

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

00:01:35 --> 00:01:38: 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

00:01:44 --> 00:01:47: 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

00:01:54 --> 00:01:58: 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,

00:02:04 --> 00:02:09: cultivating

00:02:04 --> 00:02:09: champions for resilience, and supporting communities

00:02:04 --> 00:02:09: 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

00:04:29 --> 00:04:31: 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

00:04:43 --> 00:04:46: 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

00:07:39 --> 00:07:44: of us were interested in from interested in addressing strategies

00:07:44 --> 00:07:49: to address water scarcity, but also small vessel from regions

00:07:49 --> 00:07:52: that 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

00:08:13 --> 00:08:15: concept 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

00:09:40 --> 00:09:44: possible maybe

00:09:44 --> 00:09:48: for your community constructed wetlands or reuse can bring

00:09:48 --> 00:09:51: a

00:09:52 --> 00:09:57: lot to the spaces that people live or learn and

00:09:57 --> 00:10:03: play in that would not be possible otherwise.

00:10:03 --> 00:10:06: And then when we talked about reuse this picture, there

00:10:06 --> 00:10:08: are three different types of reuse that we're looking at.

00:10:08 --> 00:10:12: And so there's non quotable reuse and direct.

00:10:12 --> 00:10:16: And then of course direct this actually you'll see the

00:10:16 --> 00:10:19: question at the end because I did this slide really

00:10:19 --> 00:10:21: focused more on Colorado as we don't have our first

00:10:21 --> 00:10:29: permitted DPR project yet.

00:10:29 --> 00:10:32: Typically non quotable reuse, we see things more like

00:10:32 --> 00:10:33: agriculture,

00:10:33 --> 00:10:38: outdoor irrigation, toilet flushing.

00:10:38 --> 00:10:44: And then indirect portable reuse is often associated more

00:10:44 --> 00:10:48: with

00:10:48 --> 00:10:51: aquifer recharge augmenting our drinking water supplies

00:10:51 --> 00:10:54: 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

00:20:55 --> 00:20:56: opportunities

00:20:56 --> 00:20:59: and approaches.

00:20:59 --> 00:21:00: So let's talk about it building a little bit on

00:21:01 --> 00:21:04: what Shannon shared.

00:21:04 --> 00:21:06: Drivers for water reuse really vary depending on where

00:21:07 --> 00:21:11: you're at, but they're also varying over time.

00:21:11 --> 00:21:15: And so historically, we've seen, particularly in the Western

00:21:15 --> 00:21:19: United States, big drivers typically for water reuse have been

00:21:19 --> 00:21:22: drought,

00:21:22 --> 00:21:26: water scarcity, water supply in many cases coupled with

00:21:26 --> 00:21:28: population

00:21:28 --> 00:21:31: growth, putting stresses on our water resources.

00:21:31 --> 00:21:35: Similarly, groundwater depletion, same kind of thing, they're

00:21:35 --> 00:21:40: stressing our

00:21:40 --> 00:21:41: our water and so looking for more supply.

00:21:41 --> 00:21:45: However, there are others out there too.

00:21:45 --> 00:21:49: Seawater intrusion is 1 and creating a seawater intrusion

00:21:49 --> 00:21:52: barrier

00:21:52 --> 00:21:55: through indirect portable reuse that Shannon defined for US

00:21:55 --> 00:21:59: wastewater

00:21:59 --> 00:22:03: discharge avoidance.

00:22:03 --> 00:22:07: Corporate sustainability goals certainly a growing thing as

00:22:07 --> 00:22:11: well, part

00:22:11 --> 00:22:15: of the marketing and and sustainability efforts that a lot

00:22:15 --> 00:22:19: of industries are looking to do and also reducing sewer

00:22:19 --> 00:22:23: 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 reuse.

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 reuse.

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

00:28:10 --> 00:28:13: purple pipe,

00:28:13 --> 00:28:15: which is a way of of indicating an industry standard

00:28:15 --> 00:28:17: for indicating that it's non portable water.

00:28:17 --> 00:28:18: It's not portable water shouldn't be cross connected with the

00:28:18 --> 00:28:20: portable water.

00:28:20 --> 00:28:23: There's centralized reuse systems.

00:28:23 --> 00:28:25: There's decentralized non portable reuse here in Colorado.

00:28:25 --> 00:28:26: 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

00:28:35 --> 00:28:37: decentralized

00:28:37 --> 00:28:40: non non portable reuse.

00:28:40 --> 00:28:44: And that was really driven in large part by facilitating

00:28:44 --> 00:28:45: Denver Water's in building system that you'll hear about more

00:28:45 --> 00:28:46: in a little bit from Austin.

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

00:28:49 --> 00:28:50: recycled

00:28:50 --> 00:28:54: water.

00:28:54 --> 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 regs are or even if there are regs

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, Giardia, 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 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

00:41:46 --> 00:41:49: centralized treatment,

00:41:49 --> 00:41:51: a blend of this, you know, boost reliability and resiliency

00:41:51 --> 00:41:54: within water stress environments.

