FINAL
MINUTES OF MEETING NO. 5
State Water Resources Control Board Division of Drinking Water
Advisory Group for Expert Panel on Direct Potable Reuse
May 1, 2015

Chair Garry Brown called to order the fifth meeting of the Advisory Group for the Expert Panel on Direct Potable Reuse (DPR), held on behalf of the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW), at 10:30 a.m. on May 1, 2015, in the Klamath Training Room at the headquarters of SWRCB in Sacramento, California. The meeting was facilitated by the National Water Research Institute (NWRI).

Advisory Group Members Present:

- Garry Brown, Chair, Orange County Coastkeeper
- Randy Barnard, California State Water Resources Control Board
- Amy Dorman, City of San Diego
- Conner Everts, Environmental Justice Coalition for Water
- Jim Fiedler, Santa Clara Valley Water District
- Julie Labonte, San Diego Regional Chamber of Commerce
- Al Lau, Padre Dam Municipal Water District
- Bruce Macler, U.S. Environmental Protection Agency
- Traci Minamide, City of Los Angeles, Bureau of Sanitation
- Keith Solar, San Diego County Taxpayers Association
- Frances Spivy-Weber, California State Water Resources Control Board
- Roy Tremblay, County Sanitation Districts of Los Angeles County
- Mike Wehner, Orange County Water District

Advisory Group Members Absent:

- Charles Mosher, Mariposa County Health Department
- Andria Ventura, Clean Water Action

Others Present:

- Mark Bartson, California State Water Resources Control Board
- Brian Bernados, California State Water Resources Control Board
- Wendy Broley, California Urban Water Agencies
- Stefan Cajina, California State Water Resources Control Board
- Jing Chao, California State Water Resources Control Board
- Suzanne Faubl, National Water Research Institute
- Steven Garner, American Water Works Association, CA-NV Section
- Karen Larsen, California State Water Resources Control Board
- Richard Mills, Department of Water Resources
- Jeff Mosher, National Water Research Institute
- Jeffrey Pasek, City of San Diego

- Tom Richardson, RMC Water
- Sherly Rosilela, California State Water Resources Control Board
- Toby Roy, San Diego County Water Authority
- Esther Tracy, California State Water Resources Control Board
- Troy Walker, Hazen and Sawyer

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1. WELCOME AND INTRODUCTIONS

Garry Brown, Chair of the Advisory Group, called the meeting to order and acknowledged members of the public participating via teleconference and webinar.

A new member of the Advisory Group, Amy Dorman, was present. Amy is replacing Marsi Steirer as the representative from the City of San Diego.

2. REVIEW AND APPROVAL OF AGENDA

Gary acknowledged that we have a full agenda and that we will keep to the schedule as closely as possible.

3. REVIEW AND APPROVAL OF MINUTES FROM PREVIOUS MEETING

The minutes of the fourth Advisory Group Meeting, held on February 20, 2015, was presented to the Advisory Group. A motion was made to approve the minutes. The motion was seconded and approved unanimously.

4. PUBLIC COMMENTS, INCLUDING PUBLIC COMMENTS ON MATTERS NOT ON THE AGENDA

No comments.

5. DEVELOPING A DPR NATIONAL FRAMEWORK

George Tchobanoglous, Professor Emeritus at University of California, Davis, delivered a presentation on direct potable reuse (DPR). Key points and information from his PowerPoint slides are provided below.

- Diagram of potable reuse facilities in Big Spring, Texas, and Windhoek, Namibia.
- Distinction between purified water and finished water.
- Noted that if finished water will be directly into a supply, the facility must be certified as a drinking water plant. Although the quality of water may be the same in both facilities, the drinking water plant must have redundancies and meet other requirements.
- Brief discussion on indirect potable reuse, a process in which finished water is introduced into a groundwater basin via an injection well. For surface water augmentation, the water is introduced into a storage reservoir and then taken out for additional treatment.
- Slide on the cost of various water supply options, including:
    - IPR with RO and without RO

    - DPR with RO and without RO
    - Brackish groundwater desalination (inland)
    - Sea water desalination
    - Imported water
    - Water use efficiency, conservation, and use restrictions
- Amount of energy required for various supply options, including:
    - Secondary treatment without nutrient removal
    - Tertiary treatment with nutrient removal effluent filtration
    - Advanced water treatment
    - Ocean desalination
    - Brackish water desalination
    - California State Project water
    - Colorado River water
- Key components of a successful DPR program
    - Technical
    - Regulatory
    - Public outreach

George noted that the technical component is the only one for which log removal credits are granted; however, we can change operations and management practices to optimize the function of the water treatment facility, so these other barriers are also important.

