ORIGINAL

ARKANSAS RIVER COMPACT ADMINISTRATION

COMPACT YEAR 2020

ANNUAL MEETING

December 9, 2020

HELD AT

VARIOUS REMOTE LOCATIONS

BEGINNING AT 9:11 a.m. MOUNTAIN STANDARD TIME

James J. Bizzotto
12/8/22

Reported By:

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APPEARANCES (Appearing Remotely)

CHAIRMAN:

Jim Rizzuto

COLORADO:

Rebecca Mitchell

Lane Malone

Scott Brazil

KANSAS:

Earl Lewis

Randy Hayzlett

Troy Dumler

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P R O C E E D I N G S

MR. RIZZUTO: Okay. Call the Arkansas River Compact Administration 2020 Annual Meeting to order at 9:11 a.m. Mountain Standard Time, December 9th, 2020, and as mentioned before we started, I'll allow for about a 10-minute break every hour at a logical breaking point. Again, reiterate, when you speak, introduce yourself and turn on your video. The attendance for this meeting, beings it's virtual, will be compiled by staff and will become Exhibit A to today's meeting.

I'd like to start with allowing the commission members to introduce themselves and any staff that they would like to introduce that are in attendance. I'll start with the Vice-Chair and the Kansas delegation, Randy.

MR. HAYZLETT: Thank you. Randy Hayzlett from Lakin, representative for Kansas, and I'll hand it off to Earl from here.

MR. RIZZUTO: Okay.

MR. LEWIS: Thank you, Randy. Thank you, Mr. Chairman. Earl Lewis. I'm the new Chief Engineer in the State of Kansas and a representative on the Compact for the State of Kansas. I'll let Troy introduce himself and then come back and

introduce the rest of our team, if that's okay.

MR. RIZZUTO: Great.

MR. DUMLER: I'm Troy Dumler from Garden City. I was appointed in -- [audio disruption] -- representative.

MR. RIZZUTO: You're breaking up a little, Troy. Okay.

MR. DUMLER: Do you want me to go through that again?

MR. RIZZUTO: Yeah, go ahead.

MR. DUMLER: Troy Dumler, representative from Kansas in Garden City, and I was appointed at the end of 2018.

MR. RIZZUTO: Okay. Earl, do you want to introduce your staff?

MR. LEWIS: Yeah, absolutely. Thank you for that opportunity. It looks like we got a pretty good representation of our staff on today. Chris Beightel, who's our chief of water management; Lane Letourneau, who's the chief of appropriations for the State of Kansas; Kenny Titus, the chief legal counsel for the Department of Agriculture; and then David Engelhaupt, who is also in the Manhattan office. All those folks work -- work out of Manhattan. From our Garden City office, we've

already heard and seen Kevin Salter is on today, Rachel Duran, and Alex Torrance. Also with us today is Kurtis Wiard with the Kansas Attorney General's office; Tom Stiles, who is the chief of Bureau of Water for the Department of Health and Environment; and then Keadron Pearson, who is with the Kansas Water Office. That's all the folks from Kansas that I saw on the participant list. If there's somebody else I missed, I apologize, and please chime in.

MR. RIZZUTO: Okay. Thank you, Earl. Okay. Colorado, start with Rebecca.

MS. MITCHELL: I'm Rebecca Mitchell, Colorado's representative, and also the Director of the Colorado Water Conservation Board. I will follow Kansas's lead and introduce some of the staff after the other members.

MR. RIZZUTO: Okay.

MR. MALONE: Lane Malone from Holly, Colorado rep.

MR. RIZZUTO: Okay.

MR. BRAZIL: Scott Brazil, Colorado rep.

MR. RIZZUTO: Back to you, Rebecca.

MS. MITCHELL: Thank you. So I -- I may miss one or two people, but I -- we do have Kevin Rein, who has been instrumental on our work here;

Kelley Thompson; Dan Steuer; Andrew Rickert; Bill Tyner; Rachel Zancanella, John Van Oort. Am I missing any Colorado staff?

MS. ZANCANELLA: Joe Regur and Bethany Arnold.

MS. MITCHELL: Thank you.

MS. KNUDSON: Julie Knudson, Purgatoire Watershed Partnership.

MS. MITCHELL: Perfect. I can't go through the whole list while I'm speaking but so I wanted to thank everybody -- I wanted to make sure to recognize them, not only for being here today, but their work that goes up to this point. I think Kansas would fully echo me that the majority of the work happens not today, but prior to that, and so all of those people have been instrumental in that.

MR. LEWIS: Absolutely, Becky, I would echo your comments there, that the staff does the majority of the work. We're glad to have staff from both sides of the line working on this.

MR. RIZZUTO: Thank you. One thing to mention, when it comes time to vote on different issues, a motion and second will be made and then each State will vote. It would be good maybe, for the court reporter's benefit, if one person be

designated, say Randy on the Kansas side and Rebecca on the Colorado side, to make the motions. That way, she doesn't have to try and guess who, in fact, is doing it.

So if that's okay, we will move on, and the first item on the agenda is actually reviewing if there are any revisions to today's agenda. Okay. Hearing none, we'll adopt the agenda and it will become Exhibit B.

Next, report of the Chair and Vice-Chair. Randy, I'll start with you.

MR. HAYZLETT: Thanks, Jim. I don't have a lot to report. I just kind of wanted to, like Becky said, I want to thank the staff and everybody that's worked hard to make this virtual meeting work. Any meeting you go to that's virtual may have some glitches, but it's getting off to a good start. I think it will be good. It's been a crazy year and I hope that everybody is well and that 2021 will be better and we can meet in person. That's all I have, Jim.

MR. RIZZUTO: Okay. And I, too, you know, having gone through some of the tests and the like with the staff, kudos. I've been involved over the years in a number of virtual conferences and you

are truly professional in how you've put this together, so thanks to all of you and hopefully we'll get through the agenda, and I echo Randy's comments. Next year, I look forward to seeing everyone in person, in Kansas, I believe. Okay.

Next, reports of federal agencies. I'll call on the U.S. Geological Survey. Again, identify yourself and make sure your video and speaker is on.

MR. KIMBROUGH: Very good. Good morning, Mr. Chair, members of the Administration. Bob Kimbrough with USGS. How's my audio coming through?

MR. RIZZUTO: Good.

MR. KIMBROUGH: All right. I'm going to share my screen, and let me know, please, if you can see my Power Point, the picture of the USGS gage on the Purgatoire River.

MR. RIZZUTO: Yes, I can see it.

MR. KIMBROUGH: Very good. Alrighty. Well, I'll get started then. I just want to spend a few minutes reviewing streamflow conditions in the Arkansas River Basin for Water Year 2020. This information was collected by USGS in cooperation with the Arkansas River Compact Administration, and I'm on the second slide. Are they advancing for you?

MR. RIZZUTO: Yes.

MR. KIMBROUGH: Very good. All right. I think many of you are aware USGS and ARCA have a long-standing cooperative program for USGS to collect hydrologic data for reach of the Arkansas River that extends from Fowler, Colorado to Coolidge, Kansas, about a hundred -- about a 100-mile reach and, in this reach, we operate 10 continuous recording streamgages.

Five of those gages are on the mainstem Arkansas. They're labeled here in yellow. We have one above John Martin Reservoir at Las Animas, and then four downstream of the reservoir, at Lamar, near Granada, and near Coolidge, Kansas.

We also have streamgages on four tributaries to the Arkansas: The Apishapa, Purgatoire River, Big Sandy Creek, and Wild Horse Creek, and then we also have the streamgage on the Frontier Ditch near Coolidge.

We did have a couple changes in 2020 that were approved by the Administration just a year ago at the Annual Meeting. One was the discontinuing the crest-stage gage on Big Sandy Creek near Kornman, shown here in purple, and then also, ARCA is now contributing funding to help support a water quality

monitor below John Martin Reservoir. This particular monitor provides a continuous record of water temperature and specific conductance, and we have continuous record back to 1989. It's a really valuable dataset for water quality below the reservoir, and we really appreciate ARCA stepping up and help with continuing to fund that gage.

All right. My next six slides, I want to run through streamflow -- summary streamflow conditions for Water Year 2020 at select sites. Water Year 2020 begins October 1, 2019, and runs through this past September, 2020. So I'll show hydrographs for two sites upstream of John Martin Reservoir and then four main stem sites downstream of the reservoir.

Beginning with the Arkansas River at Las Animas, total runoff or total flow for the Water Year was about 106,000 Acre Feet and only 56% of average. There's a graph at the bottom of the slide here showing 7-day average streamflow in cubic feet per second, so that black solid line is a running 7-day average of streamflow for Water Year 2020, running from October 19 through September, 2020, and the units for streamflow cubic feet per second are on the vertical axis and they range from 10 to 20,000 CFS and you'll note that's a log scale. The

7-day average flow is plotted against the distribution of historical flows for the period of record at this site, and flows that have fallen in the past between the 25th and 75th percentile are considered to be the normal range by USGS, and that's the green band. Flows that have occurred in the upper quartile are considered to be above average, and they're shown in the blue colors, and then flows that have occurred in the past in the lower 25 percentile are considered below normal, shown with the oranges and reds.

You can see for this site, flows were generally in the normal range, except for periods of being below normal, beginning the Water Year in October, slightly below normal, jumping up into the above normal range in February and March and again in April, and then at the tail end of the Water Year, mid-August, you can see flows really dropping down into that below normal range and even into the red, the -- that lower 10 percentile, a much below normal.

All right. Similar information for the Purgatoire River near Las Animas. Total flow is about 8,000 Acre Feet for the year, only 18% of average, and in fact, this is the lowest total

annual runoff in this station's 43-year record. You look at the hydrograph, it's evident of the low flows. Most of the year flows were in that below normal range, except for some brief periods in June and July and very early August, when flows jumped up into the normal range for brief periods. You can see, if you look at the end of September, if you look closely at those last few days, it appears we set some new record 7-day average low flows for this time of year.

Now I'll run through some data for the four mainstem sites downstream of the reservoir, beginning with right below John Martin, flows were about 160,000 Acre Feet, 77% of average. Looking at the graph, you can see flows for the winter were kept at about 1 CFS before increasing to a peak of about a thousand CFS, occurring in June, and then again, we see the tail-off beginning in July and continuing through August below normal flows, before rebounding slightly into the normal range in September.

Arkansas River at Lamar, total flow for the Water Year, 64,000 Acre Feet, 79% of average. Looking at the hydrograph, you can see flows generally in the normal range, brief periods of

above normal or, actually, extended periods above normal in the winter months, and just a couple of instances where we dip down into the below normal range, end of May, early June, and briefly in August.

Arkansas River near Granada, total flow for the year, 66,000 Acre Feet, 57% of average. See the trace of streamflow? It's a very similar pattern to Lamar with steady flows throughout the winter and before, in the normal range before dropping, hitting some below normal flows in March. Generally in the normal range for the rest of the Water Year until we get to the middle of August, and then we -- we see that dip back down into the below normal range again.

And then last hydrograph is for the Arkansas River near Coolidge. Total flow for the year, about 91,000 Acre Feet, 63% of average, and generally, flows were kept within the normal range the entire Water Year.

Here's the table, just summarizing flows in the tributaries. Apishapa River flow in 2020 was 53% of average. In Big Sandy Creek, flows were 75% of average. Wild Horse Creek is a seasonal gage. We have data for October, 2019, and then April

through September of 2020. Totaling up those flows, it was 74% of the long-term average, and then for the Frontier Ditch near Coolidge, flows were 86% of average. So data from all 10 streamgages show that flows were consistently below average for Water Year 2020.

And some additional summary comments. Water Year 20, streamflow for the two major inflows to John Martin Reservoir were 56% of average in the Arkansas River and 18% of average in the Purgatoire, and Water Year 20, total annual flow in the Purgatoire near Las Animas was the lowest in 43 years of record.

Downstream of the reservoir, mainstem flows at the four mainstem sites ranged from 57 to 79% of average and was 63% of average at Coolidge, Kansas.

So that concludes my summary and I would, at this time, just like to acknowledge a couple of people Krystal Brown and Dustin Ethredge. They are in our Pueblo office and they maintain all of the streamgages in the Arkansas River Basin, including these 10 sites for ARCA, so a big shout-out to Krystal and Dustin. And with that, I'm more than happy to take any questions.

MR. RIZZUTO: Thank you, Bob. Any

questions from commission members? Okay. Did a good job, Bob, so thank you, and your report will become Exhibit C to the annual report.

MR. KIMBROUGH: Very good. I'll send that final summary report to Kevin and Stephanie.

MR. RIZZUTO: Okay. Good. Thank you. Next, U.S. Army Corps of Engineers.

LTC STEVENS: Good morning. Could I get an audio check?

MR. RIZZUTO: You're -- I can hear you, but you're not as loud as probably we would like.

LTC STEVENS: Okay. I can speak louder. Could I get Ryan Gronewold to share the slides for me? I'm having some difficulties with the application here.

MR. RIZZUTO: Okay.

LTC STEVENS: In fact, it just froze up. If you just let me know. My application froze up. I still have audio, so if Ryan or one of my team can put the slides up for me, I'd appreciate it.

MR. SALTER: Please let us know who's going to do that. I'm looking for Ryan Gronewold on there and I do not see him on the participants list.

MS. GONZALES: I've already made him a presenter. This is Stephanie.

MR. SALTER: Okay. Thank you.

MS. GONZALES: Mm-hmm.

MR. SHAFIKE: Stephanie, I think you have a copy of the slide, if you can present them on the screen.

MS. GONZALES: Absolutely. Give me just one second.

LTC STEVENS: I appreciate it. I've had to log in about four or five times now.

MS. GONZALES: Are you seeing the screen?

MR. SHAFIKE: I can see it. It's on the screen.

LTC STEVENS: We're good? Okay. All right. Sorry about that.

So I'll get started with slide 1 then. So good morning, Mr. Chairman and members of the Arkansas River Compact Administration. I'm Lieutenant Colonel Pat Stevens, the District Commander of the US Army Corps of Engineers, Albuquerque District. Thank you for this opportunity and -- opportunity to present key topics from the Basin report on the past year, as well as other items of interest.

While the Albuquerque District's water management and civil works responsibility covers

five river basins, a significant portion of our activities are focused on the Arkansas. Joining me from the Albuquerque District office are Nabile Shafike, Chief Water Management Section, Garrett Ross, Arkansas River Basin Manager, and Ryan Gronewold, Planning Branch Chief. We also have Chris Gauger, John Martin Project office manager, and Kim Falen, Trinidad Project office manager.

Slide 2, please. Keep going. I'll assume the slides are keeping up with me as I go on.

I would like to provide an overview of our water management operations, describe some nonroutine inspections and maintenance completed at John Martin Dam, and highlight some of our projects and programs that are occurring within the Arkansas River Basin.

I'll start with an overview of last winter's basin snowpack and spring water supply forecast, followed by a summary of the Corps' Compact Year 2020 water management operations at our Trinidad and John Martin project. I'll then give a brief overview of our standard water quality monitoring program at Trinidad and John Martin. I'll present some of our Compact Year 2020 maintenance accomplishments and highlight some of the

capabilities and services available through the -- to the District, Albuquerque District's Readiness and Contingency Operations office. Slide 3, please.

The May 1st Natural Resources Conservation Service water supply forecast estimated the basin wide snowpack of the Arkansas River Basin to be 81% of median, with the snowmelt runoff forecast ranging from 45% of normal at Trinidad Lake to 78% of normal for Pueblo Reservoir.

Actual snowmelt runoff was much worse than forecast, with Pueblo Reservoir receiving about 50% of the average inflow, with an April through July volume of 178,600 Acre Feet of natural unregulated snowmelt inflow.

Trinidad Lake experienced a March through July inflow volume of 11,430 Acre Feet, which equates to 31% of average. John Martin Dam and Reservoir did not receive a runoff inflow forecast from NRCS. The Compact Year 2020 is observed April through July runoff period inflow total of 76,000 -- or excuse me -- 67,050 Acre Feet, which is 46% of the historic 30-year average, based on the period spanning 1981 through 2010. Slide 4, please.

Trinidad Lake started Compact Year 2020 with 19,880 Acre Feet in storage and ended the Compact

Year with 15,520 Acre Feet in storage. Lake storage peaked at 24,360 Acre Feet on March 31st, 2020. The maximum daily inflow was 212 cubic feet per second on July 26th and the maximum daily release was 188 cubic feet per second on July 28.

The total Compact Year inflow for Trinidad Lake was 18,690 Acre Feet, which is the third lowest annual inflow volume on record, based on 47 years of records from 1973 to 2020 for the Madrid gage upstream -- Madrid gage upstream of the lake.

Total Compact Year outflow was right at 20,000 Acre Feet which, along with the lake evaporation, caused Trinidad to end the Compact Year lower than it started. The Corps did not operate the flood control at Trinidad Dam and Lake during 2020 and there were no invasive species detected during our routine monitoring. Slide 5, please.

John Martin Reservoir started Compact Year 2020 at 73,240 Acre Feet in storage and ended the Compact Year with 33,890 Acre Feet in storage. Reservoir storage peaked at 123,840 Acre Feet on April 7th, 2020. The maximum daily inflow was 1058 cubic feet per second on June 22, and the maximum daily release was 1,207 feet per second on June 9th. The total Compact Year inflow for John

Martin Reservoir was 133,120 Acre Feet, which is 58% of the average Compact Year inflow for the period spanning 1944 through 2020. The total Compact Year outflow was 146,760 Acre Feet resulting in the reservoir, ending the Compact Year 39,350 Acre Feet lower than it started. Corps did not operate the flood control at John Martin Dam and Reservoir during 2020 and there were no invasive species detected during routine monitoring. Slide 6, please.

Now I want to talk about a new water quality monitoring program initiated by the Corps in Compact Year 2020. Project site project staff have been collecting monthly water quality data from our reservoir since 2012, which is forwarded to the environmental staff in Albuquerque for review and entry into the water quality database.

At the locations shown by green circles, staff collects surface measurements of turbidity, pH and specific conductance, as well as secchi depth. Data on temperature and dissolved oxygen are collected through vertical profiles through the water column, and the invasive species monitoring typically occurs from June through October.

It sounds like we have a hot mic out there, if

everybody could check their mutes. Thank you.

In Compact Year 2020, the Albuquerque District entered into cooperative agreements to install riverine water quality stations upstream and downstream of Trinidad Lake and John Martin Reservoir at the locations indicated by the red triangles. These sites will collect data on water temperature, dissolved oxygen, turbidity, pH and specific conductance at 15-minute intervals. Total suspended sediment and sampling of anions and cations will be completed monthly at these riverine stations. Monitoring most of these -- monitoring at most of these riverine stations began in July and August of 2020, and this project is currently funded to provide riverine monitoring through 2025. Slide 7, please.

The Corps completed several inspections of maintenance jobs at John Martin Dam during Compact Year 2020. John Martin project staff teamed with safety personnel and engineers from the District headquarters in Albuquerque to access, inspect, and perform needed maintenance with all six outlet works and conduits. Areas of damaged conduit lining were identified and repaired, and accumulated debris and mineralization was removed from the conduit air vent

holes positioned downstream of each set of flood gates. The Chapman air valves associated with the conduit air vents were serviced and repaired prior to the conduit inspections.

Trunnion pier safety railings were replaced on the work platforms between each of the spillway tainter gates to help ensure the safety of John Martin staff while performing inspections and maintenance on the spillway structure.

New safety harness tie-off points were installed for use in performing maintenance on the tainter gates. Pivot points and, finally, surface concrete repairs were completed on the spillway weir to correct leaking seals under tainter gates 5 and 7. At Trinidad Dam and Lake, routine annual operation and maintenance was conducted during Compact Year, 2020. Slide 8, please.

Public Law 84-99 provides the Corps with authority to assist state and local governments before, during, and after flood events. In the Arkansas River Basin, the Corps works with the State of Colorado Division of Homeland Security and Emergency Management and the Colorado Water Conservation Board to provide flood fight activities in years with significant snowpack and spring

snowmelt runoff. An example of services that the District can provide through hydraulic modeling of burn scar areas, sandbag and flood fight training, as illustrated in these photos. Assistance can be obtained by contacting the Army Corps of Engineers, Albuquerque District, Readiness and Contingency Operations office at the contact information shown. And slide 9, please.

This concludes our report and I'd be happy to answer any questions with the assistance of my staff and I apologize for the start. Had a little trouble getting the slides up, but hopefully, it came through okay, and I'll answer any questions.

MR. RIZZUTO: All right. Questions for Lieutenant Colonel Stevens? Hearing none, thank you, Lieutenant Colonel.

LTC STEVENS: Thank you to you.

MR. RIZZUTO: Okay. And that presentation will become Exhibit D to the report.

Next, U.S. Bureau of Reclamation. Should be Mike Holmberg.

MR. HOLMBERG: Let me do a quick sound check here. Can you hear me okay?

MR. RIZZUTO: A little louder would help.

MR. HOLMBERG: Okay. I'll get a little

bit closer to the microphone here. Is that a little better?

MR. RIZZUTO: That's better.

MR. HOLMBERG: Okay. Stephanie, I'll have you present the slides. I've got kind of an iffy internet connection, so I'm afraid that there would be a lag, and if I start to cut out or lag, I'll go ahead and turn my video off, just to make sure everybody can hear me okay.

My name is Mike Holmberg. I'm a water scheduler at Bureau of Reclamation. I work out of the Pueblo field office. I'm going to talk a little bit today about our operations from the Fryingpan-Arkansas Project last year and touch briefly on this year's winter operations and then, when I'm done, I'm going to pass it off to Patrick Fischer. Patrick is the Deputy Area Manager for Reclamation's Eastern Colorado Area office, and he's going to give some general updates from Reclamation.

So in 2020, we imported just over 51,000 Acre Feet through the Boustead Tunnel. The average import is usually around 56,000 Acre Feet, so we were a little bit below. The snowpack in the collection system was near average until around May, and then it dropped off at the table and started to

dry up on us, so we opened up the collection system on the west slope on April 27th. The runoff peaked in June and, by mid-July, we were finished. Next slide, please.

So this is a -- I'm not -- I don't think the -- we're on the screen.

MR. RIZZUTO: So the next slide has not come up.

MS. GONZALES: Hold on, let me try that again. I'm not sure why. Okay. Can you see it?

MR. HOLMBERG: Yes.

MS. GONZALES: Let me see here. Hold on just a second.

MR. SALTER: Stephanie, if you hit the enable editing, I think that will help.

MS. GONZALES: Oh, okay. How about there?

MR. SALTER: And then if you go to the display settings.

MS. GONZALES: Okay.

MR. SALTER: In the top bar, then it should say display settings and switch monitors, I think will help, because what we're seeing is the speaker view. There just above your cursor is the display settings with the down arrow. There you go.

Thank you.

MS. GONZALES: Mm-hmm.

MR. HOLMBERG: Slide Number 3, please, Stephanie. Excellent. Let me get back to my place here.

This is just a quick graphical look at Turquoise Lake in 2020. Our lake levels there were above average from October to January, and then went to average or below average for the rest of the Water Year. Next slide, please.

Similar story for Twin Lakes. Excuse me. We stayed above average until May and then it dropped down below. August and September really showed just how dry the spring and summer was in the headwater area. Next slide, please.

So for Pueblo Reservoir, we stayed consistently above average in Water Year 2020. I guess there's not a whole lot more I can say about that one. Next slide.

As of December 1st, Turquoise Lake is sitting at 83% of average, Twin Lakes is at 92% of average, and Pueblo Reservoir is at 110% of average. Next slide, please.

This is our crystal ball we gazed into in 2020. We run our forecasts on the first of the

month, from February through May. February to April, those forecasts are based on snowpack. We had a pretty consistent snowpack and forecasts stayed pretty consistent for those months, between 60 and 64,000, and then 68,000 for April, and then beginning in late April, the precip dropped below average to well below average, and it reduced our May 1st forecast to 62,000 Acre Feet. So that forecast is based on the average precipitation and, like I said before, our actual imports through the Boustead Tunnel into Turquoise Lake were about 51,000 Acre Feet. Next slide.

Currently, in 2021, the Arkansas River Basin is at about 90% average snowpack. You can see that that's the dark blue line going up the left side of the graph there. Next slide.

And then in the collection system in the Colorado River Basin, we're at about 74% of average, and we'll start putting together the 2021 forecasts in February. Next slide, please.

So for our winter operations, right now we're releasing 100 CFS from Twin Lakes and 3 CFS from Turquoise Lake and bringing that water down to Pueblo Reservoir. We anticipate moving a total of about 60,000 Acre Feet from the upper reservoirs to

Pueblo Reservoir. To date, we've brought down about two-thirds of that, and movement of that water will be adjusted moving forward as we will trend the snowpack, and we'll adjust the flows according to customer needs. Next slide.

