Webinar

Water Wise Development Coalition Meeting - 9

Date: June 25, 2025

00:00:18 --> 00:00:19: Hello everyone.
00:00:19 --> 00:00:20: Thank you for joining.
00:00:20 --> 00:00:22: We're just waiting a few minutes for people to log
00:00:23 --> 00:00:24: in and then we'll get started in.
00:00:24 --> 00:00:27: In the meantime, if you want to introduce yourself in
00:00:27 --> 00:00:31: the chat box with your name, title, organization, and where
00:00:31 --> 00:00:33: you're calling in from, we'd love to hear from you.
00:01:14 --> 00:01:15: All right, well, I'm going to go ahead and get
00:01:15 --> 00:01:15: started.
00:01:15 --> 00:01:17: Thank you all so much for joining.
00:01:18 --> 00:01:19: I'm Marion Epic.
00:01:19 --> 00:01:21: I'm the Senior Director of Resilience for the Urban Land
00:01:21 --> 00:01:24: Institute, and it's my pleasure to welcome you to our
00:01:24 --> 00:01:26: Water Wise Development Coalition meeting.
00:01:28 --> 00:01:31: If you're not familiar, the Urban Land Institute is a
00:01:31 --> 00:01:35: global nonprofit organization, and we're primarily focused on the responsible
00:01:35 --> 00:01:38: use of land and sustainable development.
00:01:39 --> 00:01:43: We have over 46,000 members worldwide, and the members really
00:01:44 --> 00:01:47: vary in all different sorts of land use sectors.
00:01:47 --> 00:01:50: As you can see on this chart, I work for
00:01:50 --> 00:01:54: Uli's Urban Resilience program, which is focused on how building
00:01:54 --> 00:01:58: cities and communities can be more resilient to the impacts
00:01:59 --> 00:02:00: of climate change.
00:02:00 --> 00:02:04: We do this by advancing industry understanding of resilience, cultivating
00:02:04 --> 00:02:09: champions for resilience, and supporting communities directly and becoming more

00:02:09 --> 00:02:10: climate resilient.

00:02:10 --> 00:02:14: We've published many publications that are available for free on

00:02:14 --> 00:02:18: our website on climate resilience and how to adapt real

00:02:18 --> 00:02:22: estate and communities to various environmental hazards.

00:02:23 --> 00:02:25: You can see some of our report covers in the

00:02:25 --> 00:02:28: bottom here, and I'll go over a few of them

00:02:28 --> 00:02:28: today as well.

00:02:31 --> 00:02:35: One of the reports that's relevant to today's meeting is

00:02:35 --> 00:02:36: our Water Wise report.

00:02:36 --> 00:02:40: I wrote this several years ago, and it's all about

00:02:40 --> 00:02:44: best practices for addressing water scarcity through real estate and

00:02:44 --> 00:02:48: land use, and it includes both water reuse and many

00:02:48 --> 00:02:51: case studies that include water reuse.

00:02:51 --> 00:02:52: So I hope that you'll check it out.

00:02:52 --> 00:02:54: It's available for free and you can get it with

00:02:54 --> 00:02:55: this QR code.

00:02:58 --> 00:03:01: Some of you have mentioned that you're also interested in

00:03:01 --> 00:03:03: too much water, not just too little water.

00:03:03 --> 00:03:05: And so I just wanted to let you know that

00:03:05 --> 00:03:07: we have many reports on too much water as well.

00:03:07 --> 00:03:11: Some of them include harvesting the value of water, which

00:03:11 --> 00:03:15: is primarily about how we use green infrastructure to capture

00:03:15 --> 00:03:15: storm water.

00:03:15 --> 00:03:18: And then also surge, which I recently wrote on coast

00:03:18 --> 00:03:20: resilience and real estate.

00:03:20 --> 00:03:23: And then many more are available at this QR code

00:03:23 --> 00:03:23: on the right.

00:03:26 --> 00:03:29: For those of you who are new, we started the

00:03:29 --> 00:03:33: Water Wise Development Coalition in partnership with the Alliance for

00:03:33 --> 00:03:37: Water Efficiency, the Sonoran Institute, and the Water Now Alliance

00:03:37 --> 00:03:40: in order to make this a truly cross sector coalition

00:03:40 --> 00:03:43: of people who care about the intersection of land and

00:03:43 --> 00:03:47: water use and want to make them more water efficient.

00:03:47 --> 00:03:51: This work is supported by the Colorado Water Conservation Board

00:03:51 --> 00:03:53: and the Gates Family Foundation.

00:03:53 --> 00:03:54: So we're very thankful for that.

00:03:55 --> 00:03:57: We meet quarterly online.

00:03:57 --> 00:04:00: This is one of our meetings and the whole point

00:04:00 --> 00:04:03: is to advance water smart real estate and supportive policies.
00:04:04 --> 00:04:06: And we also have, in addition to expert speakers, which
00:04:07 --> 00:04:09: we have today, we'll also have group discussion towards the
00:04:09 --> 00:04:10: end.
00:04:10 --> 00:04:11: So we hope you'll stay on the line.
00:04:13 --> 00:04:17: We have a wonderful agenda filled with speakers today on
00:04:17 --> 00:04:17: water reuse.
00:04:18 --> 00:04:21: So we're going to start with Shannon Spurlock from the
00:04:21 --> 00:04:22: Pacific Institute.
00:04:22 --> 00:04:25: She'll give us an overview of water reuse and resources
00:04:25 --> 00:04:26: that are available.
00:04:26 --> 00:04:29: Then we'll have John Rearing with Carrillo Engineers and Kyle
00:04:29 --> 00:04:31: Pickett with the Worthen Foundation.
00:04:31 --> 00:04:34: They're going to be talking about how to make water
00:04:34 --> 00:04:37: reuse work for your projects at any scale that you're
00:04:37 --> 00:04:38: working at.
00:04:38 --> 00:04:40: So we're really excited to hear from them.
00:04:40 --> 00:04:43: And then finally, Austin Kirkmarek from Denver Water, he's going
00:04:43 --> 00:04:46: to be talking about the case study of Denver Water
00:04:46 --> 00:04:49: and how they're doing water reuse in both their headquarters
00:04:50 --> 00:04:51: building and then also regionally.
00:04:52 --> 00:04:56: And we'll finish up with some group discussion and resource
00:04:56 --> 00:05:00: sharing and then I'm going to turn it over actually
00:05:00 --> 00:05:01: to Shannon.
00:05:03 --> 00:05:05: Thank you so much, Barry Ann.
00:05:05 --> 00:05:06: I'll begin sharing this.
00:05:22 --> 00:05:22: Thank you.
00:05:25 --> 00:05:28: Thank you so much for having me as part of
00:05:28 --> 00:05:28: this program.
00:05:29 --> 00:05:30: My name is Spurlock.
00:05:30 --> 00:05:33: I work with the Civic Institute and I just want
00:05:33 --> 00:05:36: to do a quick volume check and see Marianne, if
00:05:36 --> 00:05:38: you can tell me if you're able to hear me.
00:05:38 --> 00:05:39: Well, it's it's a little.
00:05:39 --> 00:05:41: Soft if you don't mind speaking up.
00:05:42 --> 00:05:42: OK.
00:05:42 --> 00:05:45: I will speak up and share the good news of
00:05:45 --> 00:05:46: reuse to everyone.
00:05:50 --> 00:05:54: So I work with the Pacific Institute and really focus
00:05:54 --> 00:05:57: on the policy and partnership elements and work in the
00:05:58 --> 00:06:01: space of storm water and the use and water reason

00:06:01 --> 00:06:05: efficiency is a priority in the Pacific Institute.
00:06:05 --> 00:06:08: And for those of you unfamiliar with the Pacific Institute,
00:06:08 --> 00:06:12: we are a national and global organization that where our
00:06:12 --> 00:06:16: mission is to help address the world's most pressing water
00:06:16 --> 00:06:16: challenges.
00:06:18 --> 00:06:21: And so I'm going to start with this big picture
00:06:21 --> 00:06:25: overview and and not take for granted that each of
00:06:25 --> 00:06:27: you know what water reuse is.
00:06:29 --> 00:06:34: So essentially water reuse is the recycling of water.
00:06:35 --> 00:06:36: Very big picture.
00:06:36 --> 00:06:40: I and you'll notice as I present, I don't redirect
00:06:40 --> 00:06:42: from the screen typically.
00:06:42 --> 00:06:45: So, but this is the definition that is used by
00:06:45 --> 00:06:48: the water reuse association and this is how they define
00:06:48 --> 00:06:48: it.
00:06:48 --> 00:06:52: And I will say there's been an evolution over time
00:06:52 --> 00:06:55: that we've seen the definition of reduce being broadened.
00:06:56 --> 00:06:58: And so we started off, I would say more municipal
00:06:58 --> 00:07:01: wastewater and then we, you know, now it includes things
00:07:01 --> 00:07:02: like storm water.
00:07:04 --> 00:07:08: So and then we'll still see examples of this presentation
00:07:08 --> 00:07:12: for the most part does have some examples outside of
00:07:12 --> 00:07:16: Colorado actually, but I've tried to really kind of hone
00:07:16 --> 00:07:19: in and the student Colorado for many of our examples
00:07:20 --> 00:07:22: to highlight different types of reuse.
00:07:24 --> 00:07:26: So one thing you'll see you've seen a presentation for
00:07:26 --> 00:07:27: me before.
00:07:27 --> 00:07:30: You will let me talk about the role of reuse
00:07:30 --> 00:07:34: as being a very nimble strategy and go back to
00:07:34 --> 00:07:39: something very highlighted in the beginning that there's some of
00:07:39 --> 00:07:44: us were interested in from interested in addressing strategies to
00:07:44 --> 00:07:49: address water scarcity, but also small vessel from regions that
00:07:49 --> 00:07:52: are water rich got a lot of water water.
00:07:52 --> 00:07:56: These is a strategy that is really effective regardless of
00:07:56 --> 00:07:58: the part of the world or country.
00:07:59 --> 00:08:02: And are there your own water scarce or water rich.
00:08:04 --> 00:08:08: And then for those of you who are newer to
00:08:08 --> 00:08:13: recycling to water recycling, just going to highlight this concept
00:08:13 --> 00:08:15: here of de facto really.

00:08:15 --> 00:08:19: But the water that we use is currently all water
00:08:19 --> 00:08:21: we use is recycling.
00:08:22 --> 00:08:24: We're not making more water.
00:08:24 --> 00:08:27: What we have is what came with our with our
00:08:27 --> 00:08:31: lovely planet and water is what bridges, you can say
00:08:31 --> 00:08:33: us and the dinosaurs.
00:08:34 --> 00:08:39: And so that is something that the water cycle naturally
00:08:39 --> 00:08:42: recycles the water that we use.
00:08:42 --> 00:08:45: And then we as humans, of course, are part of
00:08:45 --> 00:08:48: that water cycle and, and pull it out and then
00:08:48 --> 00:08:51: put it back in and then it is just recirculated.
00:08:52 --> 00:08:56: So that sometimes I know it's a a different thought
00:08:56 --> 00:08:59: for people to contain spoils.
00:09:00 --> 00:09:05: Another thing we think about with water reuse overall is
00:09:05 --> 00:09:10: multiple benefit outcomes that are that are that result from
00:09:10 --> 00:09:12: water reuse is a strategy.
00:09:12 --> 00:09:17: Often water reuse was just as a water supply strategy
00:09:17 --> 00:09:19: and that's the primary benefit.
00:09:20 --> 00:09:23: But of course there are many other benefits that come
00:09:23 --> 00:09:24: out of water reuse.
00:09:25 --> 00:09:29: So that I'm speaking to is more kind of critical
00:09:29 --> 00:09:30: water access.
00:09:30 --> 00:09:34: But if we look at also group water quality, nutrient
00:09:34 --> 00:09:40: management, social benefits, what does water reuse make possible maybe
00:09:40 --> 00:09:44: for your community constructed wetlands or reuse can bring a
00:09:44 --> 00:09:48: lot to the spaces that people live or learn and
00:09:48 --> 00:09:51: play in that would not be possible otherwise.
00:09:52 --> 00:09:57: And then when we talked about reuse this picture, there
00:09:57 --> 00:10:03: are three different types of reuse that we're looking at.
00:10:03 --> 00:10:06: And so there's non quotable reuse and direct.
00:10:08 --> 00:10:12: And then of course direct this actually you'll see the
00:10:12 --> 00:10:16: question at the end because I did this slide really
00:10:16 --> 00:10:19: focused more on Colorado as we don't have our first
00:10:19 --> 00:10:21: permitted DPR project yet.
00:10:22 --> 00:10:29: Typically non quotable reuse, we see things more like agriculture,
00:10:29 --> 00:10:32: outdoor irrigation, toilet flushing.
00:10:33 --> 00:10:38: And then indirect portable reuse is often associated more with
00:10:38 --> 00:10:44: aquifer recharge augmenting our drinking water supplies such as in

00:10:44 --> 00:10:50: the Curry Waters example and then direct portable reuse treating

00:10:50 --> 00:10:53: water to drinking water standards.

00:10:54 --> 00:10:57: We, Colorado is the first state in the nation to

00:10:57 --> 00:11:02: have worked with regulators to bring that opportunity to light.

00:11:03 --> 00:11:06: And in fact my colleagues were wearing bad effort.

00:11:08 --> 00:11:10: So that's significant.

00:11:10 --> 00:11:13: California also, we have a number of states that I

00:11:13 --> 00:11:16: think Florida has since passed those regs as well.

00:11:18 --> 00:11:19: But we see others coming down the pipe.

00:11:20 --> 00:11:25: So I'm not going to get into the discussion of

00:11:25 --> 00:11:27: non portable versus portable.

00:11:28 --> 00:11:31: I think there are a lot of different elements around

00:11:31 --> 00:11:34: that that are very interesting, but I'm going to keep

00:11:34 --> 00:11:35: it higher efficient.

00:11:38 --> 00:11:42: The other types when we think about water reuse and

00:11:42 --> 00:11:45: how it is applied to end uses, we could think

00:11:45 --> 00:11:50: about centralized, A centralized approach or a decent approach and

00:11:50 --> 00:11:53: Austin will be speaking more to this later on.

00:11:53 --> 00:11:58: But here again I'm using some examples from Colorado centralized

00:11:58 --> 00:11:59: approach again.

00:12:02 --> 00:12:06: So I referenced for example non footable reuse being associated

00:12:06 --> 00:12:08: say with outdoor irrigation.

00:12:09 --> 00:12:14: Whereas centralized we have the purple pipe, it is coming

00:12:14 --> 00:12:19: from a main treatment plant and it is truly literal.

00:12:19 --> 00:12:23: It is centralized in the pipes about conveying the water

00:12:23 --> 00:12:24: to the different end uses.

00:12:25 --> 00:12:29: With decentralized or on site use, we're looking at things

00:12:29 --> 00:12:32: more building scale and so we see a lot of

00:12:32 --> 00:12:33: Denver water.

00:12:33 --> 00:12:37: I believe maybe there might be two permits now for

00:12:37 --> 00:12:41: decentralized reuse in Colorado, but we actually see a lot

00:12:41 --> 00:12:45: of this in San Francisco and or so in New

00:12:45 --> 00:12:48: York and in areas as well where there is more

00:12:48 --> 00:12:53: urbanization, denser building And it would be really too disruptive

00:12:54 --> 00:12:57: in many ways to put in a centralized system.

00:12:57 --> 00:13:00: And there are other reasons you would do a decentralized

00:13:00 --> 00:13:01: approach as well.

