

Summary of the workshop conducted at the Arizona Water Reuse Symposium 2022: Defining the Future of Potable Reuse in Arizona

The Annual Arizona Water Reuse Symposium was held July 24-26, 2022 in Flagstaff Arizona. Water professionals from across the state of Arizona, including state departments, utilities, consultants, contractors, regulators, equipment manufacturers and laboratory services, and guests from neighboring states, attended presentations and engaged in conversations regarding water reuse in Arizona. Participating organizations are shown in Table 1 attached and included over 80 different organizations.

With the Arizona Department of Environmental Quality (ADEQ) beginning their direct potable reuse (DPR) rulemaking process later this year and anticipated draft regulations expected in 2023, the 2022 symposium focused largely on DPR. The final day of the symposium was dedicated to DPR regulations and included a 4-hour workshop with state regulators and water professionals to facilitate a deep dive discussion around key issues or concerns regarding specific topics within DPR regulations. These topics included: chemical barriers, microbial pathogen barriers, monitoring and compliance, operator certification and training, organizational capacity, public outreach and communications, and source water management

The workshop was conducted using the world-café method which included breaking up into small group rounds to focus on one of the seven topics listed above. Questions and key concepts were posed to the group for discussion, allowing participants to share their insight and experiences. Each small group table included at least one ADEQ representative. The groups each spend 30 minutes discussing a topic area before moving on to a new topic. Small groups rotated three times, allowing the groups to explore three topic areas around DPR regulations. Table 1 below includes a summary of the key points that were covered in each discussion group.

Chemical Barriers	Microbial pathogen barriers	
 Quantitative limits for chemicals Treatment techniques for unregulated chemicals Treatment techniques for groups of chemicals 	 Requirements for microbial pathogenic removal; Approaches to process validation and barrier monitoring; Identifying needs for sampling and analysis. 	
Monitoring and compliance	Operator certification and training	
CECs/UCMR/CCLs Managerial	Certification requirements	
 On-line analyzers/instrumentation I 	 Training opportunities 	
Permit framework	Prior operations experience	
 Small and outlying communities 	Public messaging	
Organizational capacity	Public outreach and communication	
Technical	People to involve	
Managerial	Messaging	
Financial	 Implementation and Adoption 	
Regulation		



Source water management

- Protecting source water
- Critical elements of a source control program
- Establishing source water compliance point

Key themes and takeaways from each session are provided below. A full compilation of notes for each discussion topic are provided in Attachment A.

Microbial Treatment Barriers

Facilitators Troy Walker and Andrea Odegard-Begay – Hazen and Sawyer Key Themes and Takeaways from Discussion

- General agreement on the option of California 12-10-10 (virus, giardia, cryptosporidium) and Texas 8-5.5-6 (minimum). The California target is a default (presumptive) removal requirement, and the Texas is based on source water characterization
- Consider a minimum number of barriers required
- Consider a cap for maximum log removal per barrier (California)
- Consider identification of some required processes, but not necessarily technologies (e.g. Colorado identifies filtration and disinfection)
- Establish agreed upon microbial surrogates
- Additional Department of Health Services (DHS) consideration should be given to microbial sampling methods and requirements to support treatment
- To be effective, need in-house or co-op lab. Need to identify analytical laboratories and locations (especially when considering smaller communities)
- Characterization of source water to identify removal requirements is beneficial
- Consideration that Class A+ effluent to begin with as a minimum standard to begin DPR

Chemical Treatment Barriers

Facilitators George Maseeh – Carollo Engineers and Zaid Chowdhury – Garver USA Key Themes and Takeaways from Discussion

- Regulations should be chemical-specific as the baseline:
 - Limit enforceable numeric standards to SDWA MCLs
 - Additional numeric standards may be included in the AZ DPR Reg as long as there are acceptable defendable values that are available from other regulatory authorities (e.g., public notification levels for NDMA in CA). These could be offered as guidance rather than enforceable standards
 - Unregulated chemicals from CCLs and UCMRs should be kept non-prescriptive and addressed in permitting and guidance
 - Certain treatment techniques could be mandated or recommended for controlling the occurrence of chemical contaminants with agreeable definition of the treatment technique (e.g., GAC adsorption with EBCT of 15 minutes with replacement frequency of six months)
 - Treatment techniques should demonstrate diverse treatment for chemicals in the permitting process



- Source water characterization for chemicals should be conducted in parallel with pathogen characterization
- There should be an alternate discharge available for off-spec treated water
- Compounds that are formed in the WWTP or compounds that bioaccumulate should be considered for regulation
- Monitoring for chemicals will be a challenge, and a diverse monitoring plan will be needed that includes both online analyzers and grab samples
- Scalable pilot demonstrations should be included in the guidance documents.
- Some support was shown for prescriptive advanced oxidation and GAC adsorption to be included in regulations

Monitoring and Compliance

Facilitators Rob McCandless - Stantec, Suzanne Grendahl- City of Scottsdale Key Themes and Takeaways from Discussion

- Reflect the level of monitoring of existing regulatory frameworks
- Industrial Pretreatment Program could be a way to capture unregulated chemicals
- Demonstrate local limits; require an IPP for any DPR program
- Water systems should establish the goals and expectations for unregulated chemicals
- How many unregulated chemicals should be monitored? Is the data reportable?
- Consider chronic vs acute health impacts
- There should be monitoring at critical points along the treatment process in DPR applications
- Duplicate instrumentation
- Define monitoring for process control versus compliance
- Consider remote-located WTP
- Contingency planning for off-spec water
- Use the entry point to the distribution as the compliance point
- Increased treatment monitoring redundancy for smaller/outlying communities
- Consider a Monitoring Assistance Program for small and outlying communities
- Consider how to accommodate private utilities within Arizona Corporation Commission governance
- Must demonstrate adequate technical/managerial/financial capacity to sustain a monitoring and compliance program. Submit a plan along with TMF requirements

Operator Certification and Training

Facilitators David Walby- City of Scottsdale, Heather Tugaoen-Stantec Key Themes and Takeaways from Discussion

- A drinking water certified operator should be ultimately responsible for any DPR introduced to the potable water distribution system
- If the DPR facility is onsite at a water treatment plant or offsite at a third-party location, it should be graded for compliance at minimum as a surface water treatment plant (SWTP)
- Arizona should consider rebranding reclaimed water to better represent quality and end-use
- Consider implementing a fifth full operator certification as a long-term goal



- A separate certificate to go alongside a water/wastewater treatment operations license focused specifically on DPR and related technologies could bridge knowledge gaps and reassure public of adequate knowledge/competency
- An AWT/DPR certificate advised to fall on the water treatment side of the operator certification program, but consideration should be given to variances based on qualified wastewater operators
- How DPR/AWT facilities are to be graded should be considered as part of rulemaking
- Training opportunities may include:
 - simulation (physical or computer-based) to run operations, provide setpoints, and manage failure scenarios
 - pilot/demonstration scale
- Curriculum to be built out for DPR educational training opportunities
- Prior experience with DPR/AWT is likely to be limited to pilot scale experiences unless a centralized training option is available.