So over the past year or so, there's been some work done to repair the buttress joint on Pueblo Dam. The original seals that were in place on those buttress joints had started to deteriorate over time and was leaking water into the gallery. Pueblo Reservoir is made of 23 independent buttresses and, as such, they move a little bit independently of one another, and so we were getting some seepage into the gallery. I actually believe Reclamation -- this is the only dam Reclamation has that's built this way. Next slide, please.

So this is a picture of one of the -- the repairs that was done. They sealed the joints with a rubber membrane fixed to the face of the dam with stainless steel panels. After this repair was done, we saw a reduction of seepage into the gallery of about 62%. We were more successful on the north side than on the south side. The south side of the dam, we saw a reduction of only about 50%. Next slide.

So the facility assessment for mussels for the Fry-Ark system are complete, as are the action response plans. To date, there have been no adult mussels found, and the results for this year for mussel larvae came back negative at Pueblo Reservoir. If you want a copy of the report or if you have questions about it, you can contact Pat McCusker at the email address provided on the screen. Next slide.

Okay. So before I introduce Patrick, is there any questions?

MR. RIZZUTO: Questions for Mike? Okay. Hearing none, we can move on.

MR. HOLMBERG: All right. Thanks for listening. So I'll pass it on to Patrick Fischer. He's the Deputy Area Manager for the Reclamation Eastern Colorado Area office, so it's all yours, Patrick.

MR. FISCHER: Thank you, yeah. Good job, Mike. Good morning, everybody. Good morning, Mr. Chairman, members of the Administration. Is my volume coming through okay? Can everybody hear me all right?

MR. RIZZUTO: Very good.

MR. FISCHER: Awesome. Patrick Fischer,

Deputy Area Manager. Just want to take a brief opportunity to give you an update on activities within our office. Next slide, please.

So we've had quite a bit of change here at the Eastern Colorado office and within our region regarding leadership. So Jeff Rieker has been with us for just over a year, providing leadership at the Eastern Colorado Area office. I joined Jeff in the area manager's office last July, and then we have a new regional director as of last June. Brent Esplund is joining us from the Upper Colorado Region, and then he's actually hired a couple new deputies in Billings, Montana, in the last couple months, so just notifying folks that we've got some new faces and we're definitely excited about the future.

Transitioning over to the Department of Interior reorganization, you may or may not have heard that, under the Trump Administration, the department had reorganized some of the regions to better, I guess, match basins. They call it the Unified Interior Regional Boundaries, and there was some question whether or not our office would be realigned maybe closer to Salt Lake City, and I'm just updating that. Administratively, we'll be

staying the same, continuing to report to our regional office in Billings, so no big changes there.

And then I just want to highlight the fires. So I think Randy had mentioned that it's been a crazy year and, for us, we'll add fires in the mix. Gosh, in the last couple months, we've seen two of the largest fires in the State, and not only our office, but some of our facilities went through different levels of evacuation, and it just made us really turn our attention back to the importance of continuity of operations, and we see this as an opportunity to learn more about how fires of this nature impact the watersheds and, you know, future opportunities to mitigate. And looking back, you know, in the history, in the last decade, southeastern Colorado is certainly not a stranger to fires. As I was doing a quick historical review, it looks like 2018 was a big year down in southeastern Colorado, so just something to be mindful of. Next slide.

So we had asked folks which topics they might be interested in today, and the next three seemed to have some level of interest, so I'll touch briefly on each, starting with excess capacity contracts in

Trinidad. Not a lot of activity has gone on here. It's my understanding our area manager, Jeff Rieker, has been working with Mr. Steve Kastner on just better defining which types of water do and do not fall under something like excess capacity, and we certainly recognize that federal action of that nature as a federal process and -- and that would certainly involve some level of public involvement, should we ever get there.

Next topic, Pueblo Reservoir recovery of storage. So I believe Chris Woodka might be teed up to present some of this information later, so I won't dive into it other than, you know, Reclamation is, you know, participating as appropriate with the Southeastern Colorado Water Conservancy District.

And then, finally, the Arkansas Valley Conduit. I think I have another slide that touches on that, so we can go ahead and go to that next slide, as Mike did a great job covering the operations.

So the Arkansas Valley Conduit, we had a big year in Fiscal Year 2020 for this project, where we actually received a level of appropriations that have allowed us to move forward with final design on certain features and then also look forward to

initiating natural construction, which is a major milestone.

So there's a couple of contracts that we're currently focused on working closely with the Southeastern Colorado Water Conservancy District, one of which is the Boone Reach, that first 10-mile section, and then another is the Dechloramination Facility. That always rolls off the tongue kind of -- kind of difficult, but with both of those projects, we're looking at making some real meaningful progress, and you can see milestones on the slides here.

I believe that concludes the presentation. If anybody has any questions, I'll stand by and --

MR. RIZZUTO: Okay. Thank you, Patrick. Questions of Patrick? Hearing none, both to Mike and Patrick, thank you for your presentations. Your presentation will become Exhibit E to the annual report. Thank you again.

Up next, National Weather Service, Tony Anderson.

MR. ANDERSON: Good morning, everybody. Can everybody hear me?

MR. RIZZUTO: Very good.

MR. ANDERSON: Very good. Let me get

my -- can you see my slides?

MR. RIZZUTO: Not yet.

MR. SALTER: I do have your presentation cued up, Tony, if you would need that.

MR. ANDERSON: Okay.

MS. GONZALES: Kevin, can you make him the presenter. I'm not able to.

MR. SALTER: We got Tony.

MR. ANDERSON: Okay. Now we're seeing the slides.

MR. SALTER: Yes, we are. Thank you.

MR. ANDERSON: Sweet. All right. Thank you.

Thank you, Mr. Chairman, and members of the Administration. It's a pleasure to be here. Good morning to everyone. My name is Tony Anderson. I'm the service hydrologist with the National Weather Service at the weather forecast office in Pueblo and I just want to take you through some of what we saw this Water Year, some of our forecasting, our water supply forecasting, and how accurate or inaccurate it may have been, and talk a little bit about why we saw what we saw.

The National Weather Service, in conjunction with the National -- Natural Resource Conservation

Service, forecasts 11 locations in Colorado in the Arkansas system. Nine of those are native flow forecast points and two of them, the two stations at Las Animas, are forecasts for observed flow. We'll talk a little bit more about that in a minute. I'm only going to look at five today, the gages at Salida, Pueblo, Pueblo Reservoir at Trinidad Reservoir, and the two stations at Las Animas on the Purgatoire and the Arkansas.

Our forecasts are produced by the Arkansas Red Basin River Forecast Center in Tulsa, in collaboration with the Natural Resource Conservation Service, so I did not do these forecasts, although that was my job for 12 years. So whatever you see or hear from me, please don't kill the messenger, 'cause I don't have great news.

We issued seasonal forecasts from April -- for April through September native runoff volume. Basically, native runoff volume -- well, we'll get that in a second. We issue them the first month -- first week of the month or the first five working days of the month from January through June. That may change as we adjust our methodologies and, right now, we're only using the ensemble systems that we have that try to account for some of the uncertainty

in our forecasts.

The precipitation estimates that you're going to see are from -- are generated at the River Forecast Center for their continuous models. They are generated using radar and gages and are compiled every hour of every day through the year, and they are published as daily totals, monthly totals, and annual totals.

The observed flows I use come from the USGS gaging stations and their web pages and from the Colorado Department of Water Resources gaging stations and web pages. This is my time for my annual plug for both of these agencies. They are amazing partners and they do an incredible job keeping their gages up, especially in this year. My kudos to Krystal Brown and her team and John Van Oort and Joey Talbott and so at DWR. Incredible job, and I am professionally blind without that information, so I'm your -- I'm your biggest fan and I steal your data with impunity.

Our native flows are derived in cooperation with the NRCS to estimate the effects of transbasin diversions, irrigation diversions and water supply diversion, as well as reservoir operations on the observed flows at each gage. By the time we get to

Pueblo Dam, we're -- we have about 32 adjustments we make to the observed flow to try and account for all of those factors. We don't get anywhere near all of them, but we get the big ones, and of course, the forecasts and the data you're going to see for the Arkansas and Purgatoire at Las Animas are not for native flow. Those are for actual observed flow that goes past the gage.

This is the Water Year precipitation estimates from the River Forecast Center. The thing that jumps out at me here is the uniformity in the display. Normally, we see a great many more colors up along the divide but, this year, pretty -- pretty muted, and the strange thing is we actually got a near normal snowpack, and still we didn't -- we're not seeing that great diversity of precipitation. Generally speaking, we're in that 10 to 15-inch rain -- range on average for the year.

And the percent of normal, this is probably the more telling graphic. The warm colors are below average, and you can see most of the basin was in below 75% of normal, and there were considerable chunks that were in the 50% or below 50% of normal, and it's pretty much basin-wide. There are very few warm or cool colors in there. A little bit in

western El Paso County but, other than that, it was a below normal year.

I'm going to take you through some of our forecasts, and this is a graphic I developed as part of my forecasting process to verify my results and identify patterns and hopefully find failure points that I could correct. I'm no longer doing these forecasts, but I still use the graphics to see how my -- the guy I trained is doing.

The black horizontal line is the 30-year normal. The red line are the -- the hash marks in the red line are the actual forecast values that we issued. The yellow lines are the confidence intervals for each forecast and so, basically, that's our 90% confidence interval. The blue, solid blue horizontal line, is the seasonal native flow actually observed, or observed flow, and the blue hash line with the triangles is the monthly accumulated volume. The general goal for this graphic is that, as the forecaster, is that the solid blue line would end up being constantly between the two yellow lines. You're not going to see a lot of that this year. It was a very, very difficult year in forecasting.

The pattern you're going to notice, this is

the forecast graphic for Salida, and the pattern you're going to notice is that we had pretty consistent forecasts through the beginning of the year, near -- near or slightly below normal, and then there was a sudden drop on the May 1st forecast. At Salida, we had -- we averaged 295,000 Acre Feet of native flow and, this year, we estimated 2,009 went past the gage. I'll talk more about why we see that drop in -- on May 1st in a little bit.

Moving downstream, the -- you'll notice the yellow bands appear wider, and that's because we're further downstream and there's greater uncertainty and less confidence in the forecasts, so the models give us a much wider range of possible answers. Average flow is 255 -- or 455,000 Acre Feet. We observed 269,000. And again, if you'll look at the observed line, that blue line, we're flirting with that bottom confidence interval.

This is the graph for the Purgatoire River at Trinidad Reservoir. This is the inflow estimates. We were forecasting a little below normal, but still up around that normal line, until that May 1st forecast. Huge uncertainty in the Trinity -- or the Trinidad forecasts. Even historically, it's just a

very difficult area to forecast, and you can see here again, we only got one year -- one month's lower confidence interval is below the observed line. 47,000 Acre Feet average, and we observed 9,000 or 9.7 -- 9700 Acre Feet.

Moving down to the two observed flow forecast points at Las Animas, these are just awful looking forecast graphics. You can see the solid blue line observed is below the probable minimum all the way across the board and, in these cases -- well, 148,000 Acre Feet is our normal. We observed 59,000 Acre Feet. It was a brutal forecasting year and, again, you can see the same pattern in the observed or the forecast values. Near normal, maybe slightly dropping until May 1st, where there was a significant drop in our forecasts.

Moving over to the Las Animas or the Purgatoire, same pattern on the forecasts, and again, our observed was way below the probable minimums that we had -- we calculated. Here, you're seeing something in at 24,000 Acre Feet normal. We observed 4100 and, at this point, we could probably not get the model to go as low as 4100. Models despise extreme events and they are -- they are designed to force themselves back to the median or

back to the mean, and extreme events are just exceptionally difficult to model and, therefore, it would be very difficult to get a forecast that low.

Same data with a different look. Here, we're looking at the Purgatoire River stations, Trinidad on the left and Las Animas on the right. 21% of normal, observed native flow at Trinidad, and 17% at Las Animas.

On the Arkansas, a general pattern, higher than -- higher values upstream, lower values downstream, in terms of the percent of normal. We were 71 at Salida, 59 at Pueblo, and 40% of normal observed flow at Las Animas.

This is an exercise I do to estimate or try and calculate the efficiency of runoff. That's my term for it, and it's basically what percentage of the total precipitation that fell in the basin came past the gage and, for the same stations, using native flow for the upstream stations and observed flow for the stations at Las Animas.

The pattern holds. It tends to be higher upstream than downstream. However, I believe last year at Salida, that 23% value was actually 38% last year. A precipitous drop to 8% at Pueblo. I think that was 10% last year, and then on the Trinidad, or

on the Purgatoire, the numbers dropped tremendously. We had a 1.8% of the precipitation ran off in the Trinidad Reservoir going down to the Las Animas stations. Both of them indicate less than 1% of the precipitation that fell in the basin was observed at the gage at -- on the Purgatoire, that's less than one-tenth of 1%.

So what happened? Why were our forecasts so -- well, let's call them bad, for to be kind. Well, this is this year's snow water equivalent graphic from the NRCS, and what I want you to do is look at the blue line from last year. That is the 2020 snow water equivalent line.

Everything was going fine until April 1st. We were above normal or at normal in terms of our snowpack, and that's the biggest driver of our water supply forecasts. However, you'll notice that the blue line shifts away from the red line, which is the average or the median.

Snow water equivalent. We suddenly started losing snow water equivalent much faster than we would in a normal year. It was a warm, dry April and May. And, okay, we started losing the snow water equivalent, but what we noticed on May 1st was that we had not seen the runoff increase as we would

have expected if all of that snow water equivalent had run off. I think the warm, dry conditions were creating a atmosphere for sublimation of the snowpack, and that is what caused us to lose a great deal of water that we had expected to see actually in the streams going past the gages. It was -- it was a tremendously strange year for hydrology as a whole.

As you can see, we'll take a quick look. The heavy dark line is this year, and you've seen this graph before, we're right about normal for the year, but we're early times yet. We'll talk more about that in a minute.

The other thing that hit us and probably caused us to underfore- -- or overforecast was a drought that started last year in July. It started in July. We were in -- we started seeing drought conditions in the State in late August, early September and, by the time October rolled around, we were in a drought. These are both for the first week of December, and you can see that those dry conditions going into the winter probably allowed the soils and our groundwater reservoirs to absorb more water than we had anticipated and the model did not pick that up. So that was also -- that was

another reason we probably saw less water in the runoff than we had -- than we would normally have expected.

I'll keep talking about this graphic on the right, because that's right now. That's 2020, and we are in a fairly severe drought statewide. We're a little better off in the Arkansas than most of the State, but it's pretty darn dry out there, and you all know that.

I am more concerned this year for next year's runoff than I have been in the 20 years I've been doing this. We're -- conditions right now are set up for a good potential for a bad Water Year next year. I was so concerned, I went back and looked at the -- the Decembers following the last four -- three droughts and during the years I've been working, 2002, 2012 and 2018. These are all graphics for the first week of December.

2018 is the one that doesn't belong. We were recovering from the drought at that point and it's not anywhere near as bad as the other three. 2002, we were actually in the recovery phase of the drought. That's actually not as bad as 2002 got. 2012, that's the one that concerns me, because that's -- that drought still had seven months to go.

That drought didn't break until July of 2013, so I couldn't tell you which one of those is worse. I think, for the Arkansas, maybe 2012. They all look pretty bad.

So why am I showing you this? Well, as we look forward, the Climate Prediction Center issues outlooks for precipitation and temperature going out three months, six months, eight months, and looking through January -- December, January and February, outlooks precipitation is on the left. Temperature is on the right. What is showing on precipitation is a weak to moderate signal towards dry conditions for the next three months.

The temperature signal is stronger. It is a moderate to strong signal for above normal temperatures. Now, there's still probably a 25 to -- or 20 to 25% chance we could be above normal, but the signals for right now are indicating below normal precipitation and below normal -- or above normal temperatures. This is pretty consistent with the La Nina pattern, and that La Nina greatly influences the Prediction Center's outlooks, and the La Nina is well established to be well in the spring or summer sometime.

Jumping further forward, February, March and

April outlook, the further out we get, the less confidence we have in these outlooks, but there's still signals there that we can try and take advantage of. The only real change between the December, January, February outlook and this one is that the dry signal on the left has strengthened. It is now a moderate to strong signal, rather than a weak to moderate. Again, there's still a chance of above normal precipitation, but it's diminished as we go. This is a pretty strong signal, and that is our primary snow or snow water equivalent accumulation period.

So what does that tell us looking forward? The Climate Prediction Center that takes those outlooks, takes all the information they have, takes the drought monitor information and tries to look forward on what's going to happen to drought conditions in the country. Brown is a bad color on this slide. It means the drought will persist. What it doesn't tell us is whether the drought will stay at the same level or whether it will intensify. However, it does not -- they are not indicating strong possibilities of drought relief for Colorado.

So what I'm trying to tell you, and stay as cheerful as I can while I do it, is the probability

exists for this drought to continue through the spring and possibly into the summer. It's -- I -- it's not a forecast. I'm not saying it's going to happen, but I'm saying the probability is there, and it is not a remote probability. It is a fairly strong one. So take whatever management actions are appropriate, because it's a very real chance that we're going to look at a Water Year as bad or worse than 2020.

If anyone has any questions, once again, please don't kill the messenger. Someday, I want to come here and tell you that all of our forecasts were accurate, we had a great Water Year, and next Water Year was going to be even better, but I don't ever seem to get to do that.

MR. RIZZUTO: Well, thanks for the great news, Tony. Questions of commission members? Hearing none, okay. Thanks again, Tony, for your presentation.

MR. ANDERSON: My pleasure. Thank you for letting me be here.

MR. RIZZUTO: At this time, as I mentioned, I'd allow for a break to get people away from their computers, so why don't we take a 10-minute recess and come back at 10:28. Okay.

(A break was then taken from 10:18 a.m. MST to 10:28 a.m. MST.)

MR. RIZZUTO: Okay. We'll reconvene the annual meeting of ARCA at 10:28 a.m. mountain standard time and we'll proceed to Item 5 on our agenda, which is reports from local water users and state agencies, and first will be Steve Kastner with Purgatoire River Water Conservancy District.

MR. KASTNER: Hello. I think I'm here.

MR. RIZZUTO: You are.

MR. KASTNER: If you can you hear me? Okay, good. I am Steve Kastner, General Manager of Purgatoire River Water Conservancy District. Also on our meeting today is Connie Mantelli of our office. That's everybody.

I have a few slides today, Mr. Chairman, internal -- kind of an internal summary of the district this year. I think I'd like to share those here. Hopefully, that's visible.

MR. RIZZUTO: It is.

MR. KASTNER: Let me make it a little clearer. Election year, so I went with red, white and blue.

MR. RIZZUTO: Okay.

MR. KASTNER: So this first slide is, on

the far right, our total diversions within the district for our District ditches this year. The far right, mostly red column, 2020, 21,000 Acre Feet. Last year was 50,000. Our average on the term of this graph was 40,000, so we're -- we're right at half of average, and maybe 40% of last year. I think, from the earlier presentations, everybody should have the idea it wasn't a good year to be in Purgatoire down there.

Of our 21,000 Acre Feet, almost 20,000 was under our project administration and the other 1100 was under normal priority administration in the district. That last sentence is under the drought categories, we were pretty much in extreme drought all year, as I think we still are, last time I checked.

This second graph is a graph, the blue line being our stored water in the reservoir for irrigation. We peaked at 7351 Acre Feet at the end of March, beginning of April, and then began our irrigation year, so the blue line starts to go down and the red line is our total diversions in the district, and the red line starts to go up in April, so just kind of a quick summary of our water supply activities right there.

Of the 7300 Acre Feet we released from storage, the other 14,000 Acre Feet of our diversions came from the direct river flows or some other minor amounts of leased water, and then return flows within the district where we divert our water more than once, like most places.

We did revert from project administration to priority administration at the end of August, pretty much where that blue line goes down towards zero. We run out of stored water and we go back to priority.

The next graph, I've presented before. I find some interest, hopefully. It's kind of blurry in the graph, but the thick blue and the thick red lines are the -- the blue line is the Purgatoire at Trinidad gage. That's the gage closest to the beginning of our district. The red line is Purgatoire at Thatcher gage, the gage below our district, and you can see both in the horizontal blue and the horizontal red dashed lines are the long-term averages. You can see we're quite a bit below those. The Thatcher gage was about a quarter of its average and the -- the Trinidad gage was maybe a little over a third of its long-term average.

Those thinner red and blue squiggly lines are a running seven-year average of flows for the term of this chart, and you can see since about 2011 or so, our running average is below the long-term average. I mean, it just -- it just points out the -- kind of the duration of what's going on here.

Let's see. What else do I got in here? The low flows through Thatcher are indicative of the very handful of days where the district was required to pass water through to downstream entities on the Purgatoire or on the Arkansas, literally, a handful of days this summer. It also reflects, again, a lack of real monsoon moisture in that area for the second year in a row.

The third graph is kind of a bar chart of our dry-up acres in the district. These acres are dried up by State Parks and Wildlife for Permanent Pool uses and by the City of Trinidad for municipal uses. The amount of dried up acres in red there is slightly increasing as the city dries up a little more every year. They don't have too much more they can dry up under present decrees, so this probably won't change much in the --

The blue is our irrigated, remaining irrigated acres. The sum of the acres, total acres for '19,

was 13,248. I compare that to our 19,499 total acres that we are allowed to irrigate, so we were -- we're under our operating principle limits.

We did, the Water Commissioners and myself, did survey lands again this summer and, this coming winter, we should have results from that. It was more difficult this year surveying, telling what was irrigated and what was not. Kind of a fine line this year.

Some additional notes that I have put down. The top one, our Irrigation Improvement Rule Plan, this is the fourth year the District had such a plan. We're up to 18 center pivots this year. That's up from the previous three years. I have the numbers there. I think we'll have a few more next year.

Total diversions through these 18 sprinklers this year were 961 Acre Feet. That's a little over half of the previous year. Our return flow deficits to make up from these sprinklers under the rules was 76 Acre Feet, and those -- that deficit was made up of return flows from a consumptive use water the District has leased.

Concern for this coming year is that market for consumable waters may not exist. The city is

low on their own stored waters, due to the drought conditions, so we take a little more work this year to come up with a plan.

Livestock diversions last winter were 382 Acre Feet during the non-irrigation season. We're allowed 1200 during that season. Since I've been down there, we haven't come close to the 1200. I try to minimize the stock water diversions or make them as efficient as possible, because it directly impacts the amount of the irrigation water we have for the next summer.

Last year, I mentioned our effort at some congressional legislation. We filed -- Senator Gardner's office filed a bill in summer of '19. The purpose was to extend our construction loan term and to confirm Reclamation's excess capacity authority at Trinidad and a few other issues.

We were doing okay, and then Senator Manchin, who's on the Energy and Natural Resource Committee, wanted a recommendation from Reclamation on the proposal. He was concerned of the drought and its effect on other federal projects and maybe an onslaught of similar legislation. He wanted some more review layer, I'll call it, before they got to the senate, so and that and 2020 was turned out to

be a rather bad time to get something through Congress, for a couple reasons.

Anyway, Senator Gardner wasn't re-elected and I have already had contact with Senator Bennett's office and I think, starting this January, this new year when they settle in, we will try to get that effort going again and try to get some -- something coordinated through Reclamation or Interior on moving that ahead.

Just to note that yesterday, I did present an update on the Sedimentation Accounting Proposal I introduced last year at ARCA at the Engineering Committee yesterday, and that is all I had, other than to express appreciation for Division 2 staff. Pretty much in touch with them every day in the summer, especially last year, and also to the Corps locally in Trinidad. I think they were -- thought we were kind of crazy sometimes in the small amount of gate -- magnitude of gate changes we were asking for, but it was a small river, and then some of our water rights are small, and so we were trying to do the best job we could and appreciate the Corps making accurate gate changes on such small amounts, so -- and that is all I have for a quick summary, Mr. Chairman, unless there's questions.

MR. RIZZUTO: Thank you, Steve. Questions of Steve? Okay. Thanks again, Steve.

Next, Southeast Colorado Water Conservancy District, Chris Woodka.

MR. WOODKA: Thank you. I'm Chris Woodka. I'm the Senior Policy and Issues Manager for the Southeastern Colorado Water Conservancy District. I hope you can hear me okay.

MR. RIZZUTO: We can.

MR. WOODKA: Can you see my screen okay?

MR. RIZZUTO: Yes.