00:13:02 --> 00:13:08: But these are also kind of two big categories of

00:13:08 --> 00:13:10: how use water is often.
00:13:10 --> 00:13:11: Distributed.
00:13:15 --> 00:13:17: I think I'm quite a bit ahead of schedule here.
00:13:17 --> 00:13:20: I was kind of thinking about building things out a
00:13:20 --> 00:13:21: little more.
00:13:21 --> 00:13:24: But one thing I was asked to also talk about
00:13:24 --> 00:13:27: are some of the resources that are out there.
00:13:28 --> 00:13:32: And there are two key ones that I've highlighted nationally.
00:13:33 --> 00:13:36: And if you're on this call and, and I'm, I've
00:13:36 --> 00:13:39: also been part of groups where I'm new to a
00:13:40 --> 00:13:40: call.
00:13:40 --> 00:13:44: So I don't want to presume everyone knows about these,
00:13:44 --> 00:13:47: but the Water Reuse Action Plan is actually a really
00:13:47 --> 00:13:48: excellent resource.
00:13:49 --> 00:13:53: It's a federally integrated effort to advance reuse and the
00:13:53 --> 00:13:57: ways in which that effort has moved forward fall into
00:13:57 --> 00:14:02: buckets like innovation, policy, technology, information sharing.
00:14:03 --> 00:14:08: And so it has brought together public private partnerships through
00:14:08 --> 00:14:12: some of the actions to help elevate recycling across the
00:14:12 --> 00:14:17: United States and then went on site where you specifically
00:14:17 --> 00:14:21: they're part of National Blue Ribbon Commission is the build
00:14:21 --> 00:14:27: initiative, which is building infrastructure locally for decentralized water systems.
00:14:28 --> 00:14:32: And there are five colors of that effort and they
00:14:32 --> 00:14:38: really focus on capacity building, communications, public health and then
00:14:38 --> 00:14:41: innovation and then advancing.
00:14:41 --> 00:14:45: We're telling the story of what that of decentralized power
00:14:45 --> 00:14:46: systems.
00:14:47 --> 00:14:51: And so those are two ongoing initiatives which are excellent
00:14:51 --> 00:14:56: resources to understand what's happening in the world of reuse
00:14:56 --> 00:15:01: and really great participants from from across the nation and
00:15:01 --> 00:15:06: even internationally help shine a broader light on what's happening.
00:15:09 --> 00:15:12: And for those of you who are based out of
00:15:12 --> 00:15:17: Colorado or working in Colorado, I wanted to bring to
00:15:17 --> 00:15:21: the top, reuse is something that we see actively expanding
00:15:21 --> 00:15:23: through the state.
00:15:24 --> 00:15:27: And we actually, I think we have the support of
00:15:27 --> 00:15:33: the Colorado Water Conservation Board, multiple other partners to elevate

00:15:33 --> 00:15:35: reuse across the state.

00:15:36 --> 00:15:39: So I've highlighted just a couple elements here.

00:15:39 --> 00:15:41: There's a slide after this.

00:15:41 --> 00:15:44: It's more specific about the regulations and help shape this.

00:15:45 --> 00:15:49: But within the Colorado water Plan, you know, just a

00:15:49 --> 00:15:55: couple examples because reuse is actually the birds throughout it.

00:15:56 --> 00:15:59: So one of them is when we look at the

00:15:59 --> 00:16:04: goals of the S Platte Natural Basin roundtables like it

00:16:04 --> 00:16:08: is spelled out to maintain and promote Reeves and then

00:16:08 --> 00:16:12: of course the that this S Platte, S Platte Basin

00:16:12 --> 00:16:14: is in one of the most.

00:16:16 --> 00:16:21: And then in agency actions, there are four different buckets

00:16:22 --> 00:16:26: that the Colorado Water Plan looks at how water can

00:16:26 --> 00:16:28: help suppress support.

00:16:29 --> 00:16:34: See driving communities within the state of Colorado and vibrant

00:16:34 --> 00:16:36: communities is one of them.

00:16:36 --> 00:16:37: A municipal industrial is 1.

00:16:37 --> 00:16:39: Agriculture is 1.

00:16:40 --> 00:16:43: Make sure the 4th 1 is escaping me for the

00:16:43 --> 00:16:43: moment.

00:16:44 --> 00:16:47: If Kevin is here, he can give me a sideways

00:16:47 --> 00:16:49: look here at this moment.

00:16:49 --> 00:16:54: But with this though, it is really pulled out that

00:16:54 --> 00:16:58: an agency action that can't be taken is that we

00:16:58 --> 00:17:03: want to intentionally expand the roles of water weeds in

00:17:03 --> 00:17:04: Colorado.

00:17:09 --> 00:17:11: So finally within, I think this is one of my

00:17:11 --> 00:17:15: last slides here that we're coming toward the end here.

00:17:15 --> 00:17:21: So within resources at the state level in Colorado, there

00:17:21 --> 00:17:27: are three primary regulations that really define how recycled water

00:17:27 --> 00:17:29: can be used and uses.

00:17:29 --> 00:17:34: They're listed here and they do cover everything from non

00:17:34 --> 00:17:38: quotable to Gray water to direct quotable reuse.

00:17:38 --> 00:17:41: And again, I know my colleagues here will be covering

00:17:41 --> 00:17:44: different elements of these war in depth they're applied.

00:17:49 --> 00:17:52: And then this actually, I, I don't know if John's

00:17:52 --> 00:17:54: going to be talking more about this later on, but

00:17:55 --> 00:17:57: what I wanted to talk about just big picture here.

00:17:57 --> 00:18:00: And I want to bring it up for the communication

00:18:00 --> 00:18:00: element.
00:18:00 --> 00:18:03: But I, I do, I would love if John did
00:18:03 --> 00:18:07: talk about later on, not that if there's an opportunity
00:18:07 --> 00:18:11: and it makes sense, but reuse for the public.
00:18:11 --> 00:18:13: I think for many of us on this call, it's
00:18:13 --> 00:18:16: a natural extension of what we know about strategies to
00:18:16 --> 00:18:17: advance water resilience.
00:18:19 --> 00:18:24: But recycling of water is something that is not always
00:18:24 --> 00:18:25: well accepted.
00:18:25 --> 00:18:29: And I wanted to highlight this as a really excellent
00:18:29 --> 00:18:35: educational outreach opportunity that was within the state of Colorado
00:18:35 --> 00:18:39: and that was had from so many different partners at
00:18:39 --> 00:18:41: the table, everyone from Colorado.
00:18:42 --> 00:18:45: And again, I'll let John highlight more here.
00:18:45 --> 00:18:49: But the collaboration that made this happen and bring it
00:18:49 --> 00:18:51: to life is noteworthy.
00:18:51 --> 00:18:57: And then also the outreach that each partner did on
00:18:57 --> 00:19:02: behalf it will reuse the significant as well.
00:19:02 --> 00:19:06: So as much as we can talk about reusing opportunities
00:19:06 --> 00:19:09: for reuse, I think we have to make sure that
00:19:09 --> 00:19:12: we don't just kind of speak to the choir and
00:19:12 --> 00:19:15: that education with end users is an integral part of
00:19:15 --> 00:19:17: any strategy that we're thinking.
00:19:18 --> 00:19:22: I think this is my last slide here.
00:19:22 --> 00:19:23: Very good.
00:19:23 --> 00:19:26: So that is meant to be a broad overview of
00:19:26 --> 00:19:27: recycling.
00:19:27 --> 00:19:29: It's a it's little one O 1 with some some
00:19:29 --> 00:19:32: more technical elements at the state level.
00:19:32 --> 00:19:35: But with that, I know you'll hear a lot more
00:19:35 --> 00:19:40: from my presenters who are delving into certain, my colleagues
00:19:40 --> 00:19:43: who are presenting for delving into certain elements.
00:19:44 --> 00:19:46: Thank you so much, Shannon.
00:19:46 --> 00:19:49: That was a great overview and we're going to get
00:19:49 --> 00:19:50: more technical as we go.
00:19:50 --> 00:19:52: So I just want to thank you for for starting
00:19:52 --> 00:19:54: with the one O 1 so that people are well
00:19:54 --> 00:19:56: equipped to go into these next sections.
00:19:57 --> 00:20:00: Since we have 4 speakers today, I'm wondering if people
00:20:00 --> 00:20:03: don't mind just putting their questions for Shannon in the
00:20:03 --> 00:20:05: chat box and she can respond directly in there.

00:20:05 --> 00:20:09: Unless anyone has a really burning question that they want
00:20:09 --> 00:20:13: to ask verbally, I don't see anyone unmuting or putting
00:20:13 --> 00:20:14: their hand up.
00:20:14 --> 00:20:17: So I encourage you to put your questions in the
00:20:17 --> 00:20:19: chat box for Shannon and we'll go to our next
00:20:19 --> 00:20:21: speaker, John Rearing.
00:20:26 --> 00:20:26: OK.
00:20:26 --> 00:20:30: Thanks, Marianne, and thanks everyone for joining us today.
00:20:31 --> 00:20:33: It's a pleasure to be able to visit with you
00:20:33 --> 00:20:35: today and talk a little bit more about reuse.
00:20:36 --> 00:20:39: One of my favorite topics right there with Shannon and
00:20:39 --> 00:20:43: talked a little bit about how to make water reuse
00:20:43 --> 00:20:44: work for your project.
00:20:45 --> 00:20:47: And then that's going to be a good intro and
00:20:47 --> 00:20:51: segue into Kyle's talk about a little bit more about
00:20:51 --> 00:20:55: some of the equipment and on site or decentralized opportunities
00:20:55 --> 00:20:56: and approaches.
00:20:56 --> 00:20:59: So let's talk about it building a little bit on
00:20:59 --> 00:21:00: what Shannon shared.
00:21:01 --> 00:21:04: Drivers for water reuse really vary depending on where you're
00:21:04 --> 00:21:06: at, but they're also varying over time.
00:21:07 --> 00:21:11: And so historically, we've seen, particularly in the Western United
00:21:11 --> 00:21:15: States, big drivers typically for water reuse have been drought,
00:21:15 --> 00:21:19: water scarcity, water supply in many cases coupled with population
00:21:19 --> 00:21:22: growth, putting stresses on our water resources.
00:21:22 --> 00:21:26: Similarly, groundwater depletion, same kind of thing, they're stressing our
00:21:26 --> 00:21:28: our water and so looking for more supply.
00:21:28 --> 00:21:31: However, there are others out there too.
00:21:31 --> 00:21:35: Seawater intrusion is 1 and creating a seawater intrusion barrier
00:21:35 --> 00:21:40: through indirect portable reuse that Shannon defined for US wastewater
00:21:40 --> 00:21:41: discharge avoidance.
00:21:41 --> 00:21:45: Corporate sustainability goals certainly a growing thing as well, part
00:21:45 --> 00:21:49: of the marketing and and sustainability efforts that a lot
00:21:49 --> 00:21:52: of industries are looking to do and also reducing sewer
00:21:52 --> 00:21:55: flows, particularly combined sewer flows.

00:21:56 --> 00:21:57: These are evolving overtime too.

00:21:58 --> 00:22:01: Wastewater discharge avoidance historically was more of a thing in

00:22:01 --> 00:22:05: the eastern United States, say for example in the Chesapeake

00:22:05 --> 00:22:05: Bay watershed.

00:22:06 --> 00:22:08: This is becoming a thing in all parts of the

00:22:08 --> 00:22:11: US now as we see more and more stringent discharge

00:22:11 --> 00:22:11: limits.

00:22:12 --> 00:22:15: In fact that's pushing many towards portable reuse where we

00:22:15 --> 00:22:18: can put that recycled water supply to beneficial use year

00:22:19 --> 00:22:21: round with the year round portable supply.

00:22:22 --> 00:22:24: But we see this in particular a couple of examples

00:22:24 --> 00:22:25: pointed out here.

00:22:25 --> 00:22:30: Wastewater discharge avoidance in the lower left there state of

00:22:30 --> 00:22:33: Florida a few years ago passed Senate Bill 64, which

00:22:33 --> 00:22:38: then prohibited non beneficial discharges to ocean out falls of

00:22:38 --> 00:22:39: wastewater.

00:22:39 --> 00:22:41: And so in that case, what do you do with

00:22:41 --> 00:22:44: the water right the recycled or reclaimed water?

00:22:45 --> 00:22:47: You got to find a way to reuse it beneficially.

00:22:47 --> 00:22:50: So that's a real driver in Florida, in the Northeast,

00:22:50 --> 00:22:54: sorry, in the the northeast part of the country, New

00:22:54 --> 00:22:59: York City, the Department of Environmental Protection is really encouraging

00:22:59 --> 00:23:03: on site decentralized, what they call district scale reuse and

00:23:03 --> 00:23:07: other recycled water projects, incentivizing those and so forth.

00:23:08 --> 00:23:12: Because they've got concerns about combined sewer flows and consigned

00:23:12 --> 00:23:16: sewer overflows because they do have combined sewers between storm

00:23:16 --> 00:23:17: water and wastewater.

00:23:17 --> 00:23:19: And so anything they can get out of those sewers

00:23:19 --> 00:23:21: is a step towards reducing those overflows.

00:23:22 --> 00:23:24: And in the upper right part, you see actually one

00:23:24 --> 00:23:27: that's been there a long time now, Orange County, California

00:23:27 --> 00:23:29: has their groundwater replenishment system.

00:23:29 --> 00:23:32: And that really started as a seawater intrusion barrier, where

00:23:32 --> 00:23:36: Orange County always using groundwater or water supply, still do

00:23:36 --> 00:23:36: today.

00:23:37 --> 00:23:39: But they were using it to the point where it's

00:23:39 --> 00:23:41: starting to draw seawater in from the ocean and then

00:23:41 --> 00:23:43: making their drinking water more saline.

00:23:44 --> 00:23:48: And so they started injecting recycled water, purified recycled water

00:23:48 --> 00:23:51: as a way of seawater intrusion barrier, which also then

00:23:51 --> 00:23:55: becomes a water supply and indirect portable reuse.

00:23:55 --> 00:23:58: Mostly what we're going to be talking about here in

00:23:58 --> 00:24:02: my set of slides is municipal wastewater and reusing, recycling

00:24:02 --> 00:24:02: that.

00:24:03 --> 00:24:05: But there are other elements to this as well, different

00:24:05 --> 00:24:06: ways of reusing water.

00:24:07 --> 00:24:09: A lot of these get captured as a fit for

00:24:09 --> 00:24:12: purpose supplies or the right water for the right use.

00:24:12 --> 00:24:14: That's a kind of A tag line.

00:24:14 --> 00:24:16: Denver water is used for a long time and these

00:24:16 --> 00:24:20: can include things like rain barrels, right, capturing roof runoff

00:24:20 --> 00:24:24: or storm water and capturing and reusing that beneficially.

00:24:25 --> 00:24:28: Rain Burrows often times are used for landscape irrigation.

00:24:28 --> 00:24:32: Storm water runoff can be used for non portable purposes.

00:24:32 --> 00:24:36: There's also some really interesting work going on in California

00:24:36 --> 00:24:40: and Australia looking at using, capturing and reusing storm water

00:24:40 --> 00:24:44: for portable uses as well or portable supply augmentation.

00:24:44 --> 00:24:49: Third graphic there represents grey water, sometimes referred to as

00:24:49 --> 00:24:50: laundry to landscape systems.

00:24:51 --> 00:24:54: Basically at the household level, they can be used for

00:24:54 --> 00:24:55: landscape irrigation.

00:24:55 --> 00:24:58: Not just laundry water, but other Gray water sources from

00:24:58 --> 00:25:02: homes and businesses can be used for non portable purposes

00:25:02 --> 00:25:05: and then produced water from oil and gas activities, production

00:25:05 --> 00:25:06: activities.

00:25:06 --> 00:25:09: There's another area where there's a lot of emphasis in

00:25:09 --> 00:25:11: areas where there's oil and gas development.

00:25:13 --> 00:25:16: Regardless of those, we want to really make sure that

00:25:16 --> 00:25:20: we've got a system set up for safe and effective

00:25:20 --> 00:25:22: implementation of water reuse.

00:25:22 --> 00:25:25: No matter whether you're doing grey water, recycled water from

00:25:25 --> 00:25:28: a municipal system, produce water, storm water, capture and

use
00:25:28 --> 00:25:31: any of those, there's really 3 pillars to success for
00:25:31 --> 00:25:31: that.
00:25:32 --> 00:25:34: Without any one of these, you can think of it
00:25:34 --> 00:25:36: like a three legged school in a sense.
00:25:36 --> 00:25:39: Without any one of these, you don't have that safe
00:25:39 --> 00:25:41: and effective water reuse that you're looking for.
00:25:41 --> 00:25:43: First off, clear regulatory requirements.
00:25:44 --> 00:25:47: It's really critical to have that a regulatory basis established
00:25:47 --> 00:25:50: so that not only do the people planning the systems
00:25:51 --> 00:25:54: and implementing the systems know what the rules are, but
00:25:54 --> 00:25:57: also that the community has and can have confidence that
00:25:57 --> 00:26:00: what we're doing here is safe, right?
00:26:00 --> 00:26:03: It's driven by a regulatory body.
00:26:03 --> 00:26:05: It's enforced, it's monitored.
00:26:05 --> 00:26:10: There's an independent agency looking over, monitoring the quality and
00:26:10 --> 00:26:11: the safety of it.
00:26:12 --> 00:26:14: That goes hand in hand with robust community engagement.
00:26:15 --> 00:26:19: Certainly it's not just regulatory, but there's other aspects to
00:26:19 --> 00:26:21: getting that social license for water ease.
00:26:22 --> 00:26:26: I think we've made tremendous ground in that regard over
00:26:26 --> 00:26:27: the past 20-30 years.
00:26:28 --> 00:26:31: But certainly more work to be done there and it
00:26:31 --> 00:26:34: shouldn't be taken for granted because that can undo any
00:26:34 --> 00:26:37: good initiative very quickly for water ease.
00:26:37 --> 00:26:40: And so it's important to pay really close attention to
00:26:40 --> 00:26:41: that really from day one.
00:26:41 --> 00:26:43: You can't start that too early.
00:26:43 --> 00:26:45: And the third that goes with both of those is
00:26:45 --> 00:26:49: solid technical expertise, technologies that underlie all of this and
00:26:49 --> 00:26:50: really make it possible.
00:26:53 --> 00:26:55: Just saying in the industry that that I really like
00:26:55 --> 00:26:55: it.
00:26:55 --> 00:26:58: It backs up in a way all three of these
00:26:58 --> 00:26:59: different pillars.
00:26:59 --> 00:27:02: And that's what water shouldn't be judged by its history.
00:27:02 --> 00:27:04: It's not where it came from, but rather by its
00:27:04 --> 00:27:05: quality, right?
00:27:05 --> 00:27:08: It's, and that's what we're really good at, right, is
00:27:08 --> 00:27:12: producing water, appropriate water quality for the intended end use,

00:27:12 --> 00:27:16: whether that's landscape irrigation or drinking water or any place

00:27:16 --> 00:27:17: in between.