- Log reduction values for DPR for three microbial groups
    - Enteric virus
    - *Cryptosporidium spp.*
    - Total coliform bacteria
- Source control programs: it is important to have regulatory authority over your water treatment facility/process; if you don't, then you cannot enforce the measures necessary to control sources of contamination.
- Wastewater treatment
    - Treatment process must be designed to feed into a DPR system.
    - Examples of five different process treatment scenarios.
        - All meet the federal standard for secondary treatment (BOD and TSS at 30 or less, and pH of 6-9), but all have different effluent quality.
- Secondary treatment
    - In general, the goal of secondary treatment has been discharge to the environment.
    - If the goal is to prepare the water for an advanced treatment process, then the treatment train must be designed differently. There is an opportunity for a renaissance in wastewater treatment. For example OCWD used to get water from the Sanitation District before they started nitrifying. After they started nitrifying the membrane performance increased 30%.
    - Treatment changes dramatically when solids are not returned to the plant.
    - Wastewater treatment should be re-conceptualized so that we can produce an even better effluent in the future.
- Measures to improve performance and enhance reliability of existing WWTPs.
- Because of the impact of diurnal flows, there is now an issue with flow equalization.

- Alternative technologies for enhanced primary treatment
    - Cloth screens
    - Disk filters – used to alter the particle size distribution, which changes the treatment kinetics.
    - Charged bubble flotation – coat froth with a polymer, which absorbs dissolved constituents in the wastewater. Used for algal pond effluent reuse. The water has turbidity of less than 1 when it comes off the lagoon.
- Effects of climate changes on rainfall intensity and operation of WWTPs
    - Intensity of rainfall events has changed dramatically.
    - Biological processes tend to get flushed into the chlorine contact tanks.
    - Public wants to capture storm flows; these volumes are going to be huge, and we'd need to build infrastructure for a storm that will occur once a year.
    - Until 1992, water use was relatively flat, and after conservation programs began, the wastewater flows started to decrease. I anticipate that the total flow numbers will continue to drop. This has serious implications for the amount of water available – in some communities there just will not be enough.
- Impact of water conservation and drought on water infrastructure (piping/plumbing)
    - Solids deposition
    - Oxidation
- Alternative collection systems for source separated resource streams.
- Impacts of water conservation on treatment plant capacity.
    - Approximately 30% excess tankage available in the U.S.
- Impact of chaos theory on achieving low effluent constituent concentrations.
    - Probability distribution with respect to advanced treatment: as standards become lower and lower, we may not be able to achieve our finished water quality goal with a single treatment process.
    - We must design our processes so that the probability distribution is below the critical bend.
- Typical treatment trains for advanced water treatment.
    - The issue here is that what do you do with Total Organic Carbon (TOC)? (not a regulatory issue, but a process control issue).
    - Is there a difference in the TOC produced by different treatment trains, and does it make a difference?
- Differences in effluent quality between advanced water treatment processes
    - Range of effluent quality values for a number of parameters after different treatments.
- Pathogen removal values for treatment trains.
- Reliability of various treatment trains.
    - Redundancy.
    - Robustness.
    - Resiliency.
- Use of engineered storage buffers
    - Sampling interval
    - System turnaround time
    - System correction
- Potential water quality changes as a result of blending purified water with surface water.

    - Organic material and nutrients.
    - Inorganics.
    - Travel level constituents.
    - Disinfection stability and disinfection byproducts (DBPs)
    - Temperature - an important issue
        - Different waters have different temperatures.
        - This is a kinetic issue, for good or for bad.
        - Customers do not want water at 68 degrees; they want clean, cool water. So you must have a cooling facility. This is an important consideration when you start talking about DPR.
    - The alkalinity may end up changing.
- Residuals Management
    1 Surface water discharge
    2 Discharge to wastewater collection system
    3 Deep well injection
    4 Evaporation ponds (without and with greenhouse)
    5 Land application
    6 Zero liquid discharge (ZLD)
    7 RO concentrate discharged through existing wastewater effluent ocean outfall
    8 RO concentrate
- Management (i.e., disposal) costs for RO concentrate
    - Deepwell injection
    - Evaporation ponds
    - Land application (spray)
    - Brine line
- Operator requirements for DPR facilities
    - Production of purified water in an AWT facility not certified for drinking water.
    - Expert Panel feels all these people should be certified in drinking water.
    - New category of certification may be required.
- George's proposal for WateReuse.
    - Public should not be charged for these reports.
    - Framework document should be the portal into all WaterReuse DPR reports.
    - Organize all the documents in one location.

Jeff Mosher thanked George for his presentation and said that NWRI will forward the Framework document to all of the Advisory Group members when it is published in June. He then asked the Advisory Group members for questions and comments.