00:41:54 --> 00:41:58: And then again, you know, talking about it with occupants.

00:41:58 --> 00:42:01: All water is already recycled water.

00:42:01 --> 00:42:05: It has a really, you know, there's a real meaningful

00:42:05 --> 00:42:08: opportunity to have those conversations and that, you know,

00:42:08 --> 00:42:10: the,

00:42:10 --> 00:42:11: you know, reuse will save energy and water and associated

00:42:11 --> 00:42:13: costs depending upon that bottom line.

00:42:13 --> 00:42:16: But that's the math you need to do contributing to

00:42:16 --> 00:42:18: 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

00:42:29 --> 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

00:43:15 --> 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

00:46:45 --> 00:46:46: particular

00:46:46 --> 00:46:50: project.

00:46:46 --> 00:46:50: So again, open and honest communication with the

00:46:50 --> 00:46:54: developers, with

00:46:54 --> 00:46:58: the utility and the regulatory environment to better

00:46:58 --> 00:47:02: understand where

00:47:02 --> 00:47:05: is the maximal opportunity for reuse within a project or

00:47:05 --> 00:47:09: like a district scale project development incentives.

00:47:09 --> 00:47:10: So there Chicago has a green permit program.

00:47:10 --> 00:47:10: Cincinnati offers financial grants and low interest loans for

00:47:10 --> 00:47:10: innovative

00:47:10 --> 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
[**email protected**] 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

00:50:09 --> 00:50:13: pipe

00:50:13 --> 00:50:18: recycled water program and then focus in on our campus

00:50:18 --> 00:50:21: and our decentralized and especially Rufus portion of that.

00:50:21 --> 00:50:25: And then lastly, I'll jump into some incentives that we've

00:50:25 --> 00:50:27: already developed that encourage efficient water use and

00:50:28 --> 00:50:29: how those

00:50:29 --> 00:50:31: can hopefully be expanded in the the future for more

00:50:31 --> 00:50:33: decentralized water use.

00:50:33 --> 00:50:37: But a little bit about Denver water.

00:50:37 --> 00:50:39: We are established all the way back in 1918.

00:50:39 --> 00:50:42: We're governed by a board of water commissioners and

00:50:42 --> 00:50:43: we're

00:50:43 --> 00:50:48: carved out by the City and County of Denver charter.

00:50:48 --> 00:50:48: But we are a public agency that is separate from

00:50:48 --> 00:50:48: the City and County of Denver.

00:50:48 --> 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

00:54:05 --> 00:54:06: 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

00:54:46 --> 00:54:50: 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

00:55:28 --> 00:55:30: as

00:55:30 --> 00:55:33: one system in Denver.

00:55:33 --> 00:55:36: Since we are the water supplier, we are different from

00:55:36 --> 00:55:39: the water treatment and also the stormwater management

00:55:39 --> 00:55:43: piece.

00:55:43 --> 00:55:47: But this plan has really done a great job of

00:55:47 --> 00:55:50: breaking down some of those barriers so that we're talking

00:55:50 --> 00:55:54: to each other, making sure that projects are meeting mutual

00:55:54 --> 00:55:59: benefits when we look at reuse or one water developments.

00:55:59 --> 00:56:04: And then in 2024, years after our our campus was

00:56:04 --> 00:56:07: fully built, we finally commissioned our Rufus or reuse for

00:56:07 --> 00:56:12: us centralized or decentralized on site water treatment

00:56:12 --> 00:56:14: facility.

00:56:14 --> 00:56:16: And we are now kind of reaping the benefits of

00:56:16 --> 00:56:21: that and using that and expanding the conversation of what

00:56:21 --> 00:56:25: reuse can look like at a campus level.

00:56:25 --> 00:56:31: So within our distribution area, you can kind of see

00:56:31 --> 00:56:32: in the upper left of the the graphic, this little

00:56:32 --> 00:56:36: box highlights our recycled water customers and our purple

00:56:36 --> 00:56:40: pipe

00:56:40 --> 00:56:42: system.

00:56:42 --> 00:56:44: And right now the primary uses are the seasonal uses,

00:56:44 --> 00:56:48: so industrial cooling, irrigation and things like that.

00:56:48 --> 00:56:49: There's a couple distinctions in there.

00:56:49 --> 00:56:55: We serve both raw and recycled water.

00:56:55 --> 00:56:59: It both of those come from our recycled water treatment

00:56:59 --> 00:57:04: facility.

00:57:04 --> 00:57:05: The difference is some of them are conveyed through

00:57:05 --> 00:57:09: ditches,

00:57:09 --> 00:57:10: so all the chlorine is removed and the rest is

00:57:10 --> 00:57:14: served through irrigation or connection points to our purple

00:57:14 --> 00:57:15: pipe

00:57:15 --> 00:57:19: system.