00:27:17 --> 00:27:19: But we should be thinking about it in terms of

00:27:19 --> 00:27:21: its quality, not where it kind of came from.

00:27:22 --> 00:27:24: As Shannon pointed out, all water is recycled, right?

00:27:24 --> 00:27:26: The same water that the dinosaurs drank.

00:27:26 --> 00:27:30: So it, it's all been recycled from somewhere.

00:27:31 --> 00:27:34: There's a utility in the Portland area, Clean Water Services,

00:27:34 --> 00:27:36: that's been brewing beer for a number of years with

00:27:37 --> 00:27:37: recycled water.

00:27:38 --> 00:27:41: And one of their little stickers I've got on my

00:27:41 --> 00:27:43: wall back here is it says it's aged 3.4 billion

00:27:44 --> 00:27:45: years, reinforcing that point.

00:27:47 --> 00:27:51: OK, so regulatory structures, for better or worse, there are

00:27:51 --> 00:27:53: no nationwide regulations for water reuse.

00:27:53 --> 00:27:55: It's all done state by state.

00:27:56 --> 00:27:58: And as a result, there's differences from state to state

00:27:58 --> 00:28:01: that we need to navigate and we need to be

00:28:01 --> 00:28:01: aware of.

00:28:02 --> 00:28:03: But you can think of this in a few different

00:28:03 --> 00:28:04: categories here.

00:28:04 --> 00:28:06: There's centralized non portable reuse.

00:28:06 --> 00:28:10: That's in purple here because that's distributed through purple pipe,

00:28:10 --> 00:28:13: which is a way of of indicating an industry standard

00:28:13 --> 00:28:15: for indicating that it's non portable water.

00:28:15 --> 00:28:17: It's not portable water shouldn't be cross connected with the

00:28:17 --> 00:28:18: portable water.

00:28:18 --> 00:28:20: There's centralized reuse systems.

00:28:20 --> 00:28:23: There's decentralized non portable reuse here in Colorado.

00:28:23 --> 00:28:25: Regulation 84 covers both of those.

00:28:26 --> 00:28:30: It's been expanded over time to address additional types of

00:28:30 --> 00:28:35: uses, but also in particular expanded out to cover decentralized

00:28:35 --> 00:28:37: non non portable reuse.

00:28:37 --> 00:28:40: And that was really driven in large part by facilitating

00:28:40 --> 00:28:44: Denver Water's in building system that you'll hear about more

00:28:44 --> 00:28:45: in a little bit from Austin.

00:28:46 --> 00:28:49: Grey water is another one different than non portable recycled

00:28:49 --> 00:28:50: water.

00:28:50 --> 00:28:54: We talked about that indirect portable reuse, direct portable

reuse.

00:28:54 --> 00:28:58: Shannon mentioned those and there's also some communities that have

00:28:58 --> 00:29:01: mandates for decentralized reuse like Austin and San Francisco PUC.

00:29:03 --> 00:29:07: Now, while there is no national standard or national regulation,

00:29:07 --> 00:29:10: EPA has in the past put out some guidelines kind

00:29:10 --> 00:29:14: of best practices or reuse from a regulatory water quality

00:29:14 --> 00:29:16: and treatment perspective.

00:29:16 --> 00:29:19: But they've also got this really handy tool now because

00:29:19 --> 00:29:19: it is state by state.

00:29:20 --> 00:29:22: They've done a great job of pulling all this together

00:29:22 --> 00:29:24: through their reuse Explorer tool.

00:29:24 --> 00:29:25: You can Google that.

00:29:25 --> 00:29:27: It's it's readily available on the web and you can

00:29:27 --> 00:29:28: see what you do there.

00:29:28 --> 00:29:30: You can put in your state if you want to

00:29:30 --> 00:29:33: know a particular state's rules, you can pick what source

00:29:33 --> 00:29:35: or sources of water you want to look at the

00:29:35 --> 00:29:39: regulatory requirements for whether it's storm water, rainwater, treating municipal

00:29:39 --> 00:29:40: wastewater.

00:29:40 --> 00:29:43: And you can also choose reuse applications such as on

00:29:43 --> 00:29:45: site non portable reuse.

00:29:45 --> 00:29:48: And so that's a really great way to understand what

00:29:48 --> 00:29:50: the applicable rags are or even if there are rags

00:29:50 --> 00:29:52: for your particular state and application.

00:29:54 --> 00:29:59: Typically rights are driven by risk mitigation, mitigating risks through

00:29:59 --> 00:30:03: both the regulation but also how we operate reuse systems.

00:30:03 --> 00:30:05: Think about this in a few different buckets.

00:30:05 --> 00:30:09: There's treatment requirements, often times looking at pathogen barriers and

00:30:09 --> 00:30:10: chemical barriers.

00:30:11 --> 00:30:14: Pathogens are things we worry about more for human contact

00:30:14 --> 00:30:18: and acute types of exposures, chemical long term exposures, water

00:30:18 --> 00:30:22: quality specifications then go hand in hand with that treatment.

00:30:22 --> 00:30:24: If that's the treatment, then what water quality do we

00:30:24 --> 00:30:25: require to come out of that?

00:30:26 --> 00:30:30: And there's also management practices that are tied to the

00:30:30 --> 00:30:31: type of use.
00:30:31 --> 00:30:34: A lot of times it's for non portable uses and
00:30:34 --> 00:30:37: depending on the type of access, type of exposure that
00:30:37 --> 00:30:40: we might see the risks of of exposure.
00:30:40 --> 00:30:44: These are things like access control or color-coded piping.
00:30:44 --> 00:30:47: We mentioned purple pipe and signage to clearly indicate that
00:30:47 --> 00:30:48: this is non portable.
00:30:48 --> 00:30:50: This helps avoid cross connections.
00:30:50 --> 00:30:52: A backflow prevention.
00:30:52 --> 00:30:56: Again helping us avoid cross connections with portable systems.
00:30:56 --> 00:31:00: For non portable reuse training requirements and use specific requirements
00:31:00 --> 00:31:03: depending on again that risk and likelihood of exposure.
00:31:05 --> 00:31:08: The pathogens are usually regulated.
00:31:09 --> 00:31:12: They can be regulated based on concentrations like E coli
00:31:12 --> 00:31:14: concentrations and so forth.
00:31:15 --> 00:31:18: When we look more at audible uses or high exposure
00:31:18 --> 00:31:23: conditions, you often see these expressed as log removal requirements.
00:31:24 --> 00:31:27: And so a log removal, one log is a tenfold
00:31:27 --> 00:31:31: reduction in pathogens and you can see here 6 log
00:31:31 --> 00:31:32: would be 99.99.
00:31:32 --> 00:31:37: So 6 nines percent reduction, 10 log somewhere there, right?
00:31:37 --> 00:31:41: So we're talking about really, really high levels of reductions
00:31:41 --> 00:31:44: there that are hard to measure because it requires so
00:31:45 --> 00:31:45: much water.
00:31:46 --> 00:31:48: So a lot of times we'll do that through log
00:31:48 --> 00:31:49: removal credits.
00:31:49 --> 00:31:51: But you see over there, we've got dilution with circle
00:31:52 --> 00:31:53: on the slash through it dilution.
00:31:53 --> 00:31:55: If you're trying to get to 10 log removal, 6
00:31:55 --> 00:31:59: log removal, anything beyond a really A1 log removal, that's
00:31:59 --> 00:32:00: not your ticket, right?
00:32:00 --> 00:32:04: So often times it's it's tempting to think, oh, we'll
00:32:04 --> 00:32:08: just dilute it with the traditional freshwater 5051 to 1
00:32:08 --> 00:32:11: and it'll get some some good done there.
00:32:11 --> 00:32:15: In reality, even if you're diluting it 12:50, that's only
00:32:15 --> 00:32:18: getting you one log removal, not going to be anywhere
00:32:18 --> 00:32:20: close to this 10 log removal that we might see
00:32:20 --> 00:32:23: for viruses, Cryptosporidium, Jardia, bacteria.
00:32:23 --> 00:32:27: So as an example, for the state of Colorado, direct

00:32:27 --> 00:32:31: portable reuse, log removal requirements for virus, crypto and Jardia

00:32:31 --> 00:32:34: are 1210 and 10 log removals for localized non potable

00:32:34 --> 00:32:35: reuse.

00:32:35 --> 00:32:38: They also put in log removals for that, although they

00:32:38 --> 00:32:41: don't have that for other non portable uses.

00:32:41 --> 00:32:44: And those are, as you can see, a little bit

00:32:44 --> 00:32:46: lower, even have seven and six log for virus, protozoa

00:32:46 --> 00:32:48: and bacteria respectively.

00:32:48 --> 00:32:50: And then what we can do is once we know

00:32:50 --> 00:32:53: those targets, we can piece together different treatment trains that

00:32:53 --> 00:32:54: get us to those totals.

00:32:54 --> 00:32:58: And so here's an example, three different examples of ways

00:32:58 --> 00:33:04: we might piece together different process components, unit process equipment

00:33:04 --> 00:33:07: into a treatment train that would meet in this case

00:33:07 --> 00:33:10: the 12/10/10 DPR regs for Colorado.

00:33:12 --> 00:33:13: Now reuse comes of many scales.

00:33:13 --> 00:33:15: You already heard about the Denver water.

00:33:15 --> 00:33:16: You're going to hear about that a little bit more

00:33:16 --> 00:33:17: than building scale.

00:33:18 --> 00:33:21: It could be neighborhood scale, maybe you were getting a

00:33:21 --> 00:33:22: park or other things like that.

00:33:22 --> 00:33:25: If it's a non portable system or citywide, right?

00:33:25 --> 00:33:28: So this is an example, City of Aurora's got purple

00:33:28 --> 00:33:31: pipes running to many of his parks and other facilities

00:33:31 --> 00:33:35: with high irrigation uses throughout the community, starting with that

00:33:35 --> 00:33:38: little green dot, the wastewater plant way up here in

00:33:38 --> 00:33:41: the northwest part of the city and extending out through

00:33:41 --> 00:33:43: this network of purple pipe.

00:33:43 --> 00:33:45: There can be at those different scales.

00:33:45 --> 00:33:47: But what we see is that for the on site

00:33:47 --> 00:33:50: and building scale, leading utilities are really walking the talk.

00:33:50 --> 00:33:53: They're not just telling you to do it, they're demonstrating

00:33:53 --> 00:33:55: this in their own facilities.

00:33:55 --> 00:33:56: For example, Austin Water.

00:33:56 --> 00:33:58: I see we've got some folks on the call here

00:33:58 --> 00:33:59: from Austin.

00:33:59 --> 00:34:02: Austin Water's got their on site collection and reuse system

00:34:02 --> 00:34:03: or Oscar.

00:34:03 --> 00:34:07: I think there's a friendly competition out there to come

00:34:07 --> 00:34:10: up with cool names for your on site system like

00:34:10 --> 00:34:13: Denver Water has reuse for us, otherwise known as Rufus.

00:34:13 --> 00:34:16: I don't know that San Francisco named theirs when they

00:34:16 --> 00:34:19: have their in billing decentralized reuse system, but nonetheless, these

00:34:19 --> 00:34:22: are three examples of utilities kind of showing the way,

00:34:22 --> 00:34:23: leading the way.

00:34:23 --> 00:34:25: Don't just say, you know, do what I say, but

00:34:25 --> 00:34:26: do what I do.

00:34:27 --> 00:34:29: Typical uses of on site recycled water.

00:34:29 --> 00:34:32: I think Kyle's going to get into this a little

00:34:32 --> 00:34:35: bit more in a moment, but landscape irrigation, toilet and

00:34:35 --> 00:34:38: urinal flushing and industrial uses are some common ways of

00:34:38 --> 00:34:40: non potable on site recycled water use.

00:34:41 --> 00:34:43: But if you're going to do an on site or

00:34:43 --> 00:34:46: a decentralized reuse system, few things to think about here.

00:34:46 --> 00:34:48: And these are things that we see come up time

00:34:48 --> 00:34:50: and again in the urban environment.

00:34:50 --> 00:34:54: First off, can our municipal water or wastewater tap fee

00:34:54 --> 00:34:56: or system connection fee be reduced?

00:34:57 --> 00:34:59: Maybe it can, maybe it can't.

00:34:59 --> 00:35:02: It's something that utilities tend to struggle with because they

00:35:02 --> 00:35:04: worry about needing backup capacity, right?

00:35:04 --> 00:35:06: Do they need to have the water supply or the

00:35:06 --> 00:35:10: wastewater treatment capacity in case your on site system goes

00:35:10 --> 00:35:10: down?

00:35:11 --> 00:35:12: And if they do, that comes at a cost.

00:35:13 --> 00:35:15: Will my Capital One operating cost be higher or lower

00:35:16 --> 00:35:17: than the municipal system?

00:35:17 --> 00:35:19: That's going to be pretty site specific.

00:35:20 --> 00:35:22: I need to think about economy of scale there.

00:35:22 --> 00:35:25: But certainly there's many examples where this does work economically

00:35:25 --> 00:35:27: out there across the country.

00:35:27 --> 00:35:30: What's going to happen if the onset system goes offline

00:35:30 --> 00:35:32: kind of goes hand in hand with that first question

00:35:32 --> 00:35:35: up there, who's going to own the system long term?

00:35:35 --> 00:35:38: And so if you're a developer or working with the

00:35:38 --> 00:35:42: developer and they're gung ho about the system, that's great.

00:35:42 --> 00:35:45: But then the question comes, will it be maintained?

00:35:45 --> 00:35:46: What if that building gets sold?

00:35:46 --> 00:35:47: Will it be maintained?

00:35:47 --> 00:35:48: Who's going to keep up with that maintenance?

00:35:49 --> 00:35:51: Who's going to keep up with the regulatory requirements for

00:35:52 --> 00:35:53: sampling and reporting?

00:35:53 --> 00:35:57: All things to have your eyes open to walking into

00:35:57 --> 00:35:59: the the idea.

00:36:00 --> 00:36:03: There's my contact information on the QR code there.

00:36:03 --> 00:36:06: And I think Next up is Kyle, who's going to

00:36:06 --> 00:36:08: walk into some of those a little bit more detail.

00:36:09 --> 00:36:11: Thank you so much, John.

00:36:11 --> 00:36:13: And just because we have so many speakers, again, if

00:36:13 --> 00:36:16: you have questions, please put them in the chat box

00:36:16 --> 00:36:17: and John can respond directly.

00:36:18 --> 00:36:19: Thank you, John.

00:36:20 --> 00:36:26: OK, now comes the part where I remember how to

00:36:26 --> 00:36:27: unshare.

00:36:30 --> 00:36:31: There should be a a red.

00:36:32 --> 00:36:33: Yeah, OK.

00:36:33 --> 00:36:34: It's on my third screen.

00:36:36 --> 00:36:37: Hi, Kyle.

00:36:37 --> 00:36:45: Hello, so my name is Kyle Pickett.

00:36:45 --> 00:36:49: I am a recovering sustainability consultant based in San Francisco.

00:36:49 --> 00:36:51: I'm currently in Washington state at the moment.

00:36:51 --> 00:36:54: This image that you see is actually from Clear Lake

00:36:54 --> 00:36:56: Washington near Mount Rainier.

00:36:56 --> 00:36:59: It was just up there for a family reunion.

00:36:59 --> 00:37:01: I just thought it was a beautiful shot of the

00:37:01 --> 00:37:03: the water, but I'm here to really talk about it

00:37:03 --> 00:37:05: as part of a design opportunity.

00:37:05 --> 00:37:07: So these days I wear multiple hats.