Organizational Capacity

Facilitators Brian Biesemeyer- City of Scottsdale, Erin Young - City of Flagstaff Key Themes and Takeaways from Discussion

- There are multiple operational scenarios to consider with how a DPR facility is situated organizationally or contractually. These scenarios require careful and thorough consideration of how operations staff might need to communicate or share information across internal or external boundaries to ensure DPR facility compliance and public safety
- General consensus was to not establish a separate AWT or DPR operator class however consider that running a DPR facility requires a mix of water and wastewater operational knowledge
- Industrial pretreatment programs and requirements need to be considered as how noncompliance or loading allowances could impact the DPR process. Consider how pretreatment issues could impact smaller vs. larger systems
- A utility considering DPR should consider managerial items prior to starting a project, such as securing a water right to the DPR water source through a contract, or maintaining AZPDES or APP permits to use as back-up options
- A utility incorporating a DPR facility into its water supply portfolio should consider completing and/or updating a rate study, cost of service study, and/or impact fees analysis to ensure the capital and operational costs of the DPR facility are distributed fairly through the community
- No consensus on whether plans such as water supply contingency plans, alternative discharge plans, operations and maintenance plans, emergency plans, financial plans, etc., should be required through regulation or recommended through guidance
- Consider the requirement of a utility to commit to proper staffing and pay rates

Public Outreach and Communication

Facilitators Channah Rock - University of Arizona, Zoe Scott - University of Arizona Key Themes and Takeaways from Discussion

- Each utility implementing a public outreach program should consider:
 - What is the goal of doing outreach?



- Who is doing the public outreach? Dedicated person from each utility? What about small utilities that don't have the capacity? Is it ADEQ's responsibility?
- What is our benchmark for successes/public acceptance?
- Include leaders and/or trusted institutions, public health educators (doctors/nurses), professors or third-party groups. Advocacy cannot solely come from government, utilities, or those who may profit off DPR implementation
- Work with influencers/community champions, media and/or social media, elected officials, utilities to get ahead of misinformation
- Inclusion of marginalized groups
- Diverse (independent) advisory committee including technical and public backgrounds
- Use research community needs to guide community specific education/outreach
- Inform and begin educating public on DPR as soon as possible. It takes 3-10 years for public to accept changes
- Drive home the safety of DPR water
- Unify and determine who sets the terminology. (IPR vs DPR, "purified water")
- Educate on the water/wastewater cycle and why DPR is necessary to solve water scarcity in Arizona. Also educate public on source water. Use demonstration facilities and graphics
- Incentivization programs for consumers to adopt DPR
- Learn from others success stories

Source Water Management

Facilitators (Austa Parker- Brown and Caldwell, Katie Vanyo-Hazen and Sawyer) Key Themes and Takeaways from Discussion

- Demonstrate plans to monitor and protect the source water, emergency response and off-spec operation, and continued management of the program, including evaluating new industries.
- Provide guidance and examples for various applications and utility sizes.
- Encourage utilities to establish partnerships with multiple agencies including industrial users, wastewater treatment facility/wastewater utility, and water providers
- Enhanced source control discussions are important with all agencies involved.
- Demonstrate partnerships with industry and source water (wastewater facility) as applicable
- Allow the utility to establish source water compliance point
- Provide flexibility in source control approach for each utility
- Demonstrate funding capability
- Expand outreach and education for industrial discharges and stormwater protection

Table 1: Arizona Water Reuse Symposium DPR Rulemaking Workshop		
Participating	Organizations	
ADC Wastewater Engineering	Hazen and Sawyer	
AF Engineering PLLC	HDR Engineering Inc	
Arizona Public Service	Hunter Contracting Co.	
Arcadis US, Inc.	IES Southwest, Inc.	
Archer Western Construction	Jacobs Engineering Group Inc.	
Arizona Department of Environment Quality	JR Filanc Construction	
Arizona Department of Water Resources	Kiewit	
Arizona State University	LRE Water	
ASR Construction Group	Marana Water Department	
Big Park Water Company	Maricopa County Environmental Services Department	
Black & Veatch	McCarthy Building Companies, Inc.	
Brown And Caldwell	Montgomery & Associates	
Carollo Engineers	MWH Constructors	
City of Buckeye	PCL Construction, Inc.	
City of Cottonwood	Pinetop-Lakeside Sanitary District	
City of Flagstaff City Council	Resilient Infrastructure Group	
City of Glendale	Scottsdale Water	
City of Goodyear	Stantec Consulting Services Inc	
City of Peoria	State of Colorado - CDPHE	
City of Phoenix, Water Services Department	SUEZ Water Technologies and Solutions	
City of Sedona	Sundt Construction Inc	
City of Sierra Vista	Tetra Tech	
City of Surprise	The University of Arizona WEST Center	
Clear Creek Associates	Town of Chino Valley	
Colorado Springs Utilities	Town Of Prescott Valley	
Coombs Hopkins Company	Town of Queen Creek	
Corbins Electric	Tucson Water	
D&H Water Systems	University of Arizona Maricopa Ag Center	
Environmental and Urban Construction Joint Stock Co	University of Arizona WEST center	
EPCOR USA Inc.	US Bureau of Reclamation	
Eurofins Eaton Analytical	Victaulic	
Flagstaff Water Group	Warner & Associates	
Flagstaff Water Services	Albuquerque Bernalillo County Water Utility Authority	
Friends of the Verde River	Water Infrastructure Finance Authority of Arizona	
Garver	Water Origination	
Geosyntec	Water Works Engineers, LLC	
Gerba lab University of Arizona	WestLand Resources, Inc.	
GHD Inc.	Wilson Engineers	
Global Water Resources	Woodson Engineering and Surveying	
Grand Canyon National Park, National Park Service	Water Research Foundation	

Treatment Barriers – Microbial Removal – Summary of Workshop Sessions.

Facilitators: Troy Walker and Andrea Odegard-Begay – Hazen and Sawyer

This topic considered various aspects of the management of microbial risk and removal through treatment barriers. This included topics such as:

- Specific requirements for microbial pathogenic removal;
- Approaches to process validation and barrier monitoring;
- Identifying needs for sampling and analysis.

The workshop group was introduced to the topic and provided with the initial recycled water work group recommendations, taken from *Guidance Framework for Direct Potable Reuse in Arizona* NWRI, 2018.

Specific recommendations included the following:

Recommendations	Regulation	Guidance or Permitting
The implementation of a log credit system will need to be established; however, the system can be addressed through policy or guidance. In addition, the burden can be placed on the utility to propose its approach to achieving the log reduction targets in the form of a project proposal.		√
A "project proposal report" or "design report" should be required through regulation.	√	
The requirements for the project proposal report or design report can be addressed in guidance and/or permitting.		√
Using the Texas approach will require ADEQ to review the project, characterize the wastewater, and approve the treatment process.		\checkmark
The implementation of a log credit system will need to be established; however, the system can be addressed through policy or guidance. In addition, the burden can be placed on the utility to propose its approach to achieving the log reduction targets in the form of a project proposal.		√
A "project proposal report" or "design report" should be required through regulation.	\checkmark	

The requirements for the project proposal report or design report can be addressed in guidance and/or permitting.	√
Using the Texas approach will require ADEQ to review the project, characterize the wastewater, and approve the treatment process.	\checkmark

A facilitated discussion with three groups provided the following input, which has been grouped.

General Microbial Credits and Log Removal Values

- General agreement on the option of California 12-10-10 (virus, giardia, cryptosporidium) and Texas 8-5.5-6). The California target is a default (presumptive) removal requirement, and the Texas is based on source water characterization (and may be the stated Texas targets or another as determined form the analysis).
- Flexible approach (CA/TX) as above is recognized as a good option.
- Can we include the water treatment plant in microbial pathogen credits? Should it remain silent?
- Consider a minimum number of barriers required.
- Consider a cap for a maximum log removal per barrier (California).
- Revisit log removals based on what is happening elsewhere.
- Allow for innovative approaches for validation of UV.
- Consider identification of some required processes, but not necessarily technologies (e.g. Colorado identifies filtration and disinfection).
- Should pilot testing of the proposed treatment train be mandated?

