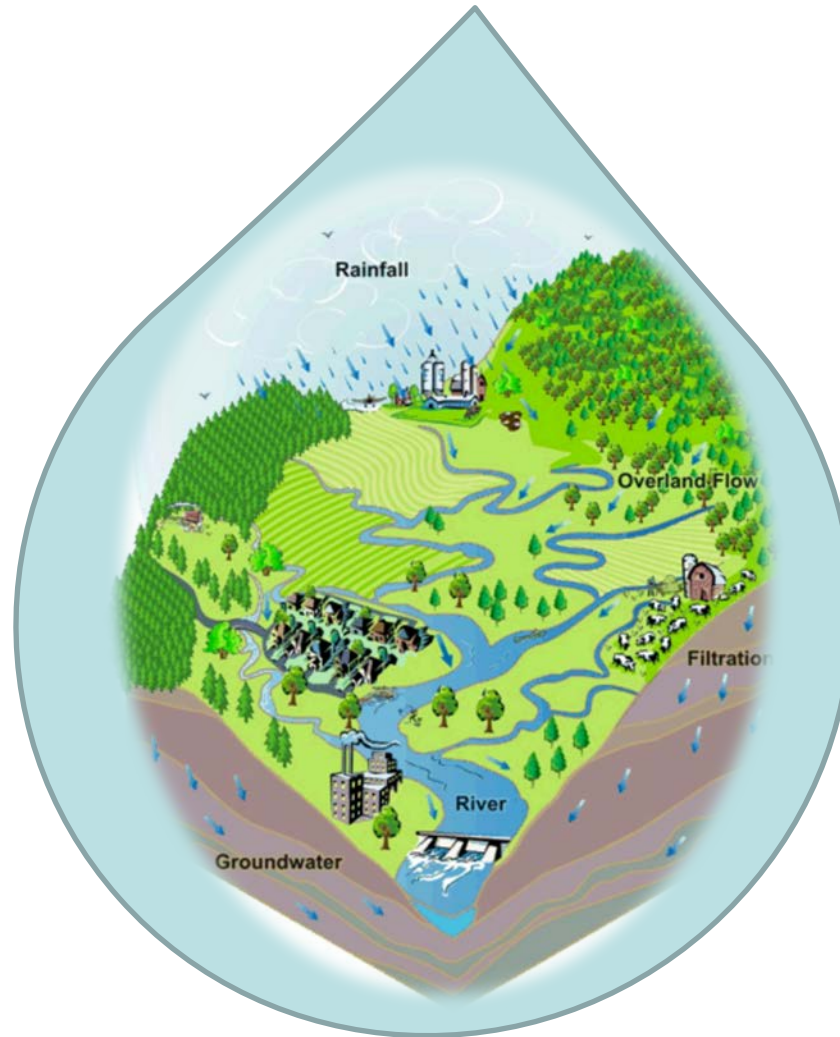
# Update on Safe and Sustainable Water Resources

## National Drinking Water Advisory Council, July 21, 2011

*Jennifer Orme-Zavaleta, PhD*  
*Interim National Program Director*



# Background



“We have made exceptional progress in protecting the environment of America’s communities and restoring the trust of the American people. And we have made a number of historic environmental advances along the way. The year 2010 marks the EPA’s 40<sup>th</sup> anniversary. It is a moment of celebration but also a time when we face some of the most complex and far-reaching environmental challenges in the history of the EPA, our nation and our planet. It is critical that we work harder and look further ahead.”



*EPA Administrator Jackson  
2011 – 2015 Strategic Plan*

**Our Challenge:** “21<sup>st</sup> century environmental problems require 21<sup>st</sup> century solutions; we cannot effectively address such challenges with 20<sup>th</sup> century approaches.”



*Paul Anastas  
ORD Assistant  
Administrator*



# 20<sup>th</sup> Century Challenges and 40 Years of Progress in Protecting Aquatic Resources



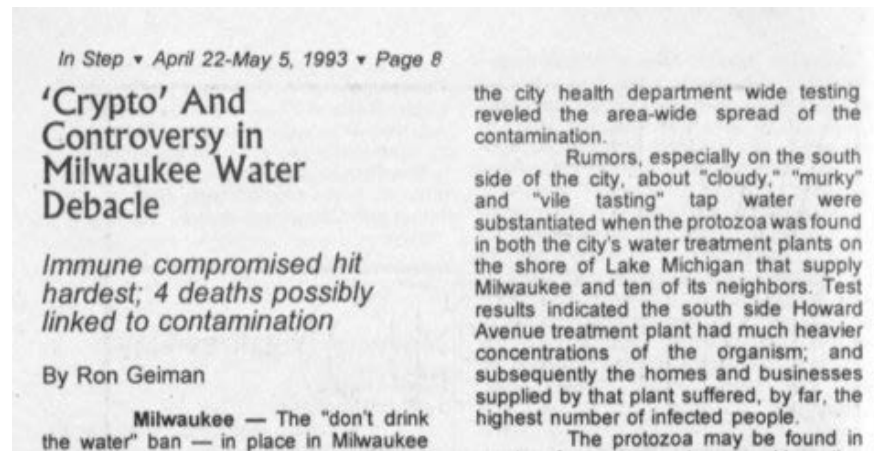
Cuyahoga River, 1969



Love Canal, 1978



Acid Rain impacts to water quality



1993 Cryptosporidium outbreak



# 21<sup>st</sup> Century Challenges

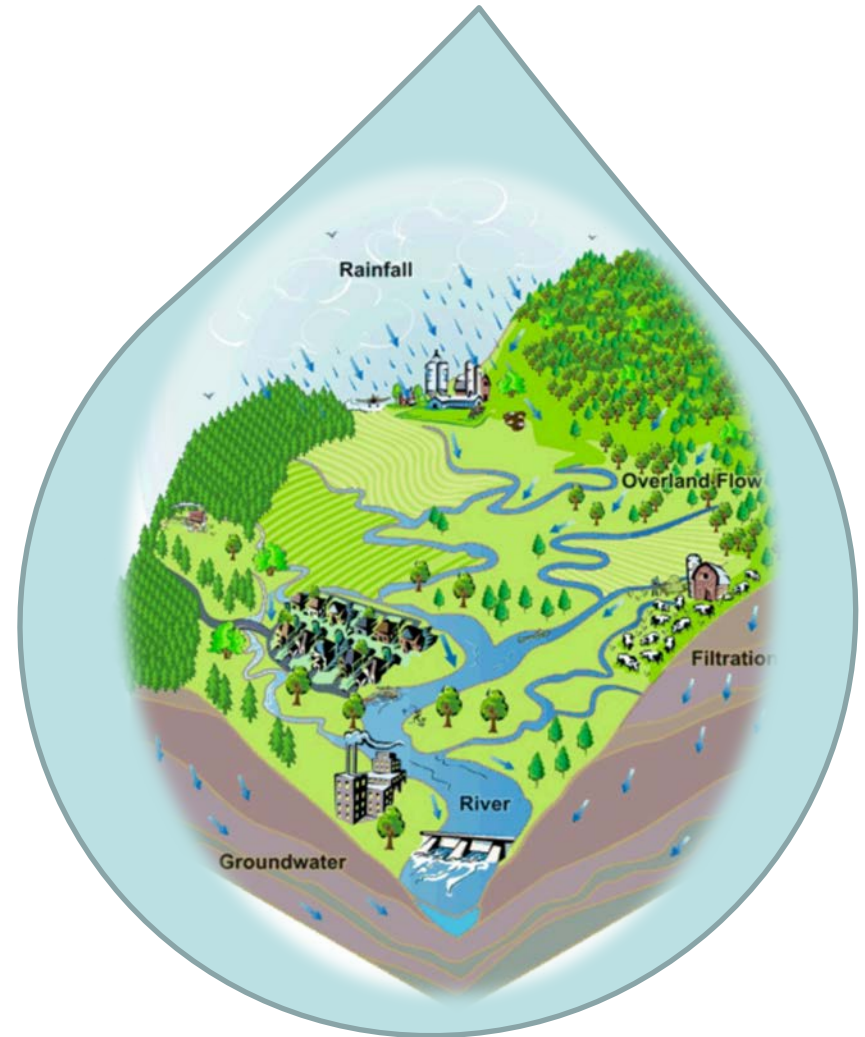
- Rate of waters listed for impairment exceeds rate at which they are being restored
- Causes of degradation are more complex; less visible
- Multiple sources of pollution requiring new, innovative approaches
- Key challenges include
  - aging water infrastructure
  - legacy and emerging contaminants
  - competing demands for water
  - pathogens
  - nutrients



Water resources are not sustainable using 20<sup>th</sup> century approaches to address 21<sup>st</sup> Century problems

Goal of EPA Safe and Sustainable Water Resources (SSWR) Research Program:

- Seek sustainable solutions to 21<sup>st</sup> century problems facing our Nation's water resources
- Integrate the existing Drinking Water and Water Quality research programs into one holistic program



# Why Integrate?



# Overarching Goals

- Protect public health and the environment
- Provide safe and sustainable water to meet societal, economic and environmental needs
- Water resources are managed in a sustainable manner that:
  - integrates drinking water, wastewater, stormwater, and reclaimed water;
  - maximizes energy production, nutrients and materials management, and water recovery; and
  - incorporates comprehensive water planning (such as low impact development and smart growth) and optimum combinations of built, green and natural infrastructure