00:37:07 --> 00:37:09: I am not only the Co founder of the Wordland

00:37:09 --> 00:37:12: Foundation, but I also serve as a senior advisor for

00:37:12 --> 00:37:15: US Green Building Council California and as a director of

00:37:15 --> 00:37:19: special projects for the Berdani Institute for the Built Environment.

00:37:20 --> 00:37:22: Back in 2018.

00:37:22 --> 00:37:26: We produce an award-winning Water E practice guide and the

00:37:26 --> 00:37:29: whole goal for that, based upon some projects that we

00:37:29 --> 00:37:33: were working on was to be still highly technical information

00:37:33 --> 00:37:37: and down to digestible chunks of text and infographics so

00:37:37 --> 00:37:41: that anyone could become better informed about on site water

00:37:41 --> 00:37:43: reuse as a design opportunity.
00:37:43 --> 00:37:45: So whether you were an architect or an engineer, a
00:37:45 --> 00:37:48: policy maker, a student, you could pick up one of
00:37:48 --> 00:37:50: our guides and become better informed.
00:37:50 --> 00:37:52: So this is a little bit of our journey from
00:37:52 --> 00:37:53: yuck to yay.
00:37:54 --> 00:37:58: And you know, as some of the other panelists mentioned,
00:37:58 --> 00:38:00: it's all been done before.
00:38:00 --> 00:38:01: Our water is what we have.
00:38:01 --> 00:38:04: It's all been recycled beset in our firm.
00:38:04 --> 00:38:06: It's all been dinosaur pooped before.
00:38:06 --> 00:38:08: Kind of relevant to what John was just just talking
00:38:08 --> 00:38:08: about.
00:38:09 --> 00:38:10: But I'm really here to talk about a few insights
00:38:11 --> 00:38:11: from the guy.
00:38:11 --> 00:38:13: And I'm going to be a little speedy through this
00:38:13 --> 00:38:16: because our guide is also available for free as a
00:38:16 --> 00:38:18: download, and I'll cover that here at the very, very
00:38:19 --> 00:38:19: end.
00:38:19 --> 00:38:21: So we did talk a little bit about the water
00:38:21 --> 00:38:26: types available in buildings from Blackwater, Gray water, foundation, drainage,
00:38:26 --> 00:38:28: evaporative cooling.
00:38:28 --> 00:38:32: Those have some additional mineralities and things that need to
00:38:32 --> 00:38:36: be, you know, considered when you're talking to a water
00:38:36 --> 00:38:41: reuse provider, a vendor, more about the stakeholders and decision
00:38:41 --> 00:38:42: drivers.
00:38:42 --> 00:38:45: So all, if you're working on a water reuse project,
00:38:45 --> 00:38:49: your developer, your owner is going to recognize that there
00:38:49 --> 00:38:52: are risks and rewards in advancing this kind of strategy.
00:38:52 --> 00:38:56: So we have highlighted some internal and stakeholder kind of
00:38:56 --> 00:39:01: engagement components, but your job, depending upon your role is
00:39:01 --> 00:39:04: to really kind of have a meaningful conversation.
00:39:04 --> 00:39:08: So sometimes there are issues with four people, sometimes it's
00:39:08 --> 00:39:12: the original first cost for the design of the system,
00:39:12 --> 00:39:13: sometimes it's purple pipe.
00:39:15 --> 00:39:17: But your, you know, the, the goal is to have
00:39:17 --> 00:39:21: an open, honest communication with your internal and external stakeholders

00:39:21 --> 00:39:25: to better understand what are the drivers behind wanting to
00:39:25 --> 00:39:28: incorporate on site water reuse as part of your project
00:39:28 --> 00:39:31: and then how you can actually make it come to
00:39:31 --> 00:39:31: fruition.
00:39:32 --> 00:39:35: So a few key talking points with regulators, the project,
00:39:35 --> 00:39:37: you know a lot of these I've been down to
00:39:37 --> 00:39:40: Australia to kind of kick the tires and lift the
00:39:40 --> 00:39:43: lids on some of these systems that have been operation
00:39:43 --> 00:39:44: for 20 plus years.
00:39:44 --> 00:39:48: You know that the building will will remain connected to
00:39:48 --> 00:39:51: a centralized water and wastewater system and it will meet
00:39:51 --> 00:39:55: code and regulation assuming it is available within your jurisdiction.
00:39:56 --> 00:40:00: If it's not, that's a really meaningful opportunity to have
00:40:00 --> 00:40:05: a conversation with the jurisdiction officials to better understand and
00:40:05 --> 00:40:05: you might.
00:40:06 --> 00:40:09: Be able to advance a pilot project within your jurisdiction.
00:40:10 --> 00:40:12: The systems will be monitored and maintained.
00:40:13 --> 00:40:16: And then also, I think the public education outreach is
00:40:16 --> 00:40:17: so important.
00:40:17 --> 00:40:21: Worked on a project in San Francisco called 181 Fremont
00:40:21 --> 00:40:22: Lead Platinum.
00:40:22 --> 00:40:24: The only way for them to get to Lead Platinum
00:40:24 --> 00:40:26: is through a water reuse system.
00:40:26 --> 00:40:30: And so, you know, the top third of the building
00:40:30 --> 00:40:31: was a luxury residence.
00:40:31 --> 00:40:35: And we produced some documentation for their sales team.
00:40:36 --> 00:40:37: Turns out they didn't even need it.
00:40:37 --> 00:40:40: The people who are buying these luxury condos in this
00:40:40 --> 00:40:43: tower recognize that we are in California and that we
00:40:43 --> 00:40:45: are in a water stress environment.
00:40:45 --> 00:40:49: So having those kinds of resources available, going through some
00:40:49 --> 00:40:53: education and outreach is a really, really important component from
00:40:53 --> 00:40:55: a utility perspective.
00:40:55 --> 00:40:57: And I think this is really important and this is
00:40:57 --> 00:40:58: really relevant to SFPUC.
00:40:58 --> 00:41:03: I've worked with them very closely since Article 12 C
00:41:03 --> 00:41:06: was deployed back in 2014, 2014.
00:41:06 --> 00:41:09: I think we were growing as a city.
00:41:10 --> 00:41:12: So being able to delay or mitigate the need for

00:41:12 --> 00:41:16: expensive infrastructure by using on site water reuse as a
00:41:16 --> 00:41:18: strategy was one of those ways to help kind of
00:41:18 --> 00:41:19: fill that gap.
00:41:19 --> 00:41:22: But then also be able to say 181 Fremont will
00:41:22 --> 00:41:26: save 1.7 million gallons of water a year with their
00:41:26 --> 00:41:27: Gray water system.
00:41:27 --> 00:41:27: I see.
00:41:27 --> 00:41:32: Jonathan Farr, I'm on the epic ethics Advisory Board on
00:41:32 --> 00:41:33: this call.
00:41:33 --> 00:41:37: So, but Salesforce Tower also a really great example of
00:41:37 --> 00:41:40: potable water savings just from one building.
00:41:42 --> 00:41:46: We were talking about resilience, so decentralized and centralized treatment,
00:41:46 --> 00:41:49: a blend of this, you know, boost reliability and resiliency
00:41:49 --> 00:41:51: within water stress environments.
00:41:51 --> 00:41:54: And then again, you know, talking about it with occupants.
00:41:56 --> 00:41:58: All water is already recycled water.
00:41:58 --> 00:42:01: It has a really, you know, there's a real meaningful
00:42:01 --> 00:42:05: opportunity to have those conversations and that, you know, the,
00:42:05 --> 00:42:08: you know, reuse will save energy and water and associated
00:42:08 --> 00:42:10: costs depending upon that bottom line.
00:42:11 --> 00:42:13: But that's the math you need to do contributing to
00:42:13 --> 00:42:16: building and community sustainability.
00:42:18 --> 00:42:20: I want to spend just a few moments on this.
00:42:20 --> 00:42:23: So water reuse really is the poster child for an
00:42:23 --> 00:42:26: integrated project delivery process.
00:42:26 --> 00:42:29: And if you're not familiar with integrated project delivery, it
00:42:30 --> 00:42:32: is a process by which you have the entire design
00:42:32 --> 00:42:35: team, owners and others within the room to be able
00:42:35 --> 00:42:39: to have a conversation around the goals for the building
00:42:39 --> 00:42:41: and then be able to plan that out.
00:42:41 --> 00:42:45: Because if you don't, there will be impacts if you
00:42:45 --> 00:42:49: don't plan for water reuse and owner or developer wants
00:42:49 --> 00:42:53: to do it later, there might be size constraints, floor
00:42:53 --> 00:42:58: plate issues in in deploying water reuse within that building.
00:42:58 --> 00:43:01: So it really is a poster child for an integrated
00:43:01 --> 00:43:02: project delivery.
00:43:04 --> 00:43:07: Just kind of highlighting a few of the systems that
00:43:07 --> 00:43:11: are, you know, kind of widely used membrane bioreactor is
00:43:11 --> 00:43:15: one of those that is widely used across multiple different
00:43:16 --> 00:43:19: vendors and technologies and related to SFPUC.

00:43:19 --> 00:43:22: They do not have membrane, they have an accelerated tidal
00:43:23 --> 00:43:23: flow wetland.
00:43:24 --> 00:43:27: So all of the planters that you see out front
00:43:27 --> 00:43:30: of the building and to the side, that's actually part
00:43:30 --> 00:43:32: of the infrastructure for for reuse.
00:43:35 --> 00:43:39: So all of the O&M component to this conversation really
00:43:39 --> 00:43:43: it's really important to know your cost, energy use is
00:43:43 --> 00:43:48: variable amongst, you know, some of these systems pumps, the
00:43:48 --> 00:43:51: treatment, disinfection and then the monitoring.
00:43:52 --> 00:43:55: There are service contracts that usually come with a lot
00:43:56 --> 00:43:57: of these these vendors.
00:43:57 --> 00:44:00: And so, you know, applying the that math to your
00:44:00 --> 00:44:03: bottom line will also help keep you from having any
00:44:03 --> 00:44:06: surprises around the numbers going forward.
00:44:08 --> 00:44:12: Resource recovery is, I think, a really important thing.
00:44:13 --> 00:44:16: Seven years ago or so when I started lecturing at
00:44:16 --> 00:44:19: Berkeley and Stanford and their architecture departments around watery use
00:44:19 --> 00:44:20: as a design opportunity.
00:44:21 --> 00:44:25: The vast majority of my my class would raise their
00:44:25 --> 00:44:27: hand to the yuck part.
00:44:27 --> 00:44:30: It's not we're not there yet, but like last year,
00:44:30 --> 00:44:33: only three people raised their hand out of the class
00:44:33 --> 00:44:37: of like 150 and recognize that there are additional opportunities
00:44:37 --> 00:44:39: related to resource recovery.
00:44:39 --> 00:44:42: So the water energy carbon Nexus is a really important
00:44:42 --> 00:44:43: part of that conversation.
00:44:44 --> 00:44:48: Companies like Epic, Leantech and Natural Systems Utilities is addressing
00:44:48 --> 00:44:52: this meaningfully across some of their their technologies, but that
00:44:52 --> 00:44:55: is also one of those things that matching up the
00:44:55 --> 00:44:59: right water, the right technology for the right project.
00:44:59 --> 00:45:02: Having worked on single building and district scale systems, I
00:45:02 --> 00:45:04: can tell you there's a lot of nuance there.
00:45:05 --> 00:45:08: But by having an open and honest conversation, by starting
00:45:08 --> 00:45:11: your project teams, by building some trust there and some
00:45:11 --> 00:45:15: relationship, you can have a much more deliberate conversation around
00:45:15 --> 00:45:18: not just water we use, but what are the other
00:45:18 --> 00:45:18: opportunities.

00:45:19 --> 00:45:21: Is there a heat recovery component that you can apply
00:45:21 --> 00:45:24: to the domestic water supply so you're not using as
00:45:24 --> 00:45:25: much energy?
00:45:25 --> 00:45:29: Is there a nutrient component where you can take the
00:45:29 --> 00:45:32: the cake, as it were, from the black water and
00:45:32 --> 00:45:35: a plot and make it into a high value soil
00:45:35 --> 00:45:38: or or compost a soil amendment, if you will.
00:45:39 --> 00:45:42: So these are really kind of meaningful components of the
00:45:42 --> 00:45:43: resource recovery.
00:45:43 --> 00:45:44: It's not just about water reuse.
00:45:46 --> 00:45:47: All right, show me the money.
00:45:47 --> 00:45:49: So I'm going to just warn you right now, the
00:45:49 --> 00:45:51: next couple graphs are a little old.
00:45:54 --> 00:45:56: So we'll just, we'll just go from there.
00:45:56 --> 00:45:59: But the the numbers don't lie and it continues to
00:45:59 --> 00:45:59: escalate.
00:45:59 --> 00:46:04: So our water and sewer rates escalation is typically about
00:46:04 --> 00:46:07: 7 to 13% nationally every year.
00:46:07 --> 00:46:10: You see some of these cities, the big one on
00:46:10 --> 00:46:13: the left, well, I'll just use the pointer right here,
00:46:13 --> 00:46:14: that's Atlanta.
00:46:15 --> 00:46:19: And then we also have this was Seattle and then
00:46:20 --> 00:46:22: also San Francisco.
00:46:22 --> 00:46:24: And this data actually comes from MKA.
00:46:24 --> 00:46:26: And this graph is actually part of our our 2018
00:46:27 --> 00:46:28: water reuse practice guide.
00:46:29 --> 00:46:31: The price of water is also one of those things
00:46:31 --> 00:46:33: it doesn't make sense for the jurisdiction.
00:46:33 --> 00:46:37: If your price of water is, is, you know, 73,
00:46:37 --> 00:46:40: you know, dollars a year, it might be a different
00:46:40 --> 00:46:45: conversation around what is the right strategy for that particular
00:46:45 --> 00:46:46: project.
00:46:46 --> 00:46:50: So again, open and honest communication with the developers, with
00:46:50 --> 00:46:54: the utility and the regulatory environment to better understand where
00:46:54 --> 00:46:58: is the maximal opportunity for reuse within a project or
00:46:58 --> 00:47:02: like a district scale project development incentives.
00:47:02 --> 00:47:05: So there Chicago has a green permit program.
00:47:05 --> 00:47:09: Cincinnati offers financial grants and low interest loans for innovative
00:47:09 --> 00:47:10: projects.