- Fran Spivy-Weber: The California Air Board is working on a new policy this year on methane. While wastewater plants are not major contributors of methane, they are contributors. Is there something you would like to see in the policy that would enhance what you are doing here?
    - George Tchobanoglous: The question we need to ask ourselves is: what is the optimal use of the carbon in wastewater? In the past, the answer was that we ought to produce gas. What are other uses? In Denmark, wastewater is a source of potable water resources and energy.

        - Jeff Mosher: You're turning around how we are treating wastewater.
        - George Tchbanoglous: Wastewater is a little like teaching civil engineering… we haven't changed in 100 years with the exception that we dropped railroad engineering. There is an opportunity for rebirth here.

- Julie Labonte: I'm curious if there has been discussion on how the work performed by George and the Panel will be coordinated with the DDW DPR Expert Panel.
    - George Tchobanoglous: I lectured to them at their most recent meeting in March, and we will provide the report to them. From some of the questions that came up, I believe that we need to let them know we should stop reinventing the wheel.
    - Jeff Mosher: The Framework document will have a significant impact on the Expert Panel. And you guys can look at this and advise the Expert Panel on this topic – you can play a role there.
    - George Tchobanoglous: The expert panel would welcome your feedback.

- Bruce Macler: What caught my attention as a regulator is that the wastewater field is behind the times. I'd like to hear if you and other folks have thought through what could be done on the wastewater side, from a regulatory standpoint, to help get control here.
    - George Tchobanoglous: We could nitrify and denitrify, but a lot of places don't want to do that. The California energy commission ordered an independent audit and found a 30% savings. We are now just getting people to start thinking about these things–if your focus has been on primary or secondary clarifiers, you may think this won't work.
- Conner Everts: What if we've peaked in natural gas and the price becomes volatile? Do we still have the opportunities for natural gas production at that point?
    - George Tchobanoglous: The question is, is it cheaper to produce methane or is it cheaper to buy carbon from another source? As an example, West Basin receives effluent from the City of Los Angeles. The turbidity will fluctuate from 5 to 35. You spend all this time treating turbidity before you get to advanced treatment.
        - Conner Everts: Just a comment, that we should take advantage of the media tsunami that is following the drought. People's opinions on this (DPR) have almost flipped.

- Tom Richardson (RMC Water and Environment): Considering this as a DPR national framework document, the conversation in the industry revolves around source water augmentation and direct treatment augmentation. You referred to this in your presentation. Do what extent will you acknowledge that in this document? Treatment strategies will be fundamentally different.
    - George Tchobanoglous: Look at the Overview Slide – you are going to treat and blend the water in both. You can take these two diagrams and make them into ten. To the extent that we can, we certainly will address this issue. The most important thing to understand is that when you are talking about finished water, you are talking about a certified drinking water plant. That's the point that must come across. The "tap to tap" is a myth – we have to do a lot more to make that happen.
        - Jeff Mosher: That's exactly what's happening at Cloudcroft (in New Mexico). Their wastewater and water are all combined into one scenario.

- Al Lau: I think there will need to be a separate certification to operate these types of plants.

- Bruce Macler: The more I worry on the wastewater side because the drinking water standards are there, and they deal with the issues we recognize. We really don't have operator requirements under the Clean Water Act. Having said that, all of these situations where you don't have good secondary treatment, and you have discharge into a river near an intake, we already have IPR going on right there.
    - George Tchobanoglous: We can't throw the surface water treatment regulations under the bus. We need to look at wastewater as a third water source.
        - Jeff Mosher: The drinking water and wastewater treatment processes do not work in isolation. At OCWD there is strong collaboration between the wastewater and drinking water operators.
            - Bruce Macler: But I'm not talking about OCWD; I'm talking about Sacramento where they have defacto reuse going on. The group I'm working with has a six year plan–they are working on writing rules to address this issue.
            - Jeff Mosher: as far as the Expert Panel goes, they are being asked to weigh in on the feasibility of developing criteria for DPR.

- Julie Labonte: From the perspective of the agencies, including San Diego, who is trying to implement DPR, I would think that a phased approach would be helpful. I think OCWD and other agencies would embrace that.
    - George Tchobanoglous: We want to have a positive outcome, and everyone will have a different view of what that will take.

6. STATUS UPDATE ON WRRF PROJECT 13-13: Development of Operations and Maintenance Plan and Training and Certification Framework for DPR Systems

Troy Walker, Membrane Technology Leader for Hazen and Sawyer, delivered a presentation on the WateReuse Research Foundation (WRRF) Project 13-13. The Advisory Group invited him to this meeting to talk about recommendations for training and certification of advanced water treatment operators. Key points and information from his PowerPoint slides are provided below.