## Problem Statement

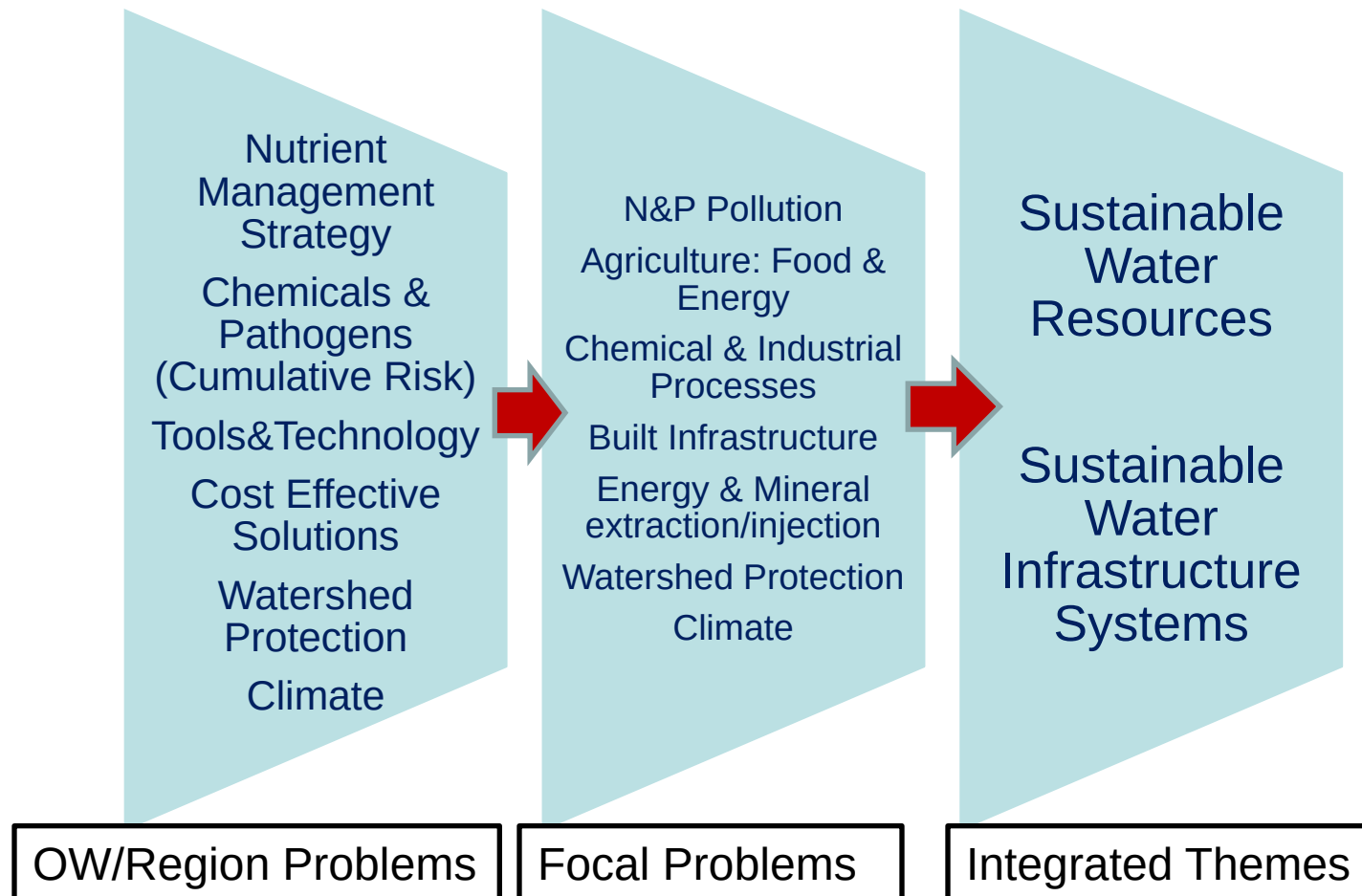
*Increasing demands for sources of clean water combined with changing land use practices, growth, aging infrastructure, and climate change and variability, pose significant threats to our Nation's water resources. Failure to manage our Nation's waters in an integrated, sustainable manner will limit economic prosperity and jeopardize both human and aquatic ecosystem health.*

## Vision

*SSWR uses an integrated, systems approach to research for the identification and development of the scientific, technological and behavioral innovations needed to ensure clean and adequate and equitable supplies of water that support human well-being and resilient aquatic ecosystems.*



# Evolution of SSWR Program



## ORIGINS OF THE PROBLEMS

### Urbanization

Including:

- Land use management
- Industrial Processes

### Population demographics

- aging drinking water and wastewater infrastructure

### Non point source pollution

- Agriculture

## MANIFESTATIONS OF THE PROBLEM IN THE WATER ENVIRONMENT

### Poor Water Quality

- Physical processes (e.g., flow; degraded habitat)
- Loadings: Nutrients, Pathogens, Chemicals, Sediments

### Additional stressors:

- Insufficient Water Quantity
- Climate change and variability

NEW FOCUS -  
Pro-active,  
Integrated,  
Sustainable  
Solutions

## SYSTEMS APPROACH TO SOLUTIONS

### Sustainable Water Resources –

Ensure safe and sustainable water quality and availability to protect human and ecosystem health by integrating social, economic and environmental research for use in protecting and restoring water resources and their designated uses (e.g., drinking water, recreation, industrial processes, and other designated uses) on a watershed scale.

**Sustainable Water Infrastructure Systems**– Ensure the sustainability of critical water resources using systems-integrated water resource management where the natural, green and built water infrastructure is capable of producing, storing and delivering safe and high quality drinking water, and providing transport and use-specific treatment of wastewater and stormwater.