MR. WOODKA: Okay. Well, we're pleased to present our annual report to the Arkansas River Compact Administration. We've had a kind of a rough year, like -- I try to get that off there. Like every -- everyone else, it was a very challenging year for us. We had to learn new ways to operate. Like many agencies, most of our staffs worked from home for most of the year. We've remained productive. We not only were able to conduct our usual business in the district, but we also participated in activities with other water agencies and organizations and, in addition, we launched several major initiatives, which I'll discuss later in the presentation.

First, I'd like to talk about the Fryingpan-Arkansas Project. As you know, the project was created by Congress in 1962. It imports water from the Colorado River Basin to the Arkansas River Basin. It's operated by the Bureau of Reclamation and includes five reservoirs, four on -- four on this slope and one on the west slope, and it provides a supplemental supply for nearly 900,000 people and more than 200,000 acres of irrigated farm land.

As the Bureau went over earlier, imports this year were about 80% of what we were expecting. A lot of reasons for that. The snowpack was, as other people have said, looked pretty good in the first part of the year, but then the dry weather just hit.

We had luckily, or fortunately, or the way the project is designed to operate, we had 15,000 Acre Feet available from 2019 that we had not yet allocated, and so that water came in very handy for all of the farmers in the Arkansas Basin this year.

This is -- this is -- I would want to point out that this balance is what the storage vessels that are part of the project are designed to accomplish, that this supply of water is especially beneficial to the irrigators in the dry years, such

as 2020.

Our Winter Water program was able to store a system total of 116,000 Acre Feet. 44,000 of that was at Pueblo Reservoir and 11,000 -- well, almost 12,000, was at John Martin. These are the winter water, and most of you are familiar with it, but it allows our irrigators to store water between November 15th and March 15th each year, and we use both Pueblo Reservoir and John Martin, too, as part of that project. Other reservoirs are maintained within the individual ditch companies.

Getting into the initiatives that we launched this year, the first one was a feature and asset valuation, and we call it a feature and asset valuation because we looked at our District assets, our enterprise assets, but these are features of the -- of Fryingpan-Arkansas Project, which are not our own assets, so we -- we chose to call it a feature and asset valuation, and we went to the first phase of that, which was a table-top exercise.

We evaluated all the major features of the Fryingpan-Arkansas Project, except for ones that we don't have much to do with, such as the power plant at Mount Albert and the Bessemer Ditch outlet at Pueblo Dam. We may get into looking at some more of

those in the next phase of the study. There's been some discussion about that.

The first phase determined that the value of the features of the Fryingpan-Arkansas Project is about 2.7 billion, with a B, dollars. That sounds like a lot, but when we've looked at various economic analyses of the value of municipal irrigation, municipal and industrial irrigation, flood control, recreation and environmental benefits of the project, it comes out to about $1 billion annually for the economies of the Arkansas Valley. So it's -- it is a valuable asset and, in future phases, we're going to work with Reclamation and then begin a condition assessment to determine the timing of projects that will be needed to continue to maintain the Fryingpan-Arkansas Project.

The second major initiative, one that Patrick Fischer referred to earlier, is our recovery of storage study. Again, this was mainly a table-top exercise, but we were able to determine from that that the rate of sedimentation in Pueblo Reservoir is accelerating and it's now at nearly a million cubic yards of material a year.

The reason -- the reason that we did this is that the sedimentation, of course, has been

gradually cutting into the storage space, not only for our project water, but for if and when accounts that we have for non-project water, and our goal in this study will be to work with Reclamation to develop strategies to reduce losses, regain space where possible, and to mitigate future losses. It's a multiyear project and one that we've put a high importance on in the district.

As also was discussed by Patrick, we got a big boost in the Arkansas Valley Conduit this year. As you can see from this photo, we -- both Senator Gardner and Senator Bennett attended a groundbreaking that we had for the AVC at Pueblo Dam in October. Also there is Becky Mitchell is in the picture -- picture there, Brenda Burman, the Secretary of Interior, and our president, Bill Long.

The event, I think a -- it was -- it was a groundbreaking staged at Pueblo Dam. We wanted to initially have a groundbreaking further down and what there probably will be several groundbreakings. We don't -- we -- we think there's a lot of steps in this, and I'm going to get into those in a minute, but I think this was a great event and it, again, it illustrates the bipartisan support in the -- in the Senate and in Congress that this project has, and

one of the things I'd like to point out about this event was that it was a very unusual one. It's kind of like event planning during a pandemic is a different kind of world and something I'd never experienced before and really brought home, you know, how difficult things are, trying to get things done while we're all looking at health-safety issues.

So this is a more detailed map of -- of the Arkansas Valley Conduit. We'll be working on a contract with Pueblo Water, the Pueblo Board of Water Works, to convey the Arkansas Valley Conduit water through Pueblo's existing distribution system.

This does not involve using any of Pueblo's water. This will be the Fryingpan-Arkansas Project water or water that is owned by the individual participants of the Arkansas Valley Conduit. Under our revised plan, you see that heavy blue line running through the middle is a -- what we're calling the trunk line. It begins at just east of Pueblo and continues all the way to Lamar. That will take about 15 years to build, funding available, of course.

The Bureau of Reclamation will build that trunk line and also a treatment plant at Boone and a

dechloramination facility. To explain what that's for, Pueblo uses chloramine in its water supply to disinfect it. None of these communities down here use chloramine and it's difficult to maintain the chloramine presence throughout the entire length of the 130-mile pipeline. So what we're going to do is build a dechloramination facility. For those who are interested, it uses a break -- break point technology to remove the chlorine from the water, and then that water is taken down to the blue line.

The green lines, and the green lines that you see in the -- on the map that's on the screen right now are distribution and delivery lines that will be built and owned by the Southeastern District or the whatever entity is formed to represent the -- the participants in the conduit.

The total cost of the project is about -- will be roughly between 564 and $610 million and, under this plan, which we finalized in late 2019 with the Bureau, we'll be able to begin deliveries of water to each of the communities as we go down the Valley. That especially benefits this area here by Rocky Ford and La Junta, where they have radionuclides in their water supply from the deep wells.

So just kind of a breakdown of funding. We

got appropriations of 28 million in 2020, which was huge. The prior years, from 2011 to 2019, we had received about $30 million. We also have $8 million in the budget request from the Administration in 2021. In Congress, there's a mechanism where they can allocate additional money to Reclamation, and we call that plus up money. Some of that may also be available for AVC in 2021.

The State would really like to thank the Colorado Water Conservation Board and the General Assembly and Governor Polis for approving a package that includes 90 million in loans and 10 million in grants, and we're not taking that all at once. We'll be using that over the life of the project. We don't have the ability to spend that much money in one year. We'll kind of have to move at Reclamation's pace, as the trunk line is being built. We'll use this money to do the distribution lines and the -- the delivery lines.

We also, in 2022, will be -- begin to be able to access Fryingpan-Arkansas Project miscellaneous revenues. These are revenues for if-and-when contracts excess capacity they're also called. In Pueblo Reservoir, they amount to about 3.4 million annually this year. That goes up every year by a

small amount and so, by 2070, we'll have as much as 12 million available annually. This money can be used to either build or repay the -- the costs for Reclamation, and that includes both the local costs that are and the appropriations costs.

The Southeastern District contributed about 4.8 million to this, creating a reserve fund using payments that were collected from Aurora under a 2003 intergovernmental agreement to settle some water issues when Aurora got a contract to use the Fry-Ark project to move water from the basin.

We also will be able to contribute 1.2 million annually for OM&R from the James W. Broderick Hydropower Plant, which I'll get -- which I'll talk about later. Our participants have, since 2011, also put in $1 million in payments on a -- on an annual basis. Those go for both administration of the project and we do water quality monitoring with the USGS and they pay a certain portion of that.

I've included this map to show the time line of how the AVC will be built. It identifies communities that are affected by radionuclides. They're the ones that have the little scary looking radioactive circles by them, and those radionuclides are generally found in the deeper wells, but -- and

the others, in most of the other communities that don't have those issues, are relying more on alluvial wells.

The alluvial wells, however, are getting new attention from our State Health Department because of the -- they're under the direct what they call groundwater under the direct influence of surface water. So the other -- so that becomes a water quality issue as well that this -- this helps resolve.

The other issue is for communities like La Junta and Las Animas that use reverse osmosis to purify water are facing stricter regulations for the brine disposal for the end product of those plants there. So with the idea behind the Arkansas Valley Conduit is that a better supply of source water will reduce all three of these problems.

The next part of my presentation will deal with the James W. Broderick Hydropower Plant and Pueblo Dam. We completed this plant in May of 2019, construction cost $20 million, under a lease power privilege with the Bureau of Reclamation. The hydroplant is rated at 7.5 megawatts and capable of producing electricity from flows as low as 35 CFS to as great as 810 CFS. It uses flows from the north

outlet of the dam, which supplies water to the Arkansas River. The water -- the water runs through the plant and it's neither consumed or altered in the process and we've calculated that, on average, we would probably use about 60% of the total releases from Pueblo Dam; in other words, whatever is not coming out of the -- the spillway gates.

Even though this was a very dry year, we were able to have high electric production rates in the first several months of 2020, and it's a function of how much water is coming out of the dam, and the runoff came pretty fast this year, so we had high flows for April, May, and June were all pretty high. July was still pretty decent. We met our budgeted revenue requirements, again, even with the low Water Year.

We sell the power from this plant to Fountain, as well as Fort Carson, which orders it through Colorado Springs Utilities. We've received great assistance from Colorado Springs for scheduling power. It's greatly appreciated, because this is unfamiliar territory for us and, again, we -- I would like to thank the Colorado Water Conservation Board for the $17.2 million loan that went toward the construction of the hydroplant. It's

anticipated that once the loans are paid off, again, we'll be able to use the revenues to help pay for OM&R on the -- on the Arkansas Valley Conduit.

My last topic is the Excess Capacity Master Contract, which was signed with Reclamation in 2016. This -- this was a big deal for the district. It's part of the -- it all ties back to the amount of storage that we have and maintaining the storage so that the reservoir stays fuller more of the time. We began using this in 2017, and it's one of several long-term contracts for non-project water in Pueblo Reservoir. Those -- those over usually are for a 40-year period and amount to when the -- when the contracts all reach full capacity would be about 100,000 Acre Feet of storage and a reservoir that has a conservation dual capacity of about 245,000 Acre Feet. Right now, its annual storage of non-project water in the reservoir is about 50,000 or 60,000 Acre Feet per year.

The reason that we developed this contract was to give our stakeholders the ability to use existing storage more effectively and, when the AVC is completed, that number that's on the lower right there of 6,575 Acre Feet will -- could be as much as almost 30,000 Acre Feet. Some of the purpose of the

excess capacity contract is to keep a supply in there for the Arkansas Valley Conduit.

So, with that, I'll be happy to answer any questions.

MR. RIZZUTO: Questions of Chris? Hearing none --

MS. MITCHELL: I have a question. Is it possible to say something? This is Rebecca Mitchell. Chris, thanks for bringing up the CWCB's contribution to the Arkansas Valley Conduit. I just had to say, with everybody listening, we consider this project incredibly important to the region, not only for supply but quality issues, and so I wanted to thank your organizations for their lead on that.

MR. RIZZUTO: Okay.

MR. WOODKA: Thanks, Rebecca.

MR. RIZZUTO: Other questions or comments?

MR. HAYZLETT: Mr. Chairman, this is Randy Hayzlett.

MR. RIZZUTO: Yeah, Randy.

MR. HAYZLETT: I have a question for Chris. At the treatment plant at Boone, will that be by-product there or how does that treatment plant work? I'm not familiar with that.

MR. WOODKA: So a break point chlorination is just a kind of a rechlorination. It's a common technology. You think of swimming pools, they use it for a little different purpose, but it gets the chlorine residual to zero. Main by-product of that would be a chlorine gas which, in some cases, can actually be recaptured and reused. There won't be any water quality impacts from the dechlorination plant, though. It's a process of -- it's a chemical process and contained within that facility and, mainly, the way it works is the water running through the plant will go through several channels so it has contact time for the chlorine to drop out of the water. I had to -- I had to learn a lot about that to be able to explain it, so I'm not a chemist, but --

MR. HAYZLETT: Yeah. Well, thanks. I appreciate that.

MR. RIZZUTO: Okay. Other questions, comments? Chris, congratulations to your organization and everyone else to finally get this project moving.

MR. WOODKA: Yeah, it's been -- it's been a -- it's been a good -- well, I came to the District four years ago and this is one of the main

things that I've been trying to work on, and I think a lot of the credit goes to Jim Broderick, who has had some great ideas about this through the years, so -- and helped push it along.

MR. RIZZUTO: Okay. Good. Thank you, Chris. Next, Lower Arkansas Valley Water Conservancy District, Amy Weber.

MS. WEBER: Hello. Yes, Amber Weber here.

MR. RIZZUTO: Amber. Sorry.

MS. WEBER: That's okay. I also have Mike Weber on, if we could just do a quick sound check, make sure you guys can hear us, while I get our presentation up.

MR. WEBER: Can you all hear me through this?

MR. RIZZUTO: Yes.

MR. WEBER: Very good. Thank you.

MS. WEBER: See here. Can everybody see the correct portion?

MR. RIZZUTO: Yes.

MS. WEBER: Is that better?

MR. RIZZUTO: Mm-hmm.

MR. SALTER: That's better.

MS. WEBER: Perfect. All right. I will

go ahead and turn it over to Mike. He's going to get us started.

MR. WEBER: Thank you for hearing what we have to say today. I appreciate the time to speak here. Mike Weber. I'm engineer with Lower Arkansas Valley Water Conservancy District.

Sorry, I'm getting feedback here. Give me just one second. Can you all hear me still?

MR. RIZZUTO: Yes.

THE REPORTER: Not very well for the Reporter. If you could speak up, Mr. Weber, that would be great.

(Discussion held off record.)

MR. WEBER: I'm going to go ahead and start off today's presentation and talk about some of the work we've been doing, and the rest of the presentation, I'm going to kick over to Amber with all the work that she's taken over in the past about year and-a-half or so.

Talking about mostly our water quality and soil health projects. A lot of our other work, you guys have heard about over the years, our Rule 10 Plan, Super Ditch, and all that. I don't have an update on any of that information currently. If you have questions, you can email them to me and I can

address them later, but we really want to focus on some of the innovative work that we've done over the past few years.

So go ahead and getting started here, I want to outline all the projects we currently have on the ground, and these are all water quality projects that we partner with the EPA. We actually have some funding through CWCB. We even have some funding from CDPHE and the Power Authority Board, so a great slew of collaboration and works that we're doing within all these projects. There will be 40 total projects when this is all completed, and the idea is to measure water quality before any best management practices are implemented, implement that best management practice and see what improvement that makes, as far as load reduction and how that moves forward.

We've been doing this since 2017 and we've shown some good results. Don't really know where we're going to go with -- with those results and I don't have them presented here. I can get into them as -- as I talk about them a little bit more, but this is a way to work with the State of Colorado and the State of Kansas to show the best management practices on fields that are nonpoint source, or ag,

is really what I'm working with. We can really improve the river as a whole as it traverses from Pueblo Reservoir all the way to the Colorado Kansas Stateline.

There's a few projects that are listed. You can ask questions about them if you want a little bit later on, but those are the projects currently on the ground that we are implementing, either have implemented or are implementing right now.

I have this next slide here, which is just some pictures of those projects and what we've been doing with them. The top left is the actual liner that we put on one of the ditches. We took that ditch. We essentially removed the earthen ditch and put it into an underground 36-inch pipe.

The middle one there is a pond liner that it's a head stabilization pond that goes back to a sprinkler system. We lined that and we've actually found that doing that has a lot of water quality benefits.

The top right there is kind of our soil health piece where we flew on some cover crop to see what would happen in B6 corn. There was some things that went wrong with that and some things we're fixing, but we're still working on it.

The bottom left is a lease fallow field that we're actually going to convert after the pilot project, the Catlin Pilot Project is completed, we're going to do some fertilizer reduction where you take that middle strip and you apply half as much fertilizer and see what happens. All of this is to reduce nitrogen, phosphorus, selenium, uranium salinity. Anything that we are having naturally occurring within our system through the marine shale, we're trying to limit that interaction, and we really helped that water quality at the river. Another pond right there on the bottom right.

Through this, I have some results here, and I just put one graph together and talked about it a little bit. We weren't measuring the river when we started in 2017. It wasn't part of the scope. We were trying to keep it in a water scale, where we could actually look at a drain or a specific field, we could localize a lot of those variables.

Starting in 2019, we decided we need to actually look at the river as a whole and, through doing that, we've actually shown that if we do a bracketed system around most of our projects, which are below John Martin Reservoir and before the May Valley drainage at Lamar there, we have shown some

reductions in phosphorus and nitrate, which are great, great clues as to what we're doing. Most of our implementation actually occurred in 2018-2019, so you're seeing some of those effects come into here.

This is on a large scale, so you can see the reduction. Especially below JMR, the nitrate levels dropped from 6 milligrams per liter, and those -- it's not zero, but it's less than .05, so it looks really low on the map here.

Want to talk about a watershed scale analysis that we did just on one of the drains we did. We installed seven sprinklers on a 2000-acre plot, and that drainage has reduced the selenium, uranium and nitrate levels by almost 30%, and the phosphorus level has actually decreased by almost 80%, so we are actually reducing a lot of that phosphorus, nitrogen, selenium and uranium, getting back to the river from that specific drainage.

I don't have any of those graphs here. If you want to see them later, that's great. I can provide them as needed, but the whole point of what I'm trying to get at here is that we are working diligently to implement best management practices to reduce these major constituents and we're starting

to show some of the impacts of it, and we're looking at the river as a whole. That's really where our mindset is is we want to improve the river as it -- as it crosses into the State of Kansas.

Some of the future projects, and I talked about future, this is the next year or two, we're going to start getting more into cover cropping, mulching, and those types of organic regenerative ag pieces. Irrigation efficiency, we're just putting up more sprinklers. We're putting up more drip irrigation, those types of things, where we can actually be more efficient with what we do. Wetland restoration, edge of field buffer strips. Water scheduling, something that's kind of new and we haven't figured out how that's going to exactly work yet, but we want to try and utilize runs of water more efficiently, instead of just throwing them out throughout the whole run of water. I don't know how that's going to work, but we're still working towards that, and then soil health and water nexus, water quality nexus.

We strongly believe that soil health can improve water quality greatly. Some of the work we've done previous is the soil health practices can improve water quality by almost 20 to 25%, depending

on the constituent and the work that you're doing with it, because that nitrate and phosphate actually stays in the soil, so those are projects that we have planned for the future.

I do want to note that all projects that have been implemented are within the Rule 10 Plan and have been approved by the State of Colorado and, I believe, by the State of Kansas. I haven't seen that side of it yet, but I believe they have all been approved and operated for all implementation that we've done so far.

The last slide here is just kind of that soil and water nexus. We think that using the five principles NRCS has implemented, we can actually make a huge difference in this lower basin of the Arkansas, and actually statewide, and we think that water quality is the ultimate benefit for this. If we can prove that it works, we can actually go out and have people adopt these practices without our help, and then we can make a larger impact. I don't have the capacity to do this myself, so we actually hired Amber to do this work, and so I'm going to turn it over to her, because she's kind of taken this and ran with it, but it stemmed from this water quality piece and it's really kind of taking those

legs and moving them a lot further.

So, with that, I'll turn it over to Amber and she can talk about our soil piece that we've been working on for a year or so.

MR. RIZZUTO: Okay.

MS. WEBER: Thank you. So, yes, I'm going to talk about projects. So Mike has nearly 40 water quality projects that he is currently operating, and about 12 of those projects include a soil health component, and then when I came on, I added several projects to those as well and those are getting ready to get implemented and started here in 2021.

So we really start with water quality in mind, because that's our big push. We view soil health as a means or a mechanism to improve it, but we really do start with water quality in mind, and we really just target those drainages that are super-impaired that we know will do the most good.

So then we go to the producers within that smaller watershed and we just ask them if they'd be willing to partner with us. They're really our experts, and we're incredibly grateful for them, because they are so gracious for allowing us to work with them on their land, improving both the water

and the soil.

After we kind of have that partnership with the producers, then we ask them what their resource concern is. We don't just want to target everything at once. That's not always super doable, so we focus on our resource concern. Some of those are grazing, so they want to create a better forage for their cattle or their goats, or perhaps they want to increase diversity. Maybe it's just organic matter as a whole. We really just want to focus on their resource concerns because, really, we're doing this for them as well. So the producers make all of the decisions. We merely support them with data and research and monitoring equipment.

Some of the best management practices are kind of the same for both water and soil quality, which makes it nice. So if you keep your ground covered year-round, that can limit the sediment that moves into the streams and river and all of that, so that's one way that we can kind of keep both in check, but we can also do other things, like buffer strips for riparian areas, et cetera.

Some other ways we can improve soil quality is through crop diversity, which can mean multiple species on a field, or it could just be making sure

that we have winter crops, et cetera, pre-manure grazing, that sort of thing.

We do install these on a farm-by-farm basis. It's just easier to monitor and collect data, control the variables, and do the mass balance calculations. When we first started or when Mike first started, he kind of looked at a larger scale, and we realized that farm-by-farm basis is really where it should be and then, further, we tried to find plots of land that have a nice setup to do a control and a variable plot, and you'll see why when I get into the equipment that we use.

So another large part of what we do is an economic analysis or what we will be doing. We want to make sure that we take a robust look at the data over the years to determine not only yield. Sometimes people say, oh, I just want to focus on yield and that's what I can determine my economics on, but really, we look at a few different variables here and pieces of data, and it's important to note that we can't do a comparison year-by-year, simply because we are so variable, which all of you know. Our irrigation water versus rainfall and everything in between, it just doesn't allow us to have that year-by-year comparison, so we really need to get a

robust set of data to look at.

Some of the things -- oh, did I catch somebody speaking?

MR. RIZZUTO: No.

MS. WEBER: Okay. Perfect. Some of the things that we want to look at is maybe yields were decreased because of the lack of water that we had. Perhaps we yielded more, because of a wet year and not because of fertilizer, so those are some of the things that we can kind of differentiate with some of this data.

Suppose quantity goes down but quality goes up, which we had happen in Otero County this past year and we had buyers just wanting to get that product out as soon as they could, because it just looked so great, but you could also have several other varies -- varieties. Quantity could go down, but your fuel and your fertilizer could be cut down as well, so your return actually goes up. So those are some of the data pieces that farmers really want to know, and we can kind of help them out with, and it will help our research as well.

We will have a team of people who will be working on this to collect the data, do the trend analysis, partial budget analysis, et cetera, and

our part producers will be right there with us. They'll be helping us with the data and informing every step of the way. We do want to make sure that we get historical data, as well as any data that we collect real time, so that we can create those trends and really see where those data pieces spike or drop, that sort of thing, and this is really mostly for the producer, but it's also going to help us tell that larger story.

So here's our data monitoring setup, and you've probably seen a similar setup, but we've customized this for our efforts so you'll notice the two solar panels, which is pretty standard, and the control box in the middle, and then you'll see a rain gauge at the top. That's that big white piece that you see there. There's actually a tipping bucket inside with a couple different layers of protection for leaves and that sort of thing that's easy to clean out. So there is a tipping bucket in there so that we can measure any rainfall and precipitation, and then you'll see, on the very left and top, there's our TriSonica, which is the black cube looking item up there, and that measures our wind speed and direction, humidity, temperature, et cetera, which can be incredibly helpful for both our

producers and ourselves.

It's a little harder to see in this picture. There's actually two soil moisture probes going on either side, so there's one that goes into the corn, and then the other one will actually come here. Picturing yourself standing next to this, it will come out towards you. So we have one on either side, one in the control, and then one in the corn, which is our variable, so those just measure our soil moisture at three different depths on both sides, so that we can keep track of that as well.

It's important to note that this is so new to us that we don't have any soil quality data or any of that yet. Hopefully, we can get some of that soon and we can run it through the QAQC process. We'll keep you apprised of what we come up with but, at this point, we don't have any data.

But the really nice thing, too, about this setup is that all of this real time data is available to the farmers. They can log on online and they can get their wind speed and humidity and everything real time, so that's really nice for them.

And really thankful for the Producer Advisory Council that I work with. They support me in a

variety of ways. I get feedback and a temperature on the work that I do. Those that serve in this capacity are the EPA, the CDPHE, Department of Ag, NRCS, CSU Ag Experiment Station, the Water Conservation Board, and several producers. I'm really grateful to this group of people and I wanted to give them a quick shout.

In an effort to combat the challenges posed by COVID-19, we're working diligently and digitally to perform tasks we would normally do in person, like committee conferences and farm tours, that sort of thing. So we are actually putting together a podcast and video series, so this is our crew at a farmer's place talking. It's one of my favorite pictures. So we are actually doing a farm -- a podcast that will come out in January.