Microbial Analysis

- Revisit the variability of microbial removal through barriers. As noted by Chuck Gerber, there is noted variability during operation due to varying operating conditions and system life. Log removals need to be set such that the log removal credited is a worst case.
- Need agreed microbial surrogates.
- Which virus is the best indicator?
- Need a reminder that no one size fits all for selection of a virus surrogate model, consider the suite of viruses that should perhaps be used.
- Improvements in rapid coliphage testing may provide benefits to supplementary sampling.
- Additional Department of Health Services (DHS) consideration should be given to microbial sampling methods and requirements to support treatment.
- To be effective, need in-house or coop lab. Need to identify analytical laboratories and locations (esp when considering smaller communities).
- Training on sampling and analysis should be included as part of operator certification
- Skilled staff and monitoring requirements may be barriers to entry for smaller communities.
- Engineered storage to allow time for sampling/lab results.
- Monitoring vs treatment technology (burdensome/validated removal).
- Pathogen monitoring in treated effluent more practical than raw sewage.
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Microbial Pathogen Source Water Characterization

- Characterization of source water to identify removal requirements is beneficial.
- Characterization of source water new WWTP operate > 1 year before DPR to allow time for process stabilization and to provide sufficient sampling results.
- Online TOC and ammonia are useful surrogates of WWTP performance.
- Consideration that Class A+ effluent to begin with as a minimum standard to begin DPR.
- Who should be responsible for sampling (WWTP or AWT proponent (if different entities))?
- Consider additional barriers of wastewater treatment (or additional treatment to AWT) that could reduce pathogen removal requirement (following characterization).

2022 Arizona Water Reuse Symposium Workshop

Treatment Barriers - Chemical Removal - Summary of Workshop Session

Facilitators: George Maseeh – Carollo Engineers and Zaid Chowdhury – Garver USA Note taker: Viking Edeback - Carollo Engineers

This topic considered various aspects of the management of chemicals of concern and treatment approaches. This included topics such as:

- Quantitative limits for chemicals
- Treatment techniques for unregulated chemicals
- Treatment techniques for groups of chemicals

The workshop groups were introduced to the topic and provided with the initial recycled water work group recommendations as well as recommendations from the *Guidance Framework for Direct Potable Reuse in Arizona* (NWRI, 2018).

Recommendations included the following table:

	Regulation	Guidance or Permitting
 A three-tier approach can be used to control chemicals for DPR and include: Tier 1 – SDWA and State requirements (including DBPs and nitrate) Tier 2 – Unregulated chemicals (including chemicals on CCLs and UCMRs) of interest from the standpoint of public health Tier 3 – Unregulated chemicals that are useful for evaluating the effectiveness of organic chemical removal by treatment trains. Specifically: The three-tier monitoring approach can be required in regulations to guide chemical control. The details for implementing the monitoring requirements can be set in guidance/permitting. 		
Nitrate is regulated under the SDWA and present a potential acute risk and, as a result, are of particular importance to DPR and should be monitored for in the advanced water treatment system.	~	
Approved analytical methods are needed.		~

Conduct comprehensive analytical studies on the types and quantities of chemicals (including CECs of interest and emerging CECs) that can be present in the treated wastewater. The results would help determine how much removal is needed and what CECs or CEC indicator parameters need to be monitored.

A facilitated discussion with three groups provided the following input:

Session 1

- Non-prescriptive guidance for treatment with flexibility for treatment alternatives.
- Pilot testing should be allowed to prove technologies.
- Influent characterization should be used to determine requirements.
- Site-specific influent sampling should be revisited periodically.
- Should provide a suite of available technologies with typical design criteria as guidance.
- Proposed processes should be tied to targeted chemicals, including those with MCLs and those included in UCMRs and CCLs.
- There will need to be strategic locations for monitoring, including both online and grab samples for lab analysis.
- An alternate discharge location for treated water should always be available for management of water quality excursions. The alternate discharge is important to be included in design.
- Regulations should be categorically open beyond the SDWA.

Session 2

- Regulating PFAS beyond PFOS and PFOA is important.
- Attention is needed if MCLs are set as a baseline. The SDWA should be used a baseline only.
- The class of the contaminant should be considered when setting regulations.
- Addressing emerging contaminants that are not regulated as a basis to require a treatment technique may be challenged.
- Site specific source characterization needs to be done and enhanced by UCMRs and CCLs.
- Bioaccumulating compounds should be considered in regulations.
- Prescribing full treatment process trains is too limiting and discourages innovation.
- Advanced oxidation of some type should be set as a requirement.
- Surrogate-based guidance should be used.
- Regulations should not define treatment technique design criteria but instead leave the design criteria open.

Session 3

- The regulations should address what is likely to be regulated by drinking water standards.
- Compounds created in wastewater treatment plants should be considered in regulations.
- DPR regulations from other states, such as Colorado and California, should be used as a starting point for Arizona regulations.

- Colorado requires any hydroxyl radical-forming AOP and either RO or two barriers of adsorption (not specifically limited to GAC). Attendees in this session agreed on requiring AOP as part of the Arizona regulations.
- Source control in the wastewater collection system should be a general requirement and not prescriptive.
- A pilot test should be required for novel treatment approaches.
- Regulations should require facilities to have accommodations for future process additions to address unknown future contaminants and standards.

<u>Summary</u>

- Regulations should be chemical-specific as the baseline:
 - Limit enforceable numeric standards to SDWA MCLs.
 - Additional numeric standards may be included in the AZ DPR Reg as long as there are acceptable defendable values are available from other regulatory authorities (e.g., public notification levels for NDMA in CA). These could be offered as guidance rather than enforceable standards.
 - Unregulated chemicals from CCLs and UCMRs should be kept non-prescriptive and addressed in permitting and guidance.
 - Certain treatment techniques could be mandated or recommended for controlling the occurrence of chemical contaminants with agreeable definition of the treatment technique (e.g., GAC adsorption with EBCT of 15 minutes with replacement frequency of six months).
 - Treatment techniques should demonstrate diverse treatment for chemicals in the permitting process.
- Enhanced source control discussions are important with all agencies involved.
- Source water characterization for chemicals should be conducted in parallel with pathogen characterization.
- There should be an alternate discharge available for off-spec treated water.
- Compounds that are formed in the WWTP or compounds that bioaccumulate should be considered for regulation.
- Monitoring for chemicals will be a challenge, and a diverse monitoring plan will be needed that includes both online analyzers and grab samples.
- Scalable pilot demonstrations should be included in the guidance documents.
- Some support was shown for prescriptive advanced oxidation and GAC adsorption to be included in regulations.

Monitoring and Compliance – Summary of Workshop Session

Facilitators Rob McCandless - Stantec, Suzanne Grendahl- City of Scottsdale

This topic considered aspects of monitoring and compliance including topics such as:

- CECs/UCMR/CCLs Managerial
- On-line analyzers/instrumentation l
- Permit framework
- Small and outlying communities

The workshop group was introduced to the topic and provided with the initial recycled water work group recommendations, taken from *Guidance Framework for Direct Potable Reuse in Arizona* NWRI, 2018.