# Sustainable Water Resource Systems

## Economy



## Public Health & Communities



*products & services*

*water supply*

*runoff and  
wastewater*

*recycled water*

*human exposure*

*infra-  
structure*

*freshwater  
depletion*

*ecosystem  
degradation*

## Water Environment

*water cycle provides ecosystem services*

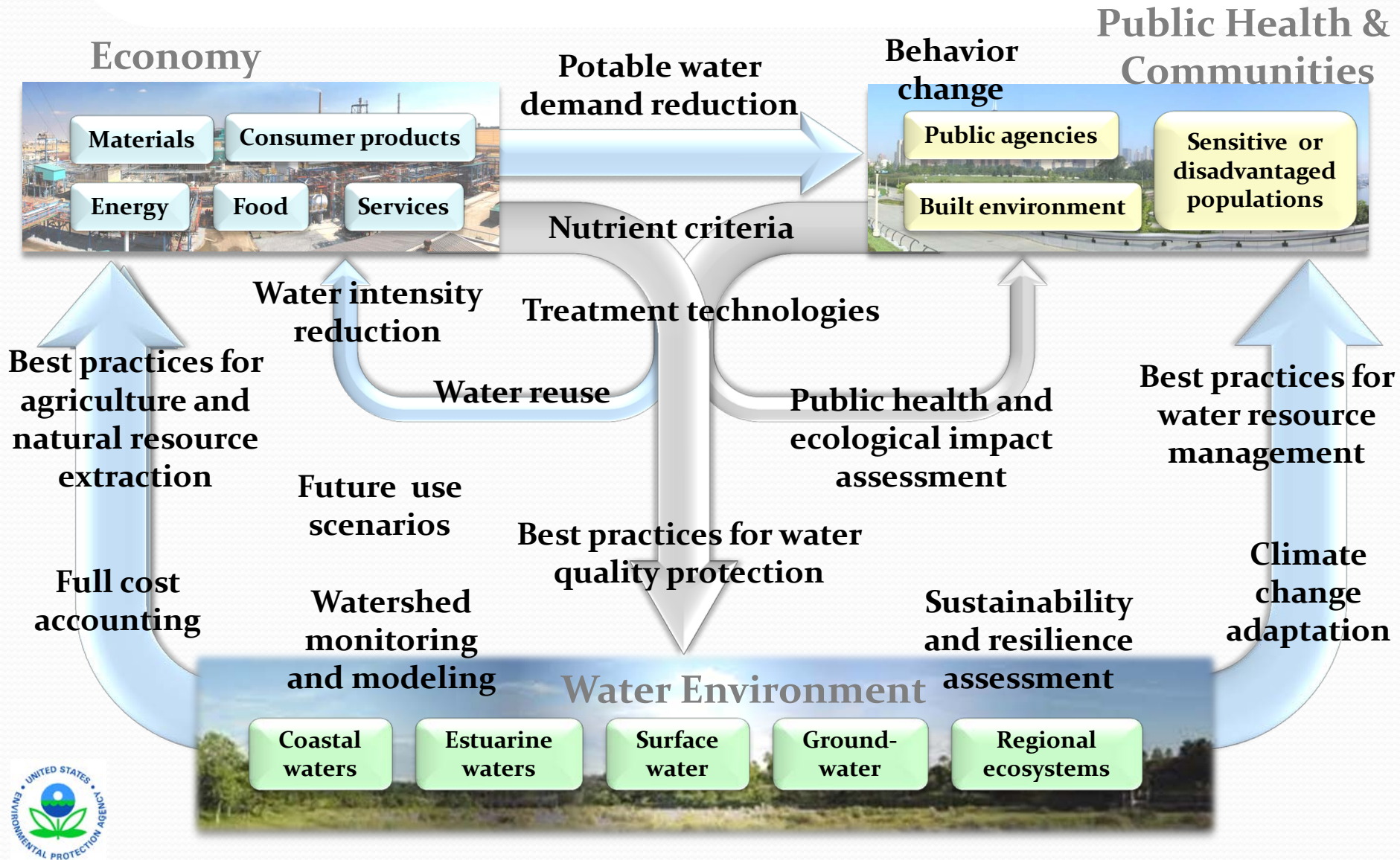


*extractive uses:  
energy, irrigation,  
industrial processes*

*recreational  
and cultural uses*



# Theme 1: Sustainable Water Resources

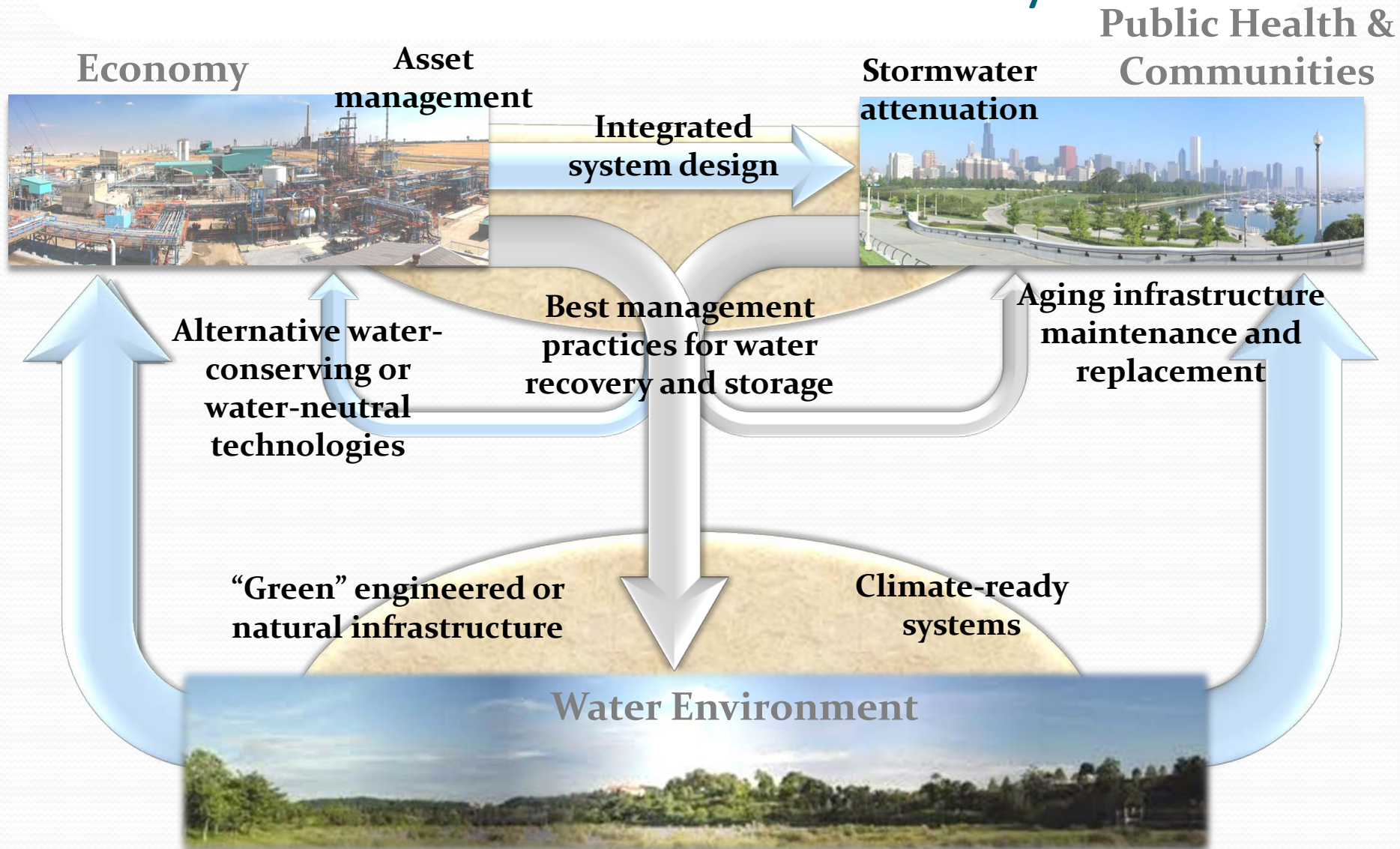


# Research Questions

## Theme 1

- What factors are most significant and effective in ensuring the sustainability and integrity of water resources and watersheds, including downstream estuarine and coastal receiving waters?
  - *Source water protection*
- What approaches are most effective in minimizing the environmental impacts of naturally occurring contaminants and different land use practices (e.g., energy production, mineral extraction and injection activities, agriculture, urbanization) leading to the sustainability of surface and subsurface water resources?
  - *Criteria development; treatment technology development*
- What are the impacts of climate variability and changing human demographics on water quality and sufficient quantity in freshwater, estuarine, coastal aquatic ecosystems, and drinking water? What approaches are needed to mitigate these impacts?

# Theme 2: Sustainable Water Infrastructure Systems



# Research Questions

## Theme 2

- What are the most effective and sustainable approaches which maintain and improve the natural and engineered water system in a manner that effectively protects the quantity and quality of water?
  - *Minimize impacts to drinking water treatment facilities*
- How do we effectively manage water infrastructure to produce safe and sustainable water resources from source to drinking water tap to receiving waters?
  - *Address aging infrastructure; better treatment approaches*
- What effective systems-based approaches can be used to identify and manage causes of degraded water resources?
  - *Integrated systems*

| Current State                                                                                                                                              | Desired State                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Not all communities receive high quality drinking water                                                                                                    | All US communities receive high quality drinking water                                                                                    |
| Human health and aquatic life are challenged by known and emerging contaminants in our water resources                                                     | Human health and aquatic ecosystems are proactively protected                                                                             |
| Lack of resilience to climate change or other destructive forces                                                                                           | Resilient, climate ready, flexible, efficient, and adaptive systems                                                                       |
| Failure of aging water infrastructure outstrips resources to repair, replace, and restore function and uncharacterized public and ecosystem health impacts | Synergistic use of natural ecosystem services and built infrastructure to achieve well characterized and safe public and ecosystem health |
| Many water bodies are impaired by excessive nutrients                                                                                                      | Nutrient levels are in balance with natural water systems and associated safe public and ecosystem health                                 |
| Watershed integrity is compromised by improper land use practices                                                                                          | Watershed/ basin hydrology has been restored to maintain integrity                                                                        |
| Increased urbanization and land development threaten healthy watersheds                                                                                    | Environmental stewardship is incorporated into our societal fabric and land use planning, resulting in an increase in healthy watersheds  |
| Wasteful practices threaten water resources and water treatment capacity is often insufficient for existing loads                                          | Water availability and quality is consistently maintained in an affordable manner to support human and ecological needs                   |
| Potable water demand is increasing in populated areas                                                                                                      | Potable water demand is safely met by local sources while maintaining ecological needs                                                    |



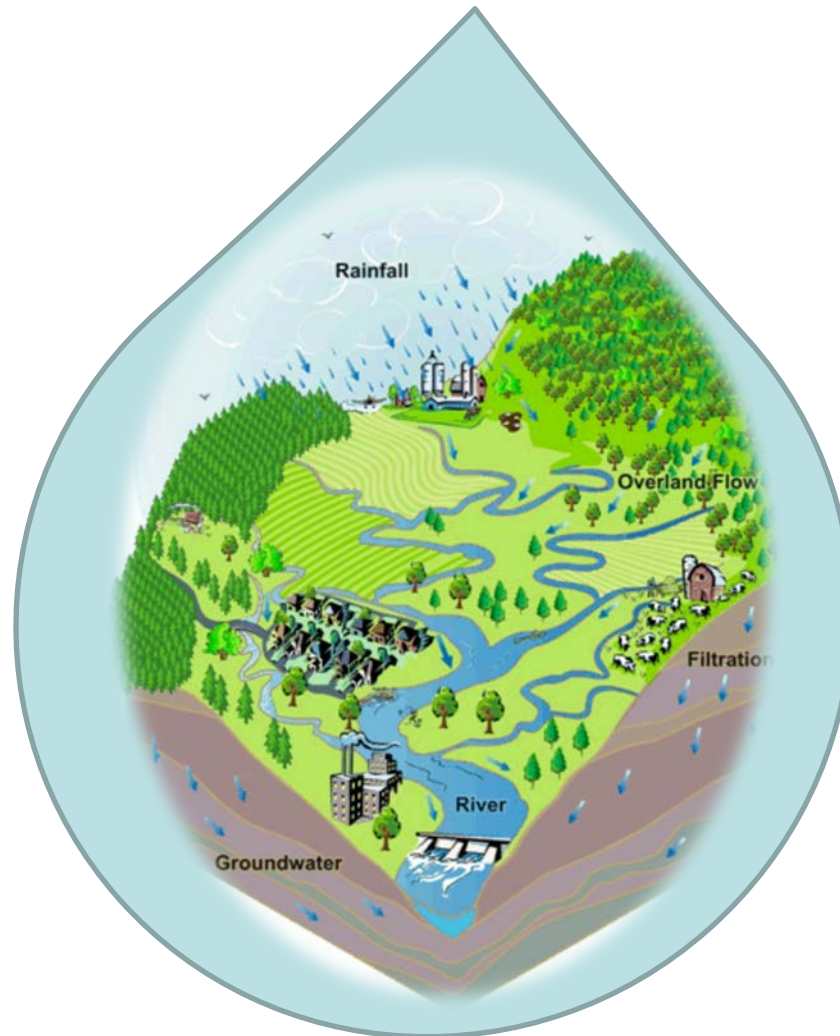
# Next Steps



- Finalize the Framework
- Develop Research Action Plan
- Develop Research Portfolio
- Determine how we measure success



# *Questions?*



# **Domestic Water Activities At CDC**

**Daneen Farrow Collier and Max Zarate-Bermudez**

National Drinking Water Advisory Council Meeting  
July 22, 2011



# **Water-related Research and Projects by CDC Centers**

- 1. Agency for Toxic Substances and Disease Registry (ATSDR)**
- 2. Coordinating Office for Terrorism Preparedness & Emergency Response (COTPER)**
- 3. National Center for Chronic Disease Prevention & Health Promotion (NCCDPHP)**
- 4. National Center for Environmental Health (NCEH)**
- 5. National Center for Injury Prevention & Control (NCIPC)**
- 6. National Center for Immunization and Respiratory Disease (NCIRD)**
- 7. National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID)**
- 8. National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)**
- 9. National Institute for Occupational Safety & Health (NIOSH)**

# **National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)**

- **Building national surveillance capacity for waterborne disease and outbreaks**
- **Improving parasitic and waterborne outbreak investigations**
- **Developing and improving access to water-related health and prevention information at <http://www.cdc.gov/healthywater/>**

# Healthy Water Webpage

CDC - Healthy Water Home - Windows Internet Explorer

http://www.cdc.gov/healthywater/

File Edit View Favorites Tools Help

Favorites Free Hotmail SideStep

CDC - Healthy Water Home

Home Feeds (7) Read Mail

CDC Home  
Centers for Disease Control and Prevention  
CDC 24/7: Saving Lives. Protecting People. Saving Money Through Prevention.