So even though COVID has provided us with challenges, it's allowed to us grow and expand and will allow us to show what's going on on the field and on the farms without posing any risk to anybody, and if you are interested in that podcast or anything, reach out, and I will be sure to include you on the distribution list when those come out in January.

Another way -- oh, man. Got a little happy

there. So we also have a story map. Unfortunately, we can't have those farm tours, though once it opens up and we can have people out again, we'd be happy to have you. This is a way that we can show some of the efforts that Lower Ark has done and Mike has really done. This is mostly a water quality story map although there is some sort of health component in there as well. The story map really displays the reason why we work so diligently on these projects and with our people, what issues we are up against, and the projects that we are doing collaboratively to combat water quality. So there's a couple different views there, and it just takes you through everything there.

We also have a social media presence now. It's an extra way that we can keep our stakeholders, participants and funders kind of involved and informed. We talk about impaired water bodies and economics and really hoping to educate as well as inform everybody down here, and feel free to like, share, comment, whatever, and keep up to date with that as well.

In addition to the local and regional efforts, it's increasingly important to us to place statewide frameworks and programs in place, so Colorado has

several things going on that Lower Ark is actually partnering on. This is the Colorado Collaborative for Healthy Soils, which is a bottom-up and big-tent organization. It's comprised of over 250 participants and organizations across the State of Colorado. There's a few in other states as well, and the goal is just to provide a producer centered and action-oriented form for soil health to be the primary conversation, and these conversations have actually led to what Colorado hopes to roll out as a soil health program through the Colorado Department of Ag.

There we go. So the soil health program is just an initiative at this point but, pending draft legislation, they will have the authority to both receive and distribute grant funding to local producers and conservation and conservancy districts to promote and implement soil health practices. They also want to employ technical assistance personnel across the State, and that's in partnership with NRCS, so that's a really neat partnership. They want to perform a soil health inventory of both practices and soil types and to provide soil health testing at a review stream.

What's neat about this is the Colorado

Department of Ag recognizes the importance of soil health, not only for our health from the crops we eat, but for livestock, water quality, et cetera, and the benefits are pretty great and we're happy to partner with them on that as well.

I'm almost done here. The last item that Lower Ark is leading is it was kind of born out of the Colorado Collaborative for Healthy Soils as a resource guide. Soil health can be fairly new to most of Colorado, so we're working on a guide that will provide the resources to producers in our region and across the State to assist the producers while they're researching and kind of getting their feet wet. Any of this information, I'd be happy to share, so just reach out to me. My email is at the end of this slide show.

So we work diligently and collaboratively with many organizations and individuals, including our producers, local, state and federal agencies, and will continue to communicate efforts done across state lines. Our goal is water quality and the delivery of such to our constituents in the Arkansas Basin and find ourselves lucky to be involved in such great work.

So thank you for listening. I'm happy to

answer any of the questions that you might have.

MR. RIZZUTO: Thank you, Amber and Mike. Questions? None. You did a great job. Thank you.

Next, Kansas Groundwater Management District Number 3, Mark Rude.

MR. RUDE: Yeah, Mr. Chairman. This is Mark Rude. Can you hear me?

MR. RIZZUTO: Yes, I can.

MR. RUDE: Wonderful. I'm trying to get things to work here.

MR. RIZZUTO: Okay. Go ahead.

MR. RUDE: While I'm doing that, I really enjoyed the Lower Ark Water Conservancy District presentation. It froze up on me and I had to get out of the meeting and get back in, so we'll see how this works. Let's see. Kevin, do I just -- or anyone, do I just share and that should come up -- bring up my screen?

MR. SALTER: If you hit share, then you'll have a choice of the things that you want to share, so you'll have to pick the appropriate screen or appropriate program, and then when you do that, you'll have to hit share again.

MR. RUDE: Okay.

MR. SALTER: So we're seeing your

presentation.

MR. RUDE: Okay. There we go. Hello, Mr. Chairman, members of the Compact commission, and everyone else. Good to be with you on this very unique ARCA meeting, but very informative, and I too want to thank -- thank everyone who was involved in setting it up, because it certainly allows me to participate and for us to provide some comments here this morning.

My name is Mark Rude. I'm Executive Director of the Southwest Kansas Groundwater Management District here in Garden City, and my opening slide is the Ark River and surrounding irrigation land downstream of Garden City.

I've got a few comments this morning. Won't go into a lot of detail, but certainly have enjoyed the presentations thus far. The comments I've got this morning, I'll just limit them to comments on updating our management program; efforts for assistance to address poor river water quality collaboratively; some study activity of the District; water quality elements of Compact entitlements; and then GMD-3 request to ARCA and member states.

Under Kansas law, the Groundwater Management

District operates under a management program and that, from time to time, is revised, and those revisions need to go to the Kansas Department of Ag, Division of Water Resources Chief Engineer, and welcome to his new position Earl Lewis as Chief Engineer in that position. We -- we will be working with him to update our management program document, and that is a document that sort of covers the -- the spectrum of water management activity in southwest Kansas, so invite you to take a look at that draft.

For years, GMD-3, we have been working for and looking for ways to encourage improvement on basin surface water quality conditions. We've had past conversations at ARCA meetings, and so I'll reiterate how exciting it is to hear the Lower Ark Water Conservancy District, specifically in some of the efforts that they're doing tremendous work, with 40 plus projects, as I understand it.

The receipts of the contaminated Ark River flows that do come into our district, we're essentially a closed basin, and so everything that comes into either groundwater storage or onto the soils of the fields of the producers that divert the surface water. So the producers, you know, they --

they deal with the poor quality surface flows in various ways and that includes commingling it with fresh groundwater, or at least fresher groundwater, or even passing at times the use of the water all together, because of the effects it would have on crops, any particular quality flow. Poor quality river flows contaminate the groundwater supply of the users and communities of southwest Kansas, and that's an ongoing reality that we're really grappling with.

Part of that effort, we've reached out looking for partners, and it was a little interesting to hear in some of, I think Amber's comments, that they're also interested in reaching out across state lines.

Certainly we've tried to do that and maybe work with federal partners to help facilitate that. One example was back in 2014, we received a basin plan of study under the Bureau of Reclamation Water Smart Program and then went through a series of meetings, which included meetings across southwest Kansas and even Holly, Colorado, and so a couple of slides from those meetings in 2014.

The focus we had in those conversations was problems with the water quality, and we also had --

we had some presentations from Don Whittemore at KU, the Kansas Geological Survey, and he reviewed with folks the sort of realities of, in this case, the slide talks about sulfates at the top and uranium at the bottom, and how they're very similar in concentrations. As you go down the basin, those concentrations increase and, as I said, were pretty much a closed basin in southwest Kansas. Once you get to the eastern side of our district, some base flows start to reappear in the Ark River Channel and the quality is much better.

Don reviewed, at that time, source of salinity and uranium. It's been mentioned already this morning in reports the weathering of the cretaceous marine shales and how those natural sources then are released into the system. Human sources, he said were insignificant, so the cause of salinity and uranium levels concentration of dissolved salts by consumption of water by evapotranspiration associated with extensive irrigated acreage, irrigation agriculture, and then shallow reservoirs that have also been mentioned in studies in the valley. That all serves to concentrate that uranium and -- and high salinity level.

It's natural, and Don estimated that in the

absence of human activities, salinity and uranium concentration would be three or four times lower. I'm not sure if he was referring to the Stateline or just exactly where, but that was what he included in the presentation, I believe at Syracuse, and perhaps at Holly as well.

One of the slides he provided was Stateline conductance data, and kudos to the U.S. Geological Survey for all their work on the gages, but that includes conductance water quality, and so just looking at this slide, Don was showing that there is a certain visual sense of what's happening for the two periods, 1976 through 1981 in red, and 1999 through 2010 in blue. It seems to show that the quality of the water at the Stateline is deteriorating.

This is a slide from that presentation as well, just saying to the attendees that through that effort to develop a plan of basin study, there were challenges. The program is a competitive program and we're certainly, at the time, seeking input from Colorado, and that all of that work would end by August, 2014, and essentially concluded about that time with really no real direction to go and no expressed interest in studying the matter from folks

other than GMD-3 and Reclamation.

A comment I wanted to make on bridging the federal Stateline basin barrier. From that experience, particularly, we -- we got a sense that -- perhaps others have found this, too, that there -- there are regional boundaries for various state agencies, and we certainly recognize ARCA as a federal -- as having a federal role to support the purposes of the Compact, bridging that -- that Stateline and looking at the basin, that portion of the basin that's applicable to the Compact agreement.

Viable federal assistance in addressing basin water quality problems across the Kansas-Colorado Stateline depends on overcoming that boundary or those boundaries, those administrative boundaries of federal partners.

Each office developed its own set of stakeholder partners not normally involved in issues outside of their region, and so it certainly stands to reason that there's a certain focus for each of those regional offices when it comes to projects and partnerships.

Federal regional boundaries change at the Colorado Stateline. Included is U.S. Army Corps of

Engineers, EPA, and Department of the Interior, including Reclamation and U.S. Geological Survey.

To further complicate these boundaries and potential barriers, we have found that when we were working with Reclamation, the Region 5 include -- we're included in Region 5, but because we're in the Ark River Basin administratively, we actually work with Department of Interior Region 6 out of down south, so there's some practice and practical changes to those boundaries as well.

So when we were working, for instance, with the basin plan of study, we -- we asked for some collaboration with the Eastern Colorado office and -- and we're not sure that we got too much at the time, but that primarily was because the Eastern Colorado Reclamation office was all the way up, you know, basically knee deep in the EIS for the Ark Valley Conduit, and certainly we don't want to disrupt those kind of things, but so it was a timing thing where they were -- they had their focuses, and really, we don't want to disrupt those activities that they were focusing on at the time. So the point here is that it takes a lot of extra effort and coordination to reach across those administrative boundaries if we're going to address

the basin issues that spans that Stateline.

Some other work that we did was, of course, talking with our legislators in Kansas and -- and there was resolutions passed in 2019 and then I believe at least one of them, if not both of them provided to ARCA, they say essentially the same thing: Trying to encourage that collaboration across the Stateline and with federal agencies and for -- for our Kansas congressional delegation to do their part in getting the funding Reclamation needs to complete some of the work that has been started.

Oops, I beg your pardon here. On the right of this slide is a table from work that Don Whittemore and Kansas Geological Survey has done, just looking at uranium and taking some -- actually, two approaches of calculating the tonnage of uranium coming across the Stateline. So it's notable in 2017 and 2018, there's some elevated levels there, and he doesn't offer whether that will rise or fall into the future, but there's a reference to that open-file report there on the slide, and so there's this -- I pointed this out last year at our presentation.

There's this functioning at the Stateline for our closed basin in southwest Kansas that the

Stateline is a functional equivalent point source discharge on some of these -- some of these mineralization concerns in the water.

GMD-3 evaluations and the additional work that we're doing that I just want to touch on, we're collecting additional water quality samples in the basin, trying to get a handle on how that effect of surface water contaminants is moving into the and affecting the broader High Plains Aquifer, certainly with partners in the Kansas Geological Survey, KDHE, and Kansas Water Office and Department of Ag.

We're also looking to almost basically ramping up in response to the Colorado request for special account in John Martin Reservoir and the question what Kansas producers would need out of the basin. We're trying to pull together the funding for a preferred interstate supply evaluation, and we think we can get there early this next year to determine the Kansas water user needs from that interstate supply.

We're also doing what we call POCs or Proof-of-Concept small water transfer projects from out of basin into the basin, to try to walk ourselves and other stakeholders through some of the thinking processes needed to -- for developing the

end project, which would be major water transfers, and so it's really just taking a truckload of water and appropriating it from available supply in the east and moving it across Kansas into southwest Kansas, and we completed a project earlier this year, and then going through the permitting processes involved, which includes invasive species and threatened and endangered species, as well as water quality monitoring and, of course, water appropriation, and we -- we're looking to do more of those on an interstate basis, to partner with entities in eastern Colorado and north Texas and maybe even northern New Mexico to, again, do some of these small water transfer projects as an effort to think through what would be involved with larger projects for transferring flood waters and other available supplies into areas that are water short or water quality impaired, so we'll see how those go. So far so good on that. They're very small projects and intended to be simple.

Finally, this is a -- a map. The larger the blue line, the more flow in the surface water source, and Colorado has one of these as well, so you can visually see where the large surface flows are available and so likely sources for water

transfers in our small Proof-of-Concept projects.

ARCA Compact-1949 basin conditions. We just -- you all know this, but just to point it out, Article IV-D express terms prohibit future beneficial development which involve the improved or prolonged functioning of existing works and which materially deplete the waters of the Ark River in useable quantity or availability for use to water users.

That's not a quote, but it's -- it's, in essence, the message there.

Regarding water quality, we've certainly noted in past conversations that some might view Compact language in the agreement as lacking direct reference to water quality and, therefore, water quality is not a Compact compliance concern, but the purposes and language of the Compact are -- are not that limiting.

It's well-established that useable water supply has both quantity and quality elements. Upstream post Compact development and use practices incrementally and over time may have dropped the quality of the 1949 basin supply, affecting Compact allocations.

I have a sensitive mouse here. I apologize.

Okay. The GMD-3 request to ARCA. Under the equal dignity of each State in questions of Compact enforcement, we're simply raising the question to ARCA of Compact compliance and harm to basin water users for ARCA to -- for ARCA and member states to investigate the changes in 1949 water quality conditions and affects on Compact allocations.

So that is a question to ARCA, and that's my last slide. If there are questions, be happy to try to address those.

MR. RIZZUTO: Okay. Thank you, Mark. Questions of Mark? Okay. Hearing none -- oh, Randy?

MR. HAYZLETT: Yes, this is Randy Hayzlett. I have no questions, particularly; just a comment on all the reports in agenda item 5, very good reports from all four individuals, and three of them in particularly really focused on water quality. These are topics that the Administration really needs to hear from and be informed on on a regular basis, so would just encourage them to continue to come to ARCA, either in committee meetings or both in committee meetings and full ARCA to make their reports, so thanks to each one of them.

MR. RIZZUTO: Okay. Anyone else?

MR. RUDE: Mr. Chairman, this is Mark. Could I just ask for a point of clarification? I think you're been very diligent in describing exhibits, and certainly like for this presentation to be made an exhibit, and I presume then that will be made a part of the record of ARCA?

MR. RIZZUTO: Okay. That's a legitimate request. Any comments from Kansas or Colorado delegation?

MR LEWIS: This is Earl Lewis. I think if we're going to make that an exhibit, we need to make each of the presentations that have been given by the local water users a equal exhibit to the minutes.

MR. RIZZUTO: Okay. Well, then, if there's no disagreement by the commission members, we could make each of them an exhibit, starting with Purgatoire being F, Southeast Water being G, Lower Arkansas, H, and Kansas Groundwater, I. So we will make each of those an exhibit as designated. Okay.

And with that, let's take probably what will be the last 10-minute break and come back at noon and we'll start up with you, Kevin.

MR. SALTER: That sounds good.

MR. RIZZUTO: Okay. We're recessed till twelve noon.

(A break was then taken from 11:50 a.m. MST until 12:05 p.m. MST.)

MR. RIZZUTO: I'll reconvene the meeting of ARCA, 2020 Annual Meeting, at 12:05 p.m. Mountain Standard Time, 1:05 p.m. Central Standard Time, and I apologize if anyone hasn't had time to eat or the like. Maybe if -- is there anyone that needs an additional break or we can just start moving forward?

Okay. Hearing none, we'll start with Item 6, Compact Compliance/Decree Issue Updates, first with the Ten-Year Compact Compliance Accounting Table, Joint Report of the States, Kevin Salter.

MR. SALTER: Thank you, Jim. We're kind of switching off these two roles on this Compact compliance between me and Kelley Thompson. I'll have to admit that I wasn't as involved this year with these issues as Rachel Duran in the office. I really appreciate the work that Kelley and Bill and his staff put together for coming up with these two particular items.

So both States do an update on the H-I Model,

and now that I'm looking at that graphic, Kelley, I think I may have pulled the wrong one, because I think it should be 2010 through 2019?

MR. THOMPSON: Right. That appears to be last year's.

MR. SALTER: So I will get the correct one for the record. We did end up with a depletion coming out of the model, and so maybe let Kelley maybe take over, and I apologize for pulling the wrong document.

MR. THOMPSON: I can potentially share that.

MR. RIZZUTO: Okay, Kelley, or is Kevin going to --

MR. THOMPSON: I guess that's the current table that Kevin was attempting to show there, yeah, just for this last year. For 2019, we did have a fairly big change in the -- in the -- in the Compact accounting, as you'll see that we, at this point, we had a -- we had a 7500-foot depletion for 2019, and so for our Ten-Year Accounting, so that was 2010 through 2019, we have a 2,756 accretion still remaining, but that number has dropped fairly significantly from the past. So I don't know, Kevin, did you want to say anything more about that

or --

MR. SALTER: No. We just like to make sure that this gets in as an exhibit, and Kelley does have the correct one up, and that way we can kind of monument the status of this accounting going forward.

MR. RIZZUTO: Any questions of Kelley or Kevin? Okay. Hearing none, that will be Exhibit J. Okay. And then Kelley Thompson again on presumed depletion factor.

MR. THOMPSON: Yeah. Let me pull up some notes here, but yeah. So thank you, Chairman Rizzuto. Appreciate the time to talk a little bit about our annual evaluation of the presumptive depletion factors, and so these are for the supplemental flood irrigation.

So after we do update the H-I Model every year, it works into that Compact accounting that Kevin was mentioning. We're required to re-evaluate the PDF that determines what we should use for administration of pumping replacements in the upcoming year. So for this water that's pumped to the well and added to a ditch along with other surface water and then used to flood irrigate, this PDF or presumptive depletion factor is the average

percent of the pumped water that then depletes the river and should be replaced through our monthly administration.

So if you can sort of see just our report here, we have settled over the last few years at a number of 36% for this particular PDF, and it's no big surprise that for administration 2021, we are recommending again a value of 36% for that supplemental flood irrigation, and I would note that we have come to agreement with Kansas on the methodology that should be used for future evaluations, and I also want to thank Rachel Duran with the State of Kansas who looked over our evaluation and did find some needles in the haystack, so to speak, that needed correcting.

So that's all I have on that, Chairman Rizzuto. Thank you.

MR. RIZZUTO: Okay. Any questions by commission members? Okay. Hearing none, we'll make that Exhibit K.

Okay. Next item on the agenda, Number 7, report of the Special Engineering Committee, Bill Tyner.

MR. TYNER: Thank you. Chairman Rizzuto, can you hear me just fine?

MR. RIZZUTO: Yes, I can.

MR. TYNER: Okay. Thank you. I appreciate the efforts that Colorado and Kansas undertook during 2020 to be able to meet multiple times as a Special Engineering Committee, with our primary focus being on the multipurpose account that Colorado has asked for in John Martin Reservoir, and yet despite the fact that the pandemic created some challenges for doing that, we did have good opportunity to try to understand each State's position better.

One of our meetings was just ahead of the kind of the lockdown for the pandemic, so we did get to meet in person and have some good presentations in Burlington, Colorado in February, and then from then on, all of our meetings were virtual meetings.

I would say that at this -- at this point, we're probably in the point in the negotiations where, because we've talked about the specific positions of each State, I expressed yesterday that I feel like we're maybe as far apart as we've ever been on coming to a resolution. However, I think that's just a natural part of a negotiation process, where you first have to fully understand the concerns of the other party, and a document that

Kansas provided to us in September helped to give us a little bit better insight about the key issues to Kansas, and so I think that I would characterize the efforts as being really good and the -- and yet the challenges we have to work out are -- are -- are fairly large and I am optimistic that we'll be able to maybe narrow those differences as we get into 2021, but I want to particularly thank the Kansas representatives and staff that participated and express thanks to our State Engineer, Kevin Rein, and Rebecca Mitchell and others who -- who participated in this process to -- to try to move us forward, and we look forward to the continued discussion.

Lower Arkansas Valley Water Conservancy District, as you saw from Amber and Mike Weber's presentation earlier, played a key role in providing some presentations to the Special Engineering Committee, as did Colorado State University, Dr. Tim Gates, and then Colorado Department of Public Health and Environment also participated in just trying to explain some of the water quality work that Colorado had undertaken, and that was helpful and appreciated, I believe, by both States.

We -- we wish that a pandemic had not waylaid

efforts to maybe see some of the on-the-ground demonstrations that -- of water quality projects that Colorado has worked on through the Lower Arkansas Valley Water Conservancy District but, as Amber Weber mentioned in her presentation, there are some opportunities virtually to try to get to know those a little bit better, and it is my sincere hope that in 2021, at some point in time, we will get a break and have a chance to get back together in person to see some of the things and have face-to-face discussions.

I think that's all I had on that particular topic. Thank you, Chairman Rizzuto.

MR. RIZZUTO: Okay. Thank you, Bill. Any questions of Bill? Okay. We'll move on to committee reports, and after we hear all of the reports from engineering, operations, administration and legal, they'll be incorporated into what will be Exhibit L, so first, I'll call on Scott Brazil.

MR. BRAZIL: Thank you, Mr. Chairman. The Engineering Committee met yesterday and Rachel and Andrew prepared a meeting summary for us, and our first presenter was Brian Macpherson from Colorado Division of Water Resources, and he provided an update on the progress related to the

Arkansas Decision Support System. This included elements of GIS, Modeling, Task Memos, Administrative Tools completed under Phase I. The project is being moved into Phase II of planning, which includes enhancements to the Colors of Water tool, additional StateMod and modeling to satisfy the Trinidad Reservoir Ten-Year Review requirements, and the Dakota Aquifer mapping, and compiling existing aquifer information and well log information to produce maps.

Bill Tyner also and Kevin Slater (sic) provided an update on the discussion related to and the proposed Colorado multipurpose account in John Martin Reservoir. Negotiations between Kansas and Colorado are moving forward.

Kevin Slater (sic) also provided an update on efforts to replace the Frontier Ditch flume. Several contractors have been identified and efforts to obtain a cost estimate in the upcoming year will be persistent.

Garrett Ross from the Army Corps of Engineers presented to the committee the 2020 reservoir operations for Trinidad and the John Martin Reservoirs. Maintenance done at the John Martin Reservoir includes work on the outlet works

conduits, the gates and repairs to the spillway and the tainter gates. Additional water quality monitoring efforts are underway at both reservoirs, including the installation of new monitoring sites.

Jeffrey Rieker from the Bureau of Reclamation provided an update to the committee on the status of the Department of Interior reorganization and Reclamation's efforts in the Arkansas River Basin. Three activities to note were the Excess Capacity contracts in Trinidad Reservoir, the Pueblo Reservoir Recovery Storage Project, and the Arkansas Valley Conduit.

Krystal Brown from the USGS reported on the Cooperative Streamgage Program, noting the beaver issues on the Big Sandy gage.

Steve Kastner from the Purgatoire Water Conservancy District informed the committee that the Purgatoire Water Conservancy District entered into a draft letter agreement with the Bureau on excess capacity contracts and an update on the concepts for the Trinidad Reservoir sediment modeling was provided. And that's the end of the report I have, Mr. Chairman.

MR. RIZZUTO: Okay. Thank you, Scott. Questions for Scott by commission members? Okay.

Hearing none, we'll move to Operations Committee and, first, Operations Secretary Report, Bill Tyner.

MR. TYNER: Good afternoon, Chairman Rizzuto and representatives of the Arkansas River Compact Administration. I don't have a presentation that I'm going to put up on the screen today. I'll just speak into the record some of the highlights of 2020.

I'll provide -- I'll provide an overview of those operations that occurred related to John Martin Reservoir during Compact Year 2020 and I'll also provide some information related to Trinidad Reservoir operations during Compact Year 2020 related to maintenance of the Permanent Pool.

I'd like to first recognize individuals who are participating today. Becky Mitchell did a good job on just some short notice trying to identify folks, but I'll just -- I'll double-back on that, just to make sure we don't miss anybody. From Colorado Division of Water Resources, Kevin Rein, State Engineer, who was on earlier. He may have had to break away or may have to break away here after a little bit with a conflicting meeting. Kelley Thompson, you've heard from, from our modeling group at the State Engineer's office.

Our Water Commissioners play a key role, and I believe we've got four Water Commissioners joining us today: Lonnie Spady, Jeff Montoya, Brandy Cole and Jeanette Meyers. Then also from the Division 2 office, assistant division engineers Rachel Zancanella and Lori Lest. From our reservoir, river and reservoir operations group, John Van Oort and Phil Reynolds. Joe Regur is our augmentation coordinator, and last but not least, Bethany Arnold, our water resources engineer for our water information team. Each of these folks, I believe, are joining us online today.