Specific recommendations included the following:

Recommendations	Regulation	Guidance or Permitting
Startup performance monitoring plan and results should be provided to ADEQ for approval. Water quality monitoring is required for each major treatment process and final product water quality (starting from source water and through the AWTF).	\checkmark	
Appropriate process monitoring for DPR systems using rapid surrogate measures is needed to verify treatment performance with respect to pathogen removal targets and to document and review system performance.		\checkmark
In the event the DPR system cannot attain target pathogen credits or other chemical water quality excursion, a judgment needs to be made based upon all of the information available as to whether the facility should be shut down or out-of-specification water bypassed or diverted to another system (i.e., the sewer).		√

Comments about monitoring for CECs/UCMR/CCLs

- Existing SDWA framework is robust
- Reflect the level of monitoring of existing regulatory frameworks
- Laboratory analyses should follow SDWA
- How do you integrate drinking water regs with DPR?
- Industrial Pretreatment Program could be a way to capture unregulated chemicals
- Demonstrate local limits; require an IPP for any DPR program
- Understand the specific characteristics of a wastewater
- Water systems should establish the goals and expectations for unregulated chemicals

- How many unregulated chemicals should be monitored? Is the data reportable?
- What do we do with the data?
- What about customer preference? Example: taste and odor
- Should the water system decide which unregulated chemicals to sample and how often?
- Consider chronic vs acute health impacts

Comments about on-line analyzers/instrumentation

- Are measurements for process control or for compliance? One is considered public information, the other is not.
- Will monitoring and compliance be different for treated water augmentation versus raw water augmentation?
- There needs to be monitoring 'along the way' before distribution. This means that there should be monitoring at critical points along the treatment process in DPR applications
- Duplicate instrumentation
- Will the permit establish alarms/alert levels or with the utility?
- Online analyzers must work but how will we verify? 3rd party certification? Readings backed up laboratory analyses?
- Define monitoring for process control versus compliance.
- Intermediate analyzers should be for process control but could be used to trigger an alarm or diversion
- Rapid screening techniques are needed for influent characterization

Comments about permit framework

- How do we handle permitting of a remote-located WTP?
- For scenarios where there are separate WRP, AWT, and WTP facilities, co-located WRP/AWT or AWT/WTP, there should be one unifying permit, but flexible to handle any scenario
- Contingency planning for off-spec water.
- Will compliance follow treatment techniques or precise treatment
- Use the entry point to the distribution as the compliance point

Comments about monitoring and compliance for Small and Outlying Communities

- Increased treatment monitoring redundancy for smaller/outlying communities
- Consider a Monitoring Assistance Program for DPR
- How to accommodate private utilities within Arizona Corporation Commission governance
- Must demonstrate adequate technical/managerial/financial capacity to sustain a monitoring and compliance program. Submit a plan along with TMF requirements
- Can off spec water be addresses with redundant treatment barriers?
- What about laboratory co-ops for multiple, smaller communities?
- What about allowing for roaming operators?

Operator Certification and Training – Summary of Workshop Session

Facilitators David Walby- City of Scottsdale, Heather Tugaoen-Stantec

This topic considered aspects of operator certification and training, including topics such as:

- Certification requirements
- Training opportunities
- Prior operations experience
- Public messaging

The workshop group was introduced to the topic and provided with the initial recycled water work group recommendations, taken from *Guidance Framework for Direct Potable Reuse in Arizona* NWRI, 2018.

Specific recommendations included the following:

Recommendations	Regulation	Guidance or Permitting
The O&M requirements for a DPR system exceed the demands of a wastewater or drinking water supply, requiring special operator skills and experience. The DPR treatment plant designated Operator of Record should have a Grade 4 level of certification as water treatment plant operators regardless of system size.	\checkmark	
The details of the number of operators required and level/types of certification can be addressed in guidance or permitting.		\checkmark
Lead operators and the Operator of Record must be Grade 4 licensed water treatment operators.		\checkmark
Certified water/wastewater operators will be needed to run a DPR system. Staffing for a DPR system should be 24/7 unless an operational electronic remote sensing system is available to provide real-time data, appropriate alarms, and automatic response so that operators and other expert support personnel can be on call at all times.		\checkmark

1 Operator Certification and Training

The 2022 WateReuse symposium breakout session for the Operator Certification and Training component furthered discussions on what level and type of certifications, training and experience should be recommended or required for the new Direct Potable Reuse rulemaking.

1.1 Certification Requirements

1.1.1 IS DPR WATER / WASTEWATER? IT'S SITUATIONALLY DEPENDENT!

At a high level, there are a lot of different scenarios for which DPR can be implemented, which was reflected throughout the discussions. For example, a DPR facility can be solely implemented at the WRF site, which for operator certification is likely the most complex scenario due to the existing WRF "Wastewater Treatment" Certification requirements plus an additional DPR and/or "Water Treatment" Certification requirement.

Consensus among the group was that because the DPR facility is producing potable/finished water, a drinking water certified operator should be ultimately responsible for any DPR production facility discharging to the potable water distribution system. This sentiment was generally regardless of where/how the DPR facility was housed (onsite for W or WW, offsite at a third-party location).

If the DPR facility is onsite at a water treatment plant or offsite at a third-party location (not WRF/WTP), consensus was that the DPR facility shall be graded for compliance at minimum at a surface water treatment plant (SWTP), which under the current Arizona code requires ranking of treatment process units on a points scale to grade the facility. It is likely that a facility doing DPR will be graded to a 4 per the required technologies, but this is not necessarily true pending upstream treatment processes at the WRF or other processes required at a SWTP/GWTP.

A question arose of whether the facility will be regraded to accommodate the added technologies from the AWT or if a separate AWT certificate for the facility will be issued (e.g., WRF is graded for a 3, AWT is separately certified or it all becomes a 4+AWT?). Could separate streams still be accommodated under a comprehensive facility grade to provide treated for purpose reclaimed water v. AWT water?

1.1.2 RECLAIMED/RECYCLED/RENEWED WATER

For example, the State of Florida now categorizes three types of water: potable water, wastewater, and reclaimed water. Reclaimed water is now categorized as a 'source' of water in the same way that groundwater or surface water would be managed.

Certain cities in Idaho who are doing water reuse (non-potable) have rebranded their treated wastewater effluent (A+) as "Renewed Water", though it is still used only for non-potable purposes. *Defining how Arizona will brand/rebrand reclaimed water / purple pipe / recycled water is key to defining quality and allowed endpoints.*

The State of Colorado recently proposed regulation that will categorize A+ treated effluent as a qualified source water under the surface water treatment rule regulations. Source monitoring requirements are in place.

1.1.3 OPERATOR CERTIFICATION RULES ARE WELL DEFINED FOR W/WW (SEPARATELY)

Certification requirements are stipulated by the administrative code and ADEQ already, for grades 1-4 of water treatment, distribution, wastewater treatment and collection system operators. These have specific knowledge requirements and testing per the Association of Boards of Certification (ABC). These also have specific experience requirements for each grade of operator (see <u>Operator Certification | ADEQ Arizona Department of Environmental</u> <u>Quality (azdeq.gov)</u>).

The pathway to getting these certifications is well defined, and sentiment throughout the discussion was that implementing a fifth full operator certification program is not feasible in the immediate term but a separate track could evolve as a long-term goal if the state of Arizona continues to have an increasing number of DPR facilities.

• As it stands now, the certification program in Arizona takes a minimum of three years to go from uncertified to a Grade 4, which assumes skipping Grade 1 via a combination of education and experience. Otherwise, it may take up to four years to achieve Grade 4 certification.

The ABC requirements cover most but not all of the DPR-related technologies, which would require additional curriculum to achieve adequate training/testing. It was discussed that a <u>separate certificate</u> to go alongside a water/wastewater treatment operations license focused specifically on DPR and related technologies could bridge knowledge gaps and reassure public of adequate knowledge/competency. This DPR certificate would be an add-on to existing water and wastewater treatment licensing, not in lieu of.

- A vocal minority indicated that a grade 4 water and grade 4 wastewater license should be required for DPR certification to provide adequate training. While this sounds great conceptually, this would be a severe incumbrance to utilities to provide such certification and may still leave gaps in understanding as described above.
- An AWT/DPR certificate was generally advised to fall on the water treatment side of the operator certification program, but consideration should be given to variances based on qualified wastewater operators who have not had water treatment operations experience but can adequately demonstrate competency.
- A decision to be made is whether an operator graded lower than a Grade 4 should be allowed to apply for the AWT/DPR certification based on education/experience and necessity to have a Grade 4 per the facility grade.
 - There are utilities that currently only operate a Grade 1-3 facility that would not have access to any Grade 4 operators but may continue their existing facility grades with the addition of the AWT facility, requiring consideration of alternative pathways to successfully operating DPR facilities.
 - Such utilities may have only ever operated groundwater treatment systems previous to DPR, which would require substantial knowledge investment to bridge gaps for sampling/monitoring requirements, technologies and troubleshooting.