00:47:10 --> 00:47:13: City of Santa Monica waives building permit fees for projects
00:47:14 --> 00:47:16: and properties that include on site watery systems.
00:47:17 --> 00:47:19: There are a number of other jurisdictions.
00:47:19 --> 00:47:22: So this slide is a little bit old.
00:47:22 --> 00:47:25: I'm with a late Comer to this conversation, but there
00:47:25 --> 00:47:29: are more and more jurisdictions that are coming online with
00:47:29 --> 00:47:33: development incentives related to on site water reuse and that
00:47:33 --> 00:47:35: water energy carbon Nexus.
00:47:36 --> 00:47:40: I worked with Senator Weiner along with Paula Kehoe from
00:47:41 --> 00:47:45: SFUC&A, a bunch of stakeholders in California to pass legislation
00:47:45 --> 00:47:49: called SB-966 in California, and it was passed in 2018.
00:47:50 --> 00:47:53: COVID kind of put a dampener on its deployment.
00:47:53 --> 00:47:55: I honestly right now don't know where it is and
00:47:55 --> 00:47:59: it's processed, but essentially it directs the California Water Control
00:47:59 --> 00:48:04: Board in collaboration with the Building Standards Commission to streamline
00:48:04 --> 00:48:07: rules and regulations for reuse across the state.
00:48:08 --> 00:48:12: I need to move your little window here highlighting a
00:48:12 --> 00:48:15: couple of the resources on SFUC has a non foldable
00:48:15 --> 00:48:17: water program, kite book.
00:48:18 --> 00:48:20: Shannon mentioned the National Blue Ribbon Commission.
00:48:20 --> 00:48:23: That's a lot of utilities that are coming together to
00:48:23 --> 00:48:25: try to advance this from a national scale.
00:48:27 --> 00:48:31: SFUC also has some additional information there too.
00:48:32 --> 00:48:36: You can to download our water reuse practice **** and
00:48:36 --> 00:48:40: Water Research Foundation also has some additional reports.
00:48:40 --> 00:48:43: And I'm really, really glad that Shannon included those other
00:48:43 --> 00:48:44: those other resources as well.
00:48:44 --> 00:48:46: Those dovetail pretty nicely.
00:48:47 --> 00:48:50: Just as an upcoming update, we are updating our water
00:48:50 --> 00:48:51: reuse practice guide.
00:48:51 --> 00:48:54: So there is AV 2, the funding efforts currently underway,
00:48:54 --> 00:48:56: our authors will be compensated.
00:48:56 --> 00:48:59: There will be a workforce development overlay because as you
00:48:59 --> 00:49:01: may or may not know, we don't need a level
00:49:01 --> 00:49:04: 1 wastewater engineer taking care of a reuse system.
00:49:04 --> 00:49:08: We need to skill credential technician that water, energy, carbon

00:49:08 --> 00:49:11: excess and any technical and regulatory updates.
00:49:11 --> 00:49:15: So ping me directly if you're interested in being part
00:49:15 --> 00:49:18: of that particular update for the guide.
00:49:18 --> 00:49:21: And then there is my contact information.
00:49:21 --> 00:49:22: I hope I stayed within time.
00:49:23 --> 00:49:23: Thank you very much.
00:49:25 --> 00:49:26: Thank you so much, Kyle.
00:49:27 --> 00:49:28: That's so helpful.
00:49:29 --> 00:49:32: And we can also collect all these links and we'll
00:49:32 --> 00:49:34: send them out via e-mail afterwards as well.
00:49:34 --> 00:49:35: So thank you for sharing those.
00:49:36 --> 00:49:39: Our final speaker is Austin from Denver Water.
00:49:39 --> 00:49:42: But again, please, if you have questions for any of
00:49:42 --> 00:49:44: the speakers, please put them in the chat box and
00:49:44 --> 00:49:47: we'll also have a a discussion with all the panelists
00:49:47 --> 00:49:47: after they present.
00:49:48 --> 00:49:48: Yeah.
00:49:48 --> 00:49:50: Thank you to all of the other speakers who've done
00:49:50 --> 00:49:52: a great job setting this up.
00:49:52 --> 00:49:54: And now I have the easy job of running through
00:49:54 --> 00:49:55: a couple case studies.
00:49:59 --> 00:50:01: Let me figure out how to advance my slides on
00:50:01 --> 00:50:01: here.
00:50:01 --> 00:50:04: OK, so I'm going to give a quick overview of
00:50:04 --> 00:50:09: Denver Water, go through our DE, our centralized purple pipe
00:50:09 --> 00:50:13: recycled water program and then focus in on our campus
00:50:13 --> 00:50:18: and our decentralized and especially Rufus portion of that.
00:50:18 --> 00:50:21: And then lastly, I'll jump into some incentives that we've
00:50:21 --> 00:50:25: already developed that encourage efficient water use and how those
00:50:25 --> 00:50:27: can hopefully be expanded in the the future for more
00:50:28 --> 00:50:29: decentralized water use.
00:50:29 --> 00:50:31: But a little bit about Denver water.
00:50:31 --> 00:50:33: We are established all the way back in 1918.
00:50:33 --> 00:50:37: We're governed by a board of water commissioners and we're
00:50:37 --> 00:50:39: carved out by the City and County of Denver charter.
00:50:39 --> 00:50:42: But we are a public agency that is separate from
00:50:42 --> 00:50:43: the City and County of Denver.
00:50:44 --> 00:50:48: We operate a little bit differently even than an enterprise
00:50:48 --> 00:50:48: fund.
00:50:49 --> 00:50:52: And our water is served across 1.5 million people, so

00:50:52 --> 00:50:56: about the double the population of the city and County
00:50:56 --> 00:50:57: of Denver.
00:50:57 --> 00:51:01: And that spans across 18 different local governments, which means
00:51:01 --> 00:51:05: we have a lot of regulatory hurdles to jump through
00:51:05 --> 00:51:06: at small scale, large scale.
00:51:07 --> 00:51:10: And it's a lot of conversations and figuring out what
00:51:10 --> 00:51:13: each locality wants to be doing and supporting them wherever
00:51:14 --> 00:51:17: they are in their journey of water efficiency, water reuse
00:51:17 --> 00:51:18: when possible.
00:51:19 --> 00:51:23: That 1.5 million people represents about 25% of the state
00:51:23 --> 00:51:24: of Colorado.
00:51:24 --> 00:51:26: And we always say that we use less than 2%
00:51:26 --> 00:51:28: of the the water in the state.
00:51:28 --> 00:51:31: That doesn't account for everything that we import like food
00:51:31 --> 00:51:32: products, things like that.
00:51:32 --> 00:51:36: But of the the water that we serve, that really
00:51:36 --> 00:51:39: is only about 2% of the total water use in
00:51:39 --> 00:51:39: Colorado.
00:51:41 --> 00:51:46: So this is what our collection system and distribution system
00:51:46 --> 00:51:47: looks like.
00:51:47 --> 00:51:49: We break it up into a A N system which
00:51:49 --> 00:51:53: is highlighted in blue and that is our Moffett Williams
00:51:53 --> 00:51:56: Fork system and half of that is on the West
00:51:56 --> 00:51:59: side of the Continental Divide, other half on the east
00:51:59 --> 00:52:00: side.
00:52:00 --> 00:52:05: And then our light blue is our Blue River system
00:52:05 --> 00:52:09: and that is Lake Dillon and that is about half
00:52:09 --> 00:52:11: of our storage capacity.
00:52:12 --> 00:52:14: Again, that's on the West side of the divide and
00:52:14 --> 00:52:16: I'll get into why this is so important.
00:52:16 --> 00:52:20: And then the remainder, the large red area is the
00:52:20 --> 00:52:23: S Platte system and you can kind of see the
00:52:23 --> 00:52:24: breakout on the right.
00:52:24 --> 00:52:27: Every year we operate a little bit differently depending on
00:52:27 --> 00:52:30: how snowpack has come in, where it is in our
00:52:30 --> 00:52:32: system, how we need to move water around to most
00:52:32 --> 00:52:35: efficiently use the water resources that we have.
00:52:35 --> 00:52:38: But at the whole, we say roughly 80% of the
00:52:38 --> 00:52:42: water usually comes from that S system, which is Blue
00:52:42 --> 00:52:44: River and S Platte River.

00:52:46 --> 00:52:49: We're one of the largest land owners in Colorado.
00:52:49 --> 00:52:53: But even with in our collection area, we only own
00:52:53 --> 00:52:54: about 2% of the land.
00:52:54 --> 00:52:58: So we really rely on Forest Service and public lands
00:52:58 --> 00:53:02: to kind of keep our watersheds healthy and do that
00:53:02 --> 00:53:06: the natural process of collecting that high quality snow melt
00:53:06 --> 00:53:10: and then conveying it down for final treatment and bringing
00:53:10 --> 00:53:11: it to our customers.
00:53:15 --> 00:53:18: So to date these are a lot of the the
00:53:18 --> 00:53:23: one water or reuse things that have been instrumental at
00:53:23 --> 00:53:24: Denver Water.
00:53:24 --> 00:53:27: The first one was our Blue River decree and that
00:53:27 --> 00:53:29: really set up our ability to store water on the
00:53:29 --> 00:53:32: West side of the Continental Divide and then bring it
00:53:33 --> 00:53:35: over for consumptive uses on the east side of the
00:53:35 --> 00:53:36: divide.
00:53:36 --> 00:53:39: And within that it set up the ability to reuse
00:53:39 --> 00:53:40: water.
00:53:40 --> 00:53:43: We can successively reuse any of the water that is
00:53:43 --> 00:53:45: imported or Trans Basin water.
00:53:46 --> 00:53:49: So that kind of laid the groundwork all the way
00:53:50 --> 00:53:54: back in 1995 for our Recite our centralized recycled water
00:53:54 --> 00:53:55: program.
00:53:55 --> 00:53:59: And then in the 1980s and 1990s, we did some
00:53:59 --> 00:54:05: direct portable reuse demonstration projects very similar to what Shannon
00:54:05 --> 00:54:06: highlighted early on.
00:54:07 --> 00:54:10: And there was a giant yuck factor back then on
00:54:10 --> 00:54:13: the the popular press called it toilet to tap, and
00:54:13 --> 00:54:15: nobody was ready for that yet.
00:54:15 --> 00:54:19: And just like Kyle demonstrated, there's been a big shift
00:54:19 --> 00:54:23: of realizing that we can treat and purify water in
00:54:23 --> 00:54:26: many different ways, get it fit for the right purpose.
00:54:27 --> 00:54:30: And that yuck factor, I think is slowly going away
00:54:30 --> 00:54:33: and really setting us up for more direct portable reuse
00:54:33 --> 00:54:34: in the future.
00:54:35 --> 00:54:38: In 2004, we commissioned our recycled water plant and have
00:54:38 --> 00:54:39: expanded since then.
00:54:40 --> 00:54:46: In 2013, the Colorado River Cooperative Agreement set our boundary.
00:54:46 --> 00:54:50: Sorry, let me jump back, set our boundary and kind
00:54:50 --> 00:54:53: of made it so Denver water would not increase who

00:54:53 --> 00:54:55: we were serving water to.
00:54:55 --> 00:54:58: And really made it so that we needed to focus
00:54:58 --> 00:55:00: on the existing supplies that we had.
00:55:00 --> 00:55:05: And that region has continued to grow.
00:55:05 --> 00:55:07: At the time, I think we were about 1.2 million
00:55:07 --> 00:55:08: people.
00:55:08 --> 00:55:10: We're now 1.5 million customers served.
00:55:11 --> 00:55:16: And then John and Corolla have been very instrumental in
00:55:16 --> 00:55:22: developing the Denver 1 water plan that really looks at
00:55:22 --> 00:55:28: water supply, wastewater and stormwater and treating it all as
00:55:28 --> 00:55:30: one system in Denver.
00:55:30 --> 00:55:33: Since we are the water supplier, we are different from
00:55:33 --> 00:55:36: the water treatment and also the stormwater management piece.
00:55:37 --> 00:55:39: But this plan has really done a great job of
00:55:39 --> 00:55:43: breaking down some of those barriers so that we're talking
00:55:43 --> 00:55:47: to each other, making sure that projects are meeting mutual
00:55:47 --> 00:55:50: benefits when we look at reuse or one water developments.
00:55:51 --> 00:55:54: And then in 2024, years after our our campus was
00:55:54 --> 00:55:59: fully built, we finally commissioned our Rufus or reuse for
00:55:59 --> 00:56:04: us centralized or decentralized on site water treatment facility.
00:56:04 --> 00:56:07: And we are now kind of reaping the benefits of
00:56:08 --> 00:56:12: that and using that and expanding the conversation of what
00:56:12 --> 00:56:14: reuse can look like at a campus level.
00:56:16 --> 00:56:21: So within our distribution area, you can kind of see
00:56:21 --> 00:56:25: in the upper left of the the graphic, this little
00:56:25 --> 00:56:31: box highlights our recycled water customers and our purple pipe
00:56:31 --> 00:56:32: system.
00:56:32 --> 00:56:36: And right now the primary uses are the seasonal uses,
00:56:36 --> 00:56:40: so industrial cooling, irrigation and things like that.
00:56:41 --> 00:56:42: There's a couple distinctions in there.
00:56:42 --> 00:56:44: We serve both raw and recycled water.
00:56:45 --> 00:56:48: It both of those come from our recycled water treatment
00:56:48 --> 00:56:49: facility.
00:56:50 --> 00:56:55: The difference is some of them are conveyed through ditches,
00:56:55 --> 00:56:59: so all the chlorine is removed and the rest is
00:56:59 --> 00:57:04: served through irrigation or connection points to our purple pipe
00:57:04 --> 00:57:05: system.
00:57:06 --> 00:57:09: So right now that only provides about two 2.6% of

00:57:09 --> 00:57:12: total Denver water use at full build out.

00:57:12 --> 00:57:16: If we can connect some of these areas of stranded

00:57:16 --> 00:57:19: assets that you see in the the upper right portion

00:57:19 --> 00:57:22: of the graphic that could jump up all the way

00:57:22 --> 00:57:23: to 6.3%.

00:57:23 --> 00:57:25: But when we look at this, it also does a

00:57:25 --> 00:57:29: great job taking demand off during the irrigation season, which

00:57:29 --> 00:57:30: is our highest demand time.

00:57:31 --> 00:57:34: And when the recycled water plant is running at full

00:57:34 --> 00:57:37: capacity, it actually takes off about 5 to 6% of

00:57:37 --> 00:57:41: demand from our potable water treatment facilities.

00:57:42 --> 00:57:45: And while that doesn't seem like a lot, it keeps

00:57:45 --> 00:57:49: us from having to do those infrastructure upgrades and upscaling

00:57:49 --> 00:57:52: of a lot of our resources for the irrigation season.

00:57:58 --> 00:58:01: So next I'm going to jump into our operations complex

00:58:01 --> 00:58:05: redevelopment and this was a really exciting project that Denver

00:58:05 --> 00:58:06: Water took on.

00:58:07 --> 00:58:11: We really kind of started from that that pre design

00:58:11 --> 00:58:15: ethic that Kyle was talking about of what are all

00:58:15 --> 00:58:17: the things that we want to do.

00:58:17 --> 00:58:20: We know that we had to start well before we

00:58:20 --> 00:58:24: got into building design of incorporating everything that we wanted.

00:58:24 --> 00:58:27: So we had a lot of the kind of standard

00:58:27 --> 00:58:31: sustainability goals of let's be lead Platinum, let's do net

00:58:31 --> 00:58:34: zero energy and then let's push the boundaries of what

00:58:34 --> 00:58:37: we can do with water management on our side.

00:58:37 --> 00:58:40: So that we at the time we're calling it net

00:58:40 --> 00:58:44: 0 water transition to 1 water as as the name

00:58:44 --> 00:58:46: conventions change within the industry.

00:58:46 --> 00:58:49: And I think we did a pretty good job of

00:58:49 --> 00:58:52: really operating on that bleeding edge of water management.

00:58:53 --> 00:58:57: We had to overcome many regulatory barriers and take on

00:58:57 --> 00:59:02: some new challenges as a water treatment provider and then

00:59:02 --> 00:59:06: also go through large scale rainwater capture and what that

00:59:06 --> 00:59:09: means within Colorado's water laws.

00:59:12 --> 00:59:15: So similar to kind of what you'll see in the

00:59:15 --> 00:59:20: ULI Water wise development guide, we, we set out with

00:59:20 --> 00:59:25: this design ethic of reducing as much as possible from

00:59:25 --> 00:59:26: the beginning.

00:59:26 --> 00:59:29: And that started with looking at our, our building and

00:59:30 --> 00:59:35: our irrigation project processes and incorporating water conservation at every

00:59:35 --> 00:59:39: level and then budgeting out how much we thought that

00:59:39 --> 00:59:39: would use.

00:59:40 --> 00:59:43: And then from there we were able to separate our

00:59:43 --> 00:59:47: potable and non potable demands and really think about where

00:59:47 --> 00:59:51: do we need potable water for public health or certain

00:59:51 --> 00:59:53: water qualities and reliability?

00:59:53 --> 00:59:56: And then what are some of the areas that we

00:59:57 --> 01:00:01: can use non portable resources and that really comes down

01:00:01 --> 01:00:05: to the rainwater capture, grey water and black water.

01:00:06 --> 01:00:09: We initially kind of explored the idea of doing our

01:00:09 --> 01:00:13: entire campus just as Gray water, but we quickly realized

01:00:13 --> 01:00:16: that we wouldn't be capturing enough of the the total

01:00:16 --> 01:00:19: water that's going into the sanitary sewer.

01:00:19 --> 01:00:23: And we could actually go a lot farther managing our

01:00:23 --> 01:00:26: water resources if we moved on to to Blackwater.

01:00:27 --> 01:00:30: And then the last part I think is often overlooked,

01:00:30 --> 01:00:33: but we have a large campus, 35 acres and integrating

01:00:33 --> 01:00:37: stormwater best practices actually goes a really long way of

01:00:37 --> 01:00:40: reducing our overall water demand.

01:00:40 --> 01:00:43: And this is something that is as simple as grading.

01:00:43 --> 01:00:45: So we have some areas of lay down yards for

01:00:45 --> 01:00:48: all of our equipment and if we can re or

01:00:48 --> 01:00:53: grade and divert those into green infrastructure, bioswales and things

01:00:53 --> 01:00:56: like that, those are areas that we don't have to

01:00:56 --> 01:00:57: water as frequently.

01:00:58 --> 01:01:01: And then if we also change our landscapes from kind

01:01:01 --> 01:01:05: of the the cultural norm of Kentucky bluegrass back to

01:01:05 --> 01:01:09: native grasses and climate adapted species, we can further water

01:01:09 --> 01:01:11: lower our water use demands.

01:01:13 --> 01:01:15: So we took all of that and then we get

01:01:15 --> 01:01:18: into the conceptual design stage and we say, here's everything

01:01:18 --> 01:01:19: that we want to have.

