

July 2017 MEETING MINUTES

WaterReuse Colorado / RMWEA/RMSAWWA Joint Water Reuse Committee/

July 6, 2017 at 12 – 3 pm; tour 3-5pm; happy hour 5pm
Colorado School of Mines

Marquez Hall Room 235 (building is marked as #40 on the [map](#))
1600 Arapahoe St, Golden CO 80401

Attendance:

Bronley McKenna
Richard Lopez
Caroline Verlander
Donene Dillow
Tara Kelley
Damian Higham
Megan Stokes
Jacob Kerstiens
Rebecca Erickson
Kate Newhart
WAYNE LORENZ
Steve Ravel
Leanne Miller
Will Raatz
David Takeda
Weston Martin
CAEMINE IADAROLA
Daniela Castañeda
Steve Fisher
Brandi Honeycutt
Jason Assouline
Michael Bourke
JUDD SUNDINE
MIKE DIRKS
Frank Blaha
Jodi Villa
MATT BENAK
BRENDAN BINNS
ERIC DOLE
Steve Farabaugh
Abigail Antolovich
Emily Nicholas
Jacob O'Juro
Christopher Riggs
Rich Murphy
Allegria D'Sha

Additional participants called in on the phone (did not capture names because of audio-visual technology hiccups)

Matt Benak wins the penmanship award for 7/6/2017!

Regulation 84 Discussion (Bret)

12:00 – 1:00

Bret Icenogle (Colorado Department of Public Health and Environment; Engineering Section Manager) provided an update on CDPHE's interest in incorporating risk analysis into a future version of Regulation 84 (Water Reuse). CDPHE's vision for incorporating risk analysis is to provide a more scientifically defensible methodology of regulating water reuse which is protective of public health while still being flexible to innovative approaches.

• Introductions & Welcome (Richie Leger)

1:00 – 1:15

- a. Overview of mission of WRCO (Richie Leger)
- b. CSM Students and Young Professionals (Self-introductions)
 - i. Emily Nicholas – work for Tzahi Cath – industrial wastewater – using biological and physical treatment to clean water
 - ii. Kate Newhart – work for Tzahi Cath – operate the pilot scale sequencing batch reactor (operate) – advanced fault detection
 - iii. Becca Ericson – research assistant at Mines – working at Plum Creek with Wes – took over research previously conducted by Martha Han on an anaerobic baffled reactor
- c. New WRCO Members (Richie) – none

• Direct Potable Reuse (DPR) Project

1:15 – 1:20

- a. WRCO DPR Project Overview (John Rehring)
 - DPR is in Colorado's future; could be prompted by a drought
 - Look at what a regulation might look like
 - Develop some tools for public outreach and education
 - Planning tools for Colorado
 - Funding came from the Water Supply Reserve Account and other supporters
 - Set for the 3rd set of workgroup meetings on August 31st – Denver Metro Chamber of Commerce downtown
 - Workshop will cover regulations in morning, outreach concepts in afternoon
 - Have been working with Tyson Engels and Ron Falco (CDPHE) on a regulatory framework that will be presented before the next workgroup

- For more info, contact John (JRehring@carollo.com)

- **CDPHE-WQCD Items**

1:20 – 1:30

- a. New Agronomic Rate Guidance – training events (Liz)

- Background
 - Water must be irrigated at an agronomic rate (for nitrogen)
 - Initially most recycled water irrigation was for turf grass
 - Developed a guidance document to help determine what the agronomic loading and requirement of each site is
 - Don't want discharge of nitrogen into the groundwater (waters of the state)
- Conducted a workshop to explain the new guidance in Erie
- Plum Creek is ready to host another meeting/training

- b. Colorado Regulation 84 (Water Reuse) – Proposing New Uses (Damian)