- Water treatment facility grades are based on technology. Wastewater treatment facility grades are based on population and public health / effluent rating (e.g., B+/A+). How DPR/AWT facilities are to be graded should be considered as part of rulemaking.
- If a 4 W x 4 WW ends up being required, would two separate individuals be able to qualify for this? Historically most water folk stay water folk and wastewater folk stay wastewater throughout a career. Cross-training is rare, and more of an 'academic' exercise than true operational need.

1.2 Training Opportunities

Example training opportunities include:

- Simulation (physical or computer-based) to run operations, provide setpoints, and manage failure scenarios
 - Simulate failure and/or suboptimal upstream performance and what to do. This can be whole system failure or component failure and mechanisms for stopgaps / bypass / alerts/alarms.
 - Consider a centralized 'training center' with opportunities for simulation and/or hands-on development opportunities.
 - "What if" scenarios are going to dominate the DPR acceptance process, and this could be incorporated somehow as well.
- Pilot / demonstration scale experience (hands-on)
- Educational training opportunities to enhance knowledge development *requires curriculum to be built out* and ongoing opportunities for DPR-specific continuing education.

A suggestion from the group was to look at analogs from other industries (e.g., power plants) which have rigorous training and certification requirements to see what technologies and pathways can be leveraged instead of reinventing the wheel.

1.3 Prior Experience

Prior experience with DPR/AWT is likely to be limited to pilot scale experiences, unless a centralized training option is available.

The existing shortage in the industry of qualified / certified operators may be exacerbated by increasing requirements under DPR/AWT.

• Providing a clear pathway and timeline (probably to start during design of an AWT to allow for adequate training / testing / experience) in guidance documents would be helpful to clarify to utilities what is involved in the process.

• Separate utilities will have difficulty bridging coordination between water and wastewater experience (e.g., Tucson Water + Pima County) depending on where the AWT fence line is located.

1.4 Other Topics

- Messaging and branding were resounding topics in each of the breakouts, with communications to the public critical for acceptance of any operator training and certification.
 - Most of the public are clueless about the existing system for certification. Bridging this gap is key to developing new programs.
- Does the grade of water input or grade of water output dictate the facility grade?

Organizational Capacity (Technical, Managerial, Financial) – Summary of Workshop Session

Facilitators Brian Biesemeyer – Scottsdale Water, Erin Young – Flagstaff Water Services

This topic considered aspects of organizational capacity including topics such as:

- Technical
- Managerial
- Financial
- Regulation

The workshop group was introduced to the topic and provided with the initial recycled water work group recommendations, taken from *Guidance Framework for Direct Potable Reuse in Arizona* NWRI, 2018.

Specific recommendations included the following:

Recommendations	Regulation	Guidance or Permitting
Establish a pretreatment program and source control program as part of the DPR permitting process	\checkmark	
Establish minimum requirements for all systems, including both small and large systems, regardless of jurisdictional issues and/or boundaries.		\checkmark
Source control program should control chemicals from a drinking water perspective, and go beyond pretreatment regulations to manage chemicals		√
Develop interagency cooperation and responsiveness plan between entities operating the wastewater, advance, and drinking water treatment facilities		\checkmark

Summary of recommendations from participants at the workshop:

- There are multiple operational scenarios to consider with how a DPR facility is situated organizationally or contractually. These scenarios require careful and thorough consideration of how operations staff might need to communicate or share information across internal or external boundaries to ensure DPR facility compliance and public safety.
- General consensus was to not establish a separate AWT or DPR operator class however consider that running a DPR facility requires a mix of water and wastewater operational knowledge.
- Industrial pretreatment programs and requirements need to be considered as how noncompliance or loading allowances could impact the DPR process. Consider how pretreatment issues could impact smaller vs. larger systems.

- A utility considering DPR should consider managerial items prior to starting a project, such as securing a water right to the DPR water source through a contract, or maintaining AZPDES or APP permits to use as back-up options
- A utility incorporating a DPR facility into its water supply portfolio should consider completing and/or updating a rate study, cost of service study, and/or impact fees analysis to ensure the capital and operational costs of the DPR facility are distributed fairly through the community
- No consensus on whether plans such as water supply contingency plans, alternative discharge plans, operations and maintenance plans, emergency plans, financial plans, etc., should be required through regulation or recommended through guidance
- Consider the requirement of a utility to commit to proper staffing and pay rates

Technical

- Certification a big deal go CA route with level 5 operators? Water operators or wastewater operators?
- General consensus of not wanting to see a separate AWT or DPR operator class
 - less complicated for ADEQ to adjust class 3 and class 4 with DPR topics within exams and training
 - nuances between a water and a wastewater operator make each think about how/why other "side" might react differently to what might be seemingly small items to the other - very important from Scottsdale experience
- Consider an "add-on" for AWT operator license
- Consider the "add-on" be for a specific train ozone or BAC
- Consider having a float person go around the state for training onsite
- In Nevada, many operators are dual-certified due to small size of utility larger facilities might have operators responsible for specific things, more specialized. Might need to force water guys to go to wastewater side
- What to do where a water utility and wastewater utility are owned by different utilities (Tucson, for example) - operators are more likely at least communicating where the water and wastewater utilities have single owner. Consider transparency in the former case - what if a wastewater plant doesn't share information about an industrial user, or bad sludge received that might impact the AWT process? Data sharing protocols/agreements?
- What process changes or interruptions needs reporting to ADEQ every upset for example?
- Training needs to include a monitoring focus
- What are the minimum number of certifications maybe an "interim" certifications or plan
- Guidance or requirements for pilot programs potential National program?
- What kind of permit will DPR be a DPR permit? APP? DW? still "TBD"
- How does industrial pretreatment assessment monitoring factor in?
 - currently size dependent may need to tighten up
 - o a small utility can be impacted harder by a single industry compared to a larger

<u>Managerial</u>

Guidance:

- Consider whether an agreement or MOU is necessary for the right to the DPR supply water
 - Who has the water rights to the DPR water? Secure those rights BEFORE construction of a DPR facility. This should not be a requirement of ADEQ
 - Determine that the utility has rights to back-up water to the DPR supply might be important, but should not be a requirement of ADEQ

- Consider the baseline approach to SDWA, with DPR water as the input.
- Consider that some dischargers or providers of reclaimed water may want the water back discharges to system are public owned
- Human Resources staff needs to be informed on staffing and salary requirements
- Maintain all other water supply permits AZPDES & APP (groundwater supply, surface water supply, etc.)

Regulation:

- Emergency Plans: (note taker did not retain discussion on whether emergency plans should be a regulation or a guideline)
 - What happens if wastewater or DPR plant shuts down?
 - may be different depending on if the DPR facility is attached to a wastewater vs.
 a water plant)
 - Alternative Discharge Plan?
 - Divert DPR water to where?
 - is AZPDES an option?
 - Send to SROG?
 - Still send to aquifer recharge (managed/constructed)?
 - Send to a holding pond?
 - Send back to wastewater treatment plant?
 - Blend as a redundancy plan?
 - Emergency Response Plan?
 - Contingency Plan?
 - Maintain all other water supply permits AZPDES & APP (groundwater supply, surface water supply, etc.)
- Operations and maintenance plans requirement or guidance? Include instrumentation and calibration requirements and asset management plan (will be different for RO vs. MF)
- Who holds the DPR permit the water or the wastewater department?
- ADEQ needs guidance or guidelines to allow subjectivity and flexibility with each permit
- Base regulations around standards such as public health standards
- Question: Should a water provider be allowed to serve 100% DPR water? Should ADEQ evaluate supply vs. risk of system not meeting customer demand?
- Should dual plumbing acceptable redundancy could Class A+ be used to satisfy fire flows, for example
- Should assurances that proper staffing levels will be achieved be part of the permit?