A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

## Healthy Water

With its many uses for drinking, recreation, sanitation, hygiene, and industry, water is our most precious global resource. Clean and safe drinking water is critical to sustain human life and without it waterborne illness can be a serious problem. Water, which is necessary for recreational water activities like swimming, also helps promote healthy living. Often, water's vital role is most apparent during an emergency or disaster.

**Wash Your Hands**  
Help stop the spread of germs

Replay RWIIPW 2011  
Video Contest  
Wash Your Hands

Text size: S M L XL  
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### Resources

#### Healthy Water

- Water-Related Work at CDC
- Water Observances

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#### Contact Us:

Centers for Disease Control and Prevention  
1600 Clifton Rd  
Atlanta, GA 30333  
800-CDC-INFO (800-232-4636)  
TTY: (888) 232-6348  
24 Hours/Every Day  
cdcinfo@cdc.gov

### Healthy Water Topics

|                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Drinking Water</b><br> <ul style="list-style-type: none"><li>Public Water Systems</li><li>Private Water Systems</li><li>Water Fluoridation</li><li>Camping, Hiking, Travel</li></ul>                                         | <b>Healthy Swimming / Recreational Water</b><br> <ul style="list-style-type: none"><li>Pools and Spas</li><li>Oceans/Lakes/Rivers</li><li>Injury and Skin Cancer</li><li>Recreational Water Illnesses</li></ul> |
| <b>Global Water, Sanitation, &amp; Hygiene (WASH)</b><br> <ul style="list-style-type: none"><li>Community Systems</li><li>Household Treatment &amp; Storage</li><li>Sanitation and Hygiene</li><li>Travelers' Health</li></ul> | <b>Other Uses of Water</b><br> <ul style="list-style-type: none"><li>Agricultural</li><li>Industrial</li><li>Medical</li></ul>                                                                                 |
| <b>Water-related Emergencies &amp; Outbreaks</b><br> <ul style="list-style-type: none"><li>Safe Water</li><li>Wastewater</li><li>Hygiene</li><li>Public Health Toolkits</li></ul>                                             | <b>Water-related Hygiene</b><br> <ul style="list-style-type: none"><li>Handwashing</li><li>Body Washing</li><li>Facial Cleanliness</li><li>Hygiene Etiquette</li></ul>                                        |
| <b>Water-related Data &amp; Statistics</b><br> <ul style="list-style-type: none"><li>Waterborne Outbreaks</li><li>Health Data</li><li>Environmental Tracking</li><li>Biomonitoring</li></ul>                                  | <b>Diseases, Contaminants, &amp; Injuries</b><br> <ul style="list-style-type: none"><li>Alphabetical</li><li>By Primary Symptom</li><li>By Type of Disease/Contaminant/Injury</li></ul>                       |

Start

CDC - Healthy Water ...

Trusted sites

100%

4:16 PM

# Drinking Water Page

CDC - Drinking Water Home - Healthy Water - Windows Internet Explorer

http://www.cdc.gov/healthywater/drinking/index.html

File Edit View Favorites Tools Help

Favorites Free Hotmail SideStep

CDC - Drinking Water Home - Healthy Water

Home Feeds (3) Read Mail

CDC Home  
**Centers for Disease Control and Prevention**  
CDC 24/7: Saving Lives. Protecting People. Saving Money Through Prevention.

A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

## Drinking Water

Drinking water comes from a variety of sources including public water systems, private wells, or bottled water. Ensuring safe and healthy drinking water may be as simple as turning on the tap from an EPA-regulated public water system. Other water sources may need a water filter, a check on water fluoridation, or an inspection to ensure a septic tank is not too close to a private well. It is important to know where drinking water comes from, how it's been treated, and if it's safe to drink.

**Plan for Drought**  
Prepare for Drought in Your Community  
GO»

Replay Tap water  
GWA 2011  
Plan for Drought »

Text size: S M L XL  
Email page  
Print page  
Bookmark and share  
Subscribe to RSS  
Listen to Audio/Podcast

### Drinking Water Topics

|                                                                                          |                                                                                                |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Public Water Systems</b><br>Quality & Testing, Regulations, Sources, Treatment...     | <b>Private Water Systems</b><br>Wells (Basics, Testing, Treatment), Nonpublic Water Sources... |
| <b>Water Fluoridation</b><br>Benefits, Safety, Guidelines, Fact Sheets...                | <b>Camping, Hiking, Travel</b><br>Safe Drinking & Recreational Water, Illness...               |
| <b>Bottled Water</b><br>Basics, Immunocompromised Individuals, Fluoride...               | <b>Water and Nutrition</b><br>Health Benefits, Daily Water Needs, Weight Management...         |
| <b>Data and Statistics</b><br>MMWR & EID Reports, References, Surveillance, Outbreaks... |                                                                                                |

### Drinking Water Systems

**Drinking Water Systems**

- Public Water Systems
- Individual Water Systems

There are two types of drinking water systems in the United States. They are:

- Public water systems that are subject to United States Environmental Protection Agency (EPA) regulations.
- Individual water systems that are not subject to EPA regulations.

According to the EPA, approximately 286 million Americans receive their tap water from a community water system. These public water systems are monitored and regulated as set by the EPA.

An estimated 15% of Americans, or about 45 million people, get their water from private ground water wells that are not subject to EPA regulations. Private ground water wells can provide safe, clean water. However, well water can also become contaminated, leading to...

### Resources

#### Healthy Water

- Water-Related Work at CDC
- Water Observances

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#### Contact Us:

Centers for Disease Control and Prevention  
1600 Clifton Rd  
Atlanta, GA 30333  
800-CDC-INFO (800-232-4636)  
TTY: (888) 232-6348  
24 Hours/Every Day  
cdcinfo@cdc.gov

### Drinking Water Fast Facts

- The impact of clean water technologies on public health in the U.S is estimated to have had a rate of return of 23 to 1 for investments in water filtration and chlorination during the first half of the 20th century (4).

Done

Start CDC - Drinking Water ... Microsoft PowerPoint - [...]

Trusted sites 100% 4:19 PM

# **National Center for Immunization and Respiratory Diseases (NCIRD)**

- ❑ Preventing disease, disability, and death from enteric viral diseases
- ❑ Responding outbreaks of enteric viral disease, including those involving drinking water sources;
- ❑ Improving local, state, and global capacity to prevent disease and respond to outbreaks
- ❑ Providing laboratory support to internal and external partners

# CDC's legionellosis activities



- **Disease surveillance and outbreak response**
  - Legionellosis is a nationally notifiable disease tracked by CDC
  - CDC provides consultation and on-the-ground epidemiologic and laboratory support during outbreak investigations
- **Environmental laboratory monitoring**
  - Problem: many labs offering environmental (water) testing for *Legionella* were not able to appropriately identify the organism (not regulated)
  - Solution: CDC's Legionella lab developed the *ELITE Program* to identify and certify labs proficient in *Legionella* testing of water specimens
- **Environmental control**
  - Problem: Limited options for disinfection of potable water systems known to be colonized with *Legionella*
  - CDC recently conducted a study testing monochloramine as an onsite, potable water disinfectant and found it to be a very effective disinfectant for a potable water system

# National Center for Environmental Health

- ❑ Developing environmental health policy and prevention programs
- ❑ Providing resources and technical assistance
- ❑ Conducting surveillance and epidemiologic investigations
- ❑ Collecting, integrating, and interpreting data through CDC's Environmental Public Health Tracking Network, the Unregulated Drinking Water Initiative and the Environmental Health Services Network.
- ❑ Developing and applying advanced laboratory technology to improve the diagnosis, treatment, and prevention of water-related disease

# **Unregulated Drinking Water Initiative for Environmental Surveillance and Public Health (UDWI)**



# **Vision**

The 45 million Americans relying on private well systems will drink clean, safe water.

# **Goals**

- **Develop and organize data, information, and knowledge about current status and conditions of private well systems.**
- **Develop means to inform public health practitioners and the public on issues associated with private well systems.**
- **Identify and recommend interventions to address public health issues associated with private well systems.**
- **Explore opportunities and approaches to continue to track private well system safety and implement the identified interventions.**

# UDWI Activities

- **July 2010 Contracts with 7 state agencies**
  - CDC requested proposals for projects to identify constraints and issues associated with accessing private well data in their state.
  - Funded 7 state projects (~\$320,000) in July, 2010
- **June 2011 FOA** - Request proposals for projects to identify and assess data and potential public health impacts associated with unregulated drinking water sources.
- **Develop outreach materials for the initiative**
- **Literature review** - Establish private wells as a public health concern
- **Communications plan**
  - Outreach and education
  - Special events

| State/Agency                                                        | Project Highlights                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Florida DOH</b><br><b>Division of Env. Health</b>                | <ul style="list-style-type: none"> <li>• Perform pilot well data collection project for Leon county, FL</li> <li>• Perform pilot PH data analysis for one contaminant of concern</li> </ul>                                                                                           |
| <b>University of KY</b><br><b>KY Geological Survey</b>              | <ul style="list-style-type: none"> <li>• Identify, characterize, and develop procedures for groundwater data sources for entry into the KY GDR</li> <li>• Estimate costs to capture, digitize, and enter data into GDR</li> </ul>                                                     |
| <b>Maine DHHS/CDC</b><br><b>Division of Env. Health</b>             | <ul style="list-style-type: none"> <li>• Pilot exercise to demonstrate ability to access, compile and manage well water data from state public health laboratory</li> <li>• Develop functionality on Maine’s EPHT web portal to visually display As data</li> </ul>                   |
| <b>Minnesota DOH</b>                                                | <ul style="list-style-type: none"> <li>• Inventory existing private well data</li> <li>• Contract with two or more counties for data sharing and transfer projects</li> </ul>                                                                                                         |
| <b>North Carolina DHHS</b><br><b>Div of PH</b><br><b>OEE Branch</b> | <ul style="list-style-type: none"> <li>• Compile, transfer, and store current state public health lab dataset, to the State Center for Health Statistics</li> <li>• Provide descriptive catalog of NC well data</li> </ul>                                                            |
| <b>Oregon Dept of Human</b><br><b>Services, PH Division</b>         | <ul style="list-style-type: none"> <li>• Inventory and assess availability of Oregon well data</li> <li>• Explore methods for linking data and increasing accessibility</li> </ul>                                                                                                    |
| <b>Wisconsin DHS</b><br><b>DEOH</b>                                 | <ul style="list-style-type: none"> <li>• Review and report on legal/regulatory data issues, existing datasets and data custodians</li> <li>• Create a “test cube” to analyze, visualize and report merged data with visualization tools and within Wisconsin’s EPHT portal</li> </ul> |