Our employees work closely with Kansas staff throughout the year, and I want to thank Kevin Salter and Rachel Duran and the rest of the Kansas staff as we worked together on ARCA matters. I have a little more complete list of employees that are recognized in the Operations Secretary's report on page 10. One group that I failed to include in that listing was our hydrographers, led by Joey Talbott, and I appreciated Tony Anderson mentioning the work that the Colorado Division of Water Resources hydrographers do to maintain quality gages, some of which are funded by the Arkansas River Compact Administration, and appreciate the work the USGS in

both States do to maintain the accurate gages.

Dan Steuer from the Colorado Attorney General's office is also participating with us today and Dan has helped us a huge amount in apprising us of things important to Compact compliance considerations throughout the year; specifically working on some things with the Trinidad Ten-Year Review. Appreciated working with both Andrew Rickert and Brian Macpherson with the Colorado Water Conservation Board. Brian's not -- I don't believe Brian's back on today. Andrew, of course, is instrumental in getting the ARCA meeting prepared and working on the budget and the Administrative and Legal Committee work in particular, but he's also done some great work to get past annual reports ready to be approved, as we'll see later in the agenda today, and worked on the approval of transcripts and other actions from meetings that take place for ARCA.

Now moving to the operations, at the beginning of Compact Year 2020, John Martin Reservoir contained approximately 70,003 Acre Feet of content. Initial account balances were adjusted on November 1st, 2019, to implement the new John Martin Reservoir survey in a manner agreed upon between

Kansas and Colorado, where each account was adjusted according to the pro rata amount held in the account during the prior 12 months.

I might point out for folks that that last reservoir survey actually showed an increase in content at the elevation we were at on November 1st, and so each of those accounts actually increased in content after that adjustment.

Conservation storage only occurred during the period from November 1st, 2019, through April 18th, 2020, with no subsequent summer storage events beyond those dates. The dry year, as has been talked about by several of the speakers, Bob Kimbrough and Tony Anderson, contributed to no summer storage events beyond that.

A total of 37,387 Acre Feet was stored during this period. Additionally, transfers from the Colorado Upstream Consumable subaccount in the Offset Account to replace deficits to conservation storage occurred in the amount of 78.83 Acre Feet, and that total is included in the total storage for conservation storage.

Storage of other waters under Section III of the 1980 Operating Plan during the winter period totaled 18,782 Acre Feet before the storage charge

was deducted from that total. The 35% was distributed first to refill the Transit Loss Account and maintain it full by adding a total of 216 Acre Feet to the account to bring it to 1700 Acre Feet and maintain it through to the end of the program.

Beyond that point, the 35% charge was then distributed to Kansas or Colorado Section II accounts and 1989 Acre Feet went to the Kansas Section II account, while 4318 Acre Feet went to the Colorado Section II accounts.

The Amity Canal's Great Plains water right came into priority only early in November of 2019 for a short period, and an additional 1839 Acre Feet of Section III water was stored under that event. From this additional storage of Section III water, the 35% storage charge should have been distributed to be used to fill the Transit Loss Account and refill the account as required by use of the Transit Loss Account to support the Kansas Section II delivery.

However, we did make an error on our part in doing that accounting and failed to make that transfer. We have worked on an adjustment with Kevin Salter to be made at the end of this year's Winter Water Storage Program in March of 2021 to

correct that error.

The Offset Account received 18,958 Acre Feet through inflow or transfer. Kansas released from the Offset Account a total of 18,320 Acre Feet. Rachel Zancanella will provide some further details on the Offset Account during her presentation.

I would just mention to you that this was one of the first years that the release from the Offset Account for Kansas's benefit was actually greater than the amount of Section II water that Kansas had available.

Additionally, I would point out that although the Lower Arkansas Water Management Association was required to deliver a minimum of just over 5,000 Acre Feet of water to the Offset Account in order to be able to deliver some of the Highlands Canal water right to the Permanent Pool, as you can see, there was far in excess of that amount delivered in the 18,958 Acre Feet that was brought into the off -- or into Offset Account during the Compact Year.

It was a tough year for the Permanent Pool. A couple of things happened and the Permanent Pool actually had a significant decrease across the Compact Year of 1,946 Acre Feet. The Highland Canal water right did contribute 153 Acre Feet.

A couple of things are the reasons for that, that decrease. As multiple speakers earlier talked about, the flows on the Purgatoire River were way below average, and further compounding that problem was the fact that Lower Arkansas Water Management Association was at a point where they had to file an application to Colorado Water Court to begin the water rights change process on the Highland Canal, and got a bit delayed doing that and so, consequently, the substitute water supply plan that would allow the Highland Canal water right to be used for the Permanent Pool also got delayed, so that was an unfortunate circumstance for the Permanent Pool that I hope will be better in 2021.

As I mentioned earlier, Kansas used all of their Section II water available during 2020, releasing 15,934 Acre Feet. That delivery resulted in a delivery deficit of 1,506 Acre Feet that is currently being made up from the storage charge on Section III water being delivered to John Martin during this Compact Year.

Colorado ditches utilized approximately 31,838 -- 30 Acre Feet of Section II water in 2020. I did want to heap some praise on the Corps of Engineers, Nabil Shafike and Terry Rush and Kim

Falen and Amy Louise, before she got transferred to some other duties with the Corps, worked with us during the low spot in the summer where we had challenges in being able to have really tight gate control on releases out of each reservoir. They worked with us and were very cooperative in trying to do everything they could to address the needs of our water users, so I did want to thank them for that effort.

At the end of the Compact Year, the content in John Martin Reservoir was down to 33,858 Acre Feet. The last small item that I'll report for Trinidad Reservoir to comply with some obligations under the operating agreement for Trinidad. The permanent fishery pool in Trinidad received approximately 280 Acre Feet of water from changed water rights from Colorado Parks and Wildlife during the year. That was far less than what was needed to offset the 1,047 Acre Feet of evaporation from the larger pools of Permanent Pool water in Trinidad. So, again, a little bit of a bad year for that Permanent Pool as well.

In my presentations yesterday -- in my presentation yesterday, I showed the releases of Section II water by Colorado and Kansas in each of

the years since the 1980 operating agreement went into effect. I did not take quite the time I should have to highlight that that first 20 years of operation under the 1980 operating agreement, we were blessed with two decades of really good water supply in the Arkansas Basin, very short periods where the water supply was -- was significantly reduced, and not anywhere near like the following 20-year period has been. The two decades beginning in about 2000, definitely recognizable in 2001, included some of the worst drought years that we've seen, and our presentations today highlighted some of those efforts, and so they've been two really poor water supply decades.

I am an optimist and I think that the Arkansas Basin is resilient and that we will see better times. It has a -- an unusual habit of reacting from severe drought times by being followed by phenomenal floods and, hopefully, those won't be damaging, but hopefully they will help to restore some of our stored water, at least.

But if our hydrology is more permanently impacted and we're -- we're on a new normal of lower water supply, that just amplifies the importance of trying to make sure that all of our Compact

compliance operations are done accurately and transparently and in good faith and that the States work together to try to manage a diminished water supply.

That concludes my report. I would be happy to entertain any questions that folks might have.

MR. RIZZUTO: Questions of Bill? Hearing none, thank you, Bill. Assistant Operations Secretary Report, Kevin.

MR. SALTER: Okay. Give me just a moment as I set up.

MR. RIZZUTO: Sure.

MR. SALTER: So, good afternoon. Kevin Salter, Assistant Operations Secretary Report, and I also work with the Division of Water Resources in Garden City, Kansas.

Yesterday, I hit the highlights of my report. You can find a lot more details in that report and I would be happy to provide an electronic copy to anybody that would like that.

Today, I'm going to try to hit the high points of the high points, so I did want to recognize Alex Torrance. She's our new river bailiff. She will handle the administration of the surface water between our Kansas ditches and take care of some

water appropriation issues.

As I kind of detailed in my report, over a number of years, communication is really important between the two States. It can reduce possible disputes and misunderstandings, and so I really appreciate the efforts that's made by the Division 2 office to get with us, and then we also try to identify any concerns that we have as soon as we can.

We did have two virtual meetings, one in the spring, one in the fall, and we're starting to invite some of the federal partners to those, as well as Colorado Parks and Wildlife, and I really appreciate those folks participating in those. It provides another conduit to get the information exchanged within the basin.

COVID-19 has forced us to work remotely and there's been some real benefits, and I think there's probably been some drawbacks with that as well, but we're going to work through those and see where we can get to from here.

I did kind of want to note a couple milestones, and I'll slow it down for the court reporter, realizing I'm going near breakneck speed.

THE REPORTER: Thank you.

MR. SALTER: We have operated under the 1980 Operating Plan for 40 years. It was originally signed in April of 1980. We've had a couple amendments to that, but it has changed for the good of how the water is used on either side of the line.

I also wanted to note that the Compact negotiations, the first meeting was held on January 7th of 1946, so come this next January 7th, that would be 75 years ago. So in looking at those negotiations, it's really amazing how much consideration those negotiators made of the various different issues within the basin that would impact this Compact. So they provided a pretty good foundation for the Compact, and considering that we've been operating under that for quite a number of years.

I just want to throw this graph up quickly. Again, as has been heard many times, it was a dry year, as reflected in this graphic of the account balances throughout the year. The lines at the top, the dashed lines is the top of conservation storage, and then with the addition of the Permanent Pool on top of that, but you can see we got nowhere close to spilling the reservoir in Compact Year 2020.

It is kind of neat to look at these graphs,

because you can see various operations that occur within the reservoir. If you look around the first part of June, you can see where Kansas started pulling water from the Kansas Section II and the Offset Accounts and then, around the first of July, where some water was transferred from the Colorado Section II subaccounts into the Offset Account. A bigger blow-up of this graph is in my report to show those operations in a little more detail.

Just some specifics on how we called. We made one call of 400 CFS, starting on June 8th and ending July 21st. I really want to express my appreciation to LAWMA and Division 2 office for coordinating some Offset Account deliveries during the Kansas run. One was a delivery to John Martin Reservoir and the second was that release from the Colorado Section II subaccount.

This is a graphic showing that release at the Stateline. You can see where the deficit occurred. The orange line is the actual flow of the Ark River near Coolidge and the Frontier Ditch. It did end up with a delivery deficit, and then we noted the amount of water in Section II and Offset Account delivered to the Stateline.

The Pueblo Winter Water Storage Program, both

in Compact Year 2020 and in this year, we have seen some unusual things that the States have had to work with. In Compact Year 2020, the gray line, the Fort Lyons sluiced ahead of the November 14th, 15th date when they normally stopped their irrigation or stopped their diversion into the Fort Lyon Canal, and that provides some additional water that went to Amity's Great Plains storage, so the States had to work through how to determine that Compact baseflow prior to November 15th.

This year, again with the dry conditions, the flows, Ark River at Las Animas, was pretty stable up until about the 9th, and then we saw some impacts of the irrigation that was occurring above John Martin Reservoir, so that created a concern for me, and we also had some water that was being diverted or around the Ark River at Las Animas gage, so I appreciate John Van Oort and Bill getting with us and coming up with a good compromise to go into this next Compact Year.

Before I close off my report, I want to make sure to thank some folks, Nathan and Andrew and Lori with the Kansas USGS section. Any time there's a request from either us or the Division 2 office, they make sure and try to get spots measured along

the Ark River. Really appreciate their efforts.

In getting everything set up for this virtual ARCA Annual Meeting, Stephanie and Andrew really threw in and you got a lot of stuff done. With the test sessions and everything we did ahead of it, I think this has went off fairly well, with one or two errors by Kevin.

Again, recognize Bill and his staff and just trying to address some of our concerns and get the right information into our hands, I really appreciate that.

Rachel Duran, she's great support. She motivates myself, and I think Bill will probably even say that there was some real efforts by her to drag one of the reports we'll hear a little about later across that finish line, but it's really good to have somebody that kind of makes us focus on what needs to get done, because there's so many distractions.

And then Brent Campbell, he's a former employee of the Kansas Division of Water Resources, but his impacts have been kind of long-lasting in that the elevation area capacity table that Bill mentioned in his report. He actually started the work on how to more fairly divide those. We

normally would think of decreases in storage between the accounts in the reservoir, and then he also was instrumental in getting the Offset Account five-year review kind of get started in that process.

So that's my report and I'll take any questions and, again, if you would like a copy, I can certainly provide it to you.

MR. RIZZUTO: Okay. Thank you, Kevin. Questions of Kevin? Okay. Thank you.

Next, Offset Account report, Rachel Zancanella.

MS. ZANCANELLA: Good afternoon. Can you hear me all right?

MR. RIZZUTO: Yes.

MS. ZANCANELLA: Okay. Thank you. Thank you, Chairman Rizzuto. I appreciate the opportunity to give the summary report for the Offset Account. I'm going to pull up my screen real quick so that hopefully you guys can all see it. Is that visible?

MR. RIZZUTO: Yes.

MS. ZANCANELLA: Excellent. I decided to add a slide, just to give a little bit of background about the Offset Report or, yes, the Offset Account. The Offset Account is an account that was created in addition to the accounts that were lined out in the

1980 Operating Agreement and in addition to the Permanent Pool under the resolution for the Offset Account.

The purpose of this account is to allow Colorado to be able to conduct operations, to prevent injury by making replacements for out of priority depletions, in order to stay in compliance with the Compact.

The account has six subaccounts: The Colorado Consumable Upstream account, the Kansas Consumable account, the Colorado Downstream Consumable account, the Kansas Charge account, the Return Flow account, and the Return Flow Transit Loss account.

Every operation in the Offset Account has to be accompanied by notice to Kansas, which includes a detailed description of the operation, outlining the source of water, the amount, the purpose, the time, the rate, the extent to which it is fully consumable, and the timing, quantity, and location of the return flows.

Sorry. Was somebody going to say something?

Only water that's approved by the Colorado State Engineer's office and deducted appropriately for transit loss, using the Livingston M model, can be stored in the Offset Account. The resolution

details how the account operates, including outlining, for example, if and when water accrues in the Stateline return flow for Kansas, they have the option of leaving it in the Offset Account until they wish to make a release or having it transferred to their Section II account, per the 1980 Operating Agreement.

Other details in the resolution include the requirements such as a 500 Acre Foot minimum delivery that has to be used -- has to be delivered by March 31st, up to the first 10,000 Acre Feet in the -- to be delivered in the account. And for example, like we ran into this year, limitations on if more than 10,000 Acre Feet are delivered in a year, a 5% storage charge that goes to Kansas is assessed on any of those deliveries over 10,000.

That's just a little bit of background on the Offset Account. It's noted a lot during the ARCA presentations, but I didn't know if everybody was particularly familiar with it, so now you are.

(Discussion held off record.)

MS. ZANCANELLA: The know-it-all slide gives the summary of the operations of the Offset Account. For 2020, the total inflows to the Offset Account were 10,773.16 Acre Feet. The total

transferred into the Offset Account was 8,371 Acre Feet. The total transferred out of the Offset Account was 78.83 Acre Feet. The total released from the Offset Account was 18,320.32 Acre Feet. 2916.07 Acre Feet were lost through evaporation, and the Stateline CU credits for 2020 were 11,278 Acre Feet.

The account started with a balance of 7,708.32 Acre Feet. When adding in each of those operations I just described and subtracting for the evaporation, transfers out and released, the ending balance on the account for 2020 was 5,537.26 Acre Feet.

And, finally, a quick update on the Permanent Pool. The minimum delivery this year was 5,192 Acre Feet in order to be able to utilize the Highland. The minimum delivery to the Offset Account was 5,192 for LAWMA, Acre Feet this year, in order to utilize the Highland water right for the Permanent Pool and, as a result, 153.08 Acre Feet were delivered to the Permanent Pool from the Highland water right.

That is all I have for my presentation. Thank you very much.

MR. RIZZUTO: Thank you, Rachel. Questions of Rachel? None?

Okay. Offset Account Review Joint Report of States, 2012 through 2016, Bill Tyner and Kevin Salter.

MR. TYNER: Chairman Rizzuto, I'll start out and then be glad to let Kevin add anything that he would like to say about it.

MR. RIZZUTO: Okay, Bill.

MR. TYNER: Is this fine?

MR. RIZZUTO: Yes.

MR. TYNER: Can you all hear me okay?

MR. RIZZUTO: Yes.

MR. TYNER: Can you hear me okay or am I not coming through quite right?

MR. RIZZUTO: I can hear you well.

MR. TYNER: Lost it again. Now can you hear me?

MR. RIZZUTO: Yes.

UNIDENTIFIED SPEAKER: They can hear you.

MR. TYNER: Okay. I lost my audio on my end, so I'll just mention that this report is done pursuant to an agreement between the States, one of the decree appendices for continuation of the Offset Account.

Under the original resolution, the Offset Account could actually be discontinued upon proper

notice by the States, but I think both States agreed that would be a bad thing and that we can use it effectively and can use it better and better the more we understand it, and so this type of report is required as part of the review process to ensure we do use it the most effective way we can.

This one got delayed a couple of years as we worked our way through trying to get this first report done, but I appreciate Rachel Duran and Kevin Salter, Rachel Zancanella, Kelley Thompson and others who worked on -- Brent Campbell worked on it early on. It did take quite a bit of effort. We did discover things as we went through this review that helped us identify where we might have had omissions that we could include in this report to make it a absolutely complete record. We identified some things that we think we can do better and have implemented some of those things as we move forward during this period where we're in the next five-year review cycle, and which will be, I believe, reported again in 2022.

I think that the Offset Account, the use of the Offset Account and the transparency that we try to maintain in using the Offset Account is fundamentally critical to Compact compliance for

Colorado and for a comfort level for Kansas. So, again, I appreciate the work by the Kansas staff and the patience of ARCA in waiting for this delayed report. Thank you.

MR. SALTER: I'd really just echo Bill's comments and appreciate all the effort that was put in. This being the second report, we thought we probably could have got it produced a little better, but we're hoping for better upon the third report that we have to turn around and just get started working on it, so hopefully we can produce that report on time. It would also be nice to be able to sit down and actually walk through the report and see if we can be doing things better, so appreciate the time.

MR. RIZZUTO: Okay. Questions of Bill or Kevin? Okay. Thank you. Report recommendations from the committee meetings for December 8, 2020, Troy Dumler.

MR. DUMLER: Thank you, Mr. Chairman.

MR. RIZZUTO: Mm-hmm.

MR. DUMLER: Committee would like to thank Rachel Duran and Andrew Rickert for providing the meeting summary and list of recommendations.

In addition to the four reports that we just

heard today, including the Operations Secretary Report from Bill Tyner, the Assistant Operations Secretary Report from Kevin Salter, the Offset Account Report from Rachel Zancanella, and the Offset Account review from Bill Tyner and Kevin Salter, we'd like to mention that Rachel Zancanella also provided an update on implementation of the Irrigation Improvement Rules.

The committee recommended that we defer the 2020 Operations Secretary Report to the Special Engineering Committee to work towards resolutions of issues that are holding up the unapproved Operations Secretary Reports, but we did have discussion on holding a Operations Committee meeting in 2021 to apprise the committee of the issues that are holding up those approvals and the work that's being done to address those issues that are holding up the Operations Secretary Reports approvals. That's all I have for our committee.

MR. RIZZUTO: Okay. Thank you, Troy. Any questions of Troy? Okay. Thank you.

Move on to Administrative and Legal Committee, and we'll start off with Recording Secretary and Treasurer report, Stephanie Gonzales.

MS. GONZALES: Okay. Good afternoon,

Chairman Rizzuto and representatives of the Compact. This is Stephanie Gonzales. I'm the Recording Secretary and Treasurer and I will be very brief in my report.

The ARCA audit was completed with no findings. It was presented for the -- or to the Compact for approval. The USGS joint funding agreement for both Colorado and Kansas, as well as the Colorado SMS contract invoicing, have been presented to the Compact with a request to authorize me to sign them and proceed with payment.

There was discussion and a request for direction for the cost-share agreement with CSU on the CoAgMet funding for continuing that agreement at the end of the expiration period. That was presented as well.

I reported to the Compact that the ARCA laptop is nearing its useful life and it will need to be replaced, and I anticipate it will survive and be replaced in the 2021-2022 budgeted fiscal year.

I reported to the Compact that the ARCA assessments for each State have been emailed to Representative Mitchell and Representative Lewis for their consideration and, finally, I would like to thank everyone again for their patience as we have

had to navigate through these meetings virtually. Kevin has laid claim to the glitches that have occurred during the meeting, but I would be remiss to let him take all the credit for that, as I had a hand in those. As you saw, we were both host and cohost, so thank you for everyone's patience and I agree, though, that the meeting has progressed fairly smoothly.

And then, finally, I would like to thank Kevin Salter, Rachel Duran, and Andrew Rickert for their work in helping prepare this meeting. It was a great collaboration between all of us to prepare the platform and make sure that everything moved very smoothly, so thank you again. That's all I have.

MR. RIZZUTO: Okay. Questions of Stephanie? On behalf of all of us, I compliment what you've been able to pull off, the people you mentioned, and the like. This has been one of the better web casts, WebEx casts I've ever gone through, so compliments to you.

MS. GONZALES: Thank you.

MR. RIZZUTO: Next, Randy Hayzlett, report and recommendations from their December 8, 2020 meeting. Randy.

MR. HAYZLETT: Thank you, Mr. Chairman.

Stephanie covered quite a little bit of what is in our summary report here but, since this will be part of the exhibit, I'll go ahead and read through those as well.

Myself, Randy Hayzlett, as chair and member, Becky Mitchell, met yesterday virtually and the committee requested Rachel Duran and Andrew Rickert to produce the meeting summary and a list of recommendations. I'll go through the summary first and then I will follow up with the recommendations and motions to follow these up here.

MR. RIZZUTO: Okay.

MR. HAYZLETT: The committee reviewed the Annual Meeting agenda and no changes were suggested to the agenda that we're working off of today. Rachel Duran noted the 1999 and the 2019 Annual Meeting transcripts and the 2020 special meeting summary were complete and ready for consideration and, with that, the committee heard an update on the status of the remaining ARCA Annual Reports.

Andrew Rickert noted that the 1997 ARCA Annual Report had been submitted earlier and was ready for consideration and, with the approval of this report, it is the goal to generate four to five reports a year to get the annual reports caught up.

Stephanie Gonzales, ARCA Recording Secretary and Treasurer, provided her report, noting that the ARCA laptop will need to be replaced, that the State assessments have gone out, and that the process for paying USGS joint funding agreement is improving.

USGS joint funding agreement and budget for FY 2021 were discussed. There were no modifications needed for the FY 2021 budget. The proposed FY 21-22 ARCA budget was reviewed. This included discussions on renewal of the Colorado SMS, or satellite monitoring system, contract, renewal of the cost-share agreement with CSU on the operations and maintenance of the CoAgMet weather stations, and data collection in the Arkansas Basin and replacing the laptop for ARCA business.

Two proposed resolutions were put before the committee, entitled "Honoring David W. Barfield" and "In Memoriam Robert Buerkle."

Nominations of ARCA officers and committee chair appointments were done within this committee and there was discussion on the possible dates and location for the 2021 ARCA Annual Meeting, and the auditor, Ronny Farmer, presented the Audit Report, and that completes the summary and so, Mr. Chair, I'll move into the action items and the

recommendations.

Number 1, they recommend ARCA approve the 1999 and the 2019 annual minutes -- meeting minutes and the 2020 special meeting summary, and I will so move that.

MR. RIZZUTO: Okay. Is there a second?

MS. MITCHELL: Second.

MR. RIZZUTO: Okay. Thank you, Rebecca. Motion has been made and seconded. Discussion? How does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: Okay. How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell. And Colorado votes yes.

MR. RIZZUTO: Okay. Motion is adopted. Next, Randy.

MR. HAYZLETT: Yes. We recommend that ARCA approve the 1997 annual report, and I'll so move that.

MR. RIZZUTO: Okay.

MS. MITCHELL: Rebecca Mitchell and I will second it.

MR. RIZZUTO: Okay. Discussion? How

does Kansas vote?

MR LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: Colorado, how do you vote?

MS. MITCHELL: This is Rebecca Mitchell, and Colorado votes yes.

MR. RIZZUTO: Motion is adopted.

MR. HAYZLETT: Okay. Item 3, we recommend that ARCA authorize Stephanie Gonzales to sign the Kansas and Colorado USGS joint funding agreements, the Colorado SMS contract for Fiscal Year (FY) 2021-2022, and the cost-share agreement with CSU on the CoAgMet funding, and I will move that.

MR. RIZZUTO: Okay. It's been moved.