01:01:19 --> 01:01:24: We want to have cisterns that capture the rainwater and

01:01:24 --> 01:01:30: the overflow from our reuse system, low flow fixtures everywhere,

01:01:30 --> 01:01:35: recycled water for our vehicle washing, recycling water in our

01:01:35 --> 01:01:40: meter shop so that we're not not not doing single
01:01:40 --> 01:01:44: use water use and sending that directly to the sanitary
01:01:44 --> 01:01:45: sewer.
01:01:45 --> 01:01:46: Sorry I got to run.
01:01:46 --> 01:01:48: I have a kid that is coming home.
01:01:48 --> 01:01:50: I'll be back in 2 seconds.
01:01:52 --> 01:01:52: No problem.
01:01:53 --> 01:01:54: I'd love that.
01:01:54 --> 01:01:57: Does anyone have any questions for any of the panelists
01:01:57 --> 01:01:58: you want to just unmute?
01:01:58 --> 01:02:00: And I think maybe what I'll do is I'll start
01:02:00 --> 01:02:02: with the question that was going in the chat box,
01:02:03 --> 01:02:05: which which is why isn't rainwater included in these water
01:02:05 --> 01:02:06: reuse definitions?
01:02:06 --> 01:02:08: And maybe Shannon, you want to kick kick us off.
01:02:11 --> 01:02:14: And then I actually do think it's included.
01:02:15 --> 01:02:22: I think, I think it leaves it open actually.
01:02:22 --> 01:02:25: That's that's what I would say like it's not Austin.
01:02:25 --> 01:02:29: I'm just answering a question real quickly while you're attending
01:02:29 --> 01:02:32: to the care and feeding of your of your little
01:02:32 --> 01:02:32: one.
01:02:34 --> 01:02:38: Just with the definition, it doesn't distinctly fall out framewater,
01:02:38 --> 01:02:40: but I do think it's included.
01:02:40 --> 01:02:42: I don't think it's excluded.
01:02:43 --> 01:02:47: So that's, that's why I, I think the definition leaves
01:02:47 --> 01:02:51: room and that's why I like that definition.
01:02:51 --> 01:02:54: I I, if anyone, Austin John file, anyone had anything
01:02:54 --> 01:02:57: else to kind of weigh in on that, but that's
01:02:57 --> 01:02:58: kind of my view.
01:03:03 --> 01:03:06: Of I don't have, I, I read through the check
01:03:06 --> 01:03:09: kind of as that was going on and really like
01:03:09 --> 01:03:13: that distinction of rainwater becomes stormwater.
01:03:13 --> 01:03:16: How we have viewed it on our site is if
01:03:16 --> 01:03:19: it's not interacting kind of with the ground level, we
01:03:19 --> 01:03:22: can keep that water a little bit cleaner and we
01:03:22 --> 01:03:24: have to do less treatment process to it.
01:03:25 --> 01:03:27: So that would be one other kind of distinction that
01:03:27 --> 01:03:28: I would bring in.
01:03:32 --> 01:03:35: But yeah, jumping back into this and we can loop
01:03:36 --> 01:03:39: back to this conversation a little bit later, we also
01:03:39 --> 01:03:45: incorporate rainwater capture off our main administration

building all the
01:03:45 --> 01:03:48: way on the left side of this diagram and then
01:03:48 --> 01:03:52: the employee parking lot and that helps feed our cisterns
01:03:52 --> 01:03:53: for irrigation.
01:03:53 --> 01:03:57: And then when we look at it from a, a
01:03:57 --> 01:04:03: regulatory kind of obstacles that we encountered, 1st we started
01:04:03 --> 01:04:06: with the the Gray water regulation 86.
01:04:06 --> 01:04:08: We realized that we wouldn't be able to meet our
01:04:08 --> 01:04:09: demands off of that.
01:04:10 --> 01:04:15: So we proposed the on site wastewater treatment system and
01:04:15 --> 01:04:19: that was a whole other set of regulations in Colorado
01:04:19 --> 01:04:24: and that really incorporates the Rufus system and the water
01:04:24 --> 01:04:27: quality that goes into the cisterns.
01:04:28 --> 01:04:31: And we made sure that that water quality was then
01:04:31 --> 01:04:35: fit for reclaimed water purposes, which allows for toilet flushing
01:04:35 --> 01:04:36: and also irrigation.
01:04:36 --> 01:04:41: And that is kind of the same water quality that
01:04:41 --> 01:04:46: we put into our centralized recycled water program.
01:04:46 --> 01:04:49: And then the last part was something that we were
01:04:49 --> 01:04:54: trying to avoid discharging any water to the sanitary sewer,
01:04:54 --> 01:04:57: but we through kind of robust modeling, we realized that
01:04:58 --> 01:05:01: we'd be filling up our cisterns and we would still
01:05:01 --> 01:05:03: need that winter discharge.
01:05:03 --> 01:05:06: So we have a, a standard sanitary sewer kind of
01:05:06 --> 01:05:10: overflow, but how that gets conveyed to the the local
01:05:10 --> 01:05:14: wastewater treatment provider, it means we still had to pay
01:05:14 --> 01:05:18: our full system development charges and things like that just
01:05:18 --> 01:05:21: they even have that back up there.
01:05:21 --> 01:05:25: And then the last part, Colorado water law is fairly
01:05:25 --> 01:05:27: complex for rainwater capture.
01:05:27 --> 01:05:30: And as a water provider, it was easier for us
01:05:30 --> 01:05:33: than most to move our water rights around a little
01:05:33 --> 01:05:37: bit, figure out how much we'd be capturing off the
01:05:37 --> 01:05:39: rooftops and storing in the cisterns.
01:05:39 --> 01:05:42: But we had to file for an augmentation plan with
01:05:42 --> 01:05:46: the state water court to prove that we could measure
01:05:46 --> 01:05:49: how much we were capturing and then re release that
01:05:49 --> 01:05:52: water back into the S Platte River so that any
01:05:52 --> 01:05:56: downstream water right holders that or senior to us wouldn't
01:05:56 --> 01:05:59: be impacted by us capturing rainwater.

01:05:59 --> 01:06:02: So there have been very few places that have kind

01:06:02 --> 01:06:06: of gone through this large scale rainwater capture in Colorado.

01:06:06 --> 01:06:10: I think our campus and then the CSU Spur campus

01:06:10 --> 01:06:14: are the 2 examples that have really gone through that

01:06:14 --> 01:06:15: effort.

01:06:15 --> 01:06:19: And then through a different legislative Ave., there was a

01:06:19 --> 01:06:23: pilot program I think created in 2009 that allowed for

01:06:23 --> 01:06:27: up to 10 pilots and then Sterling Ranch was able

01:06:27 --> 01:06:31: to capture water under that, rainwater under that and then

01:06:31 --> 01:06:35: come back and file for their their water right at

01:06:35 --> 01:06:36: a later date.

01:06:38 --> 01:06:42: So this really gets into the treatment train of our

01:06:42 --> 01:06:46: Rufus system, starting with black water from all of our

01:06:46 --> 01:06:50: kitchens, toilets, any anything that would have gone to the

01:06:50 --> 01:06:54: sanitary sewer goes through a multi stage treatment unit.

01:06:54 --> 01:06:58: And this was purchased as a treatment unit that really

01:06:58 --> 01:07:02: does the heavy lifting of cleaning up that water.

01:07:02 --> 01:07:05: And then we pass it through stage one and two

01:07:05 --> 01:07:06: in our lobby.

01:07:06 --> 01:07:09: And those are designed as a tidal wetlands.

01:07:09 --> 01:07:11: I think, Kyle, you had a slide that kind of

01:07:11 --> 01:07:15: highlighted that from another another, I think San Francisco.

01:07:16 --> 01:07:17: San Francisco might use that as well.

01:07:18 --> 01:07:21: And then the outdoor is stage 3 and all of

01:07:21 --> 01:07:25: the kind of wetlands pieces are really just denitrifying the

01:07:25 --> 01:07:29: process, taking some of that organics out of the water

01:07:29 --> 01:07:34: goes through further filtration, ultraviolet light and then we add

01:07:34 --> 01:07:35: chemicals.

01:07:36 --> 01:07:38: And this is what it actually looks like in our

01:07:38 --> 01:07:39: lobby.

01:07:39 --> 01:07:43: And we commissioned this finally last year in 2024 and

01:07:43 --> 01:07:47: from I would say 2022 to 2024, there was several

01:07:47 --> 01:07:51: complaints about smell and that was all due to fans

01:07:51 --> 01:07:56: and how well they are operating in the bathrooms and

01:07:56 --> 01:07:59: had nothing to do with the Rufus system.

01:07:59 --> 01:08:03: Our level of complaints have actually gone down substantially since

01:08:03 --> 01:08:05: we've commissioned our Rufus system.

01:08:06 --> 01:08:08: So it really shows that kind of the education piece

01:08:08 --> 01:08:10: is so important with all of this.

01:08:11 --> 01:08:14: And then the last two slides, I work on the

01:08:14 --> 01:08:16: water efficiency side.
01:08:16 --> 01:08:20: Our reuse team wasn't able to to give the the
01:08:20 --> 01:08:22: portion of reuse today.
01:08:23 --> 01:08:27: I'm sorry, I didn't realize these come in like this.
01:08:27 --> 01:08:27: But yeah.
01:08:27 --> 01:08:31: So this was originally designed for five days per week,
01:08:31 --> 01:08:35: people in office, 5 days per week, COVID happens and
01:08:35 --> 01:08:38: we were only seeing people in here two to three
01:08:38 --> 01:08:42: days per week and substantially less water going through our
01:08:43 --> 01:08:44: roof of system.
01:08:44 --> 01:08:46: So that's led to some additional challenges.
01:08:46 --> 01:08:50: But at the same time, operationally, I think we can
01:08:50 --> 01:08:52: be flexible on this.
01:08:52 --> 01:08:55: And if we don't have as much water from the
01:08:55 --> 01:09:01: Blackwater treatment, from Blackwater treatment, we can actually move one
01:09:01 --> 01:09:05: of our cisterns back over to rainwater capture and kind
01:09:05 --> 01:09:07: of supplemented it that way.
01:09:08 --> 01:09:11: And then how we're thinking about this from a water
01:09:11 --> 01:09:15: efficiency standpoint, we run a program for water efficient system
01:09:15 --> 01:09:16: development.
01:09:17 --> 01:09:20: And what this allows developers to do is pay for
01:09:20 --> 01:09:23: the full system development charge or tap fee upfront and
01:09:23 --> 01:09:27: the developer will sign an agreement that outlines everything that
01:09:27 --> 01:09:29: we expect them to do.
01:09:29 --> 01:09:32: And at the time of them paying for their system
01:09:32 --> 01:09:35: development charge, we hold 20% of that back in escrow.
01:09:36 --> 01:09:40: And we know that through running several of these as
01:09:40 --> 01:09:43: a pilot that we see anywhere from about 25 to
01:09:44 --> 01:09:48: 30% savings of portable water use just through efficiency.
01:09:49 --> 01:09:51: And these are the things that they're expected to do.
01:09:51 --> 01:09:57: So highly efficient fixtures, install highly efficient appliances and make
01:09:57 --> 01:10:02: sure that they're landscapes are water wise and have smart
01:10:02 --> 01:10:03: irrigation controls.
01:10:04 --> 01:10:08: We also think that to encourage developers to take it
01:10:08 --> 01:10:12: one step further for decentralized systems, we can take this
01:10:12 --> 01:10:16: model and run another kind of pilot program until we
01:10:16 --> 01:10:19: have more data and actually start looking at how do
01:10:19 --> 01:10:23: developers think about this in the development process?
01:10:23 --> 01:10:25: What are their expected savings?

01:10:25 --> 01:10:28: And then can we reduce their system development charges by

01:10:28 --> 01:10:29: the same amount.

01:10:29 --> 01:10:33: So it's really helpful to have allies in your rates

01:10:33 --> 01:10:34: and budget department.

01:10:34 --> 01:10:38: And we've found that we're pretty flexible and are are

01:10:39 --> 01:10:44: ethic of charging the right system development charges is applicable

01:10:44 --> 01:10:48: not only to efficiency but also to water reuse.

01:10:48 --> 01:10:52: We just haven't seen many of those come in within

01:10:52 --> 01:10:55: realistic expectations.

01:10:55 --> 01:10:57: We have a lot of developers that say, would you

01:10:57 --> 01:10:59: pay for this entire system for us?

01:10:59 --> 01:11:02: We don't know that it will save us any operation

01:11:02 --> 01:11:02: money.

01:11:03 --> 01:11:06: And we have to step stand back and say this

01:11:06 --> 01:11:08: doesn't make sense for Denver Water to do.

01:11:08 --> 01:11:11: Other than continuing to to push the boundaries of Colorado

01:11:12 --> 01:11:12: water law.

01:11:13 --> 01:11:17: Are there are there other ways that we can incentivize

01:11:17 --> 01:11:20: these for a developer to make them palatable and either

01:11:20 --> 01:11:24: a localized system at a institutional or campus level or

01:11:24 --> 01:11:28: even into kind of a large neighborhood development scale?

01:11:28 --> 01:11:30: So those are things that we're looking forward to in

01:11:30 --> 01:11:31: the future.

01:11:31 --> 01:11:33: And that kind of concludes my portion.

01:11:33 --> 01:11:35: And I think we can open it up to to

01:11:35 --> 01:11:36: questions for everyone.

01:11:38 --> 01:11:38: Excellent.

01:11:38 --> 01:11:39: Thank you so much.

01:11:39 --> 01:11:40: Austin looks like Guy.

01:11:40 --> 01:11:43: You have your hand up and Austin, if you don't

01:11:43 --> 01:11:46: mind unsharing, then we can show everyone on the screen

01:11:46 --> 01:11:47: Guy.

01:11:47 --> 01:11:48: Thank you all.

01:11:48 --> 01:11:49: Yes, thank you all very much.

01:11:49 --> 01:11:52: Quick question, So I'm down in Austin, TX and this

01:11:52 --> 01:11:55: is something that obviously is very near and dear to

01:11:55 --> 01:11:56: us down here.

01:11:58 --> 01:12:00: Is there ever a?

01:12:00 --> 01:12:03: Problem with too much water in a reuse system and

01:12:03 --> 01:12:06: why why I'm bringing that up is if you know

01:12:06 --> 01:12:09: what the system we all were just talking about that
01:12:09 --> 01:12:12: they had to scale back because you did not have
01:12:12 --> 01:12:15: a much black water going through the system.
01:12:16 --> 01:12:16: Would it be?
01:12:16 --> 01:12:21: Beneficial to not use efficient appliances and fixtures so you
01:12:21 --> 01:12:25: have a lot of water pushing through the system so
01:12:25 --> 01:12:29: the reuse is cleaner, better, more water.
01:12:29 --> 01:12:30: Does that question make sense?
01:12:32 --> 01:12:35: It does for our specific system.
01:12:35 --> 01:12:37: How we've kind of handled that is we have to
01:12:38 --> 01:12:39: keep the microbes happy.
01:12:39 --> 01:12:44: And what we've seen is it took us a little
01:12:44 --> 01:12:47: bit longer to Commission it.
01:12:47 --> 01:12:50: And I think that wasn't based off of a total
01:12:50 --> 01:12:52: water flow volume.
01:12:52 --> 01:12:55: It was more all of the other matter that is
01:12:55 --> 01:12:57: in that water to keep those bugs happy.
01:12:57 --> 01:13:00: I'm curious what everybody else on the on the panel
01:13:01 --> 01:13:02: would say to that.
01:13:02 --> 01:13:06: But we were looking for more use and trying to
01:13:06 --> 01:13:12: load our system with more biological content to to really
01:13:12 --> 01:13:15: maximize the use of that system.
01:13:17 --> 01:13:17: OK.
01:13:17 --> 01:13:20: So just the fact of not needing low flow toilets
01:13:20 --> 01:13:22: or low flow fixtures, if he flipped it around and
01:13:22 --> 01:13:24: went back to how it was in the 70s and
01:13:24 --> 01:13:26: we just opened up the flood, we just opened up
01:13:27 --> 01:13:27: the floodgates.
01:13:28 --> 01:13:31: If we're going to have a system that's basically closed,
01:13:32 --> 01:13:35: would that end up just being more beneficial?
01:13:35 --> 01:13:36: Anyway, that's just my thought.
01:13:39 --> 01:13:40: Well, I'll just jump up.
01:13:40 --> 01:13:42: Does one of the other speakers want to talk?
01:13:43 --> 01:13:45: I'll, I'll just jump in real quickly.
01:13:45 --> 01:13:47: I mean it's, it's important that the, you know, the
01:13:47 --> 01:13:50: system be sized, you know appropriately so you get the
01:13:50 --> 01:13:51: appropriate flows.
01:13:52 --> 01:13:54: There is opportunity for some to add more in.
01:13:54 --> 01:13:56: I think 1 Bligh St.
01:13:56 --> 01:13:58: in Sydney, Australia is a really good example of that.
01:13:58 --> 01:14:00: They are a sewer mining project.
01:14:00 --> 01:14:03: So they actually bring in sewage from the main line