# **Environmental Health Services Branch Domestic Water Activities**

# Framework for the Environmental Health Services Branch

## ❑ Centers for Disease Control and Prevention (CDC)

### **Vision for the 21<sup>st</sup>**

**Century:** *"Health Protection... Health Equity."*

**Mission:** *"Collaborating to create the expertise, information, and tools that people and communities need to protect their health – through health promotion, prevention of disease, injury and disability, and preparedness for new health threats."*

## ❑ National Center for Environmental Health (NCEH)

**Vision:** *"Safer, healthier people in a safer, healthier environment"*

**Mission:** *"Serve the public through responsive public health actions to promote healthy and safe environments and prevent harmful exposures."*

## ❑ Emergency and Environmental Health Services (EEHS) Division

**Mission:** *"Provide national and international leadership for coordinating, delivering, and evaluating emergency and environmental public health services."*

# Framework for the Environmental Health Services Branch

## □ Environmental Health Services Branch (EHSB)

**Objective:** *“to strengthen the role of local, state, tribal, and national environmental health programs and professionals to better anticipate, identify, and respond to adverse environmental exposures and their consequences for human health.”*

*Areas of work –identified in the CDC’s National Strategy to Revitalize Environmental Public Health Services:*

- *Building capacity.*
- *Supporting research.*
- *Fostering leadership.*
- *Communicating and marketing.*
- *Developing the workforce.*
- *Creating strategic partnerships.*

# **Environmental Health Services Branch- Domestic Water Activities**

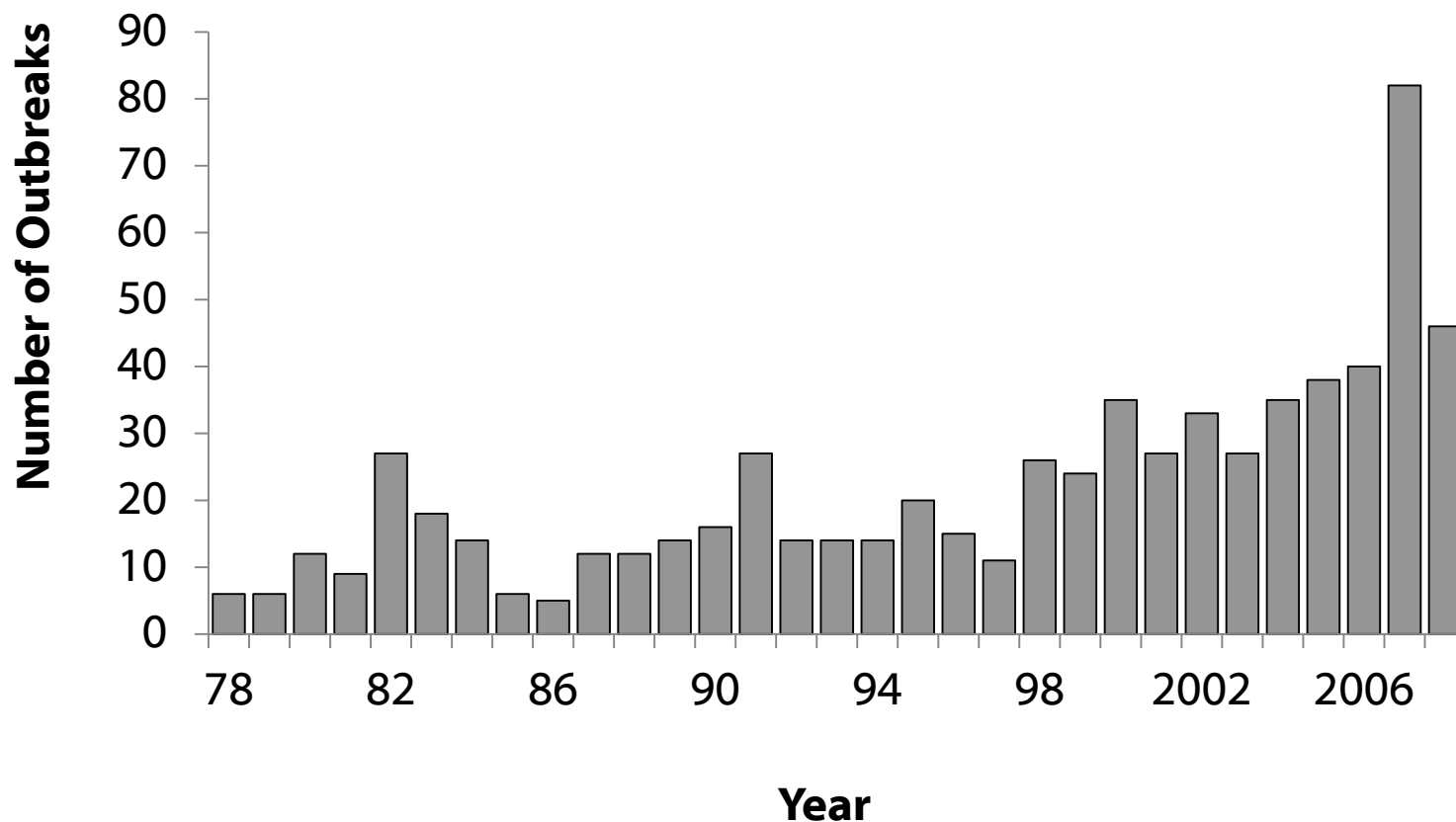
- ❑ Recreational Water**
- ❑ Drought**
- ❑ Emergency Drinking Water**
- ❑ Environmental Health Specialist Network (EHS-Net)**

# Why Create a National Model Aquatic Health Code?





# Recreational Water Illness Outbreaks, United States, 1978–2008\*



\* N=685, includes preliminary 2007 and 2008 data (as of 10/14/2009), Yoder JS *et al.* 2008. *MMWR* 57(SS-9):1–38.

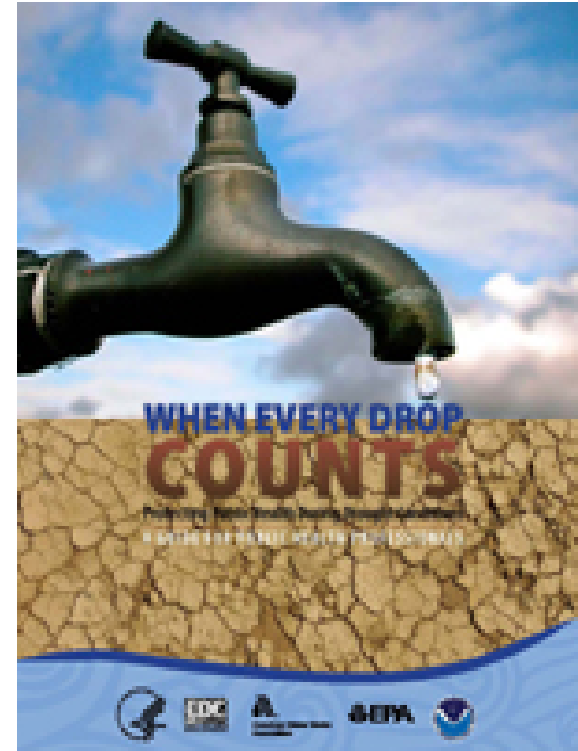
# MAHC Outcomes



- Reductions in RWIs
- Adoption of minimum standards throughout the U.S.  
(as with national food safety and building model codes)
- Need for mandatory training and education
- Improved surveillance systems
- Improved data collection
- Data-based decision making
- Systems-based approaches to facility design, maintenance, and operation
- Research agenda

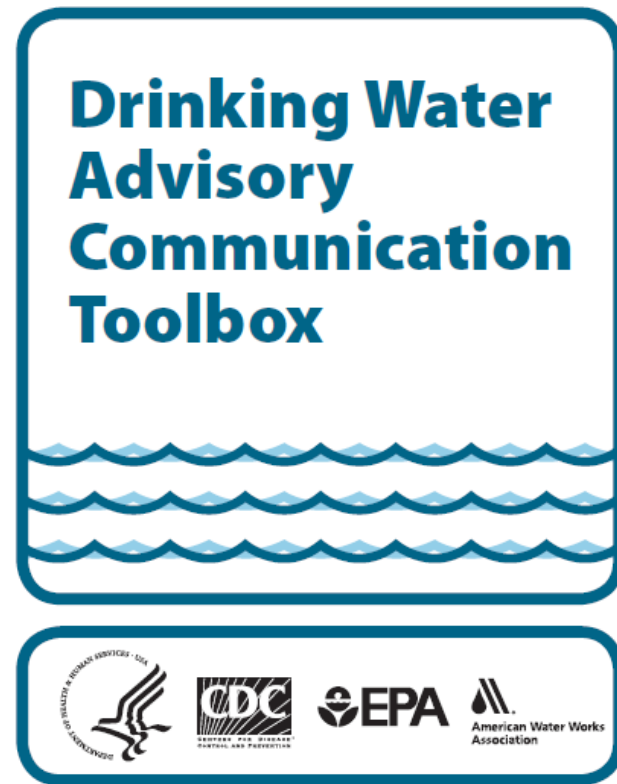
# Environmental Health Services Branch- Domestic Water Activities