Financial

Guidance:

- Have internal utility discussion is the DPR project a water project or a wastewater project or is it some of both? Should some of the project be funded by development through impact fees? Most group discussion landed on DPR as a water supply project but it could differ from one utility to the next. Perhaps a wastewater quality issue is being solved as part of the upgrade to DPR, justifying some of the cost to come from a wastewater fund.
 - Funding through impact fees may take too long to generate the funding
 - Must answer the question for each utility: where is the line between what is a wastewater project vs. what is a reuse project?
- Have a new cost of service study completed
- Explain to customers who is paying for the facility

- Account for additional staffing and operation and maintenance costs
- Consultants can assist with long-term financial plan

Regulation:

• Will ADEQ require a utility prove financial capability? If so, would a rate study or assessment of impact fees be required? Most group discussion pointed to a rate study and/or impact fees assessment as a guidance topic but not as a requirement.

Public Outreach and Communications – Summary of Workshop Session

Facilitators Channah Rock - University of Arizona, Zoe Scott - University of Arizona

This topic considered aspects of operator certification and training, including topics such as:

- Questions each utility should consider
- People to involve
- Messaging
- Implementation and Adoption

The workshop group was introduced to the topic and provided with the initial recycled water work group recommendations, taken from *Guidance Framework for Direct Potable Reuse in Arizona* NWRI, 2018.

Specific recommendations included the following:

Recommendations	Regulation	Guidance or Permitting
The development of specific guidance for agencies interested in implementing DPR projects can help assure the public that potable water produced from wastewater through DPR is adequately protective of public health.		✓
Utilities considering DPR should be encouraged to develop a robust public and permitted industry outreach program to build awareness, trust, confidence, support, and acceptance of the DPR project		✓

SUMMARY

QUESTIONS TO CONSIDER

- What is the goal of doing outreach?
- Who is doing the public outreach? Dedicated person from each utility? What about small utilities that don't have the capacity? Is it ADEQ's responsibility?
- What is our benchmark for successes/public acceptance?

PEOPLE TO INVOLVE

- Include leaders and/or trusted institutions in the community in outreach/advocacy of DPR. Must include public health educators (doctors/nurses), professors or third-party groups. Advocacy cannot solely come from government, utilities, or those who may profit off DPR implementation.
- Work with influencers/community champions, **media** and/or social media, elected officials, utilities. Get ahead of misinformation.
 - o Youtube?
 - How do we reach communities without wifi?
 - Before you can determine a social media campaign you need to know where the community's education level is at.

- Inclusion of marginalized groups, multi-language outreach education materials/workshops. What is Arizona's effort to reach disproportionately affected groups?
 - \circ $\;$ regulatory language of interacting with underserved communities.
- Diverse (independent) advisory committee. Both technical and public. Include public health, government, industry, utilities, housewives, businessmen, professors, environmental groups. Throughout DPR process not just at the preliminary stages of implementation.

MESSAGING:

- Research community **specific** needs to guide community specific education/outreach.
 - Mostly uniform education program for the state which can be adapted to a communities main concerns.
 - o needs to be able to be changed as industry changes
 - Are there programs that already exist that can be drawn from?
 - Are you required to do outreach even if this is a normality for your community and already accepted thing?
- Transparency
 - Inform and begin educated public on DPR as soon as possible. It takes 3-10 years for public to accept changes. If they are familiar with DPR prior to the need/implementation of DPR then they are more likely to accept it.
 - \circ $\;$ may not have all the details but can at least start the education process
- Drive home the **safety** of DPR water
 - ADEQ have information on safety of DPR on their website
 - Provide consistent monitoring data and/or alerts to public so they feel DPR is safe.
 - Regulators need to be stronghold on the safety of DPR. They are independent and can help gain public's acceptance, especially communities distrustful of utilities.
- **Unify terminology**. (IPR vs DPR, "purified water") Does ADEQ come up with the terminology?
- Do not diminish the quality of one water source by suggesting it to only be used for certain purposes and that another water type is more "acceptable" for drinking water than DPR. "One water" concept.
 - Additionally, do not make statements like "DPR exceeds drinking water standards" (for quality parameters like CECs) This will make public question current drinking water sources and create panic and distrust.
- Cost to consumer, be transparent. DPR vs having to import water.
 - o Prove why
- Educate on the water/wastewater cycle and why DPR is necessary to solve water scarcity in Arizona.
 - Have **demonstrations** on water treatment technologies.
 - RENTABLE MOBILE DEMO LAB. Smaller utilities can rent. Moves across the state's communities.

- Potentially each university has one. Regional mobile labs (NAU, ASU, UofA).
- Adaptable to showcase the technology of each communities' utilities
- Have a dedicate staff member who puts together pilot and does outreach
- Make it pristine. Keep public away from smell/look of wastewater
- Simple graphics and science communication. "Safe, sustainable, renewable"
- Who is responsible for maintain this?
- Source water education. Make public realize their impact on water quality (oil dumping).

ADOPTION/IMPLEMENTATION:

- Before piloting DPR, research which group may be the most accepting. Use them as the first test.
- Incentivization programs for consumers to adopt DPR.
- In the early days of DPR implementation, have sources other than the DPR plant providing the city's water.
- Train and educate internal staff
- GUIDANCE OVER REGULATION
- Learn from other's success stories.
 - Water conservation outreach programming
 - El Paso, TX and San Diego, CA DPR outreach
 - ADEQ depository?
 - Cyclical and updated education.
- K-12 education
- Focus groups > surveys

Water Reuse Symposium 2022 7/26/22 Workshop- Defining the Future of Direct Potable Reuse in Arizona <u>Public Perception/Outreach Group</u>

Group 1:

What are the most important factors to communicate about DPR for an outreach campaign?

- Need for water supplies, needs within the community
- Writing a pilot plant before creating the rules like what was discussed for the Colorado plant for DPR in the session on moday. Public communication and technical value.
- Water = health, public health communication. Examples of public health people: doctors and nurses
- Additionally, have other respected institutions in the community participate in outreach campaign. For instance, in Flagstaff groups like NAU or other groups that carry weight in the community. Respected institutions/people must be community specific.
- Evaluating what a sensible group with whom to pilot. Whom do you engage with first, who are least resistant to a program like this liberal? Academia? Socioeconomic group? (but remember there are some groups that are immovable)
 - But is this after you get a champion? Maybe first you find the champion before you find the pilot group
- Workshops w/demonstrations
- People personal choice, do the people have a say. Can people decide to do DPR, choosing their water supplier
- Include media outreach, like a newspaper, do this regularly not just once.
 - Talk with the media proactively rather than reactively. Engage and be transparent with the media. If you're elusive or evade questions, then it might lead down a poor path or press release.
 - Sponsoring media to see a demonstration/visit existing ones could include Colorado trailer or stationary Scottsdale demo.
 - Evaluation of what other success stories, so we can learn what to do/what to avoid when working with media.
 - DO NOT: No "toilet to tap" phrasing when talking to media.
- Work with utilities at the planning stage.

Additional role of **ADEQ** outreach statewide related to DPR? Should it be individual community based or ADEQ statewide outreach?