MS. MITCHELL: I second. Rebecca Mitchell with a second.

MR. RIZZUTO: Discussion? How does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell and Colorado votes yes.

MR. RIZZUTO: Motion is adopted.

MR. HAYZLETT: So this next item is we

recommend that ARCA approve the Fiscal Year (FY) 2021-2022 budget and the assessments, and I will make that motion.

MR. RIZZUTO: Okay.

MS. MITCHELL: Rebecca Mitchell for the second.

MR. RIZZUTO: Okay. Discussion? How does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell and Colorado votes yes.

MR. RIZZUTO: Okay.

MR. HAYZLETT: Next, we have some resolutions that we discussed and, at this time, I would like to hand this resolution for David Barfield off to Mr. Lewis to read and we'll take action on it from there.

MR. RIZZUTO: Okay, Earl.

MR. LEWIS: Thank you, Mr. Chairman, and thank you, Randy, and I think you have the resolution on your screen.

I will read here in just a second but, before I do, obviously, I've had the honor of replacing

Dave Barfield in this position and on this -- this group. As many of you know, when you take on one of these positions, it covers a lot of ground, but -- and I think you all know that the Ark River Compact and interstate water issue in general was something that David took a special interest in and spent a lot of time on and really gave a lot of experience and expertise in that, and that's what we're going to miss. So, certainly, I want to recognize that here before I jump into the resolution.

But again, before you today, we have a resolution honoring David W. Barfield, which reads:

WHEREAS, David W. Barfield of Lawrence, Kansas, retired February 29th, 2020, as Kansas Chief Engineer after 35 years with the Kansas Department of Agriculture, 12 of those years as the Chief Engineer; and

WHEREAS, David's retirement brought his duties as a Kansas Representative to the Arkansas River Compact Administration to a close after having served the interests of the State of Kansas and its water users along the Ark River Valley faithfully for 12 years; and

WHEREAS, as a member of the Engineering and Special Engineering Committees of the

Administration, David worked diligently to resolve issues before those committees, the authorization of a reliable water supply for the John Martin Reservoir Permanent Pool being one that he was particularly pleased with; and

WHEREAS, David facilitated many discussions with local stakeholders in Kansas to provide water users with a better understanding of the Arkansas River Compact, Kansas's work to protect its interests, and efforts made to resolve issues between the States.

NOW THEREFORE, BE IT RESOLVED by the Administration that the Administration does hereby express its appreciation and sincerest gratitude for the contributions of David W. Barfield to this Administration and extends to him the best wishes for continued good health and happiness in all his future endeavors.

BE IT FURTHER RESOLVED that the Administration honors Mr. Barfield's service by including this resolution and appropriate dedicatory remarks in the Administration's annual report for 2020 and hereby instructs the Recording Secretary to send copies of this resolution to Mr. Barfield and the Governor of Kansas.

ADOPTED by the Arkansas River Compact Administration at its 2020 Annual Meeting on December 9th, 2020, signed by the Chairman and Recording Secretary.

And with that, Mr. Chairman, I would move adoption of the resolution honoring David W. Barfield.

MR. RIZZUTO: Okay. Thank you, Earl. Second?

MS. MITCHELL: Rebecca Mitchell, second.

MR. RIZZUTO: Any discussion, other than I expected David to be here today. I thought he would never let us have a meeting without his presence. With that, how does Kansas vote?

MR. DUMLER: This is Troy Dumler. Kansas votes yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell and Colorado votes yes.

MR. RIZZUTO: Adopted. Congratulations to David.

MR. LEWIS: Thank you, Mr. Chairman, for including that.

MR. SALTER: Jim, if I could break in here, this is Kevin.

MR. RIZZUTO: Sure.

MR. SALTER: I want to make sure that, just for a little bit of housekeeping, that this would be resolution 2020-01, to keep good track of our resolutions.

MR. RIZZUTO: Okay.

MR. SALTER: Thank you.

MR. RIZZUTO: It shall be.

MR. HAYZLETT: Okay. Moving on, if you're ready, Mr. Chair.

MR. RIZZUTO: Yes, Randy.

MR. HAYZLETT: And yes, moving on then, the next resolution we have is in memoriam for Robert Buerkle, and I'm going to hand that off to Mr. Dumler for him to read that and take action from there.

MR. RIZZUTO: Okay. Troy.

MR. DUMLER: Thank you, Mr. Chairman. In memoriam for Robert Buerkle.

WHEREAS, Robert Buerkle served on the Arkansas River Compact Administration as a representative of the State of Kansas and the water users of the Ark River Valley in Kansas from December, 1994 through December, 1998. The Administration was saddened to learn of Mr. Buerkle's passing on October 12th,

2020.

WHEREAS, the current members wish to express their gratitude for Mr. Buerkle's service and offer their condolences at his passing.

NOW, THEREFORE, BE IT RESOLVED by the Arkansas River Compact Administration that this statement be placed into the record of the 2020 Arkansas River Compact Administration Annual Meeting and a copy is to be sent to the family of Robert Buerkle.

ADOPTED by the Arkansas River Compact Administration at its 2020 Annual Meeting on December 9th, 2020.

MR. RIZZUTO: Okay.

MR. DUMLER: And I'd move this be approved.

MR. RIZZUTO: Okay. Motion by Troy. Second? Waiting for Becky somewhere out there.

MS. MITCHELL: Sorry. Rebecca Mitchell for the second. I'm trying to take myself on and off mute. Sorry.

MR. RIZZUTO: All right. And following what Kevin said to the first, would this be 2020-2?

MR. SALTER: No, I'm sorry. I got a text message from the gatekeeper, Rachel Duran, and she noted that we had already used 2020-01 for the

October 20th -- October, 2020 special meeting, so we had a resolution 2020-01 at that special meeting, so Mr. Barfield's resolution would be 2020-02 and Mr. Buerkle's resolution would be 2020-03. I apologize for the foul-up.

MR. RIZZUTO: It's no problem, and I assume no one has any problem incorporating this amendment into the motion to adopt this resolution.

MS. MITCHELL: No problem.

MR. RIZZUTO: Hearing none, how does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell and Colorado votes yes.

MR. RIZZUTO: Okay. Adopted. Next, Randy.

MR. HAYZLETT: My committee recommends that ARCA approve the following slate of officers for Compact Year 2021: As Vice-Chairman Randy Hayzlett; Recording Secretary and Treasurer, Stephanie Gonzales; Operations Secretary, Bill Tyner; Assistant Operations Secretary, Kevin Salter; and with that, I will make that motion.

MR. RIZZUTO: Okay. Motion is made. Second?

MS. MITCHELL: Rebecca Mitchell, second.

MR. RIZZUTO: Okay. Discussion? How does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell. Colorado votes yes.

MR. RIZZUTO: Adopted. Randy?

MR. HAYZLETT: So the recommendation from the committee then for Compact Year 2021 for the chairs and committee members, we do not need to vote on this one. We normally just do some rotation. So for Engineering, it will be Earl Lewis as chair, Scott Brazil as member. Operations will be Lane Malone as chair and Troy Dumler as member, and Administrative and Legal will be Rebecca Mitchell as chair and Randy Hayzlett as member.

We do not need a motion on that one, is the way I understand it.

The next -- I'm sorry. Was there a comment?

MR. RIZZUTO: No. Go ahead.

MR. HAYZLETT: The next item is recommend

ARCA approve the dates of December 8th, 2021 for the committee meetings and December 9th, 2021 for the Annual Meeting, with both meetings to be held in Garden City, Kansas, and I will make that motion.

MR. RIZZUTO: Okay. Second?

MS. MITCHELL: Second. Rebecca Mitchell.

MR. RIZZUTO: Any discussion? Hearing none, how does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell. Colorado votes yes.

MR. RIZZUTO: Okay. Adopted.

MR. HAYZLETT: And, finally, we recommend that ARCA approve the Fiscal Year (FY) 2019-20 Auditor Report and authorize Stephanie Gonzales to sign the engagement letter for the auditor's services, and I would so move.

MR. RIZZUTO: Okay. Second?

MS. MITCHELL: Rebecca Mitchell with the second.

MR. RIZZUTO: Okay. Discussion? How does Kansas vote?

MR. LEWIS: Earl Lewis. Kansas votes

yes.

MR. RIZZUTO: How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell. Colorado votes yes.

MR. RIZZUTO: Adopted. Anything else, Randy?

MR. HAYZLETT: That concludes mine. Thank you, Jim.

MR. RIZZUTO: Okay. Okay. And as mentioned, all of the reports will be part of Exhibit L.

Next, we move on to new business. Is there any new business to come before us? Okay. Hearing none, public comment? Is there any public comment? Okay.

Hearing none, there's one motion left, and before we do that, on behalf of the commission, again, I'd like to thank everyone who put this meeting together. Excellent job and thank you for all of your hard work and guiding us through this annual meeting today and, as we move forward, I'd like to wish everyone Merry Christmas, Happy Holidays, Happy Hanukkah, Happy New Year, look forward to seeing everyone in Kansas and wish everyone health and safety throughout this next

year.

With that, I'd entertain a motion to adjourn.

MR. HAYZLETT: This is Randy. I so move.

MR. RIZZUTO: Okay. Second?

MS. MITCHELL: Second.

MR. RIZZUTO: All right. How does Kansas vote?

MR. LEWIS: Kansas votes yes. We look forward to seeing you in Garden City next year.

MR. RIZZUTO: Okay. How does Colorado vote?

MS. MITCHELL: Rebecca Mitchell and Colorado votes yes.

MR. RIZZUTO: Okay. We are adjourned at 1:17 p.m. Mountain Standard Time, 2:17 p.m. Central Standard Time. Thank you, everyone.

(Proceedings concluded at 1:17 p.m. Mountain Standard Time.)

STATE OF KANSAS)

COUNTY OF RENO)

This is to certify that I, Lee Ann Bates, a Certified Shorthand Reporter in and for the State of Kansas, reported in shorthand the proceedings had at the time and place set forth on the title page hereof and that to the best of my ability, the above and foregoing pages contain a full, true and correct transcript of the said proceedings.

Certified to on this 12th day of June, 2022.

Lee Ann Bates, CSR, RPR, CRR

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ARCA 2020 ANNUAL MEETING
EXHIBITS/ATTACHMENTS TO MINUTES

Letter	Description
A.	Attendance List
B.	Agenda
C.	USGS Report and Presentation
D.	USACE Report and Presentation
E.	USBR Presentation
F.	PRWCD Presentation
G.	SECWCD Presentation
H.	LAVWCD Presentation
I.	Kansas GMD #3 Presentation
J.	Ten-year Compact Compliance Accounting table (2010-2019)
K.	Colorado's PDF Evaluation
L.	Committee Reports

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Exhibit A

Annual Meeting

December 9, 2020

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2020 ARKANSAS RIVER COMPACT ADMINISTRATION ANNUAL MEETING

Wednesday, December 09, 2020, 9:00 A.M. (MST)

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2020 ARKANSAS RIVER COMPACT ADMINISTRATION ANNUAL MEETING

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ATTENDANCE LIST

2020 ARKANSAS RIVER COMPACT ADMINISTRATION ANNUAL MEETING

Wednesday, December 09, 2020, 9:00 A.M. (MST)

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Exhibit B

Annual Meeting

December 9, 2020

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ARKANSAS RIVER COMPACT ADMINISTATION
2020 ANNUAL MEETING
Wednesday, Dec. 9, 2020, 9:00 a.m. (MST)

Virtual

DRAFT AGENDA (subject to change)

Presiding: James Rizzuto, Chairman

1. **Call to Order: Chairman, James Rizzuto**

2. **Review and revisions of agenda**

3. **Report of Chair and Vice-Chair**

4. **Reports of Federal Agencies**
   A. U.S. Geological Survey
   B. U.S. Army Corps of Engineers
   C. U.S. Bureau of Reclamation
   D. National Weather Service

5. **Reports from Local Water User and State Agencies**
   A. Purgatoire River Water Conservancy District
   B. Southeastern Colorado Water Conservancy District
   C. Lower Arkansas Valley Water Conservancy District
   D. Kansas Groundwater Management District #3

6. **Compact Compliance / Decree Issues Updates**
   A. Ten-year Compact Compliance Accounting table (2010-2019) – Joint Report of the States
   B. Colorado's PDF (presumed depletion factor) Evaluation

7. **Report of Special Engineering Committee**

8. **Report and Recommendations of Engineering Committee**

9. **Operations Committee**
   A. Operations Secretary Report
   B. Assistant Operations Secretary Report
   C. Offset Account Report
   D. Offset Account Review, Joint Report of the States (2012-2016)
   E. Report and Recommendations from December 8, 2020 meeting

10. **Administrative & Legal Committee**
    A. Recording Secretary and Treasurer Report
    B. Report and Recommendations from December 8, 2020 meeting

11. **New Business**

Exhibit B

12. Public Comment

13. Adjourn

Exhibit C

Annual Meeting

December 9, 2020

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Summary of streamflow at USGS/ARCA stations
Water Year 2020 (Oct 1, 2019 - Sept 30, 2020)

Station Number	Station Name	Period of record included in the long-term average (water years)	WY2020 Annual total flow, in acre-feet	WY2019 Annual total flow, in acre-feet	2020 as % of 2019	2020 as % of long-term average
07119500	Apishapa River near Fowler	1923-25, 1940-2020	9,290	11,870	78%	53%
07124000	Arkansas River at Las Animas	1975-2020	105,600	200,000	53%	56%
07128500	Purgatoire River near Las Animas	1978-2020	7,770	25,050	31%	18%
07130500	Arkansas River below John Martin Reservoir	1949-2020	155,600	262,000	59%	77%
07133000	Arkansas River at Lamar	1949-55, 1960-2020	64,030	100,490	64%	79%
07134100	Big Sandy Creek near Lamar	1969-82, 1996-2020	7,550	13,250	57%	75%
	Base flow	1996-2020	6,190	10,780	57%	82%
	Above Base flow	1996-2020	1,360	2,470	55%	39%
07134180	Arkansas River near Granada	1982-2020	66,200	121,500	54%	57%
07134990	Wildhorse Cr. above Holly, October, April-Sept	2002-20	2,660	5,600	48%	74%
	April – September	2002-20	1,600	3,860	41%	59%
07137500	Arkansas River near Coolidge, KS	1951-2020	91,200	139,900	65%	63%
07137000	Frontier Ditch near Coolidge, KS	1951-2020	7,330	7,820	94%	86%

Exhibit C

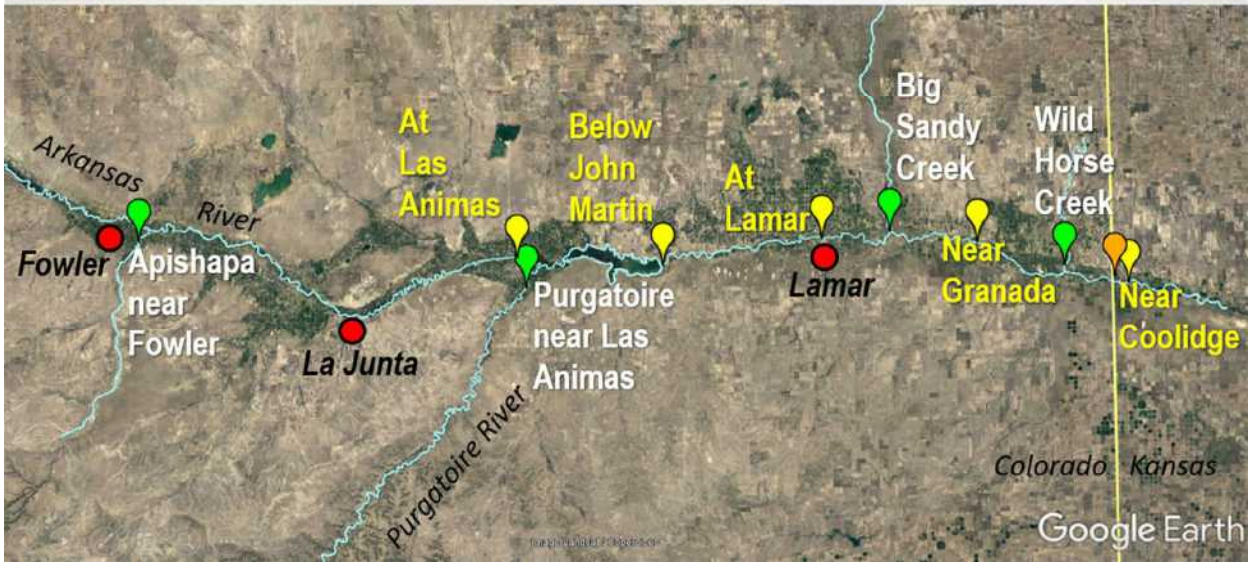
USGS/ARCA Cooperative Program 2020

10 streamgages; Fowler, CO – Coolidge, KS

5 Mainstem Arkansas sites

Frontier Ditch near Coolidge

4 Tributaries

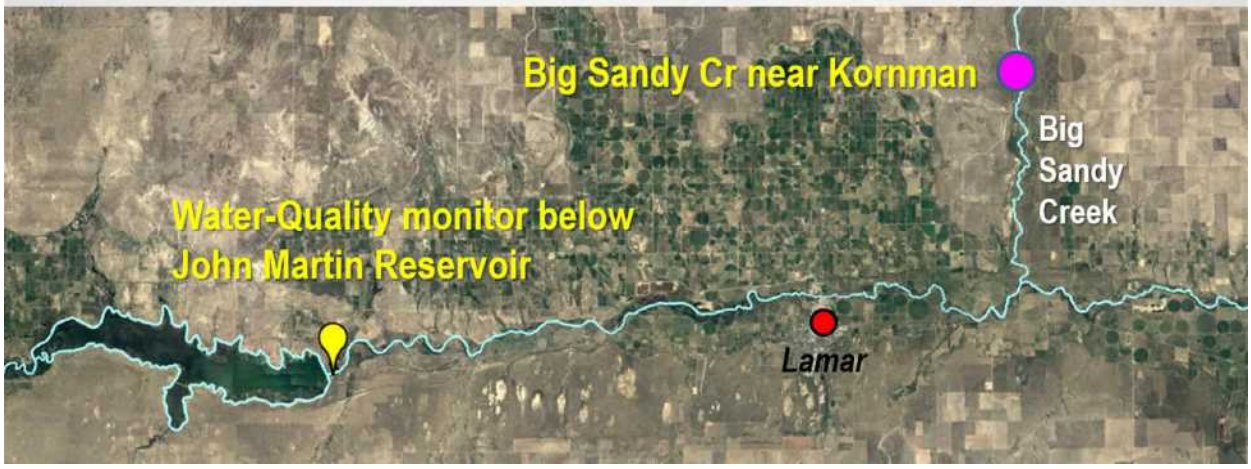


Changes implemented in 2020

Discontinued – Crest Stage Gage, Big Sandy Cr near Kornman

Addition – Water Quality Monitor below John Martin Reservoir

- Water Temperature and Specific Conductance
- Continuous record since 1989



WY 2020 streamflow conditions

WY 2020 (Oct 1, 2019 – Sept 30, 2020)

Hydrographs for 6 sites

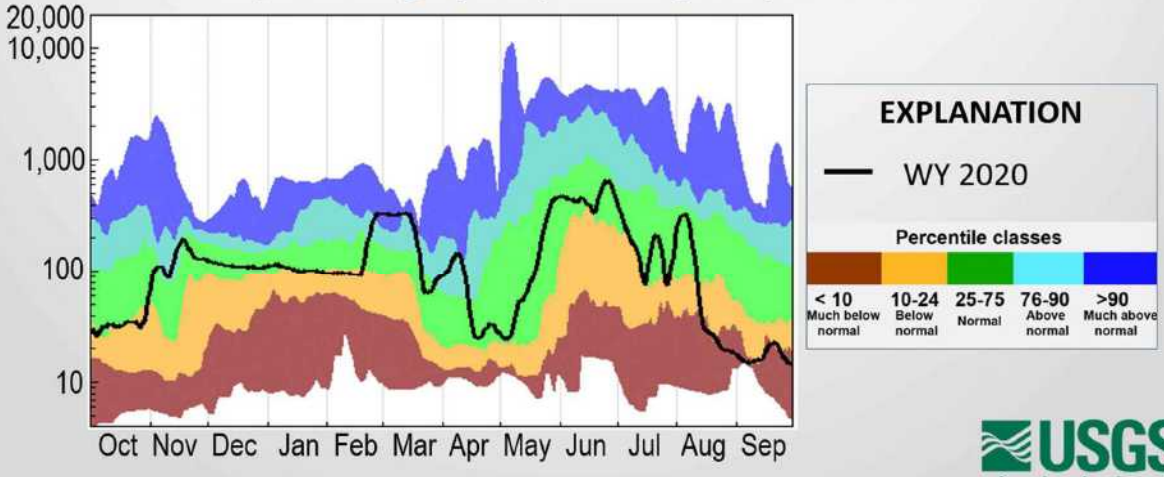
- 2 sites upstream of JMR
- 4 sites downstream of JMR

WY 2020 streamflow conditions

Arkansas River at Las Animas

105,600 Acre-Feet, 56% of average

7-day average flow, cubic feet per second



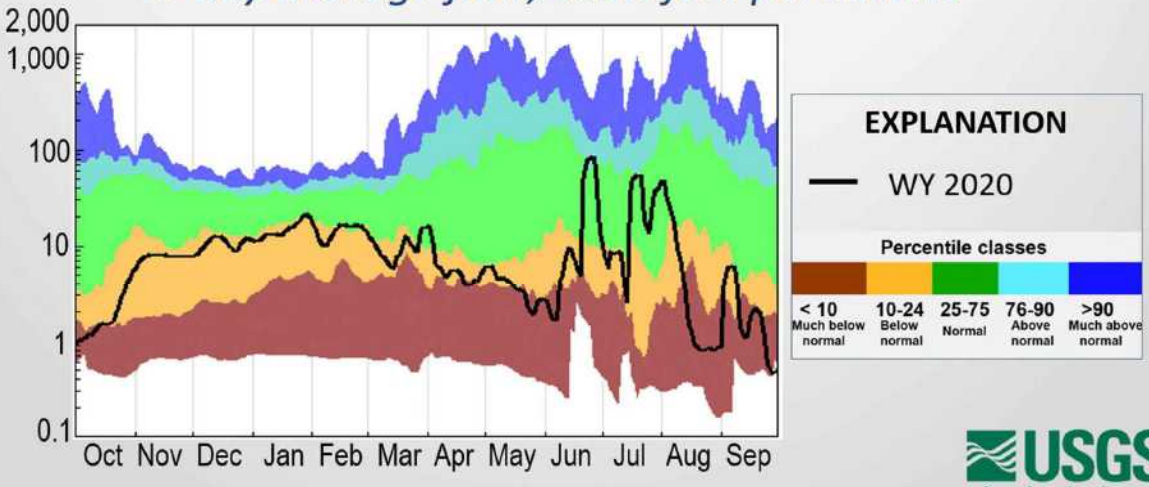
USGS science for a changing world

WY 2020 streamflow conditions

Purgatoire River near Las Animas

7,770 Acre-Feet, 18% of average
(lowest annual runoff in 43-year record)