- New uses had been proposed a few years ago but Division wasn't able to support – we found some funds to alleviate that issue
- Denver Water is proposing adding the following new uses of reclaimed water to the regulation:
 - Toilet flushing
 - Livestock washdown and watering
 - Edible crops – commercial and urban gardens
 - Impoundments
 - Division has also asked DW to address salinity and connectivity to waters of the state
- Started the stakeholder engagement process
 - Will have a public stakeholder meeting for each new use proposed
 - Goal of the meetings is to get public comment/concerns – prior to regulatory hearing in August 2018
 - First stakeholder meeting is on July 18th – livestock washdown and watering
 - Daniels Fund - 101 Monroe Street, Denver, CO - Room 126

- 12:30 – 3:30pm – all are welcome
- Next stakeholder event is on August 17, 2017 – toilet flushing
 - CDPHE (4300 Cherry Creek S Dr, Denver, CO 80246) – Room C1A
 - 12:30 – 3:30pm – all are welcome
 - A call-in web-based option will also be available
 - To receive updates on key steps in the regulatory process, register [here](#).
- CDPHE is interested in expanding into a One Water approach that would take into consideration various water types (stormwater, greywater, blackwater) and tailor treatment so that a given use would meet risk requirements; detail management practices to ensure safety
 - CDPHE is citing a WE&RF report on decentralized systems and they want to expand that type of framework to centralized systems as well
 - Denver Water has been looking at the assumptions in the WE&RF document and additional types of uses that are not included in the document
- **WRCO Business Items** **1:30 – 1:40**
 - a. Scholarships and Awards (Tara/Abbey)
 - WRCO offers 2 scholarships for undergraduate and masters level students – received applications – will have a recommendation in the next week or two
 - WRCO offers awards in other categories as well – awards ceremony in September following next WRCO meeting; winners are also passed along to the national award committee for consideration – those awards are presented at the WateReuse Symposium in September (Phoenix)
 - Customer of the Year
 - Institution of the Year
 - Person of the Year
 - Public Education Program of the Year
 - b. WRCO Treasurer’s Report for this Month (Jason Assouline)
 - Positive net income this month – have \$97k in equity
 - c. Approve May 2017 minutes and financials

- Motion to approve (Richie Leger); seconded (Tara Kelley) – approved

- d. Insurance Renewal (Dave)
 - Motion to approve up to \$750 to pay for annual insurance (Richie Leger); seconded (Allegra da Silva) – approved

- e. WRCO Leadership (Richie Leger)
 - National rep – Richie Leger is timing out (3 year term; can serve 2 consecutive terms)
 - 5 meetings a year; travel expenses are covered by WRCO up to \$3k annually
 - Most are Saturdays/Sundays
 - Need someone to fill his shoes

- **Water Environment & Reuse Foundation (WE&RF) (formerly WERF and WRRF) 1:40 – 1:45**
 - a. Issue Area Team meeting and project development (Allegra)
 - Research topics overview

- **American Water Works Association (AWWA) 1:45 – 1:50**
 - a. AWWA Water Reuse Committee Updates (Alex)
 - Not present
 - b. ISO Water Reuse Committee Overview and Highlights (Alex)
 - Not present

- **Water Research Foundation (WRF) 1:50 – 1:55**
 - a. Brenley overview of new role & how WRF research portfolio serves WRCO mission (Brenley)
 - Brenley provided a list of current WRF projects related to water reuse:

- **Framework for Evaluating Alternative Water Supplies [#4615]**
Balancing Cost with Reliability, Resilience, and Sustainability. This project will define the elements of an integrated, reliable, resilient, and sustainable water supply, and integrate these elements into a framework to support water supply planning. The main project deliverable will be a compendium of best practices for incorporating reliability, resiliency, and sustainability into water supply planning. Through utility case studies and findings from an expert workshop, the report will provide guidance on water supply planning analysis, decision-making, and stakeholder communication.
- **Integrating Land Use and Water Resources Planning to Support Water Supply Diversification [#4623]**
 - This project aims to identify and highlight key opportunities and challenges of integrated water resource and land use planning and develop user-friendly resources that can help advance the integration of water resource and land use planning. Expected publication in 2018.
- **Conventional Drinking Water Treatment of Alternative Water Sources: Source Water Requirements [#4665]**
Through a literature review, workshop(s), and expert insight, this project will establish ranges for alternative source water quality parameters that would meet or exceed the threshold for “acceptability” in conventional drinking water treatment for potable reuse applications.
- **Anticipating Trade-offs and Potential Consequences of Alternative Water Supplies [#4715]**
 - This project aims to provide guidance for utility supply planners to better identify and address the trade-offs of using alternative water supplies as viable resources in long range planning to ensure water security. Request for proposal released in March 2017.
- **Challenges and Practical Approaches to Water Reuse Pricing [#4662]**
 - Worldwide, water reuse is increasingly being considered as a water supply option. More utilities are seeking a diversified and reliable (e.g., climate-independent) portfolio of water sources, driving them to look beyond traditional surface and groundwater sources. Utilities must find the right balance of many factors to provide a resilient, reliable, and affordable water supply. Pressures include increased demand, climate change, lower groundwater levels, water quality challenges, instream flow requirements, financial capacity issues, and reduced reservoir capacity. This project will evaluate water reuse pricing challenges and practical approaches to reuse pricing.
To be completed in 2019.
- **Assessment of Techniques for Evaluating and Demonstrating Safety of Water from DPR Treatment Facilities [#4508]**
 - This project will produce a direct potable reuse (DPR) guidance framework that water utilities and regulators can use to evaluate the safety of existing or potential future DPR scenarios and help facilitate a proactive DPR monitoring process that is protective of public health. This framework will include practical guidance for selecting and implementing monitoring and control tools for DPR. A literature review was completed in 2016 and is posted under Project Papers. This is an interim deliverable.
 - *To be completed in 2018.*
- **Blending Requirements for Water from DPR Treatment Facilities [#4536]**
 - This project will develop recommendations and guidance for the appropriate use of blending as part of a direct potable reuse (DPR) project, including evaluations of treatment, impact of different water qualities and blending locations, summary of corrosion issues, and the impact on Engineered Storage Buffer (ESB) design.
 - *To be completed in 2018.*
- Reach out to Brenley (bmckenna@waterrf.org) or Frank Blaha (fblaha@waterrf.org) for more info

- **Water Environment Federation (WEF) / Rocky Mountain Water Environment Association (RMWEA)** **1:55 – 2:00**
 - a. WEF Water Reuse Committee Updates (Frank)
 - No update
 - b. WEF *Reuse Roadmap* (Allegra)
 - The document is intended as a planning guide and will be released at WEFTEC 2017 (in Chicago in September)
 - c. Anyone going to Joint Annual Conference in Loveland in September?
 - Few hands were raised; group decided not to have a formal WRCO gathering at the conference

- **Other items** **2:00 – 2:15**
 - a. Graywater Non-Traditional Uses (Tara Kelley)
 - No new graywater users
 - a. WateReuse Association (WRA) (national); medical initiative
 - Build awareness in the medical community about reuse – Johns Hopkins, George Washington University
 - Want to develop an online toolbox of research based fact sheets for doctors
 - Want sponsors for the whole project
 - a. WRA Recycled Water Consumer Network (Richie)
 - Rolled out to the Board 3 weeks ago – to promote the commitment to water resiliency, etc.; connect water users around the nation
 - Branding tools are available
 - Like a Facebook platform for WateReuse
 - Does not replace the national database of treaters and users but that died a few years ago
 - *See attached documents from Richie*
 - a. WRA has picked a Director
 - In final negotiation with the selected candidate
 - Melissa Meeker is now Director of WE&RF