- The WRRF 13-13 project team includes experts in reuse from California along with national and international partners.
- Is operations ready for DPR?
    - Need to convince a skeptical public.
    - Persuading regulatory authorities.
- While there was a lot of confidence in the technologies used for indirect potable reuse (IPR) at the time that the project began, people were still afraid of human error. What if the operators messed up?
- Striking a balance between operational cost and risk.
    - Paramount risk in IPR is public health.
    - Managing assets.
    - Chemicals and energy costs.

- Acute risk posed by microbial/biological contaminants.
    - Critical control points (CCP)–integrating public health to operations.
    - Borrowed from food industry (food safety standard).
    - HAACP (hazard analysis and critical control point technology).
    - Systematic approach to minimize risk of microbial contamination to food.
    - Pillsbury Company was hired to produce food for NASA space missions; from that work the HAACP process spun off.
    - Instead of looking at quality of finished product, you manage the quality at points earlier in the process.
- CCP approach applied to water recycling.
    - What is in the water?
    - What can go wrong? (identify hazardous events)
    - Identify ways to mitigate risks.
    - Develop critical control points.
- Operational framework.
    - Risk management.
    - Risk management process.
    - Operational risk assessment.
    - Water quality risk assessment.
    - Critical control point selection.
    - Critical control point management.
- Operations management.
    - Roles and responsibilities.
    - Operating procedures.
    - Managing incidents and emergencies.
    - Asset management and maintenance.
    - Validation and auditing.
    - Operational monitoring.
    - Operator skills and training.
    - Non conformances corrective/preventive actions.
    - Operating interfaces.
- CCP – Public health safety.
    - Is there a risk at this step?
    - Can we manage a risk at this barrier?
        - Microorganisms
        - Chemicals of concern
        - Lead/copper leaching the distribution system
    - Addition of chloramine can create a health risk (byproducts), but we manage that risk through dosing.
    - Stabilization – George pointed this out when we were talking about DPR. In removing hardness and alkalinity, we have a water that is very unstable and wants to dissolve things. If the water was not stabilized then lead and copper could leach back into the water – that qualified as a critical control point as well.
- How CCP works.
    - Processes are automated. You cannot operate the membrane system manually.

    - For and RO system, we have the CCP (the RO process itself) and a critical monitor downstream that tells us that the process is working properly. If the monitor detects that the barrier is not removing what we need it to remove, then a control action will take place, often a unit process shutdown. The system is corrected and returned to service.
- Clear response procedure to aid operations.
    - When we have an issue, the operator goes through the response process.
        - Have you notified appropriate authorities?
        - Did the equipment shut down as was planned for?
        - Is it a valid shutdown?
        - Correct the problem.
        - Is it safe to bring the system back online?
        - Document what happened, including what could have prevented the breach.
- What about other important processes?
    - Critical Operating Points.
        - We develop other processes to make sure we are protecting the equipment so that it will operate under optimal conditions.
        - If the system is operating in a way that may compromise the system, then the monitor should detect that.
- We rely on analyzers.
    - Processes are highly automated.
    - Critical that instruments are calibrated, verified, and well-maintained on schedule.
    - Plant must be well-commissioned so that we can tell if everything is working correctly.
    - Alarm systems must be manageable.
    - CCP, COP alarms at high priority.
    - There is a tendency to have too much information coming from the system for operators to deal with. A facility in Australia reports about 1,000 alarms per day, which is too many for the operators to deal with.
- Managing across jurisdictions.
    - Wastewater to advanced treatment plants.
    - For DPR – advanced treatment system to drinking water distribution system.
    - Critical to have good management in place.
    - As George pointed out, the current systems are designed to discharge to the environment, not to feed into an advanced treatment plant.
    - Where would California fit in the advanced treatment regulatory? The permit should include advanced treatment processes as well.
- Looking after the equipment.
    - Need good asset management systems in place.
    - We are developing portions of an asset management plan to fit into the framework so that we can focus on how to manage the maintenance aspect of this issue.
- Reuse is not yet well covered.
    - California has certification programs for drinking water and wastewater, but not advanced treated water.