7-day average flow, cubic feet per second



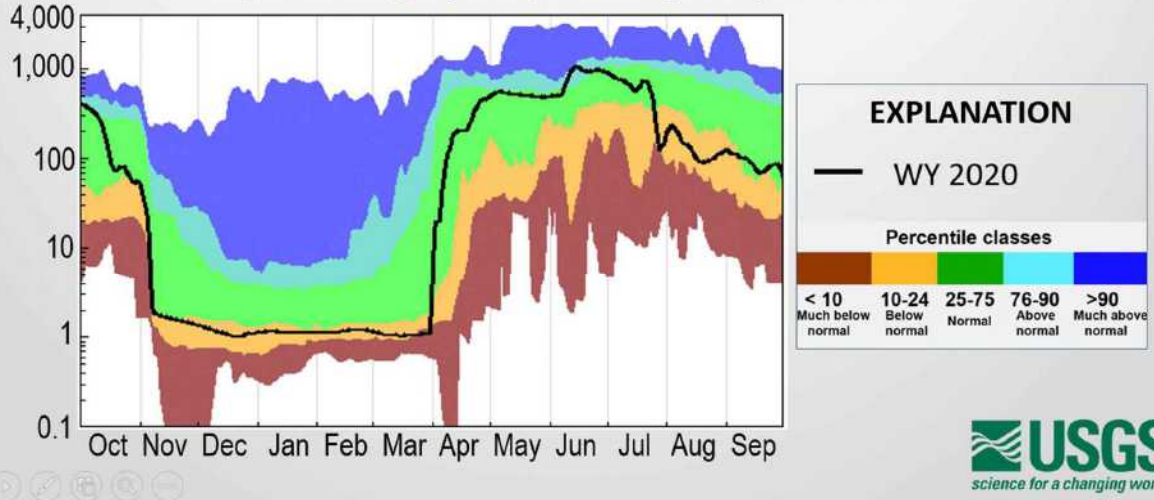
USGS science for a changing world

WY 2020 streamflow conditions

Arkansas River below John Martin Reservoir

155,600 Acre-Feet, 77% of average

7-day average flow, cubic feet per second



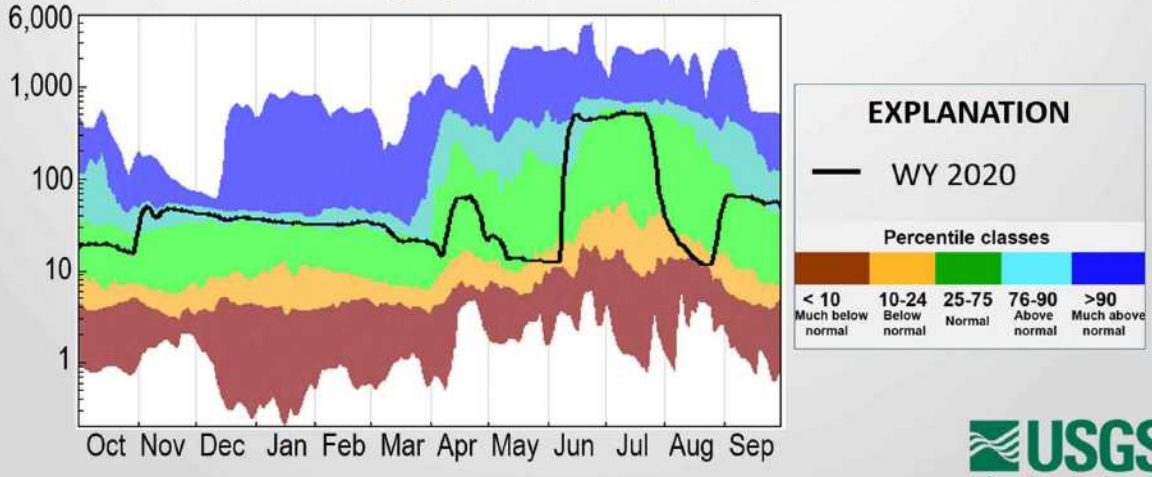
USGS science for a changing world

WY 2020 streamflow conditions

Arkansas River at Lamar

64,030 Acre-Feet, 79% of average

7-day average flow, cubic feet per second



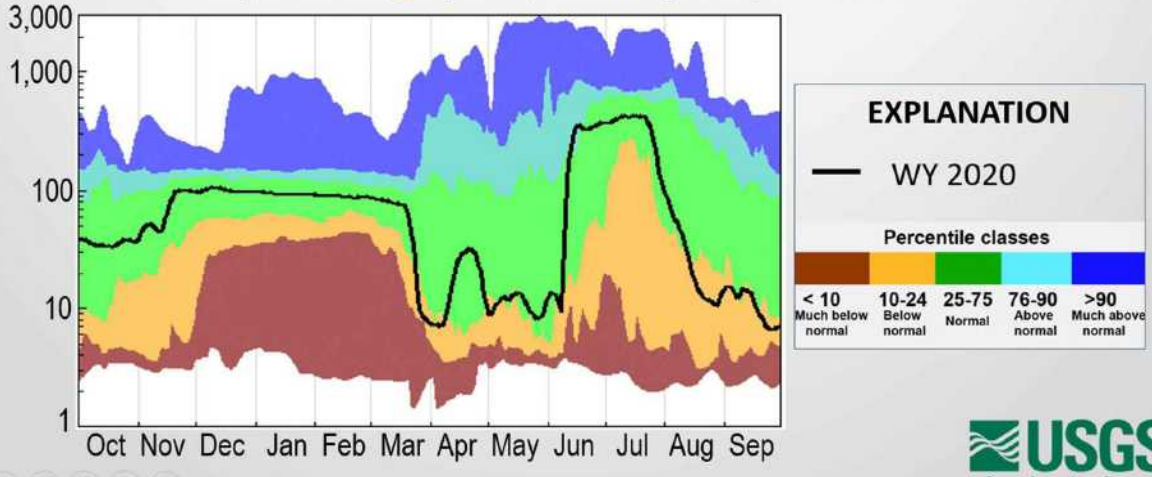
USGS science for a changing world

WY 2020 streamflow conditions

Arkansas River near Granada

66,200 Acre-Feet, 57% of average

7-day average flow, cubic feet per second



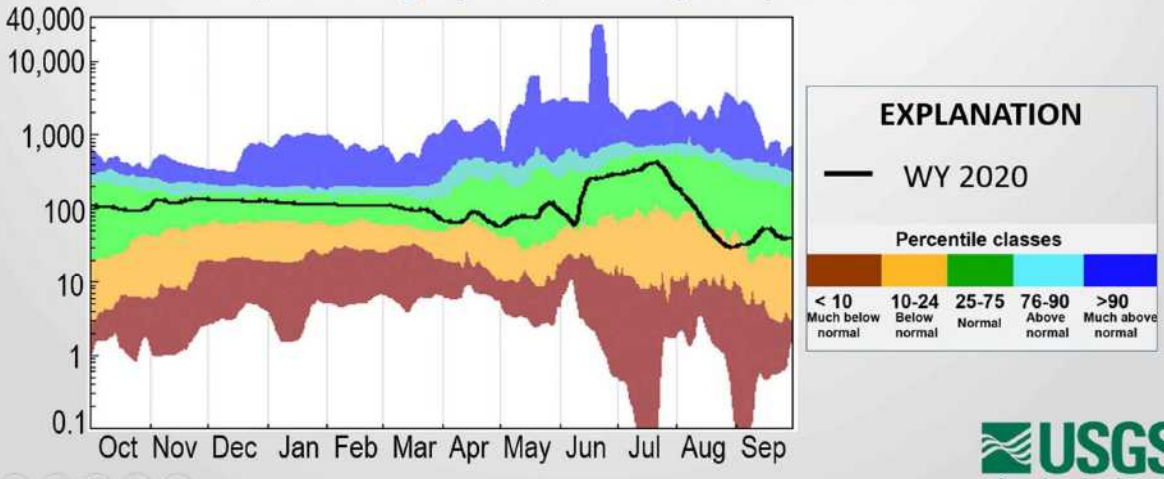
USGS science for a changing world

WY 2020 streamflow conditions

Arkansas River near Coolidge, KS

91,200 Acre-Feet, 63% of average

7-day average flow, cubic feet per second



USGS science for a changing world

WY 2020 streamflow conditions

Station	WY20 Annual Flow, in ac-ft	Percent of Average
Apishapa River near Fowler	9,290	53%
Big Sandy Creek near Lamar	7,550	75%
Wildhorse Cr. above Holly (Oct, Apr-Sept)	2,660	74%
Frontier Ditch near Coolidge	7,330	86%

USGS science for a changing world

Summary

- WY20 streamflow for the two major inflows to JMR was 56% of average in the Arkansas River at Las Animas and 18% in the Purgatoire River
- WY20 total annual flow in the Purgatoire River near Las Animas was the lowest in 43 years of record
- Downstream of JMR, mainstem flow at 4 sites ranged from 57 to 79% of average, and was 63% of average at Coolidge, KS

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Exhibit D

Annual Meeting

December 9, 2020

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Arkansas River Basin

US Army Corps of Engineers®
Albuquerque District

2020 Water Management and Civil Works Activities

Exhibit D

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Contents

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1. General

During Compact Year 2020 (1 November 2019 – 31 October 2020), activities of the U.S. Army Corps of Engineers (USACE), Albuquerque District, in the Arkansas River Basin consisted of water management, operations and maintenance, civil works, flood risk management, compliance with Section 404 of the Clean Water Act, and post wildfire flooding concerns.

2. Water Management Operations

In 2020, the Arkansas River Basin snowmelt forecast was well below normal throughout much of the basin. As of May 1st, the overall basin wide snowpack was reported as below average at 81% of median. The Upper Arkansas Basin reported 109% of median, the Cucharas and Huerfano basins reported 53% of median, the Apishapa Basin reported 10% of median, and the Purgatoire River Basin reported 15% of the median snowpack.

Table 1 compares the Natural Resources Conservation Service's (NRCS) forecast runoff to the actual measured runoff. The NRCS May 1st forecast predicted streamflow to be 78% of average for the Arkansas River above Pueblo Reservoir, and 45% of average for the Purgatoire River at Trinidad Reservoir. Actual observed snowmelt runoff inflow to Pueblo Reservoir was 50% of the 30-year average used by NRCS, actual observed snowmelt runoff inflow to Trinidad Reservoir was 31% of the 30-year average, and actual observed snowmelt runoff inflow to John Martin Reservoir was 46% of average.

Table 1. May 1, 2020, NRCS/NWS Forecast and Actual Runoff

Arkansas River Basin May 1st Most Probable Snowmelt Runoff Forecast (50% Exceedance)				
Measurement Location	Snowmelt Runoff (x 1,000 Acre-Feet)		Percent of Average	
	May Forecast	Actual	May Forecast	Actual
Arkansas River above Pueblo (April – July)	280	178.6 [1]	78%	50%
Purgatoire River at Trinidad (March – July)	16.5	11.4 [2]	45%	31%
John Martin Dam and Reservoir (April – July)	93 [3]	67.1 [2]	64% [3]	46%

[1] Data Source: Colorado Division Water Resources

[2] Data Source: U.S. Army Corps of Engineers

[3] National Weather Service inflow forecast for John Martin Dam and Reservoir

a. Trinidad Dam and Reservoir

For Compact Year 2020, the reservoir surface elevation started at 6,182.39 ft with storage of 19,880 acre-feet and ended at 6,175.78 ft with storage of 15,520 acre-feet, a net change of -6.61 ft and -4,360 acre-feet, respectively. Storage peaked at 24,360 acre-feet (elevation of 6,188.60 ft) on 31 March 2020. The maximum daily inflow was 212 cubic feet per second (cfs) on 26 July 2020 and the maximum daily release was 188 cfs on 28 July 2020. The total inflow for Trinidad Reservoir was 18,690 acre-feet and total outflow was 20,000 acre-feet. USACE did not operate for flood control at Trinidad Dam and Reservoir in 2020. Figure 1 illustrates daily release, storage and computed inflow to Trinidad reservoir.

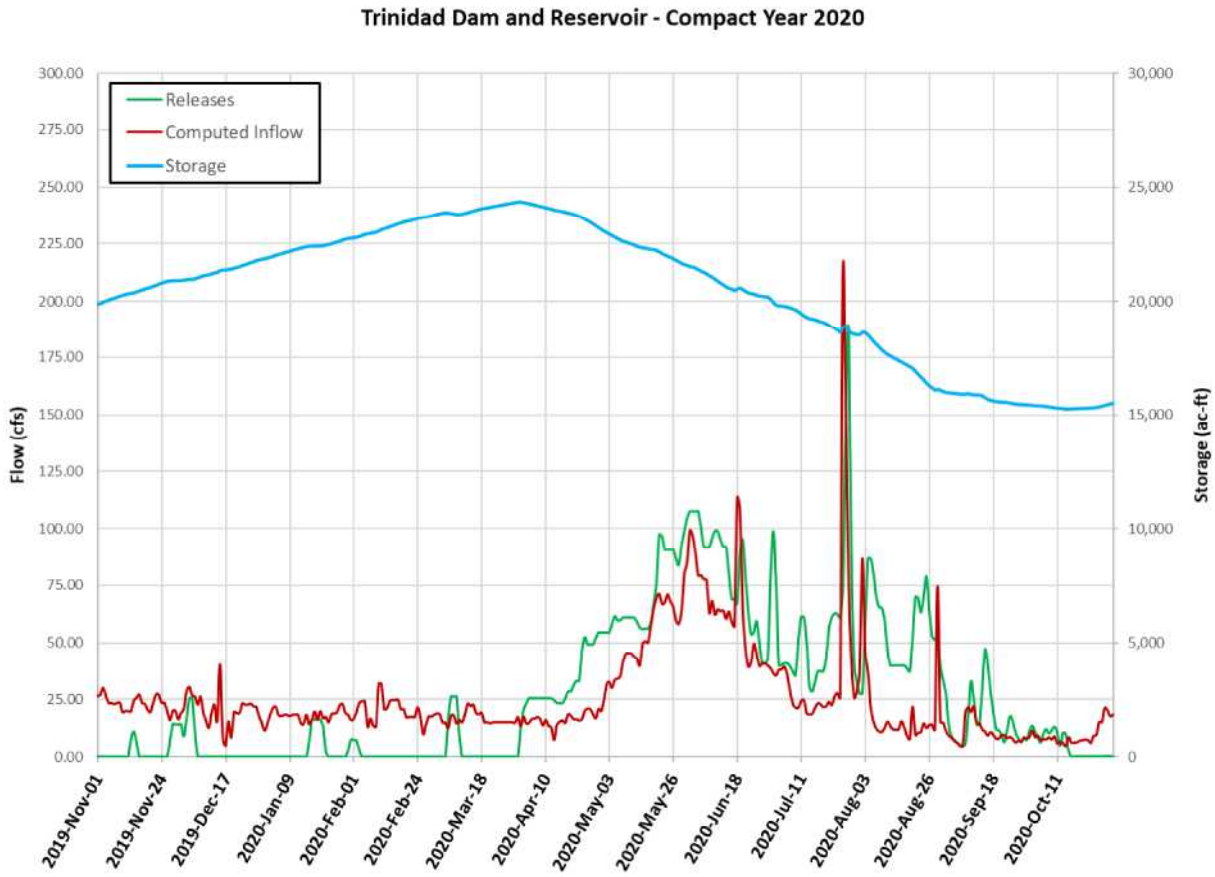


Figure 1: 2019 Trinidad Dam and Reservoir Water Operations

b. John Martin Dam and Reservoir

For Compact Year 2020, the reservoir surface elevation started at 3,817.23 ft with storage of 73,240 acre-feet and ended at 3,806.42 ft with storage of 33,890 acre-feet, a net change of -10.81 ft and -39,350 acre-feet, respectively. Storage peaked at 123,840 acre-feet (elevation of 3,826.69 ft) on 7 April 2020. The maximum daily inflow was 1,058 cfs on 22 June 2020 and the maximum daily release was 1,207 cfs on 9 June 2020. The total computed inflow for John Martin Reservoir was 133,120 acre-feet and total release was 146,760 acre-feet. USACE did not operate for flood control at John Martin Dam and Reservoir in 2020. Figure 2 illustrates daily release, storage and computed inflow to John Martin Reservoir.

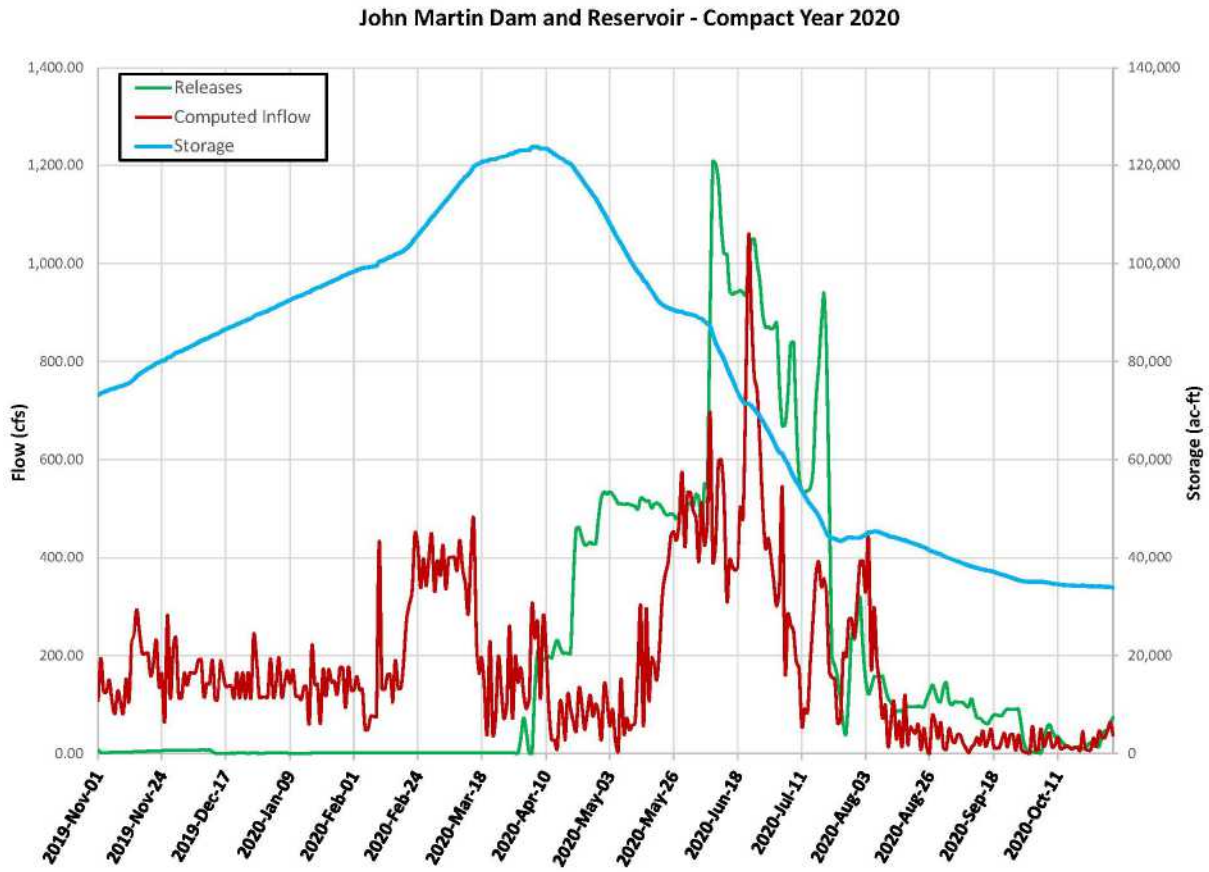


Figure 2: 2019 John Martin Dam and Reservoir Water Operations

c. Water Quality

USACE initiated an expanded water quality monitoring program in Compact Year 2020. Project staff have been collecting monthly water quality data from USACE reservoirs since 2012, which is forwarded to environmental staff in USACE's

Albuquerque District Office for review and entry into the water quality database. At the locations shown below within Trinidad Reservoir and John Martin Reservoir (Figures 3 & 4), staff collect surface measurements of turbidity, pH, and specific conductance, as well as Secchi depth. Data on temperature and dissolved oxygen are collected through vertical profiles through the water column, and zebra and quagga mussel monitoring typically occurs from June through October.

In Compact Year 2020, the Albuquerque District entered into cooperative agreements to install riverine water quality stations upstream and downstream of Trinidad Reservoir and John Martin Reservoir at the locations indicated by red dots (Figures 3 & 4). These sites will collect data on water temperature, dissolved oxygen, turbidity, pH, and specific conductance at 15-minute intervals. Total suspended sediment and sampling of anions and cations will be completed monthly at these riverine stations. Monitoring at most of these riverine stations began in July and August of 2020, and this project is currently funded to provide riverine monitoring through 2025.

The primary goals of this expanded water quality monitoring program are to identify seasonal and other trends in streamflow and reservoir water quality, and to help assess the impacts of Trinidad Reservoir and John Martin Reservoir on the Purgatoire and Arkansas Rivers. The program will also generate and disseminate reviewed real-time and high-frequency water quality data and determine the suitability of using turbidity and streamflow records to calculate high-frequency suspended sediment concentrations and loads upstream and downstream of the reservoirs. The data collected through this program will be reviewed and compiled into a database that will be available through the Albuquerque District Water Management Section.

Figure 3: Water Quality monitoring stations at Trinidad Dam and Reservoir

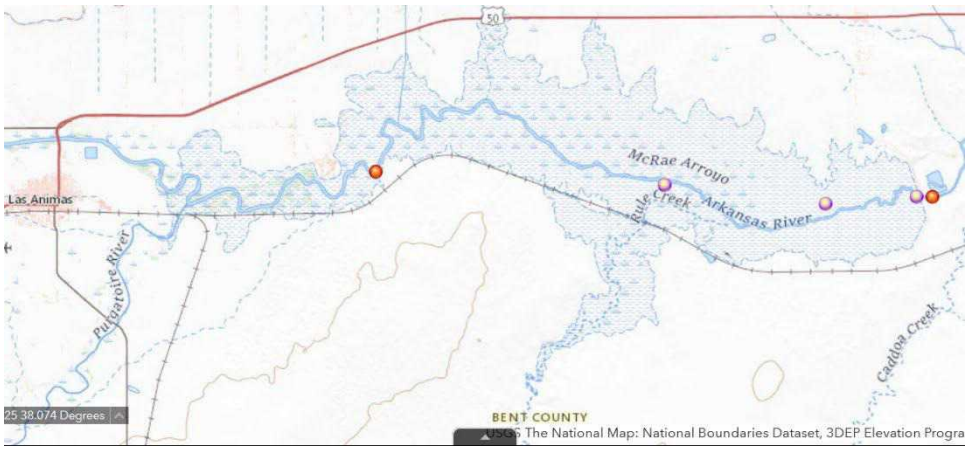


Figure 4: Water Quality monitoring stations at John Martin Dam and Reservoir

3. Operations and Maintenance

a. Trinidad Dam and Reservoir

Routine operation and maintenance projects were conducted at Trinidad Dam and Reservoir during Compact Year 2020.

b. John Martin Dam and Reservoir

During 2020, operations and maintenance projects were completed at John Martin Dam and Reservoir as described below:

a. Inspections and repairs were completed for all six outlet works conduits and service gates. Areas of damaged conduit lining were identified and repaired, and accumulated debris and mineralization were removed from the conduit air vent holes. The Chapman valves associated with the conduit air vents were serviced and repaired.
b. Trunnion pier railings were replaced on the work platforms between each of the tainter gates. These railings allow for safe restraints and with the addition of tie-off points allow for OSHA compliance while performing maintenace of the tainter gate pivot points.
c. Surface concrete repair was completed at the tainter gate seals at the top of the spillway. Patchwork was completed to repair leaking seals under tainter gates 5 and 7.

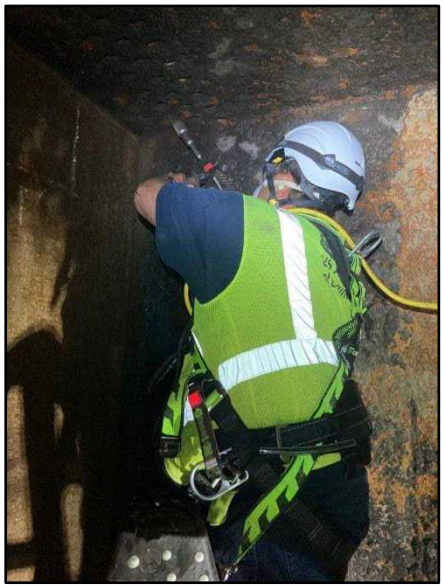


Figure 5: John Martin employee cleaning vents of mineralization and debris

Figure 6: Metal repair patch in conduit liner

4. Civil Works

a. Continuing Authorities Program

The Continuing Authorities Program (CAP) is a group of nine legislative authorities under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects without additional project-specific congressional authorization. USACE had two active CAP projects in the Arkansas River Basin in 2020.

Section 205

Section 205 of the 1948 Flood Control Act, as amended, provides authority to USACE to plan and construct small flood damage reduction projects that have not been specifically authorized by Congress. USACE had no active Section 205 projects in the Arkansas River Basin in 2020.

Section 206

Section 206 of Water Resources Development Act (WRDA) 1996 provides authority to USACE for aquatic ecosystem restoration projects in areas unrelated to existing USACE water projects. USACE has two requests received from the City of Colorado Springs pending funding to start feasibility studies, but no active Section 206 projects in the Arkansas River Basin in 2020.

The requested projects occur along Spring Creek near Pikes Peak Avenue and at Shooks Run. The projects would result in restoration of stream and riparian structure and function to include habitat improvement, stabilized stream morphology and sediment management

Section 14

Section 14 of the 1946 Flood Control Act, as amended, provides authority for USACE to plan and construct emergency stream bank protection projects to protect endangered highways, highway bridge approaches, public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities. USACE has two requests for a new start Section 14. However, there are no active Section 14 projects in the Arkansas River Basin in 2020.