- ❑ Assist PH in preparing and responding to Drought
- ❑ Developed in collaboration
  - EPA
  - AWWA
  - NOAA
- ❑ Available on-line at  
[http://www.cdc.gov/nceh/ehs/  
Publications/Drought.htm](http://www.cdc.gov/nceh/ehs/Publications/Drought.htm)



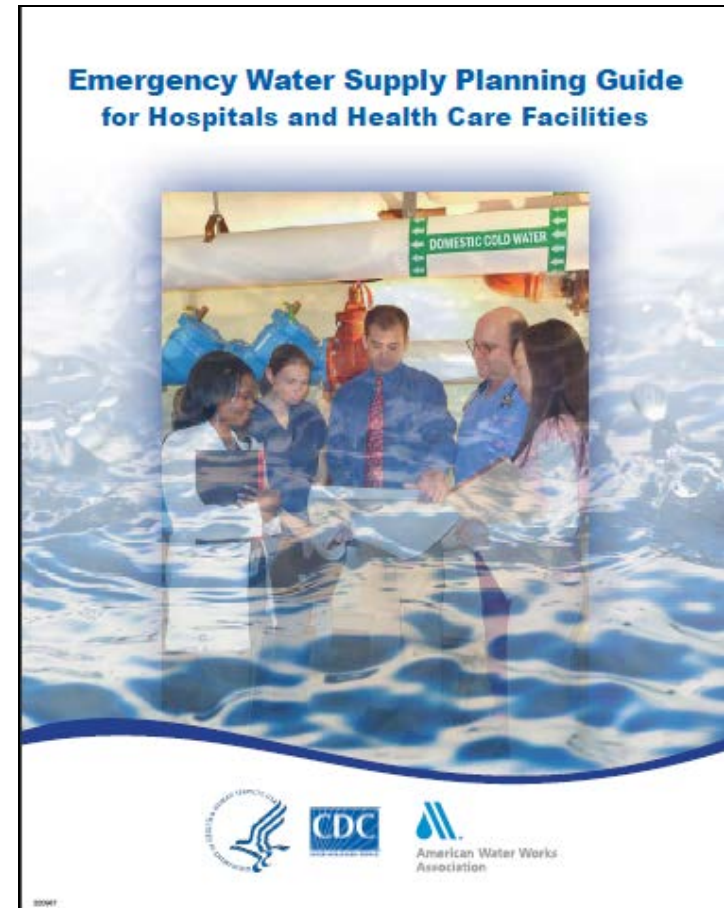
# Drinking Water Advisory Toolbox

- ❑ **Develop toolbox of materials and guidance for response drinking water advisories**
- ❑ **For local public health and drinking water authorities**
- ❑ **Developed collaboration with AWWA**
  - EPA, AMWA, ASDWA, NAWC, NACCHO
- ❑ **Available soon**



# Emergency Water Supply Planning Guide for Hospitals and Healthcare Facilities

- ❑ **Provide guidance on preparing for water emergencies**
- ❑ **Developed in collaboration with AWWA**
  - EPA
  - DHS
  - ASHE
- ❑ **Just released**  
[http://www.cdc.gov/healthywater/emergency/drinking\\_water\\_advisory/index.html](http://www.cdc.gov/healthywater/emergency/drinking_water_advisory/index.html)



# **Environmental Health Services Branch- Domestic Water Activities**

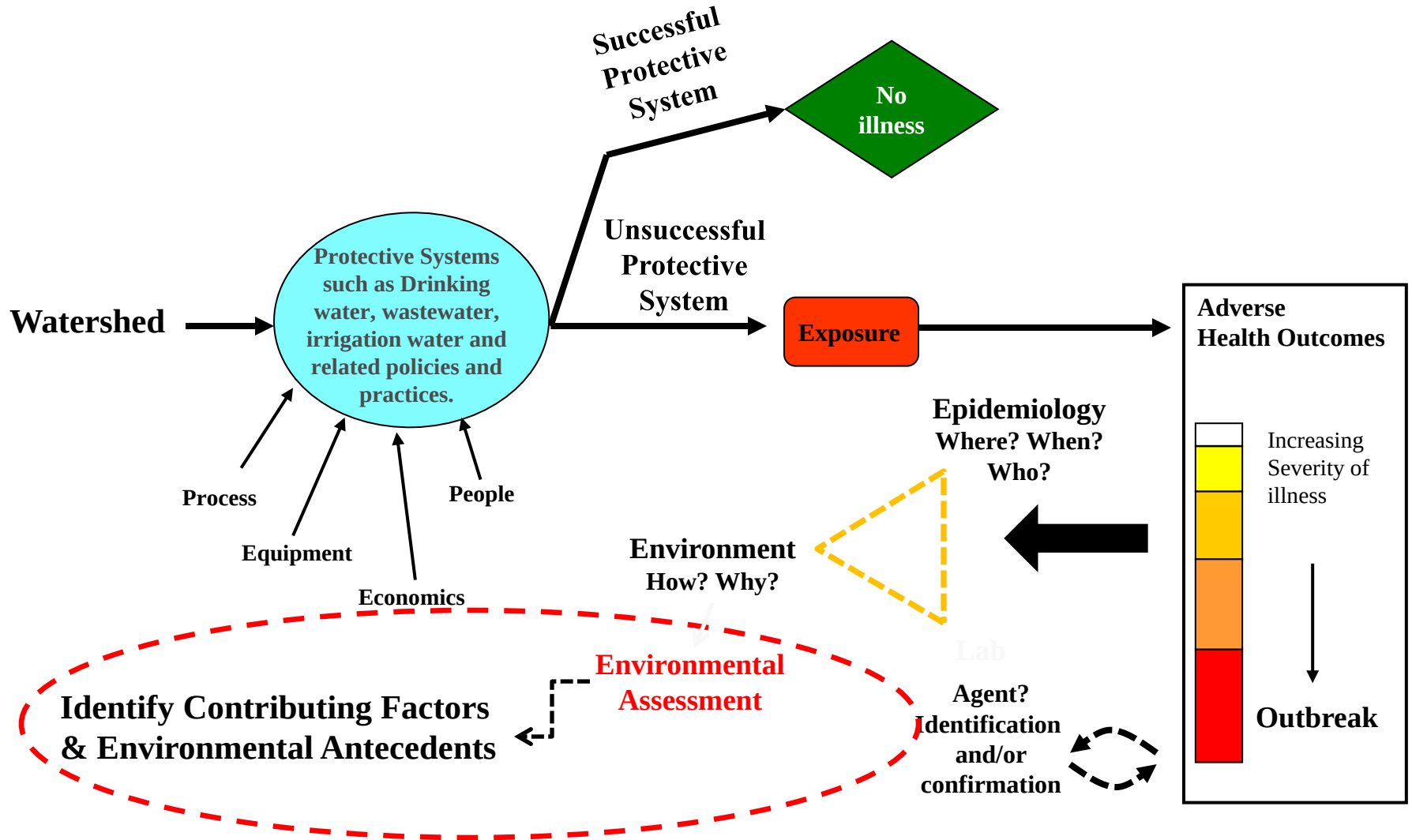
- ❑ Recreational Water**
- ❑ Drought**
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# Baseline for EHS-Net Water Studies



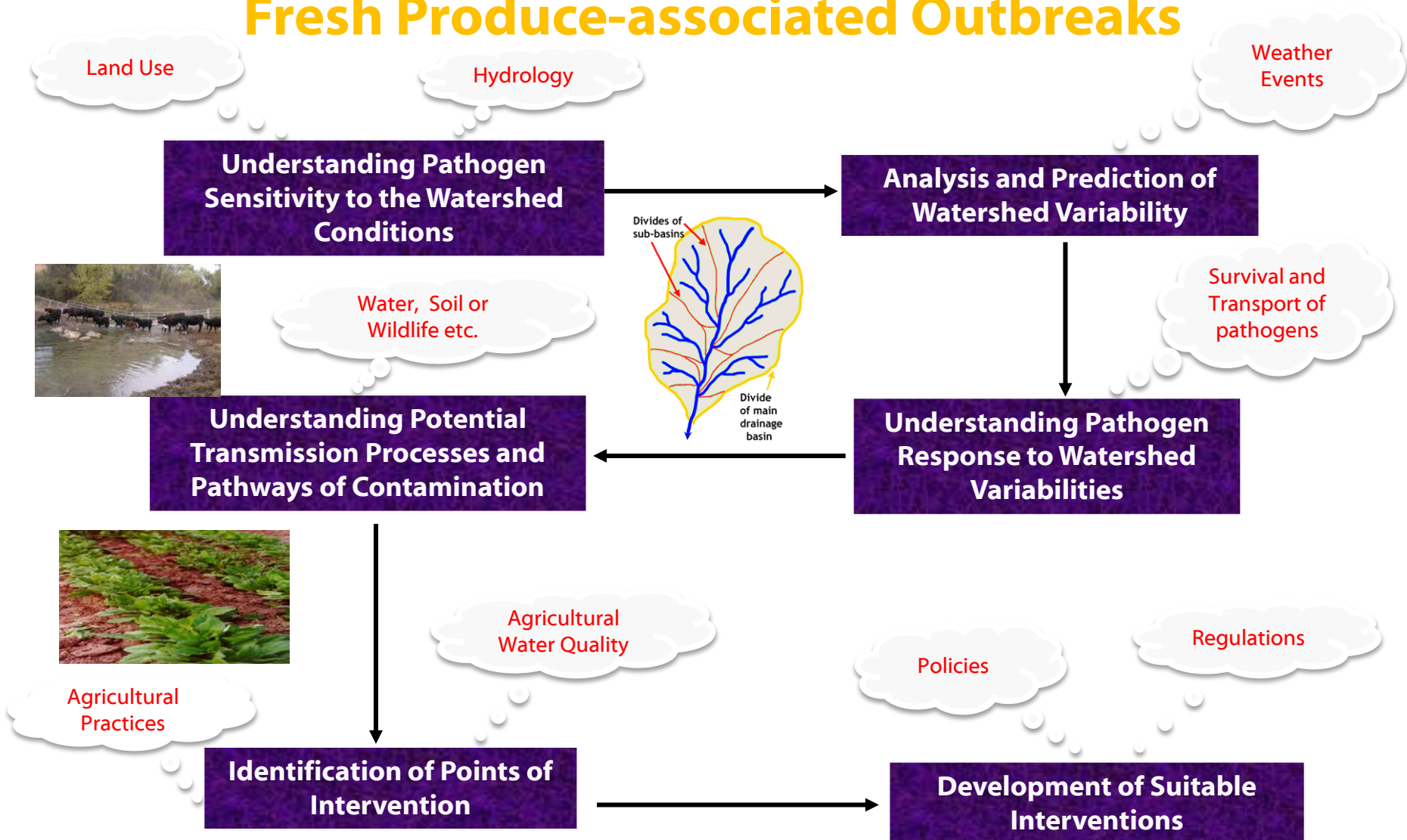
Source of watershed figure: <http://www.sanduskyriver.org/>