- Existing curriculum content (non-membrane approach).
    - Used in drinking water or wastewater context only.
    - Exists in the marketplace.
        - Membrane certification courses by voluntary organizations.
        - We have support from organizations such as AMTA, AWWA.
    - Many of the things we are analyzing for are specialized.
- In addition to process knowledge, we need to understand how to manage corrective actions in these facilities.
- How do we feed back the information from an incident and integrate it into future operations?
- The approach for IPR now includes the following:
    - OCWD – WW and DW certified.
    - SCVWD – mostly DW certified.
- Technology is closer to DW treatment – we are operating a DW plant with an impaired source water. WW treatment knowledge is also important.
- Certification – the current CA approach
    - Wastewater Grade 1-5
    - Water Operator T1-T5
- Need to acknowledge that we will be leveraging the existing pool of water and wastewater operators. There could be a module for operators of advanced treatment processes/reuse. A separate exam that would cover some of the technologies used by advanced treatment plants.
    - This will provide an opportunity for operators to further their knowledge and obtain the advanced treatment certification as a feather in their cap.
    - Need to define the right number and the type of staff needed for a DPR system.
    - Doing benchmarking with our existing facilities.
    - What specific roles must be fulfilled at a DPR facility?
- Build on the existing certification levels.
    - Focus on instrument validation and calibration.
    - Understanding of water quality, sampling and analysis.
    - Mix of staff with drinking water wastewater backgrounds is valuable.
- Conclusions
    - Recommend a single permit for DPR, from wastewater through the treatment plant to the distribution center
    - Integrate the CCP approach into the operational planning.
    - Create a solid operational plan for DPR operations.
    - Leverage certification for DPR from existing systems.

Jeff Mosher thanked Troy for his presentation and asked for questions.

- Jim Fiedler: I was impressed with your presentation. What is your timeframe and how does what we are currently doing in water treatment relate to what you are proposing with this methodology?
    - Troy Walker: The report is due at the end of July. Similar to what I said earlier, a lot of the things are existing controls and operational actions. We need to

articulate what we are going to do in a more defined way. In Australia we did just that and attained the certification. But I can't speak to what is being done here.

- Bruce Macler: The HACCP approach, which Australia has been using, and which is the baseline for the aircraft water rule. We tried to use it for the groundwater. We didn't use it, but people started thinking about the multiple barrier rule.
    - Troy Walker: If you already have an existing regulatory framework, then you don't need to necessarily duplicate and complicate your approach. In Australia we didn't have an existing rule so we used HACCP.

- Jeff Mosher: When you were talking about training and certification, you used DPR. We use "Advanced Treatment." Maybe it's just semantics, but there are other applications this certification can be applied for. Your project focuses on DPR – do you feel like you must approach everything in terms of DPR?
    - Troy Walker: If you're talking about the technologies, then you could call it advanced technology. If you start to talk about ocean desalination and reuse, the technologies are similar, but some other things are not. So I would probably call this "potable reuse." The differences are going to be around the permitting requirements. In Wisconsin they have more of a "cafeteria model" where you can pick and choose processes that apply.

7. REPORT FROM THE AD HOC COMMITTEE ON OPERATOR TRAINING

Traci Minamide, Director of Operations for LA Sanitation and the chair of the Ad Hoc Committee on Operator Training, provided a brief update on the committee's progress. Her comments included the following:

Traci Minamide: Wendy Broley has a project that is very relevant, to talk about the scope of the project that CUWA is doing on a white paper on operator training and certification. Randy Barnard sent me an e-mail from Dr. Edo McGowan regarding concerns about antibiotic resistant genes as an issue that our operators must be aware of, so that we can be sure the water we produce addresses that. I wanted to mention that because he asked that the Advisory Group talk about it today.

Regarding the white paper, I'd like to thank Wendy for being here and to thank Marsi for connecting us. CUWA has suggested first doing a literature search, then doing a survey, and going through a stakeholder process to get input before moving forward.

Wendy Broley: I am here on behalf of CUWA. We had a discussion with DDW earlier this year to find efforts for us to support DDW. The potable reuse operator certification issue came up as an urgent need. The white paper will be used to set the stage, as best we can, to frame the issue for DDW to consider. Develop and implement a statewide program that will be protective of water quality. We hope to wrap this up in July 2015. We are working with WateReuse CA; Jennifer West has already been in contact with us to kick this off. We are trying to get feedback from OCWD staff. We are forming a steering committee made up of individuals from key

collaborative partners. We hope to develop a matrix of options that we can build on for Phase II. The goal is to gain consensus before moving forward.

- Traci Minamide: How would the advisory group or the ad hoc committee tie in with what you are doing?
    - Wendy Broley: It makes sense for CUWA to provide the deliverable to DDW. Then the recommendations can be made to DDW through this forum.

- Traci Minamide: You also mentioned a survey. What would that entail?
    - Wendy Broley: The survey will focus on the current standards in practice at potable reuse facilities. And we want to find out what is being planned for new facilities. Our workgroup is helping to support the development of the survey and will look to our steering committee to see if we are asking the right questions, if the tone is correct, etc.

- Bruce Macler: Is the division of Financial Assistance involved in this? They run the certification programs and they have a huge stake in this. I have not heard a discussion of how it works.
    - Wendy Broley: That's why we are working so closely with DDW and the Advisory Group. We want to make sure that we are talking to the right people and asking the right questions. The goal is to approach the industry with a common voice.