- As of now they have a stakeholder meeting this Thursday.
- They need to have **enthusiasm** for it!! (example from Florida, have no passion, seem to be dragging feet)
- If ADEQ becomes too much of an advocate voice they could potentially lose the public's trust
- Incentivizing citizens to opt for DPR, throw everything we got at it.
 - Both for technology and consumer adoption of service.
- put DPR in overall concept of drought of the state. Make it part of the equation.

- Repository of information about why DPR is safe. Public doesn't seem to be concerned about the safety of other water sources, but they do seem concerned about DPR, so ADEQ website having info on it being safe could help the public.
- Mistrust can be generational mistrust from utilities, reckoning with history/ past issues.
 Community still trying to trust utilities. Example: citizen groups shown the plant how it works. Working with the champions of the community.
- k-12 is a great group to work with to set the foundation; adults tend to be set/jaded.
 Children are open to the realities of the future and are aware of scarcity issues.

Drinking water program is very transparent. It would be nice to have transparency about DPR being monitored and get notices of it being monitored or when things may be awry. Consumer confidence reports.

Utilities having direct discussion (face to face) with the community. Including marginalized communities, Spanish speaking, can not just consider ONE type of group.

Pilot group with intermittent challenge testing to show validation of monitoring over time. Regulation process for permit compliance.

WE have tremendous redundancy in the advance water treatment facilities, so much redundancy before end source, to know where it is going way before it could be DPR. How water treatment works and where water goes at each step or after final treatment is complicated to explain to the public, so we need to find a way to communicate this to the public in a way they would understand.

Potential q of a citizen: What happens if there is a failure? How is that going to be communicated?

Industry/utilities: have been doing the behind the scenes trying to ensure no fails occur and to correct for things when they do fail.

The reason for a pilot is so that citizens can come see everything. Very eye opening for people who don't know how water works.

Public perception of risk?? A ton of literature on risk and trust. Higher degree of trust the public has in the person educating them on a topic, the more high risk behavior they'll accept. Awareness and language are very important. At a very basic level we have hidden water and wastewater treatments from society, So we need to reconnect people/communities with these facilities. A need for how to reconcile CECs (PFOS/PFAS) with DPR. Making public more reluctant. Saying things like "DPR way exceeds standards of drinking water" this comment makes public get afraid of their current drinking water quality

Have plants that aren't the sole source for the community in the early days. So community doesn't believe they will be out of water if the plant has a fall out. Have many water sources. Have DPR as part of a portfolio not the sole source. No all or nothing speech about DPR.

Would blending water soften the blow of perception, create more acceptance? Citizens find that more comforting. Engineers think that's a waste of cleaning and waste of money. What's the appropriate amount of response time to failure (if you put it into reservoir)? How do you communicate this to the public?

-This could be confusing messaging to citizens if they were just told that the water was super cleaned just to put it back into the aquifer. Why spend all that money just to put it back into the ground?

-zero risk is not a thing.

Maybe have a third-party company be involved in communication with the community, not government or utility. Third party can communicate in a way that won't be suppressed by political reasons "how it looks to constituents". There is distrust of the government b/c of politics. So maybe keep them out of the conversation or at least don't let them be the loudest voice. Especially for regulatory needs.

Form independent advisory committees. Usually these are just for preliminary part of the projects. For DPR it might be nice to have this as an ongoing presence. (medical doc vs public health)

Balance between, industry, public health, government, and utilities. Have a balanced perspective on DPR advisory board.

Is medical community as trusted post-covid? There needs to be strong social media/internet presence with expertise to stay ahead of misinformation.

This is why incentivizing may be more important than trust-based ideology. But how can this happen for public utility.

Regulation needs to look at the data, expand drinking water framework, then explain to the public the safety of the water. If there is distrust from utilities then the state needs to be the final say to reassure the public that they've looked over the data and the water is safe.

Have a website with daily updates to show monitoring data/statistics. Allow the public to feel they know what is going on everyday.

Could get rid of public concern if DPR was just used for landscaping. Rather than drinking water. However, we're moving to a space of "one water". IPR vs DPR and getting rid of the distinguished terms. Make it the same. Terminology is very important.

When looking at a project you look at cost vs use, is it worth it? So prioritize the use of the water would make a big impact. Why does it need to be direct potable use? Prioritize reclaim for irrigation.

-be careful about not damning one source by promoting one over the other.

Group 2:

What is important for utilities to do if going down the path of DPR as related to public outreach? And how can ADEQ help with this? Pilot programs?

-Safety of the water

-Educate on the "Why". Why is DPR necessary.

- Education of water, where does it come from, what is wastewater, where does it go. Can't start talking about DPR when people don't even know that wastewater is going into the creek -cost, why are we going down the DPR route when it is so costly, will this increase the cost of water to the consumer

- multiple languages, underserved communities, need to first understand the goal of including outreach...is it so public will approve it, check a box (regulator box), or is it just to create awareness in the community.

-Need to find out issues of the specific community, concerns of that specific community.

Color, hardness, etc?

-priorities, concerns, issues, of the community.

- Need to have a flexible education program.

-Can we use programs that already exists? (like AZ WET)

-Educate on source water. The public need to realize they are the ones dirtying up the water, personal/community responsibility to keep water clean. No dumping oil. Give public the knowledge that what they put in the water affects the water they get back.

- Education on water quality, wastewater, we are already drinking water from our discharge, but public doesn't understand this.

-A critical message to the public is to have them understand the water cycle and treatment technologies before we try to gain acceptance of DPR

-demonstration of each communities' treatment techniques.

-can each community rent out the mobile water quality demo

-provide public with success stories of other communities already using DPR. Learn from others -public needs professors and doctors to tell them this is okay. Because they are smart independent people looking into this. Because public will question the people who are making money off of this.

- citizens advisory group of broad spectra of citizens: doctors, housewives, business people who meet regularly to discuss the project along with a technical advisory committee, maybe combine the two because the citizens may already have their minds made up without having the technical knowledge to understand the project. -example public is concerned with CECs even though the there was a technical study done for 5 years on the water and showed that there was no risk of CEC in drinking water. Inclusivity in public outreach. Don't want to just hit the loudest people in the room. Engage the underrepresented or immovable citizens.

Who?? Who is going to do the public outreach. If you have a smaller city you may not have a dedicated public outreach person. So, if ADEQ gave terms that the public will understand and guidelines to keep things consistent across the state. Like California's use of the term "Purified Water"

National water association have a big role to play because they have so many tools. Should a state school own a portable demonstration tool which all organizations can use? What is being done for all the small utilities in the state?

Unify effort, because there are so many ways to go wrong. Obviously adapt to community but if have a consistent known proven way to do things then the success rate can be higher.

Who are the stakeholders in each community? Maybe leans away from prescriptive structure.

If we want the communities' input, we need to show them how much their costs will go up if we use DPR or have to import another source.

What is Arizona's effort to reach disproportionately affected groups? In Colorado they find that most immigrants won't drink tap water.

How to market water when we don't have parameters set on what will "hurt" you? Is data the answer? Like ozone and air quality alerts.

Need to demonstrate why the water is safe. But be loud that just like there is no 100 there is no 0.

What is our benchmark for successes/public acceptance?

How often does education/awareness need to be done? Once every 5 years? Familiarity plays a role in acceptance.

Timing is important. When is it best to start informing people. When to start public outreach? (If they've seen it a lot before DPR becomes a reality than they are more accepting because they are familiar)

San Diego and El Paso got way out in front of it but also need to look at needs. If a community is desperate, they will say "do what you need to do" to the utilites.

There is no one size fits all for outreach.

No sneaking in DPR, need transparency. Some people say you need to be talking about this 15 years out. Because it takes b/w 3-10 years for people to accept it before the first drop of water of DPR enters the drinking water system. So maybe this need to be part of guidance. Because if people haven't heard about it before it is implemented it could be scary.