# Systems Approach for Addressing Water-related Diseases - Baseline





# Example: Systems Approach to Investigating Fresh Produce-associated Outbreaks



# EHS-Net Activities

## ❑ Extramural Research Projects

- Unregulated drinking water
- Waterborne outbreaks
- Environmental assessments (NVEAIS)
  - Improve the collection, reporting, analysis, and use of environmental assessment data to identify and reduce risk factors associated with illness

## ❑ Extramural Practice Activities

- Develop and implement demonstration, pilot or intervention projects

## ❑ Internal Research Activities

- Onsite Wastewater Systems
- Decentralized Water Reuse

## EHS-Net Grantees

| Research Grantees                  | Practice Grantees                  |
|------------------------------------|------------------------------------|
| <u>State Departments of Health</u> | <u>State Departments of Health</u> |
| New York Food Water                | New York Food Water                |
| Tennessee Food Water               | Tennessee Food                     |
| California Food Water              |                                    |
| Minnesota Food Water               |                                    |
| Rhode Island Food                  |                                    |
| Georgia* Food Water                |                                    |
| <u>Local Department of Health</u>  | <u>Local Departments of Health</u> |
| New York City Food                 | San Mateo County, CA Food          |
|                                    | Cerro Gordo County, IA Water       |

# EHS-Net Studies

## Research – Multi-site Study:

**“Identification of environmental antecedents and contributing factors related to contamination in small groundwater systems and private wells”**

|                                                  |                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hypothesis                                       | Small groundwater systems and private wells are vulnerable to both microbial and chemical contaminants in the environment                                                                                                                                                                                                                                      |
| Goal                                             | Using systems theory, develop and validate comprehensive vulnerability assessments and vulnerability scores for small groundwater systems and private wells by identifying the environmental antecedents and contributing factors that lead to their contamination                                                                                             |
| Objectives<br>(partial list of eight objectives) | <ol style="list-style-type: none"><li>1. Describe, thoroughly, the situation of the water systems to be studied by state</li><li>2. Draft study design by determining (a) target population; (b) inclusion criteria of participant water systems (including private wells) located in the study area/watershed; (c) recruitment; and (d) sample size</li></ol> |
| Timeline                                         | 3 years                                                                                                                                                                                                                                                                                                                                                        |

# EHS-Net Studies

## Research – Individual Studies:

| State      | Study Title                                                                                                                                                                                                                                         |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| California | Food and water safety risk factors associated with mobile food vehicles                                                                                                                                                                             |
| Minnesota  | Minnesota household well study project                                                                                                                                                                                                              |
| New York   | Computational fluid dynamics to study the hydraulics occurring in clear wells and disinfection reaction vessels                                                                                                                                     |
| Tennessee  | <ol style="list-style-type: none"><li>1. Cryptosporidiosis in East Tennessee</li><li>2. Private water wells and onsite sewage disposal systems in Tennessee</li><li>3. Knowledge, attitudes, and behaviors regarding the water we consume</li></ol> |

# EHS-Net Studies

## Practice – Individual Studies:

| State                                  | Study Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Iowa (Cerro Gordo County Health Dept.) | Arsenic in Cerro Gordo County Wells: Determining the distribution of groundwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| New York                               | <ol style="list-style-type: none"><li>1. Review and revise of current practices for the response to waterborne outbreaks / events: Pilot Intervention in a regulated facility with history of waterborne diseases</li><li>2. Determine the influence of Crash Carts (CCs) in the investigation Waterborne Disease Outbreaks and water Quality Assessment</li><li>3. Review and revision of current tools and practices for the response to waterborne outbreaks/events – Environmental Assessment Form (EAF)</li><li>4. Review and revision of current tools and practices for the response to waterborne outbreaks/events – Update Environmental Assessment Form (EAF) for regulated health care facilities</li></ol> |

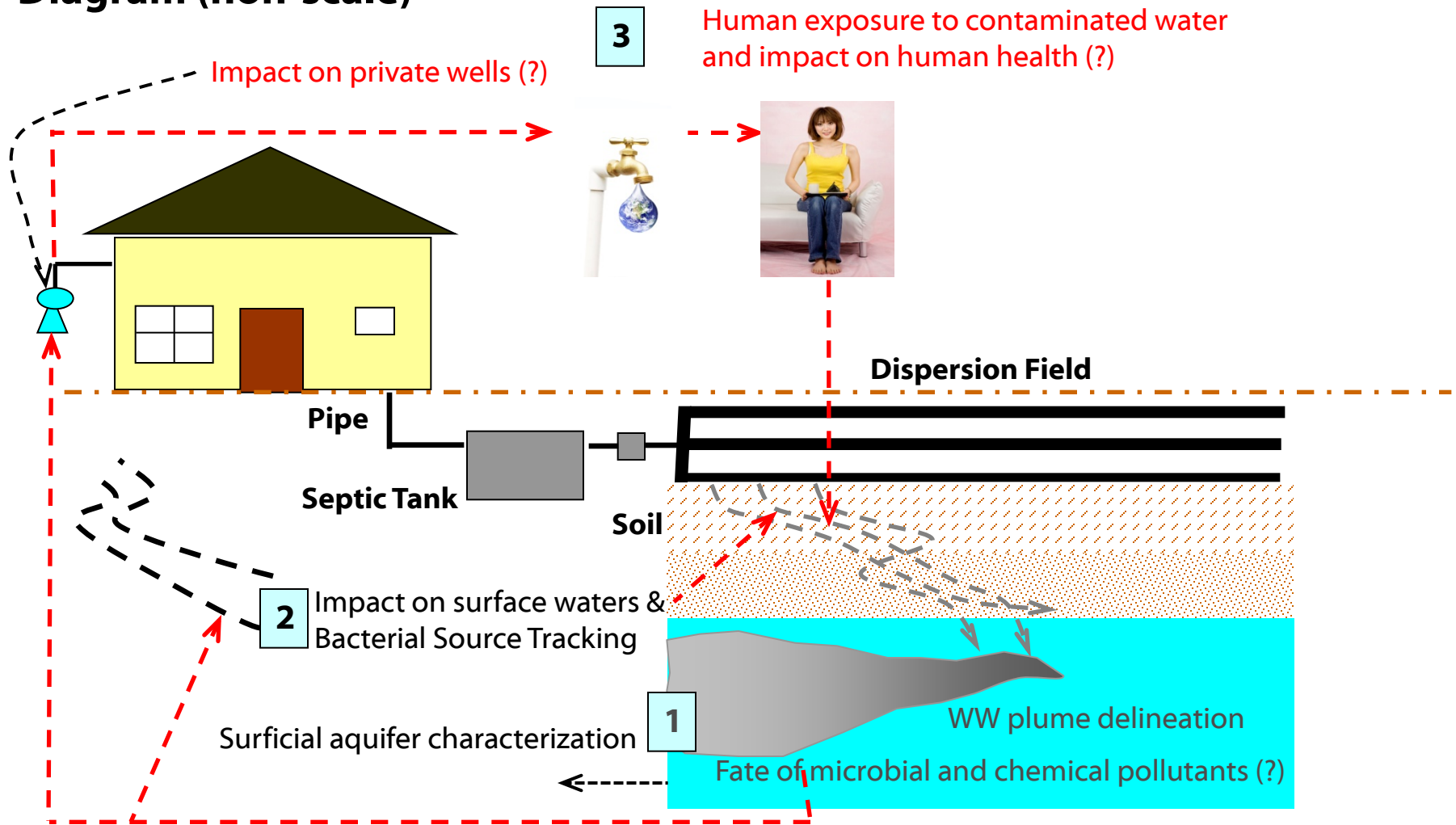
# **EHS-Net Internal Research Activities**

- ❑ Onsite Wastewater Systems**
- ❑ Decentralized Water Reuse**

# Onsite Wastewater Systems Project

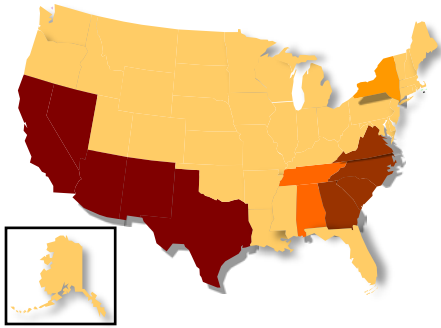
## (Evaluating Systems' Performance & Health Impacts)

### Diagram (non-scale)





# Decentralized Water Reuse Project (Non-potable reuse of treated wastewater)



- **Occurrence of chronic and acute drought in the US**
- **Enhanced management of water resources**
  - Reuse of treated wastewater for non-potable purposes
- **Water quality standards and health impacts (?)**
  - Monitoring water quality for risk analysis (indicators/pathogens)

# Thank You Questions?

**For more information please contact Centers for Disease Control and Prevention**

1600 Clifton Road NE, Atlanta, GA 30333

Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov) Web: [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

### **Appendix III: Materials Distributed During Meeting**

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3. If the initial report or the latest updated report indicates that maximum-day water demand (including fire-flow demand if fire protection is being provided) will exceed the total permitted maximum-day operating capacity of the treatment plant(s) in less than ten years but greater than or equal to five years or that finished-water storage need (including fire storage if fire protection is being provided) will exceed the existing total useful finished-water storage capacity in less than ten years but greater than or equal to five years, the next updated report shall be submitted within two years after submittal of the previous report.