- Mark Bartson: First we want to talk about what the certification program may look like. The administration of the program can follow.
- Fran Spivy-Weber: With the wastewater training and the drinking water training, are we moving toward being more integrated in the training operations that we have here at the water board? We should be.
    - Mark Bartson: I don't know if I can answer fully. Some of the administrative efficiencies can happen. The content may be overlapping.

- Fran Spivy-Weber: Bruce's point is good. On the clean water side, the division of financial assistance has done a lot of that work. We may need to have an in-house conclave.
    - Jim Fiedler: CUWA is the largest agencies in California. Traditionally those agencies have not been strong advocates to do a lot of recycling. Now they are going in that direction. We are all on a similar path here, and am encouraged by that effort. How do we effectively get operators certified, and gain the public confidence?
    - Bruce Macler: Operator certification is complex and it takes a lot of time and effort. It will take the State Board to say we need to rethink our certifications and pursue upgrading and developing the range of knowledge for these programs.

- Jeff Mosher: Traci, going back to what you've said, it seems like the right approach, and it is collaborative. That project would be good for the advisory group.

- Julie Labonte: Based on what Bruce said, I agree, this will be quite an undertaking. I wonder if DDW has some thoughts as to whether if NOT having that certification in place will delay the development of the new regulations.
    - Mark Bartson: We have talked about this. We are confident that it will not delay the process. DDW could craft system-specific operator requirements as part of a permitting process

- Traci Minamide: Troy talked about the purpose of the certification. We want to make sure there is an understanding of the public health perspective. I just wanted to put that on the table – are we all good on that point?
    - Wendy Broley: CUWA wants to make sure the focus is always on public health.

- Traci Minamide: The CUWA effort is going to start now. Where in that process will there be feedback to the ad hoc committee and the Advisory Group? Are there milestones?
    - Wendy Broley: We are going to develop a framework for the survey and then hold a steering committee meeting. We will put together the preliminary draft of the white paper and send that out for review.

- Traci Minamide: Moving on, let's address the issue brought forth by Dr. McGowan. Will the operators know about these issues related to antibiotic-resistant genes.
    - Randy Barnard: Dr. McGowan has been communicating with DDW for a few years about this issue. He wrote a paper and we gave it to the Expert Panel to determine if this should be included in the future regulations. He called me and asked how he could get the information on operator certification to the Advisory Group and ask that the issue be brought forth to the Expert Panel. He was not able to attend the meeting today so I agreed to bring the issue up.

ACTION ITEM: NWRI will contact the members of the ad hoc committee on operator certification and training to set up a phone meeting.

8. REPORT FROM THE AD HOC COMMITTEE ON TERMINOLOGY

Jeff Mosher, Executive Director of NWRI, noted that Marsi Steirer was the chair of this subcommittee, and she has retired, so he is filling in for her today. He summarized the discussion that took place at the last meeting.

- The City of San Diego created this list of terms related to potable reuse.
- The list is based on what is in the state code and other documents including those written or published by WRF, AWWA, and the City of San Diego.
- Randy Barnard added a column to the document indicating if/where a term appears in the California state regulations.
- Marsi presented the updated document to the Advisory Group and asked for feedback

Last week, NWRI distributed the revised document to stakeholder grounds, including ACWA, AWWA CA-NV, CASA, CUWA, CWEA, WRA, and WRA-CA.

- Stakeholders that have responded to Jeff say it would be useful to write a preface explaining how the document should be used.
- We have not received any specific comments on the terms yet, but we will.

Amy Dorman of the City of San Diego, who worked closely with Marsi Steirer to develop the terminology document, agreed to chair the committee going forward.

- Tom Richardson, RMC Water: The perception that there is the "source water" world and the "drinking water" world. There's a perception that IPR should be linked to source water augmentation, and DPR should be linked to drinking water augmentation. We need to be mindful of what their perspectives are.

- Bruce Macler: I was looking over this list, I had not paid any attention to it. These must be consistent with the federal regulations. Did someone look at this?
    - Randy Barnard: I looked at it in terms of the statutes and regulations, but I did not look at the CFR.

- Ray Tremblay: There have been many efforts related to this. Dr. T. mentioned it too. Did you look at and incorporate those earlier efforts into this document?
    - Jeff Mosher: The short answer is yes, it reflects what has been done in the past. But the idea is to develop a working description that will be used in California in discussing potable reuse and DPR. It is meant to be based on what was done in the past but also looking forward.

- Jim Fiedler: I know WRRF did some work reaching out to the community, Project 13-02. We were part of that project. Hopefully the work that resonated with the public can be incorporated into this as well.
    - Jeff Mosher: San Diego was on that project too. One thing that was discovered was that not every community is the same, so that's why this is a list of "suggested" terms.

- Ray Tremblay: this document defines "purified" in a certain way, and takes a narrow view. That could be an issue given the range of projects ongoing in the state.