00:57:19 --> 00:57:20: 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,

00:57:29 --> 00:57:30: 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

00:57:49 --> 00:57:52: 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

00:58:05 --> 00:58:06: 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

00:58:24 --> 00:58:27: 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
01:01:09 --> 01:01:11: 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
01:01:18 --> 01:01:19: 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
01:01:30 --> 01:01:35: 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 way on the left side of this diagram and then the employee parking lot and that helps feed our cisterns for irrigation.

And then when we look at it from a, a regulatory kind of obstacles that we encountered, 1st we started with the the Gray water regulation 86.

We realized that we wouldn't be able to meet our demands off of that.

So we proposed the on site wastewater treatment system and that was a whole other set of regulations in Colorado and that really incorporates the Rufus system and the water quality that goes into the cisterns.

And we made sure that that water quality was then fit for reclaimed water purposes, which allows for toilet flushing and also irrigation.

And that is kind of the same water quality that we put into our centralized recycled water program.

And then the last part was something that we were trying to avoid discharging any water to the sanitary sewer, but we through kind of robust modeling, we realized that we'd be filling up our cisterns and we would still need that winter discharge.

So we have a, a standard sanitary sewer kind of overflow, but how that gets conveyed to the the local wastewater treatment provider, it means we still had to pay our full system development charges and things like that just they even have that back up there.

And then the last part, Colorado water law is fairly complex for rainwater capture.

And as a water provider, it was easier for us than most to move our water rights around a little bit, figure out how much we'd be capturing off the rooftops and storing in the cisterns.

But we had to file for an augmentation plan with the state water court to prove that we could measure how much we were capturing and then re release that water back into the S Platte River so that any downstream water right holders that or senior to us wouldn't 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

01:15:04 --> 01:15:07: cheaper, easier,

01:15:07 --> 01:15:10: quicker to do than a water reuse scenario.

01:15:10 --> 01:15:14: Water reuse is really expensive and hard to do.

01:15:14 --> 01:15:15: So just thinking about that in terms of water, I

01:15:15 --> 01:15:18: mean to that.

01:15:18 --> 01:15:20: Point I do understand that literally one of the things

01:15:20 --> 01:15:21: we're running into down here in central tech, we don't

01:15:21 --> 01:15:25: 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

01:15:36 --> 01:15:38: it's

01:15:39 --> 01:15:41: residential or commercial with water.

01:15:41 --> 01:15:42: So I'm just looking at everything.

01:15:42 --> 01:15:44: So thank you all very much.

01:15:44 --> 01:15:48: This has been fantastic and.

01:15:45 --> 01:15:52: 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

01:15:52 --> 01:15:55: 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

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

01:20:42 --> 01:20:45: Denver where

01:20:45 --> 01:20:48: we're sitting on a non replenishing aquifer, right.

01:20:48 --> 01:20:52: But you know, in general, the more that we can

01:20:52 --> 01:20:56: work with the local entitlement agency that we're working

01:20:56 --> 01:20:59: through

01:20:59 --> 01:21:03: to get approved to, you know, have less of these

01:21:03 --> 01:21:04: costs owned by us, the developer or really in the

01:21:04 --> 01:21:07: end, the homeowners who are the newest to whatever town

01:21:07 --> 01:21:10: they're moving to.

01:21:10 --> 01:21:13: At the end of the day, you know, whatever you

01:21:13 --> 01:21:14: guys in your travels can do to represent kind of

01:21:14 --> 01:21:18: that thought process and not just to your point, talk

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

01:21:18 --> 01:21:20: in real

01:21:20 --> 01:21:22: time.

01:21:22 --> 01:21:25: You know, that's just kind of where our head is

01:21:25 --> 01:21:27: at when we have these conversations internally.

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

01:21:31 --> 01:21:35: plants.

01:21:35 --> 01:21:39: I think locally in Denver metro area and then kind

01:21:39 --> 01:21:42: of expanding out along the Front Range.

01:21:42 --> 01:21:46: So a lot of the water supplies that that we

01:21:46 --> 01:21:51: have here in Denver are surface water snowpack in the

01:21:51 --> 01:21:54: winter time turning into into spring runoff stored in reservoirs.

01:21:54 --> 01:21:58: And then as you move further down Douglas County South

01:21:58 --> 01:22:01: metro, we're that's where we're really seeing a lot more

01:22:01 --> 01:22:04: of the non replenishable groundwater use.

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

01:22:09 --> 01:22:13: grey water

01:22:13 --> 01:22:17: grants and really looking into kind of that Hydra loop

01:22:17 --> 01:22:21: system or greater system off the shelf more of appliance

01:22:21 --> 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

01:29:46 --> 01:29:50: leaders

01:29:46 --> 01:29:50: to implement plans and policies that support community and

01:29:46 --> 01:29:50: 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
01:36:23 --> 01:36:24: 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.

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