4. If the initial report or the latest updated report indicates that maximum-day water demand (including fire-flow demand if fire protection is being provided) will exceed the total permitted maximum-day operating capacity of the treatment plant(s) in less than five years or that finished-water storage need (including fire storage if fire protection is being provided) will exceed the existing total useful finished-water storage capacity in less than five years, the next updated report shall be submitted within one year after submittal of the previous report.

(4) Each initial or updated source/treatment/storage capacity analysis report shall evaluate the capacity of all source, treatment, or storage facilities connected to a water system and shall contain the following information:

(a) The capacity of each water treatment plant's source water facilities and treatment facilities; the permitted maximum-day operating capacity and, if applicable, permitted peak operating capacity of each plant; and the useful capacity of each finished-water storage facility;

(b) The maximum-day and annual average daily quantities of finished water produced by each plant during each of the past ten years or during each of the years the plant has been in operation, whichever is less;

(c) Projected total water demands – total annual average daily demand and total maximum-day demand (including fire-flow demand if fire protection is being provided) – for at least the next ten years and projected total finished-water storage need (including fire storage if fire protection is being provided) for at least the next ten years;

(d) An estimate of the time required for maximum-day water demand (including fire-flow demand if fire protection is being provided) to exceed the total permitted maximum-day operating capacity of the plant(s) and an estimate of the time required for finished-water storage need (including fire storage if fire protection is being provided) to exceed the existing total useful finished-water storage capacity;

(e) Recommendations for new or expanded source, treatment, or storage facilities; and

(f) A recommended schedule showing dates for design, permitting, and construction of recommended new or expanded source, treatment, or storage facilities.

(5) Each initial or updated source/treatment/storage capacity analysis report shall be prepared under the responsible charge of one or more professional engineers licensed in Florida and shall be signed, sealed, and dated by the professional engineer(s) in responsible charge.

(6) If an initial or updated source/treatment/storage capacity analysis report indicates that maximum-day water demand (including fire-flow demand if fire protection is being provided) will exceed the total permitted maximum-day operating capacity of the water treatment plant(s) in less than five years or that finished-water storage need (including fire storage if fire protection is being provided) will exceed the existing total useful finished-water storage capacity in less than five years, documentation of timely design, permitting, and construction of recommended new or expanded source, treatment, or storage facilities shall be submitted with the report. The documentation shall consist of a written statement that is signed by an authorized representative of the supplier of water and that certifies the supplier is meeting, and intends to meet, the report's recommended schedule for design, permitting, and construction of recommended new or expanded source, treatment, or storage facilities.

*Specific Authority 403.861(9) FS. Law Implemented 403.861(17) FS. History—New 8-28-03.*

#### **62-555.350 Operation and Maintenance of Public Water Systems.**

(1) Suppliers of water shall operate and maintain their public water systems so as to comply with applicable standards in Chapter 62-550, F.A.C., and requirements in this chapter.

(2) Suppliers of water shall keep all necessary public water system components in operation and shall maintain such components in good operating condition so the components function as intended. Preventive maintenance on electrical or mechanical equipment – including exercising of auxiliary power sources, checking the calibration of finished-drinking-water meters at treatment plants, testing of air or pressure relief valves for hydropneumatic tanks, and exercising of isolation valves – shall be performed in accordance with the equipment manufacturer's recommendations or in accordance with a written preventive maintenance program established by the supplier of water; however, in no case shall auxiliary power sources be run under load less frequently than monthly. Accumulated sludge and biogrowths shall be cleaned routinely (i.e., at least annually) from all treatment facilities that are in contact with raw, partially treated, or finished drinking water and that are not specifically designed to collect sludge or support a biogrowth; and blistering, chipped, or cracked coatings and linings on treatment or storage facilities in contact with raw, partially treated, or finished drinking water shall be rehabilitated or repaired. Finished-drinking-water storage tanks, including conventional hydropneumatic tanks with an access manhole but excluding bladder- or diaphragm-type hydropneumatic tanks without an access manhole, shall be checked at least annually to ensure that hatches are closed and screens are in place; shall be cleaned at least once every five years to remove biogrowths, calcium or iron/manganese deposits, and sludge from inside the tanks; and shall be inspected for structural and coating integrity at least once every five years by personnel under the responsible

charge of a professional engineer licensed in Florida. Dead-end water mains conveying finished drinking water shall be flushed quarterly or in accordance with a written flushing program established by the supplier of water; additionally, dead-end or other water mains conveying finished water shall be flushed as necessary whenever legitimate water quality complaints are received.

(3) Suppliers of water shall ensure that drinking water treatment chemicals conform to the standards referenced in paragraph 62-555.320(3)(a), F.A.C., and shall have their lead/chief water treatment plant operators certify in writing on the monthly operation reports required under subsection (12) below that drinking water treatment chemicals conform to the standards referenced in paragraph 62-555.320(3)(a), F.A.C. Lead/chief water treatment plant operators may base their certifications upon evaluations conducted by the supplier of water or upon third-party or manufacturer certifications.

(4) No supplier of water shall operate any drinking water treatment plant at a capacity greater than the plant's permitted operating capacity except with the Department's prior approval, which shall be given when such operation will not cause a violation of a maximum contaminant level, a treatment technique requirement, or other operating requirements and is for no more than three months, or under circumstances that the supplier of water documents as highly unusual and nonrecurring. The permitted operating capacity of each plant shall be as specified in the latest Department of Environmental Protection (DEP) construction permit concerning source water or treatment facilities for the plant. In cases where no permitted operating capacity has been specified in the latest DEP construction permit concerning source water or treatment facilities for a plant, the Department shall establish the permitted maximum-day operating capacity of the plant and, if the plant is designed to meet peak water demand or to supplement finished-water storage facilities in meeting peak water demand, the permitted peak operating capacity of the plant based upon information that is included in or with pertinent permit applications or that is provided by the supplier of water and based upon design requirements in Part III of this chapter, including design requirements in the engineering references listed in Rule 62-555.330, F.A.C. Each day that a supplier of water is required under Chapter 62-699, F.A.C., to have a licensed operator staff or visit a plant, the supplier of water shall measure and record in the logs and reports required under subsection (12) below the net quantity of finished drinking water, excluding any filter backwash water, produced by the plant.

(5) Suppliers of water who are using ground water not under the direct influence of surface water and who are required to provide treatment to reliably achieve at least four-log inactivation or removal of viruses in accordance with paragraph 62-555.320(12)(b), F.A.C., shall monitor, record, and maintain the effectiveness and reliability of disinfection treatment as described in paragraphs (a) through (c) below. The residual disinfectant, temperature, or pH measurements required under paragraph (a) or (b) may be performed by any authorized representative of the supplier of water; but field measurements of residual chlorine, temperature, and pH shall be performed following the appropriate procedures in the Department of Environmental Protection Standard Operating Procedures for Field Activities, DEP-SOP-001/01, as incorporated into Rule 62-160.800, F.A.C., and all other measurements shall be performed using an appropriate method referenced in subsection 62-550.550(1), F.A.C., or in *Standard Methods for the Examination of Water and Wastewater* as adopted in Rule 62-555.335, F.A.C.

(a) For each day a supplier of water serving 3,300 or more persons serves water to the public from a drinking water treatment plant that includes chemical disinfection for virus inactivation, the supplier of water shall continuously monitor the residual disinfectant concentration (C) before or at the first customer and shall record in the logs and reports required under subsection (12) below the lowest C measured before or at the first customer during peak flow, the corresponding disinfectant contact time (T) at the C monitoring point during peak flow, and the resulting lowest CT provided before or at the first customer during peak flow. In addition, at least once for each day the supplier of water serves water to the public from the plant, the supplier of water shall measure and record the temperature of the water at the point where C is monitored; shall measure and record the pH of the water at the point where C is monitored if free chlorine is being used for virus inactivation; and with this temperature and pH information, shall determine and record the minimum CT required to comply with paragraph 62-555.320(12)(b), F.A.C. If there is a failure of equipment used to continuously monitor C, the supplier of water may temporarily monitor C by taking grab samples every four hours but may do so for no more than one week following the equipment failure. If at any time the "CT provided" falls below the minimum CT required, the supplier of water shall increase the disinfectant dose until the "CT provided" is at least equal to the minimum CT required and shall notify the Department in accordance with subsection (10) below.

(b) For each day a supplier of water serving less than 3,300 persons serves water to the public from a drinking water treatment plant that includes chemical disinfection for virus inactivation, the supplier of water shall monitor the residual disinfectant concentration (C) before or at the first customer by taking at least one grab sample during peak flow and shall record in the logs and reports required under subsection (12) below the lowest C measured before or at the first customer during peak flow, the corresponding disinfectant contact time (T) at the C monitoring point during peak flow, and the resulting CT provided before or at the first customer during peak flow. In addition, at least once for each day the supplier of water serves water to the public from the plant, the supplier of water shall measure and record the temperature of the water at the point where C is monitored; shall measure and record the pH of the water at the point where C is monitored if free chlorine is being used for virus inactivation; and with this temperature and pH information, shall determine and record the minimum CT required to comply with paragraph 62-555.320(12)(b), F.A.C. If any measurement of the "CT provided" falls below the minimum CT required, the supplier of water shall increase the disinfectant dose and take follow-up grab samples at least every four hours until the "CT provided" is at least equal to the minimum CT required and shall notify the Department in accordance with subsection (10) below.

(c) For each day a supplier of water serves water to the public from a drinking water treatment plant that includes ultraviolet (UV) disinfection for virus inactivation, the supplier of water shall continuously monitor the operating UV dose and shall record in the logs and reports required under subsection (12) below the lowest operating UV dose measured. If at any time the operating UV