- a. WRA Industrial Reuse Committee (Abbey Antolovich)
 - Holding pattern waiting for new Director
- a. IWA International Reuse Conference, WateReuse Symposium, WEFTEC highlights (Allegra da Silva)
 - WEFTEC
 - Food and Beverage workshop
 - Fostering Innovation in Utilities workshop – co-sponsored by WE&RF and WRF
 - Innovative reuse – Tuesday afternoon
 - Mobile sessions on water reuse are a lot of fun
- a. TAP-IN: Source and Cycle (Damian Higham)
 - Source & Cycle was the first of 3 scheduled TAP-IN reverse pitch innovation challenge event where end users pitched their specific problems to the entrepreneurial, innovation, and business community, along with those passionate about problem solving, with the goal of working together to power solutions and build connections to innovate.
 - Source & Cycle called upon end users working in rainwater, stormwater, potable water, groundwater, reclaimed and reused water, wastewater, and sustainable/green infrastructure.
 - On June 21, six end users under Source & Cycle pitched their problems to 130 water experts, entrepreneurs, and business professionals inviting them to join forces to approach the problems in new ways and find creative solutions. Read more about the event <http://tapinco.org/colorado-source-cycle/>
 - The Problem Pitch-ers:
 - a. Damian Higham // WateReuse Colorado // Water Reuse Byproducts
 - b. Jordan Macknick // National Renewable Energy Laboratory // Reservoir Evaporation Loss
 - c. Devon Buckels // The Water Connection, The Greenway Foundation // Trash in Waterways
 - d. MaryAnn Nason // City of Boulder // Efficient Infrastructure Leak Detection
 - e. Jennifer Riley-Chetwynd & Nicole Vasconi // Denver Botanic Gardens // Sustainable Supply for Urban Agriculture
 - f. Greg Fisher // Denver Water // Peak Demand Management
 - Upcoming TAP-IN events:
 - a. August 24, 2017 – TAP-IN: Colorado Cultivate & Produce (agriculture, food, brew, and beverage)
<http://tapinco.org/colorado-cultivate-produce/>

- b. October 4, 2017 – TAP-IN: Colorado Play & Protect (outdoor recreation industry and watershed/environmental health)
<http://tapinco.org/colorado-play-protect/>

c. Legislative activity around reuse

- Damian talked with Denver Water’s lobbyist; the interim water committee is very receptive – Rep. Arndt is very receptive; end of August/beginning of September could be a good time to present an update to the committee; December/January – they develop bills
- Shannon – introduce to the ag council – anything touching water will come up in ag council
- Damian is chairing the subcommittee – contact him if you want to be involved (Damian.Higham@denverwater.org)

- **Future Meetings**

2:15 – 2:25

- a. Potential future topics to weave into meetings (brainstorming)

- i. USACE/USBR funding for water reuse
- ii. US Army research in water reuse
- iii. CU Boulder research topics
- iv. Flint crisis and what it means for recycled water industry
- v. WEF LIFT program overview
- vi. WRA International Advisory Group
- vii. Interesting drivers/barriers for reuse in Colorado (member perspectives)
- viii. Other
- ix. Contact Allegra da Silva (allegra.dasilva@stantec.com) with ideas for future topics

- September 7
 - **Plum Creek Water Reclamation Authority**
 - 4255 N US Highway 85, Castle Rock, CO 80108
- November 2 (strategic planning session in morning followed by regular membership meeting in afternoon)
 - **City of Aurora Municipal Center – Aspen Room**
 - 15151 E. Alameda Parkway, Aurora, CO

- **Featured research presentation – Emily Nicholas / Chris Bellona**

2:25 – 2:40

- Various centers on campus looking at different aspects of water – resource (stormwater, groundwater, surface water), treatment, reuse, etc.

- AQWATEC – mission is to advance novel water treatment processes
- 3 labs – analytical, piloting, and Mines park facilities
- Piloting lab in the City of Golden’s water treatment lab – have a piloting class to solve their problems
- Themes
 - a. Oil and gas
 - i. Forward osmosis
 - ii. Biologically active filtration
 - iii. Characterize the organic matter in produced and flowback water
 - iv. Biological treatment of frac flowback
 - v. White paper for how to use this water
 - b. Decision support tools – computer programs to select treatment technologies and assess viability of different technologies
 - c. Desalination
 - i. Geothermal membrane distillation & crystallization
 - ii. Pressure retarded osmosis to generate electricity
 - d. Water reclamation and reuse
 - i. MBR – can we tailor treatment (e.g. summer irrigation vs. winter nutrient removal)
 - ii. Predicting upsets – pH upset (with math department) – advanced sensors – computer learning
 - iii. Alternative potable reuse treatment trains – Bellona
 - e. Perfluoroalkyl substance removal – Chris Higgins + 7-8 projects
 - i. Working with the City of Fountain to remove the substances
 - ii. Air Force project – nanofiltration removal plus UV degradation
 - f. Life Cycle Assessment