01:14:04 --> 01:14:05: and treat it on site.
01:14:05 --> 01:14:08: And so they do have extra reclaimed water that they
01:14:08 --> 01:14:11: can send out for additional irrigation needs and such like
01:14:11 --> 01:14:11: that.
01:14:12 --> 01:14:16: But I have not really dealt with a a scenario
01:14:16 --> 01:14:20: where there was, you know, too much water for a
01:14:20 --> 01:14:22: smaller size system.
01:14:22 --> 01:14:24: Maybe other panelists can can address that.
01:14:26 --> 01:14:28: There's certainly a variability, right?
01:14:28 --> 01:14:31: And one thing you can do about the variability is
01:14:31 --> 01:14:34: just equalization storage, all right, that that's going to be
01:14:34 --> 01:14:38: an important part of any particular small system, right, that
01:14:38 --> 01:14:40: is going to have more direct kind of response to
01:14:40 --> 01:14:43: that variability of supply and demand for sure.
01:14:44 --> 01:14:48: And then just in defense of water efficiency and conservation,
01:14:48 --> 01:14:50: usually that's your first step.
01:14:50 --> 01:14:53: If you have a low water scenario, you're going to
01:14:53 --> 01:14:55: do the cheaper, easier things first.
01:14:56 --> 01:14:59: So you're going to do the low flow fixtures and
01:14:59 --> 01:15:04: water efficient appliances first because they're so much cheaper, easier,
01:15:04 --> 01:15:07: quicker to do than a water reuse scenario.
01:15:07 --> 01:15:10: Water reuse is really expensive and hard to do.
01:15:10 --> 01:15:14: So just thinking about that in terms of water, I
01:15:14 --> 01:15:15: mean to that.
01:15:15 --> 01:15:18: Point I do understand that literally one of the things
01:15:18 --> 01:15:20: we're running into down here in central tech, we don't
01:15:20 --> 01:15:21: have enough water.
01:15:22 --> 01:15:25: We are trying to find ways to get potable water
01:15:25 --> 01:15:25: to people.
01:15:26 --> 01:15:29: Unfortunately, I mean, depending on which side of the world
01:15:29 --> 01:15:32: you're on, development is great, people are coming here.
01:15:32 --> 01:15:36: We're just having a hard time supplying customers whether it's
01:15:36 --> 01:15:38: residential or commercial with water.
01:15:39 --> 01:15:41: So I'm just looking at everything.
01:15:41 --> 01:15:42: So thank you all very much.
01:15:42 --> 01:15:44: This has been fantastic and.
01:15:45 --> 01:15:48: Also, Simon, I do think there is a conversation that
01:15:48 --> 01:15:52: further some type of tension between the efficiency and reuse
01:15:52 --> 01:15:55: and I definitely I don't think that has to be
01:15:55 --> 01:15:56: the case.

01:15:56 --> 01:15:59: And I think it's kind of as Kyler Austin or

01:15:59 --> 01:16:01: John short term memory.

01:16:01 --> 01:16:06: Clearly that's something we talked about rightsizing and really thinking

01:16:06 --> 01:16:09: about, you know, future productions and growth.

01:16:09 --> 01:16:10: So they can be very.

01:16:14 --> 01:16:17: Sort of an interesting thing that I've seen the last

01:16:17 --> 01:16:21: couple of years, almost going the opposite direction of that

01:16:21 --> 01:16:25: question is an interest in increasing flow to municipal wastewater

01:16:25 --> 01:16:25: plants.

01:16:26 --> 01:16:29: I talked about how New York City is interested in

01:16:29 --> 01:16:32: separating out the combined sewers, right, by at least taking

01:16:32 --> 01:16:34: some flow out of their combined sewers.

01:16:35 --> 01:16:37: It's actually a move afoot in some parts of the

01:16:38 --> 01:16:43: country, California in particular, to intentionally reconnect our sanitary sewers

01:16:43 --> 01:16:46: and our storm sewers with a a very controlled amount

01:16:46 --> 01:16:49: of storm sewer flow into the sanitary sewer to augment

01:16:49 --> 01:16:53: the amount of flow going to the wastewater plant, where

01:16:53 --> 01:16:57: that wastewater plant is serving as a source for recycled

01:16:57 --> 01:16:57: water.

01:16:58 --> 01:17:01: So we see flows going down over time as conservation

01:17:01 --> 01:17:03: goes higher and higher.

01:17:03 --> 01:17:07: And so flows in our wastewater collection systems are down

01:17:07 --> 01:17:09: and there's available capacity.

01:17:10 --> 01:17:11: Those are down at the wastewater plant.

01:17:11 --> 01:17:14: There's less water available for recycled water sources.

01:17:14 --> 01:17:18: And so some utilities are actively looking at or implementing

01:17:18 --> 01:17:21: reconnecting a portion of their storm system like the low

01:17:21 --> 01:17:23: flow kind of base flow into the sanitary for that

01:17:24 --> 01:17:25: purpose of augmenting flows.

01:17:26 --> 01:17:30: Really interesting, like conversant backwards from what many of us

01:17:30 --> 01:17:34: have done for careers trying to separate out a sanitary

01:17:34 --> 01:17:35: and storm sewers.

01:17:41 --> 01:17:41: Excellent.

01:17:41 --> 01:17:43: Any other questions for the speakers?

01:17:49 --> 01:17:50: Hey guys, this is Ryan.

01:17:50 --> 01:17:52: Cohen with LGI Homes in Denver.

01:17:52 --> 01:17:53: How's everybody doing?

01:17:56 --> 01:18:00: Hey, on the the side of this conversation where we're

01:18:00 --> 01:18:05: thinking about what everything costs, when we're talking

about a
01:18:05 --> 01:18:08: lot of this conversation, what we hear on our end
01:18:08 --> 01:18:10: is more impacts.
01:18:11 --> 01:18:14: And I'm wondering if you guys, you know, with Denver
01:18:14 --> 01:18:18: water or kind of farther upstream with the conversations you're
01:18:18 --> 01:18:21: having as, you know, experts in this field talking to
01:18:21 --> 01:18:24: municipalities and States and local governments.
01:18:24 --> 01:18:28: Is there talk about combining some of these systems into
01:18:28 --> 01:18:31: kind of something that can kind of roll into something
01:18:31 --> 01:18:34: that becomes more efficient cost wise on the back end,
01:18:34 --> 01:18:36: not only for us but for our customer and?
01:18:36 --> 01:18:37: Homeowner.
01:18:40 --> 01:18:42: I'll jump in just real, real quickly.
01:18:42 --> 01:18:46: So I'm consulting on a project down in Palm Springs,
01:18:46 --> 01:18:49: CA, which is actually where I live and not out
01:18:49 --> 01:18:52: here at the there at the moment, but we're considering
01:18:52 --> 01:18:55: a residential district scale system.
01:18:55 --> 01:18:58: So there are 45 small homes that are part to
01:18:58 --> 01:19:02: part of a small development and we are working on
01:19:02 --> 01:19:06: ways to essentially create just a localized little reclaimed water
01:19:06 --> 01:19:10: purple pipe district where we can reclaim the water right
01:19:11 --> 01:19:15: there and then also use for some basic irrigation needs.
01:19:15 --> 01:19:18: In California, we do have a non functional turf law
01:19:18 --> 01:19:20: that is coming into play.
01:19:20 --> 01:19:25: So there are some regional considerations related to vegetation, but
01:19:25 --> 01:19:29: it will, as it's currently sitting, we'll pencil out and
01:19:29 --> 01:19:32: reduce some long term water and energy costs.
01:19:33 --> 01:19:35: So from a district scale system that makes a lot
01:19:35 --> 01:19:37: of sense for a single family residential.
01:19:37 --> 01:19:40: And this is actually related to a, a comment I
01:19:40 --> 01:19:44: put in the chat about an architectural design competition for
01:19:45 --> 01:19:48: water and water reuse for residential applications.
01:19:49 --> 01:19:52: You know, there are systems like Hydra Loop out of
01:19:52 --> 01:19:56: Europe, the Netherlands, I believe that has a grey water
01:19:56 --> 01:19:59: kind of reuse system that is scalable for, you know,
01:19:59 --> 01:20:01: single family residential homes.
01:20:01 --> 01:20:04: But it's the cost and the energy cost is actually
01:20:04 --> 01:20:06: a little prohibitive at the moment, but there are ways
01:20:06 --> 01:20:09: that you can do it through like district scale.
01:20:10 --> 01:20:10: Yeah.

01:20:10 --> 01:20:13: My, my concern isn't so much about the long term

01:20:13 --> 01:20:16: costs, it's about the implications upfront that get passed on

01:20:17 --> 01:20:19: and you know, sticker price to the homeowner.

01:20:19 --> 01:20:22: You know, I think I speak for most of our

01:20:22 --> 01:20:25: customers when I say they wouldn't mind paying, you know,

01:20:25 --> 01:20:28: 5 to 10% more on a monthly utility payment basis

01:20:28 --> 01:20:31: if it meant that they're upfront, you know, home costs

01:20:31 --> 01:20:33: could be reduced up to 10 percent, 8%.

01:20:34 --> 01:20:37: So you know, that's kind of what's in our mind

01:20:37 --> 01:20:39: is not just savings over time.

01:20:39 --> 01:20:42: And obviously we're conservation minded, especially here in Denver where

01:20:42 --> 01:20:45: we're sitting on a non replenishing aquifer, right.

01:20:45 --> 01:20:48: But you know, in general, the more that we can

01:20:48 --> 01:20:52: work with the local entitlement agency that we're working through

01:20:52 --> 01:20:56: to get approved to, you know, have less of these

01:20:56 --> 01:20:59: costs owned by us, the developer or really in the

01:20:59 --> 01:21:03: end, the homeowners who are the newest to whatever town

01:21:03 --> 01:21:04: they're moving to.

01:21:04 --> 01:21:07: At the end of the day, you know, whatever you

01:21:07 --> 01:21:10: guys in your travels can do to represent kind of

01:21:10 --> 01:21:13: that thought process and not just to your point, talk

01:21:14 --> 01:21:18: about what's possible, but what what's economically feasible in real

01:21:18 --> 01:21:18: time.

01:21:20 --> 01:21:22: You know, that's just kind of where our head is

01:21:22 --> 01:21:25: at when we have these conversations internally.

01:21:27 --> 01:21:31: Yeah, Ryan, those are some really great and interesting plants.

01:21:31 --> 01:21:35: I think locally in Denver metro area and then kind

01:21:35 --> 01:21:39: of expanding out along the Front Range.

01:21:39 --> 01:21:42: So a lot of the water supplies that that we

01:21:42 --> 01:21:46: have here in Denver are surface water snowpack in the

01:21:46 --> 01:21:51: winter time turning into into spring runoff stored in reservoirs.

01:21:51 --> 01:21:54: And then as you move further down Douglas County South

01:21:55 --> 01:21:58: metro, we're that's where we're really seeing a lot more

01:21:58 --> 01:22:01: of the non replenishable groundwater use.

01:22:04 --> 01:22:09: Colorado Water Conservation Board has supported a few grey water

01:22:09 --> 01:22:13: grants and really looking into kind of that Hydra loop

01:22:13 --> 01:22:17: system or greater system off the shelf more of appliance

01:22:17 --> 01:22:21: water reuse at the single family residential.

01:22:21 --> 01:22:24: And then at a larger scale, Sterling Ranch was one
01:22:24 --> 01:22:28: of the the developments that has done kind of a
01:22:28 --> 01:22:33: more district scale rainwater capture recycled water for irrigation purposes.
01:22:34 --> 01:22:37: And I think they've been very successful in kind of
01:22:37 --> 01:22:39: making that math pen pen out.
01:22:39 --> 01:22:42: But I think the biggest portion of what we're seeing
01:22:42 --> 01:22:47: for water system development charges really ties back to when
01:22:47 --> 01:22:51: that community is buying the water rights and building the
01:22:51 --> 01:22:54: infrastructure to store those water rights.
01:22:54 --> 01:22:58: So here in Denver, you're really paying for things that
01:22:59 --> 01:23:01: we did 50 to 80 years ago.
01:23:01 --> 01:23:04: And and a lot of our increases in water rates
01:23:04 --> 01:23:08: are trying to kind of gradually increase year over year
01:23:08 --> 01:23:12: as opposed to and have slower increases in rates and
01:23:12 --> 01:23:16: system development charges compared to some of the other communities
01:23:17 --> 01:23:19: where you put off that as long as possible.
01:23:19 --> 01:23:23: And then you see a 15 or 20% right now
01:23:23 --> 01:23:29: we're seeing the water supply side about .05% of development
01:23:29 --> 01:23:30: costs.
01:23:31 --> 01:23:34: So you got to think about that as what is
01:23:34 --> 01:23:37: that that mean as in the full development package, all
01:23:37 --> 01:23:39: of the fees that you have to pay to to
01:23:39 --> 01:23:40: develop new lands.
01:23:42 --> 01:23:46: Denver is pretty low at the state level when when
01:23:46 --> 01:23:49: we look specifically at Colorado.
01:23:49 --> 01:23:53: And you certainly see a lot higher system development, wastewater
01:23:53 --> 01:23:58: development charges as you move into those rapidly growing communities
01:23:58 --> 01:24:01: like Aurora, Fort Collins and and kind of that Northern
01:24:01 --> 01:24:03: Front Range expansion.
01:24:06 --> 01:24:06: That makes sense.
01:24:06 --> 01:24:07: Thanks.
01:24:08 --> 01:24:11: May I jump in for a quick second here, Megan
01:24:11 --> 01:24:13: Thomas with Epic Cleantech.
01:24:13 --> 01:24:15: We're an on site water reuse provider.
01:24:16 --> 01:24:20: I just wanted to mention that the upfront costs are
01:24:20 --> 01:24:23: a big obstacle to lots of folks and that is
01:24:23 --> 01:24:28: why many on site reuse providers including ourselves offer creative

01:24:28 --> 01:24:29: financing solutions.

01:24:30 --> 01:24:33: So in addition to many of the incentives that have

01:24:33 --> 01:24:37: been mentioned, you know, grants reduction in connection fees, so

01:24:37 --> 01:24:41: on and so forth, there are also financing models that

01:24:41 --> 01:24:44: do push those costs to the back end to the

01:24:44 --> 01:24:45: OpEx side of things.

01:24:49 --> 01:24:50: Thank you, Megan.

01:24:53 --> 01:24:56: And if you want to put the Epic cleantech link

01:24:56 --> 01:24:58: in the chat box, maybe people would love that.

01:25:01 --> 01:25:02: Great.

01:25:02 --> 01:25:03: Any other questions for the speakers?

01:25:06 --> 01:25:08: No, I'm not seeing any.

01:25:08 --> 01:25:09: If you have any.

01:25:09 --> 01:25:12: We have a few follow up state opportunities from you

01:25:12 --> 01:25:14: and I and our partners.

01:25:14 --> 01:25:16: So I'm going to present those in a second.

01:25:16 --> 01:25:19: But I want to take a moment to thank our

01:25:19 --> 01:25:20: speakers so much.

01:25:20 --> 01:25:22: What what wonderful presentations.

01:25:22 --> 01:25:25: We really appreciate you giving your time to this meeting

01:25:25 --> 01:25:28: and hopefully you can stay on and maybe answer any

01:25:28 --> 01:25:31: other questions that come up in the in the chat

01:25:31 --> 01:25:31: box.

01:25:31 --> 01:25:32: Thank you guys.

01:25:34 --> 01:25:34: Sounds good.

01:25:34 --> 01:25:35: Thank you Let.

01:25:36 --> 01:25:38: Me, pull up my slides one second.

01:25:40 --> 01:25:42: All right, just a few announcements here.

01:25:43 --> 01:25:48: We were recently awarded a Colorado Water Plan grant to

01:25:48 --> 01:25:53: do a few new things beyond just the coalition.

01:25:53 --> 01:25:57: One of them it will be convening local round tables

01:25:57 --> 01:26:01: or focus groups between the public and private sectors on

01:26:01 --> 01:26:06: helping them navigate how to implement water wise, real estate

01:26:06 --> 01:26:08: and supportive policies.

01:26:08 --> 01:26:12: This is a really flexible opportunity for us to work

01:26:12 --> 01:26:16: with municipalities and to bring in experts of their choosing

01:26:16 --> 01:26:21: who volunteer their time to help advise the municipality.

01:26:21 --> 01:26:23: So if anyone is interested, please reach out to me

01:26:23 --> 01:26:25: my emails right here on the slide.