ACTION ITEM: NWRI will contact the members of the ad hoc committee on terminology to set up a phone meeting after all the stakeholder responses have been received.

9. UPDATE AND REVIEW OF EXPERT PANEL ACTIVITIES

Jeff Mosher, Executive Director of NWRI, provided an overview of the most recent activities of the DDW Expert Panel on Surface Water Augmentation and Direct Potable Reuse.

- Meeting #4 in March was held at the San Francisco Estuary Institute (SFEI). Discussion focused on the following:
    - Finalizing the panel report from Meeting #2.
    - Completing the draft panel report from Meeting #3.

    - Presentation on reservoir criteria by Dr. Michael Anderson.
    - Timeline of the surface water augmentation criteria.
    - Discussion of worst-case scenario and how that fits into the State criteria.
- Next steps.
    - Finalize reports from Meeting #2 and Meeting #3.
    - Prepare and submit report from Meeting #4.
    - DDW will supply a polished SWA criteria before the next Expert Panel meeting.
- Future Meetings.
    - June 2-3, 2015, in Orange County.
    - Will review the draft DDW SWA criteria.
    - Presentations on DPR technologies.
    - Discussion on feasibility of developing DPR criteria.
- September 23-24, 2015, in Berkeley.
- Includes a water quality symposium, which will be open to the public.
- The Expert Panel is getting ready to ramp up quickly on the DPR issue.

Garry Brown thanked Jeff for his presentation and asked for questions.

- Toby Roy: Regarding the SWA regulations, they are going to talk about the regulations in June, and then when will the draft regulations be released to the public?
    - Mark Bartson: The text we are giving to the Expert Panel is not a draft regulation. As far as the timing goes, are you asking for the draft regulation?
        - Toby Roy: I've seen what you've been talking about, I don't know if that's public information. When are you releasing information to the public?
            - Karen Larsen: We are initiating the CEQA process. We are working on the schedule; hopefully by June we will be able to tell you more. I know that doesn't help you now.

- Toby Roy: The information they will cover in the June meeting, can that be released publicly?
    - Mark Bartson: There will be a formal document from the Expert Panel, which will be a public document.
    - Jeff Mosher: The meeting reports usually come out four to six weeks after a meeting. But things are changing, and the panel might not see all the criteria related to the reservoir.
- Fran Spivy-Weber: We had a visit from the City of San Diego's mayor recently, and he was under the impression that in order to get funding from the revolving fund, that everything had to be sequential and wait for the regulations to be done before he could start a project. And our division of financial assistance said no, you can do things in parallel. He was encouraged to contact us about funding before they started the CEQA for building so that they don't make mistakes along the way for the building part. For everyone who is here, these are not sequential activities, these are parallel.

10. DISCUSSION AND COMMENTS FOR THE EXPERT PANEL

Garry Brown asked for comments from the Advisory Group.

- Jim Fiedler: In light of where we are now, what ways can we think about accelerating the effort for developing criteria? What can we have the Expert Panel consider? What can DDW do? We don't have the water supply and the pressure is on to develop new sources of supply. As a committee here, what can we do to accelerate our own effort? We are working on the feasibility of guidelines. Is that all we can do? The governor is committed to addressing not just CEQA but also permitting. Opening the door to DPR also opens up the door to a lot of other options.
    - Frances Spivy-Weber: Jim, be sure and read George's paper. It lays out some important and complex issues that the DPR community really has not grappled with. It's not enough to say "go faster."
    - Jeff Pasek: George talked about "direct direct" in his presentation this morning.
    - Mike Wehner: There is "direct direct" and "not really direct."
    - Jeff Mosher: So this discussion is additional support for why we need this terminology document.
- There was additional discussion during Agenda Item 10 regarding DPR terminology and the distinction between what was referred to as "indirect-direct" potable reuse, which includes passing the water through a surface water treatment plant before routing it to a drinking water distribution system, and "direct-direct" potable reuse, which does not include a surface water treatment plant as part of the process. The Advisory Group will advise the Panel to consider these treatment processes separately. In addition, it was noted that a DPR approach that includes a surface water treatment plant could be implemented in a faster timeframe.

ACTION ITEM: The Advisory Group will advise the Expert Panel to make a distinction between potable reuse projects that include a surface water treatment plant and those that do not for the purpose of determining the feasibility of criteria.

- Jim Fiedler: At the end of this, we have our expert panel making recommendations on feasibility. But what is expected to happen from that point on?
    - Mark Bartson: The next step will be developing the regulation. We don't know how much time we will have. Having this group look at the practical considerations, and certainly the operator certification is one thing. If we could work through more of those issues that would help.
        - Karen Larsen: That makes the assumption that they are going to say that it is feasible. My guess is they will say it is feasible given that we have more information on these topics.