- i. Compare different treatment trains
- ii. Amy Landess (?) is joining faculty and has a LCA focus

• **Red Rocks – Video from Colorado Water Congress** **2:40 – 2:55**

- Laura Belanger (past president for WRCO) arranged for high visibility of water reuse at the Colorado Water Congress to help influence broader water policy
- Panel session on Potable Water Reuse
- Brought in Melissa Meeker (current Director of WRA) and Florida folks who had made beer out of recycled water
- Kristina Robbins (Professor at Red Rocks Community College – Multimedia) and her students did a video and took photos and testimonials
- Program – Industry Experience – bring exceptional experiences to network and get involved in hands on project-based learning
- When they were contacted by WateReuse this was the first class project
- Students:
 - a. Rich Myrup
 - b. Christopher Riggs – was the first student to be involve – always wanted to be a media person
 - c. Juno Jacobs

• **Tour Instructions – Emily Nicholas** **2:55 – 3:00**

- a. Mines Park Laboratories
- b. General Research Laboratories

• **Happy Hour & Networking – Golden City Brewery** **5:00**

Upcoming Conferences

<u>Title</u>	<u>Organization</u>	<u>Location</u>	<u>Start date</u>	<u>Website</u>
2017 IWA International Reuse Conference	International Water Association (IWA) and WE&RF	Long Beach, CA	7/23/2017	http://iwareuse2017.org/
2017 Annual WateReuse Symposium	WateReuse	Phoenix, AZ	9/10/2017	
2017 Rocky Mountain Joint Annual Conference	Rocky Mountain Water Environment Association (RMWEA) & Rocky Mountain Section AWWA (RMSAWWA)	Loveland, CO	9/11/2017	http://www.rmwea.org/annual_conference.php
2017 Tri-State Seminar	Tri-State	Las Vegas, NV	9/26/2017	http://www.tristateseminar.com/events/32nd-annual-tri-state-seminar/event-summary-828b0feb87194839ba92fbc9b31bc31a.aspx
2017 WEFTEC	WEFTEC	Chicago, IL	9/30/2017	http://weftec.org/about/about-weftec/
2017 Intermountain AWWA Annual Conference	AWWA	Sun Valley, ID	10/11/2017	http://www.ims-awwa.org/group/2017AnnualConference
2017 PNCWA Annual Conference	Pacific NW Clean Water Ass	Vancouver, WA	10/22/2017	http://www.pncwa.org/annual-conference
2017 Annual Fall Conference	CA-NV AWWA	Reno, NV	10/23/2017	
2017 Annual AWRA Conference	AWRA	Portland, OR	11/5/2017	http://www.awra.org/meetings/Portland2017/index.html
2017 WWEMA Annual Meeting	WWEMA	Scottsdale, AZ	11/8/2017	?
2017 India ACE Conference	India AWWA	Mumbai	11/2017	?
2017 Colorado River Basin conference	?	Las Vegas, NV	12/16/2017	?
2018 Emerging Contaminants Summit	?	Westminster, CO	3/6/2018	http://www.contaminantssummit.com/
2018 Membrane Technology Conference and Exposition	AWWA/AMTA	Palm Beach County, FL	3/12/2018 Abstracts due Thursday, July 20, 2017	https://www.awwa.org/conferences-education/conferences/membrane-technology.aspx
2018 ACE – 100 th Annual Meeting	AWWA	Washington, DC	3/10/2018	http://www.acenet.edu/events/Pages/ACE-100th-Annual-Meeting.aspx
2018 WEFTEC				