Value of Water.

Influencers, media, elected officials, educators outreach needs to include these people. Where do people get their information. Maybe utility need to have a person that fills this role.

Use examples from Conservation education efforts in k-12. Maybe follow this example for education on DPR.

Group 3:

The whole staff is on board, internal training. Make sure the people interacting with the public aren't putting out the wrong information.

-train and educate internal staff

-unified language across utilities (universal language from AZDEQ)

-do away with direct and indirect terminology, its all water. Inconsistent terminology leads to confusion in the public and industry.

-community specific utility research so they know what the community wants to learn about. -who are the champions?: medical community, can ADEQ do an advisory group to help out as an option like they do for superfund, local business organization, environmental groups, universities, legislators (lawyers), elected officials, large industries, the bigger contributor. The water users/contributors.

-tours/educate the public

Important pieces of pilot program:

-define the purpose:

Maybe to satisfy regulatory body

-educate

Segregate the wastewater and advanced, keep them away from gross stuff Accessibility

- Make it look pristine
- Make it an experience, give them something to be excited about
- Simple graphics and notes
- Have dedicated staff that this is their primary job
- Safe, sustainable, renewable
- Connected to why are we doing this? Prove why we would spend the money to

do this.

Education on the world of water. Something that can be shipped around to smaller communities. Who is responsible for maintaining this shared resource. Large communities may want their own thing.

The small communities will have more financial restraints. Additional funding.

-long term research once proven treatment train
-training
-optimization

ADEQ staff and support for education. Want them to supportive of these projects.

Local regulatory?? Yes there is some level of education that needs to be done and who is in control.

Short term DPR in Texas they had some YouTube videos that they include medical people to make community feel the water is safe. Both show the process of DPR and also the safety of DPR (medical providers)

How do we do outreach? Social media? YouTube? How do mass populations get their content/information?

Maybe have someone at the utility whose only job is managing the social media. That is also specific community groups, no accessibility for communities without WIFI.

Before you can determine a social media campaign you need to know where the community's education level is at.

Communication starts with research on education level.

Capitalize to shift on water awareness. Is there a state level project?

Talk to people before sending out the message. Because the message is very critical.

When talking about DPR people don't even know that this has been happening for year.

Focus groups are helpful cause surveys can sometimes only reach 2 maybe 15 % of public. Interview with community leaders can be helpful, how to identify these people

Start with a long list

Engage with client

Client engages with their list of people (politicians)

But when do we start to engage and communicate?? As early as possible! As soon as you start to think about going down this path. The earlier on you may not have all the details but can at least start the education process.

The crisis is high right now so interests may be high right now.

Start early!! Start with schools k-12 outreach.

Water conservation did this with schools and people grew up knowing we need to conserve water. What is ADEQ role to play with the outreach? It is a find line to regulatory body and individual advocates/ Could be risk of public thinking individuals are in cahoots with regulatory bodies and public is distrustful of government.

Minimum requirement of outreach prior to beginning a project. Along with thresholds in regulatory language of interacting with underserved communities.

GUIDANCE OVER REGULATION

Show that you've done something to educate the public (big picture) Are you required to do outreach even if this is a normality for your community and already accepted thing.

Up to the community how much outreach needs to be done for acceptance.

Long term outreach program need to be flexible and needs to be able to be changed as industry changes so it can't just be written and put in file cabinet. Maybe stop doing outreach when it becomes a norm.

Important to hear from successful projects they are published and available to the public. This may be important for small communities that struggle to fund projects they can pull knowledge from success.

ADEQ could house the success stories. To inform each other. Have content available.

AZ Water/Water Reuse organization needs to push out content so that there aren't redundancies of content. Continually letting people know that content is available refresh/repush the knowledge periodically. Cyclical and updated education.

Language barriers, need to be able to reach different audiences. Water systems near the border only speak Spanish. Need people who can communicate ideas in the native language of the people that are being educated.

Distrust of government, how do we address this?

People hate the utility because billing is messed up, so because of this poor management the citizens don't trust the utility company because one section of the utility is falling behind.



Source Water Management – Summary of Workshop Session

Facilitators Austa Parker- Brown and Caldwell, Katie Vanyo-Hazen and Sawyer

Note Taker: Lynn Carroll, Hazen and Sawyer

This topic considered various aspects of pretreatment and source water management. This included topics such as:

- Protecting source water;
- Critical elements of a source control program;
- Establishing source water compliance point.

The workshop group was introduced to the topic and provided with the initial recycled water work group recommendations, taken from *Guidance Framework for Direct Potable Reuse in Arizona* NWRI, 2018.

Specific recommendations included the following:

Recommendations	Regulation	Guidance or Permitting
Establish a pretreatment program and source control program as part of the DPR permitting process	\checkmark	
Establish minimum requirements for all systems, including both small and large systems, regardless of jurisdictional issues and/or boundaries.		\checkmark
Source control program should control chemicals from a drinking water perspective, and go beyond pretreatment regulations to manage chemicals		\checkmark
Develop interagency cooperation and responsiveness plan between entities operating the wastewater, advance, and drinking water treatment facilities		\checkmark

Key Elements of a Source Control Program

- Regulatory authority
- Monitoring and assessment of the collection system service area
- Source investigations
- Maintenance of current inventory of chemicals and constituents
- Public and industrial outreach program
- Response plan

Key Themes and Takeaways from Discussion

- Each utility should demonstrate their plans to monitor and protect the source water, emergency response and off-spec operation, and continued management of the program, including evaluating new industries. The regulations should provide guidance on elements to be included in the source water management plan and provide examples for various applications and utility sizes.
- Encourage utilities to establish partnerships with multiple agencies including industrial users, wastewater treatment facility/wastewater utility, and water providers
- Utility to demonstrate partnerships with industry and source water (wastewater facility) as applicable
- Allow the utility to establish source water compliance point based on location and operating agency of the Advanced Water Treatment (AWT) facility
- Provide flexibility in source control approach for each utility
- Utility to demonstrate funding capability both short term (to develop the source control plan) and long term (to maintain the program)
- Utility to expand outreach and education for industrial discharges and stormwater protection

Additional Comments, Considerations and Best Practices:

- Source control program should consider impacts on public health, treatment processes, and operations.
- Consider opportunity to require pretreatment and point source inventory
- Establish and demonstrate response plan both emergency response, as well as notification and response to off spec water. Also identify alternate source in the event of a shut down
- Each utility to consider impacts of I&I and brine discharge when developing source control plan, and that considers non-point source and varying qualities of WW discharge
- Utilities should consider cost sharing opportunities with partners and stakeholders. This can be considered at the start of the program to establish specific source water quality, or anytime during the program if upgrades to the treatment process, either at the wastewater treatment facility or AWT, are required to meet regulation
- Utility to demonstrate staff resources to maintain source control program
- The regulator wants to see that the utility can demonstrate the compliance point for source water, establish the feed water quality, and demonstrate response to off-spec water
- ADEQ will acknowledge a variety of applications for DPR depending on the circumstances to provide flexibility in source water management, including:
 - Wastewater treatment and AWT are owned and operated by the same agency
 - The AWT is located at Drinking Water Treatment Facility and owned/operated by drinking water agency (separate from WW)
 - The AWT facility is owned and operated by a separate agency and must coordinate with WW and DW agencies
- Drinking Water and Wastewater utilities should establish a partnership and working relationship to share data and information critical to maintaining public health
- Using secondary effluent as compliance point may make sense for utilities who already have a discharge permit and can demonstrate WW produced, though some systems may differ.

- Monitor and update pretreatment program every 5 years to accommodate new regulation, protect public health and treatment processes
- All expert panel recommendations need to be included in a rule to some degree