01:26:26 --> 01:26:28: Another thing that we're doing is we're going to be

01:26:28 --> 01:26:32: more closely documenting the business case for Water Wise land

01:26:32 --> 01:26:32: uses.

01:26:33 --> 01:26:35: Our Water Wise report does some of this, but we

01:26:35 --> 01:26:38: want to get it into even more greater detail showing

01:26:38 --> 01:26:42: the return on investment for Water Wise strategies, including water

01:26:42 --> 01:26:42: reuse.

01:26:42 --> 01:26:45: So if you know of case studies that really demonstrate

01:26:45 --> 01:26:48: that financial ROI, please let me know and we'd love

01:26:48 --> 01:26:51: to look into it further and hopefully include it.

01:26:53 --> 01:26:55: And I'm going to turn it over to Liesl from

01:26:55 --> 01:26:58: the Alliance for Water Efficiency for a few announcements.

01:27:00 --> 01:27:01: Thanks, Marianne.

01:27:01 --> 01:27:03: Hey everybody, it's Liesl with AWE.

01:27:04 --> 01:27:07: Just wanted to share a couple of things related to

01:27:07 --> 01:27:11: federal policy, which is ever changing and ever exciting to

01:27:11 --> 01:27:15: watch, but our team is closely monitoring things and just

01:27:15 --> 01:27:18: wanted to share a few updates with this audience.

01:27:18 --> 01:27:22: So we're working with lots of different folks to help

01:27:22 --> 01:27:27: submit partners and advocate for the production of both Watersense

01:27:27 --> 01:27:29: and the Energy Star programs.

01:27:30 --> 01:27:33: Energy Star seems to be slated for a major reduction

01:27:33 --> 01:27:35: in possible elimination and energy.

01:27:35 --> 01:27:39: The Star program includes some water related products, so like

01:27:39 --> 01:27:43: dishwashers and clothes washers for examples are regulated under Energy

01:27:43 --> 01:27:44: Star program.

01:27:45 --> 01:27:50: Watersense seems to be intact, although not necessarily like going

01:27:50 --> 01:27:54: to be expanded, but there is risk of their funding

01:27:55 --> 01:27:56: getting cut.

01:27:56 --> 01:27:58: So we are of course worried about this and working

01:27:58 --> 01:27:59: on it.

01:27:59 --> 01:28:01: So we have some opportunities to get involved here and

01:28:01 --> 01:28:03: there's a couple of hyperlinks in here.

01:28:03 --> 01:28:04: So let me share out slides.

01:28:04 --> 01:28:06: We'll have that available to you.

01:28:06 --> 01:28:08: And then if you go to the next slide, so

01:28:08 --> 01:28:12: if you want and get engaged, here's a couple of

01:28:12 --> 01:28:12: options.

01:28:12 --> 01:28:14: You can join a coalition with.
01:28:14 --> 01:28:16: We've got a sign on letter or one party for
01:28:16 --> 01:28:19: that if you want to continue to support grant funding
01:28:19 --> 01:28:22: for folks who are doing great work across programs through
01:28:22 --> 01:28:23: the Water Smart program.
01:28:25 --> 01:28:28: And then there's this ever perennial challenge of making sure
01:28:28 --> 01:28:31: that we want to get water conservation rebate.
01:28:31 --> 01:28:33: So like if you are a customer of a water
01:28:33 --> 01:28:36: utility and you complete a project and you get an
01:28:36 --> 01:28:38: incentive of a rebate right now that is considered taxable
01:28:38 --> 01:28:41: income whereas energy efficiency measures are not.
01:28:41 --> 01:28:43: So this has been, we've been beating the drum of
01:28:43 --> 01:28:45: this for many years and are always going to continue
01:28:46 --> 01:28:46: to work on it.
01:28:46 --> 01:28:48: So if you want to help support that, we can
01:28:49 --> 01:28:51: and you can reach out to Kelly whose e-mail is
01:28:51 --> 01:28:53: on there for really any of these items.
01:28:54 --> 01:28:57: And then our last slide is just pointing out and
01:28:57 --> 01:29:01: celebrating that our upcoming symposium is on the horizon in
01:29:01 --> 01:29:02: early August.
01:29:02 --> 01:29:06: So if you are interested and want to learn more,
01:29:06 --> 01:29:10: there's information there about it, but early bird ends here
01:29:10 --> 01:29:11: in a few days.
01:29:11 --> 01:29:13: So if you want to talk more about that, I'm
01:29:13 --> 01:29:16: happy to chat more about lots of information there and
01:29:16 --> 01:29:18: hope to see some of you there.
01:29:18 --> 01:29:18: Thanks, Marianne.
01:29:19 --> 01:29:20: Thank you so much, Lisa.
01:29:21 --> 01:29:23: And then I'm now going to turn it over to
01:29:23 --> 01:29:24: Meryl with the Snort Institute.
01:29:26 --> 01:29:28: Hi, I, I have an unstable Internet connection, so I'm
01:29:28 --> 01:29:30: just going to keep it to audio.
01:29:30 --> 01:29:30: Sorry about that.
01:29:31 --> 01:29:34: But Merrill Corbin here with the Sonoran Institute and a
01:29:34 --> 01:29:36: part of the Water Wise Coalition.
01:29:36 --> 01:29:39: And just wanted to share a few updates for our
01:29:39 --> 01:29:40: program.
01:29:40 --> 01:29:43: For those of you who are unfamiliar, Growing Water Smart
01:29:43 --> 01:29:46: is a training and assistance program that empowers local leaders
01:29:46 --> 01:29:50: to implement plans and policies that support community and Regional
01:29:50 --> 01:29:51: Water resilience.

01:29:51 --> 01:29:54: And you know, more and more we're actually seeing communities

01:29:54 --> 01:29:57: really think about water reuse more holistically.

01:29:57 --> 01:30:00: So excited to see some of the resources that were

01:30:00 --> 01:30:03: shared and excited to share those with communities throughout the

01:30:03 --> 01:30:06: Colorado River Basin who are really trying to do this

01:30:06 --> 01:30:07: work at the local level.

01:30:07 --> 01:30:09: So next.

01:30:09 --> 01:30:09: Slide.

01:30:11 --> 01:30:14: But I wanted to highlight our upcoming two-part webinar series.

01:30:14 --> 01:30:19: So we recently completed a report that analyzed the historical

01:30:19 --> 01:30:22: impacts of water transfer projects in Colorado.

01:30:22 --> 01:30:25: So with our partners at the Northwest Colorado Council of

01:30:26 --> 01:30:29: Governments and Northern Water, as well as the Colorado River

01:30:29 --> 01:30:33: District and Trout Unlimited, we created a report that really

01:30:33 --> 01:30:36: kind of goes into the the nuanced decision making around

01:30:36 --> 01:30:39: water supply planning and water transfer projects.

01:30:40 --> 01:30:43: And our first webinar is called From Pepper supplots.

01:30:43 --> 01:30:47: So really thinking about the transfer of water from agricultural

01:30:47 --> 01:30:47: to urban uses.

01:30:48 --> 01:30:50: And then that's in July, July 22nd.

01:30:50 --> 01:30:53: And then the second one is more focused on the

01:30:53 --> 01:30:56: bigger movement of water from one basin to another.

01:30:56 --> 01:30:58: And that will be in late September.

01:30:58 --> 01:31:00: So I hope you all will will join us.

01:31:01 --> 01:31:01: Thank you.

01:31:01 --> 01:31:04: Merrill, can you put a link to how to register

01:31:04 --> 01:31:06: for these in the chat box?

01:31:06 --> 01:31:07: You got it coming right up.

01:31:08 --> 01:31:08: Thanks.

01:31:09 --> 01:31:09: Appreciate it.

01:31:10 --> 01:31:11: All right.

01:31:11 --> 01:31:14: And then finally, we have some ideas for future meetings,

01:31:14 --> 01:31:17: but I'd love to hear from you guys about what

01:31:17 --> 01:31:20: you think would be most relevant to cover in our

01:31:20 --> 01:31:23: upcoming meetings and does the order make sense?

01:31:24 --> 01:31:27: Meryl had mentioned this agriculture development interface.

01:31:27 --> 01:31:30: We've heard that from other people as well, that that's

01:31:30 --> 01:31:31: an interesting topic.

01:31:31 --> 01:31:32: Do we want to move that up?
01:31:33 --> 01:31:35: Do we want to have a meeting on how the
01:31:35 --> 01:31:38: Colorado River Compact negotiations are going?
01:31:38 --> 01:31:42: And how that might influence land use decision making.
01:31:43 --> 01:31:46: Are people wanting to hear more about 1 water approaches
01:31:46 --> 01:31:48: or do you think that maybe we've heard enough about
01:31:48 --> 01:31:49: that?
01:31:49 --> 01:31:52: I'd love for you guys to just unmute and tell
01:31:52 --> 01:31:52: me.
01:31:52 --> 01:31:55: Tell me what you want so that we can meet
01:31:55 --> 01:31:57: your requests.
01:32:00 --> 01:32:05: Marianne, we will have a representative from the Colorado AG
01:32:05 --> 01:32:08: department on our call in in July.
01:32:08 --> 01:32:10: So just wanted to flag that.
01:32:10 --> 01:32:13: But it might actually be nice to have Robert in
01:32:13 --> 01:32:16: March or the the following year just spacing wise.
01:32:17 --> 01:32:19: OK, just so just keep this down here or yeah,
01:32:19 --> 01:32:21: I think it's a good spot.
01:32:21 --> 01:32:21: Yeah.
01:32:21 --> 01:32:22: OK, great.
01:32:22 --> 01:32:22: Yeah.
01:32:26 --> 01:32:27: Any other thoughts?
01:32:28 --> 01:32:29: Go ahead, Jorge.
01:32:31 --> 01:32:33: Hi, everyone and thank you for this webinar.
01:32:33 --> 01:32:37: I put on the the chat and invitation for our
01:32:37 --> 01:32:42: exchange on sports venues regarding water resiliency.
01:32:42 --> 01:32:45: The first one is going to be in person in
01:32:45 --> 01:32:49: Guadalajara, in Mexico at the Akron Stadium, and we're going
01:32:49 --> 01:32:52: to have webinars on August and October if anyone is
01:32:52 --> 01:32:54: interested in sharing their experience.
01:32:54 --> 01:32:56: About resiliency, it's very welcome.
01:32:56 --> 01:32:57: Thank you.
01:32:58 --> 01:32:58: Thank you.
01:32:58 --> 01:33:01: Jorge, do you have any like links that people could
01:33:01 --> 01:33:03: go to to register or do they have to e-mail
01:33:03 --> 01:33:03: you?
01:33:04 --> 01:33:06: I I put the e-mail in there.
01:33:06 --> 01:33:08: We don't have the links yet, but if they are
01:33:08 --> 01:33:10: interested I'm more than happy to share that.
01:33:11 --> 01:33:11: Excellent.
01:33:11 --> 01:33:14: And could you e-mail me once you do have links

01:33:14 --> 01:33:16: and then we can share them?

01:33:16 --> 01:33:17: OK, awesome.

01:33:18 --> 01:33:18: Thank you.

01:33:19 --> 01:33:19: Thank you.

01:33:20 --> 01:33:23: Any other thoughts on do people want to do 1

01:33:24 --> 01:33:26: water next or a different topic next?

01:33:30 --> 01:33:33: Hey, Rand, this is Jonathan with Epic Clean Tech out

01:33:33 --> 01:33:33: of Austin.

01:33:33 --> 01:33:37: And I'm just thinking like more of a regulatory where

01:33:37 --> 01:33:41: this momentum is going specifically with water reuse and major

01:33:41 --> 01:33:45: metros that it's now mandated if there's something that we

01:33:45 --> 01:33:45: can do.

01:33:45 --> 01:33:46: To talk about.

01:33:47 --> 01:33:52: The lessons learned and and where this might be going

01:33:52 --> 01:33:54: from an HJ and regulatory.

01:33:55 --> 01:33:58: Strategy state to state we we've.

01:33:58 --> 01:33:59: Seen this done at the federal level.

01:34:00 --> 01:34:03: Where this has been hosted and maybe with Uli, it

01:34:03 --> 01:34:06: might be a, a, a really distinct opportunity to tie

01:34:06 --> 01:34:10: this narrative across the states of what is happening in

01:34:10 --> 01:34:14: location X, you know, San Francisco, what might be happening

01:34:14 --> 01:34:18: in Honolulu in the future versus Florida and the intricacies

01:34:18 --> 01:34:18: of that.

01:34:19 --> 01:34:22: I'd love to see maybe more of a drill down

01:34:23 --> 01:34:24: and we we would help.

01:34:24 --> 01:34:24: We.

01:34:25 --> 01:34:29: Would definitely support that or, or provide some resources in

01:34:29 --> 01:34:32: that direction of where this momentum is happening both on

01:34:33 --> 01:34:37: a regulatory and financial level, because it is really important.

01:34:37 --> 01:34:40: So it, it, it incorporates the one water, but maybe

01:34:40 --> 01:34:44: it gets more into more into that, like regulatory.

01:34:44 --> 01:34:45: This is what's happening.

01:34:45 --> 01:34:48: These are the, this is what's happening on the ground

01:34:48 --> 01:34:51: level and to the questions that were asked today, like,

01:34:51 --> 01:34:54: you know, from efficiency, the like fixtures to what the

01:34:54 --> 01:34:58: ROI looks like from a developer, what's happening from a

01:34:58 --> 01:35:01: grant and rebate strategy, all these complexities across the United

01:35:02 --> 01:35:05: States and the thousands of water municipalities might be something

01:35:05 --> 01:35:08: to put on, you know, maybe, you know, later this
01:35:08 --> 01:35:08: year.
01:35:08 --> 01:35:10: It ended like mid 2020.
01:35:10 --> 01:35:11: 6.
01:35:11 --> 01:35:14: Because there's a lot of enthusiasm involved.
01:35:14 --> 01:35:15: With this right now.
01:35:15 --> 01:35:15: OK.
01:35:15 --> 01:35:16: That's good to hear.
01:35:17 --> 01:35:20: And I know the EPA was tracking those regulations across
01:35:20 --> 01:35:23: the country, but I don't know if they're still doing
01:35:23 --> 01:35:23: that.
01:35:23 --> 01:35:29: Liesl, do you know if they if there's where they
01:35:29 --> 01:35:34: are on that, if Liesl is still here, might have
01:35:34 --> 01:35:36: lost her?
01:35:36 --> 01:35:39: That's an interesting point, Jonathan.
01:35:39 --> 01:35:41: And maybe I'll follow up with you directly about that
01:35:41 --> 01:35:43: and maybe we can incorporate some of that into the
01:35:43 --> 01:35:44: one water discussion.
01:35:45 --> 01:35:45: Does that make sense?
01:35:49 --> 01:35:49: Yeah.
01:35:49 --> 01:35:51: Thanks for thank you.
01:35:51 --> 01:35:53: Any other comments or questions?
01:35:54 --> 01:35:55: Preferences.
01:35:58 --> 01:36:02: 11 idea that I'm not seeing on here maybe an
01:36:02 --> 01:36:07: update on all the non functional turf type legislation that's
01:36:07 --> 01:36:10: out there and updates on what's going on in in
01:36:10 --> 01:36:11: that realm.
01:36:12 --> 01:36:15: I think Nevada is still kind of leading on that
01:36:15 --> 01:36:18: California's got some great stuff.
01:36:18 --> 01:36:20: We have a lot of great stuff here in Colorado
01:36:20 --> 01:36:23: just so maybe some information sharing around that topic would
01:36:23 --> 01:36:24: be interesting as well.
01:36:24 --> 01:36:24: It's.
01:36:25 --> 01:36:27: Like there's a lot of interest in like, what's going
01:36:27 --> 01:36:28: on with policies.
01:36:30 --> 01:36:30: Yeah.
01:36:30 --> 01:36:34: Maybe that's the next topic of like, where are we?
01:36:34 --> 01:36:39: Because it's so fragmented, it's hard to track really.
01:36:40 --> 01:36:47: And yeah, so, OK, I'll noted any other comments, questions.
01:36:50 --> 01:36:54: All right, thank you all so much for joining us
01:36:54 --> 01:36:54: today.

01:36:54 --> 01:36:57: I'm going to be following up with many links and
01:36:57 --> 01:36:59: feel free to reach out anytime if I can help
01:36:59 --> 01:37:00: with anything.
01:37:01 --> 01:37:03: But we love that you guys were all here.
01:37:03 --> 01:37:05: And a huge thank you to our speakers for excellent
01:37:05 --> 01:37:06: presentations today.
01:37:06 --> 01:37:07: Thank you guys.
01:37:08 --> 01:37:09: Thank you very much.
01:37:14 --> 01:37:14: Bye.