- Mike Wehner: For many years we have been developing GW projects without regulations. Can we continue to do that, and can the department allow projects to move forward without the regulatory guidance?
    - Mark Barston: When we were at CDPH it was our understanding that we could go ahead and authorize projects without a regulation.
    - Karen Larsen: We can permit SWA projects now on a case-by-case basis.

- Mike Wehner: The question most readily applies to instances when you do not have an environmental buffer. This speaks to Jim's point – we are in a desperate situation. Can we move forward?
    - Karen Larsen: We need to consult with our legal staff.

- Bruce Macler: Does the water code say that you cannot do potable reuse? There's nothing in the federal regulations that says you can't.
    - Mark Bartson: We all know about de facto reuse. One scenario you can imagine is that the reservoir is much smaller than recommended in the criteria.
        - Jeff Mosher: This is a topic that will come up with the Expert Panel. They can discuss this at the meeting in June.

11. AGENDA ITEMS AND POTENTIAL TOPICS FOR FUTURE MEETINGS OF THE ADVISORY GROUP

- Bruce Macler: I'd like someone from the Division of Financial Assistance come in and present on the certification process from both the drinking water and wastewater sides.
    - Jeff Mosher: We actually had those folks present at the meeting in San Diego, which you could not attend. But going forward, do we need to have someone from the Division of Financial Assistance come to these meetings in the future?
        - Mark Bartson: We will talk to them. Going forward we can have them participate in the meetings. They do need to be here.

ACTION ITEM: DDW will invite appropriate individuals from Division of Financial Assistance to attend future meetings of the Advisory Group.

- Ray Tremblay: We have had a few WRA speakers. Are there other topics that they are currently investigating that are relevant?
    - Jeff Mosher: We have not had someone from the WateReuse Foundation. Why don't we talk with Julie Minton and see what projects are near completion and useful to the group.
    - Mike Wehner: There has been follow up to the most recent WRAC meeting. Julie can also give a rundown on the next group of projects.

ACTION ITEM: NWRI will get in touch with Julie Minton to discuss status of relevant projects that are near completion and possibly arrange from PIs to present their work at future meetings of the Advisory Group.

- Jim Fiedler. AWWA is now changing their focus and trying to get into the research work. They are picking up a few projects that WRA didn't want to pursue.
    - Jeff Mosher: Yes, one was on blending, and one was on monitoring.

- Garry Brown: The landscape has changed in the last year since we started. More money is being put into the system since the drought began. Is money being channeled toward these studies?

- Frances Spivy-Weber: I just saw the list of projects that may be funded today. Sac regional just received a loan to revamp their whole wastewater system. Orange County is a master at figuring out how to get their hands on our money. We may be funding new things like the OC program, but are we really asking the right questions given the future of water projects. It seems to me that one area the Advisory Group might take on would be to identify things that are not currently standard practice, like direct potable and direct direct potable, if we want to ensure that the water is safe and the ratepayers are not paying through the nose. What do we think about making this a recommendation for whoever wants to do one of these innovative projects? Lack of money is not a problem. The problem is that we need to be clear about where we want to go.
    - Julie Labonte: Related to Fran's comments, we are reviewing the proposals for Prop 1 funding. From what we've seen, the guidance documents require shovel-ready. They require CEQA review. I think the state by releasing that money right now is investing in old technology. If all that money goes out in the next three years there's going to be very little DPR technology.
        - Fran Spivy-Weber: there is so little money in the grants, it's so tiny. It is the revolving fund loans that you will be using to get your projects built. You will have to do CEQA, because this money is federal as well as state. We are trying to make the grant/loan process seamless, so that you as a builder of a big project, you don't have to figure it out. We are telling everyone to say that they are interested in doing a project. They will be assigned a person at the state who will help them take advantage of the money when it is available and move forward. A lot of people have angst over Prop 1 and the amount of money there is just tiny compared with what the need is. The revolving fund money will come in and supplement the grant program. This will be a great place to get project started.
            - Julie Labonte: So you can approach the state before you are done with CEQA?
                - Fran Spivy-Weber: Yes, call Dan Newton and he will assign a person to work with you.

- Jim Fiedler: We are trying to expedite potable projects. What are the environmental impacts of these projects? Most will use RO, and there is concentrate that needs to be disposed of. We don't want this to be a hindrance to getting to DPR.

12. FINAL DISCUSSION AND REVIEW

ACTION ITEM: NWRI will send out Doodle poll for meeting dates for July 2015. Mike Wehner offered to host the meeting at OCWD in Fountain Valley.

13. ADJOURN

The meeting was adjourned at 2:45 pm.

Meeting Minutes prepared by Suzanne Faubl, National Water Research Institute, (714) 378-3278 or email sfaubl@nwri-usa.org.