The requested project along North Douglas Creek located in the City of Colorado Springs, CO, immediately east of I-25 and west of the confluence with Monument Creek would stabilize 1,100 linear feet of North Douglas Creek that severely eroded during 2013 and 2015 Flood Events and continues to erode with normal flow events. Erosion has damaged the major drainage culvert under I-25 and Sinton Road. If the erosion and bank failure continue, the roadway infrastructure could be damaged and impact the major north-south highway in Colorado.

The requested project with the Fremont Sanitation District, Fremont County, was initiated in the summer of 2019. The objective of the project is to repair and prevent further erosion of the south bank of the Arkansas River to protect the District's wastewater main and the adjacent Canon City Area Recreation and Parks District recreation trail. Currently the project is in a deferred status per request of the Fremont Sanitation District.

Figure 7: Erosion along south bank of Arkansas River in Fremont County.

b. Investigations Program

The USACE Investigations Program includes specifically authorized studies for comprehensive solutions to large complex problems relating to flooding, ecosystem restoration, loss of land and property, floodplain management, and watershed planning and analysis. The Investigations program consists of two phases: the feasibility study

phase, and the pre-construction engineering and design (PED) phase. The feasibility study is used to investigate the Federal interest, engineering feasibility, economic justification and environmental acceptability of a recommended water resources project, and results in a feasibility report. The feasibility report is the document on which congressional authorization for PED and Construction is based. During the pre-construction engineering and design phase, development of the first construction contract bidding package can be completed while waiting for congressional construction authorization. If the project is authorized for construction by Congress, USACE and the project sponsor can move forward with the remaining detailed design and construction. USACE had no active Investigations or Construction projects in the Arkansas River Basin in 2020.

5. Flood Risk Management Program

USACE established the National Flood Risk Management Program (FRMP) in May 2006 to integrate and synchronize USACE activities, both internally and with counterpart activities of the Department of Homeland Security, Federal Emergency Management Agency (FEMA), other Federal agencies, state organizations, and regional and local partners and stakeholders. The USACE Levee Safety Program was authorized in WRDA 2007 and established by the National Levee Safety Act of 2007. The Inspection of Completed Works/Rehabilitation Program (ICW/RP) is the USACE program that provides for the inspection and rehabilitation of Federal and non-Federal flood risk management projects within the ICW/RP (PL8499). For 2020, no active projects in the ICW/RP were removed from the program based on inspection.

The National Levee Database (NLD) is used to track both USACE and Non-USACE levee system inventory and other flood risk management features. The NLD is viewable to the public through the following internet link; https://levees.sec.usace.army.mil/#/. The database contains pertinent information (length, height, crest width, etc.) concerning levee systems as well as flooding risk information for the systems. The database viewer uses both an interactive text search and graphical search functions to locate levee systems of interest.

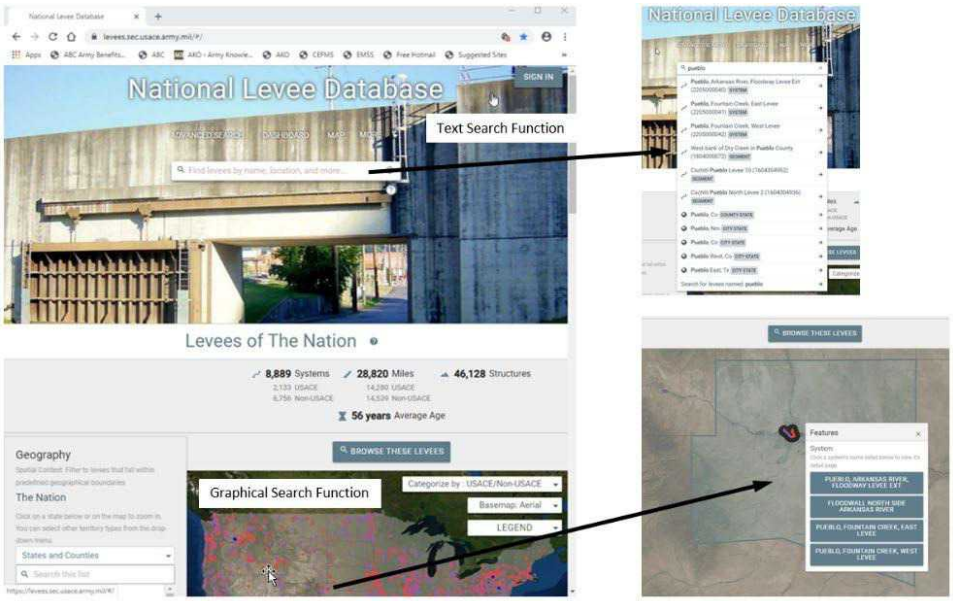


Figure 8: National Levee Database Search Functions

An additional component of FRMP is the Silver Jackets Program, which is part of the National Flood Risk Management Program. The Silver Jackets Program proposes establishing an interagency team in each state with a representative from FEMA, USACE, the State National Flood Insurance Program Coordination Office, and the State Hazard Mitigation Office as standing members and lead facilitators. The lead FRMP Manager for the formation of the Silver Jackets Program in Colorado and the Arkansas River Basin resides in the USACE Omaha District, and the Albuquerque District performs a support role.

The Colorado Silver Jackets team was officially created in 2013. The team consists of four USACE Districts that include the Sacramento, Albuquerque, Kansas City, and Omaha Districts, with the lead Silver Jackets coordinator sitting in the Omaha District. The State of Colorado is represented by the Colorado Water Conservation Board as well as the Colorado Department of Homeland Security. FEMA Region 8 is also part of the State team. There are several ongoing FY20 projects in Colorado including the development of the Colorado After Fire Community Guide, the Mesa County Flood Hazard Assessment, the Grand Junction Emergency Action Planning support and the Riverside Community Flood Risk Report.

6. Regulatory Program

USACE has regulatory authority under Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. The Albuquerque District, Southern Colorado Office (SCO) reviewed a total of 99 activities in the Arkansas River Basin during Compact Year 2020, including 35 activities authorized under general (Regional or Nationwide) permits and 1 activity authorized under a

Standard Individual Permit. General permits are activity-specific permits that are used to authorize projects that result in minimal adverse impacts on the aquatic environment. Standard Individual Permits are required for activities having more than minimal adverse impacts and/or for activities that do not meet the terms and conditions of a general permit.

Persons or agencies who are planning to conduct work in any waterway in the basin are advised to contact SCO at 201 W. 8th Street, Suite 350, Pueblo, Colorado 81003, email at CESPA-RD-CO@usace.army.mil, or telephone 719-744-9119. Information, including all public notices, is also available on the USACE Albuquerque District web home page at: https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/.

7. Emergency Management Coordination

Public Law 84-99 provides USACE with the authority to assist state and local governments before, during, and after flood events. In the Arkansas River Basin, USACE works with the State of Colorado Division of Homeland Security and Emergency Management and the Colorado Water Conservation Board to prepare for flood fight activities in years with significant snowpack and spring snowmelt runoff.

Assistance can be obtained by contacting the U.S. Army Corps of Engineers, Albuquerque District, Readiness and Contingency Operations Office, 4101 Jefferson Plaza NE, Albuquerque, New Mexico 87109 or telephone 505-342-3686 during our normal business hours between 7 am and 4 pm, weekdays.

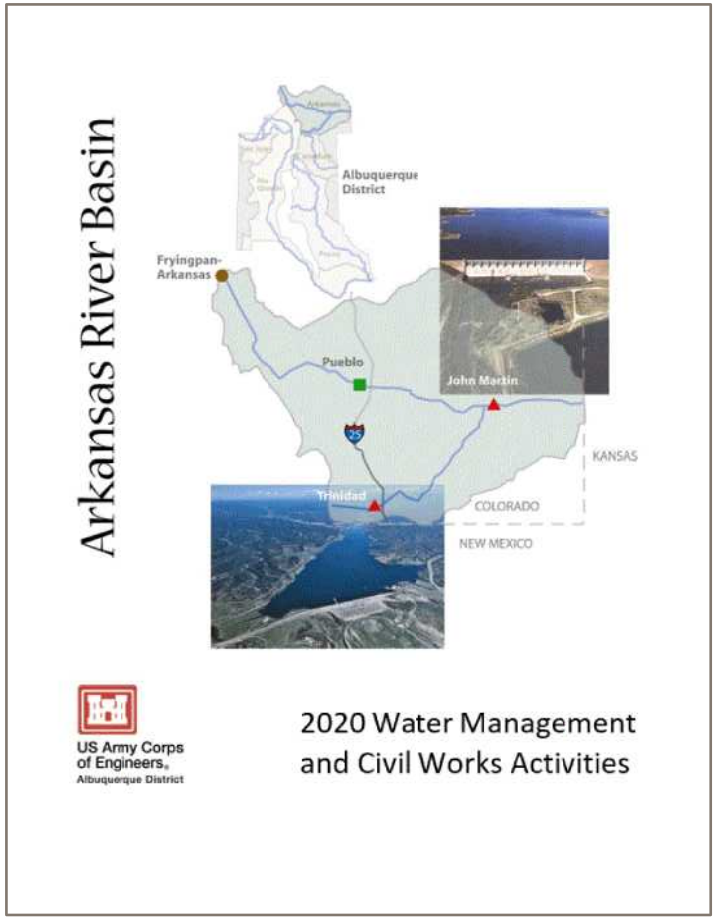
2020 ARCA ANNUAL MEETING
ARKANSAS RIVER BASIN REPORT

LTC Patrick M. Stevens V, PE, PMP
District Commander
South Pacific Division/Albuquerque District
9 December 2020

US Army Corps of Engineers®

TOPICS

- Compact Year 2020 Water Management
- Arkansas Basin Water Quality Monitoring
- Operations and Maintenance
- Emergency Management Coordination



COMPACT YEAR 2020 WATER MANAGEMENT
Snowpack and Runoff

May 1st Natural Resources Conservation Service Forecast

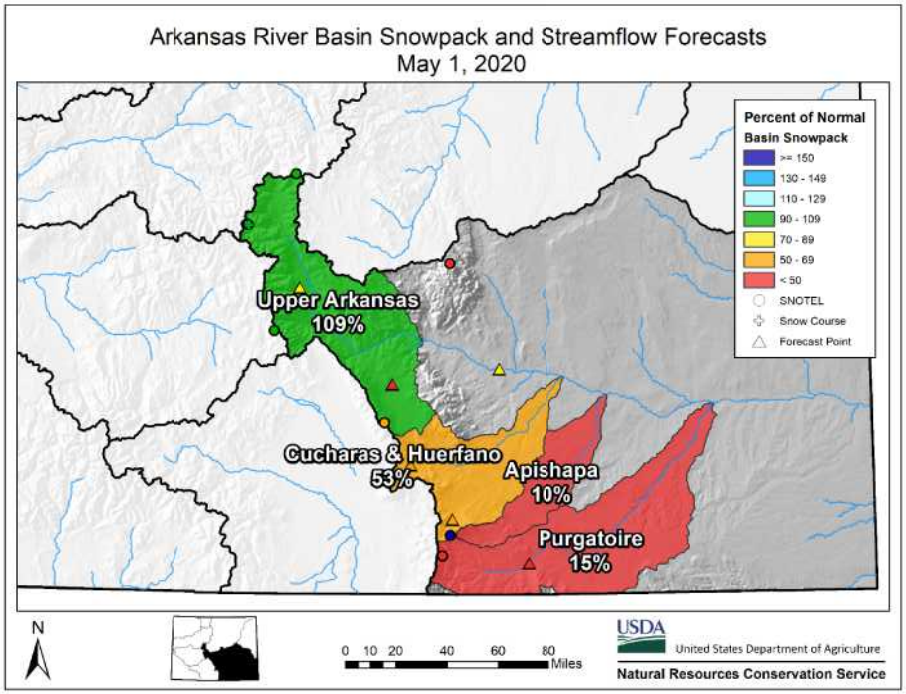
- Upper Arkansas Basin snowpack: 109% of median
- Purgatoire Basin snowpack: 15% of median
- Basin total: 81% of median

Trinidad Dam and Lake

- Forecast runoff inflow: 16,500 ac-ft
- Actual runoff inflow: 11,430 ac-ft (31% of average)

John Martin Dam and Reservoir

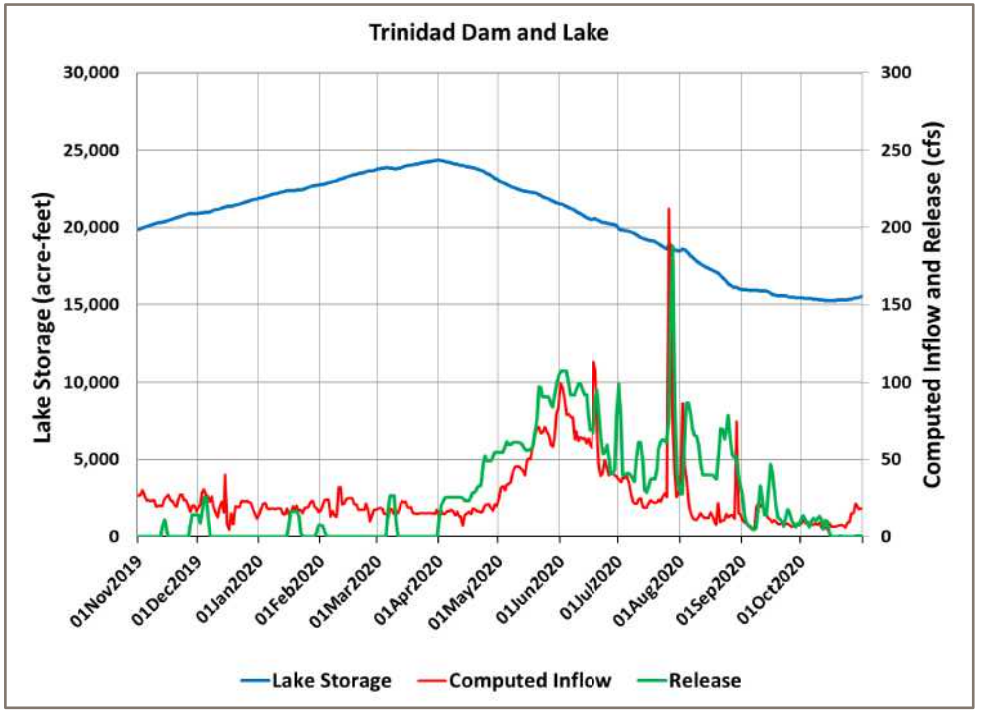
- NRCS does not forecast runoff inflow
- National Weather Service: 93,000 ac-ft
- Actual runoff inflow: 67,050 ac-ft (46% of average)



COMPACT YEAR 2020 WATER MANAGEMENT
Trinidad Dam and Lake

Compact Year 2020 Water Management

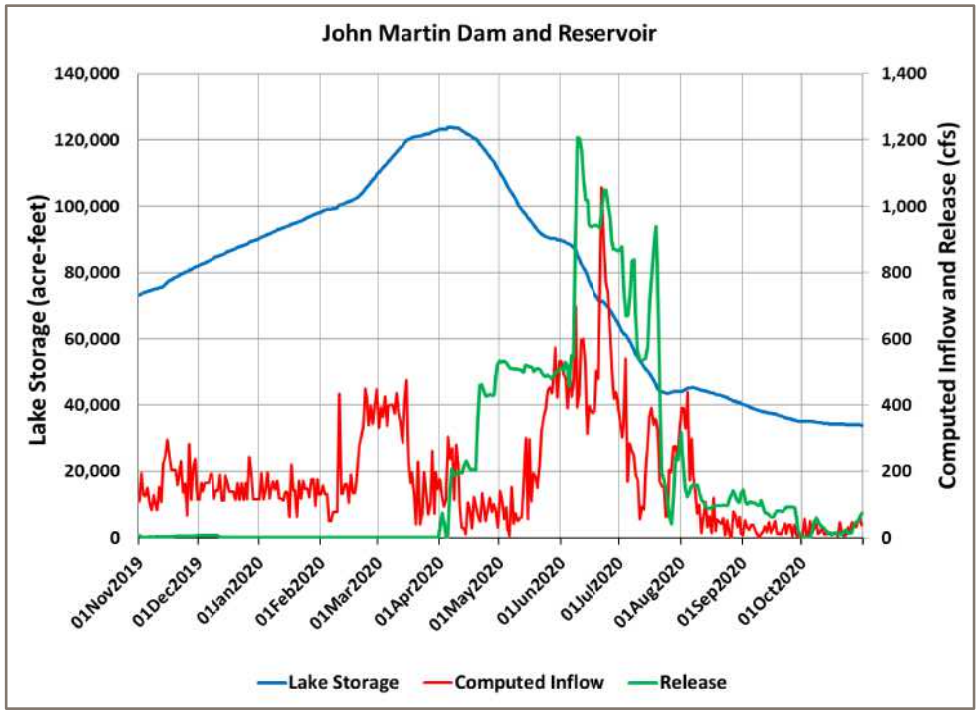
- Computed inflow: 18,690 ac-ft
- Release: 20,000 ac-ft
- Maximum storage: 24,360 ac-ft
- Minimum storage: 15,260 ac-ft
- End of Compact Year storage: 15,520 ac-ft
- No Flood Risk Management Operations
- No evidence of zebra or quagga mussels



COMPACT YEAR 2020 WATER MANAGEMENT
John Martin Dam and Reservoir

Compact Year 2020 Water Management

- Computed inflow: 133,120 ac-ft
- Release: 146,760 ac-ft
- Maximum storage: 123,840 ac-ft
- Minimum storage (also end of year): 33,890 ac-ft
- No Flood Risk Management Operations
- No evidence of zebra or quagga mussels



ARKANSAS WATER QUALITY MONITORING

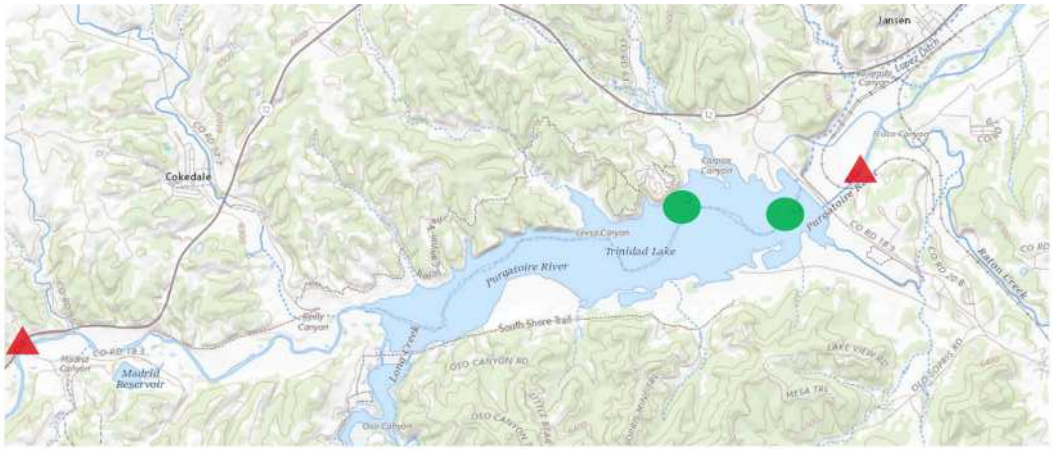
Reservoir Stations (2012 – Current)

Monthly during ice-free period

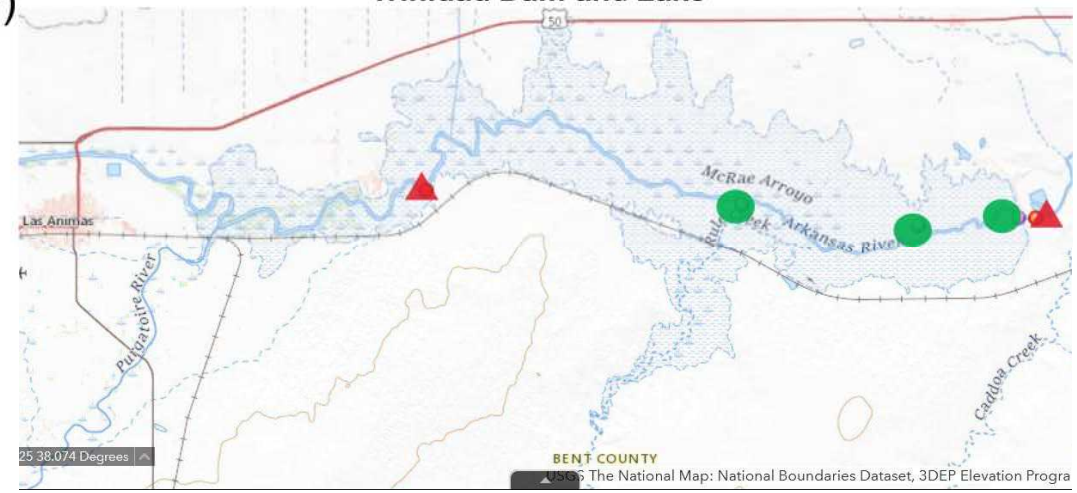
- Vertical profiles
  - Temperature
  - Dissolved oxygen
- Surface measurements
  - Turbidity
  - pH
  - Specific conductance
- Secchi depth
- Zebra and quagga mussel (June-October)

Riverine Stations (2020 – 2025)

- 15-minute interval
  - Water Temperature
  - Dissolved oxygen
  - Turbidity
  - pH
  - Specific conductance
- Monthly anions/cations and total suspended sediment



Trinidad Dam and Lake



John Martin Dam and Reservoir

OPERATIONS AND MAINTENANCE

<u>John Martin Dam and Reservoir</u>

- Outlet works conduits and gates
  - Thorough inspection of all six conduits and service gates
  - Cleaned debris and mineralization from air vents
  - Repaired damaged sections of conduit liner
  - Serviced and repaired Chapman air valves for all conduits
- Spillway tainter (radial) gates
  - New trunnion pier railings to improve safety
  - Concrete repairs to correct leaking gate seals

<u>Trinidad Dam and Lake</u>

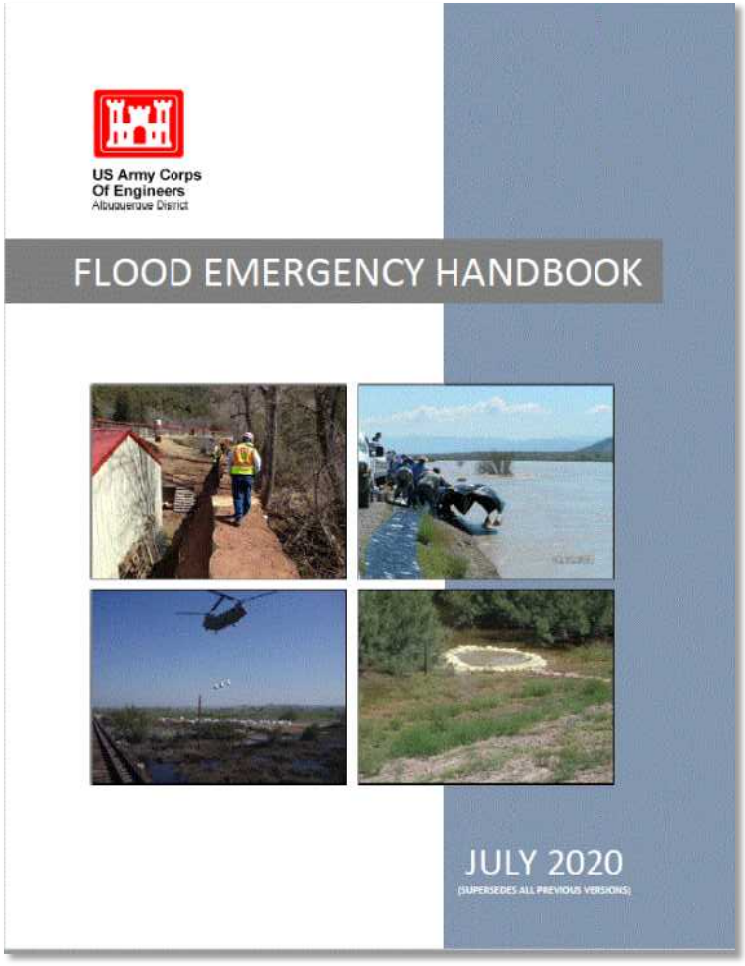
- Normal annual O&M during 2020

EMERGENCY MANAGEMENT COORDINATION

Public Law 84-99 authorized USACE to assist state and local governments before, during, and after flood events.

Assistance can be obtained by contacting:

U.S. Army Corps of Engineers, Albuquerque District
Readiness and Contingency Operations Office
cespa-eoc@usace.army.mil
505-342-3686



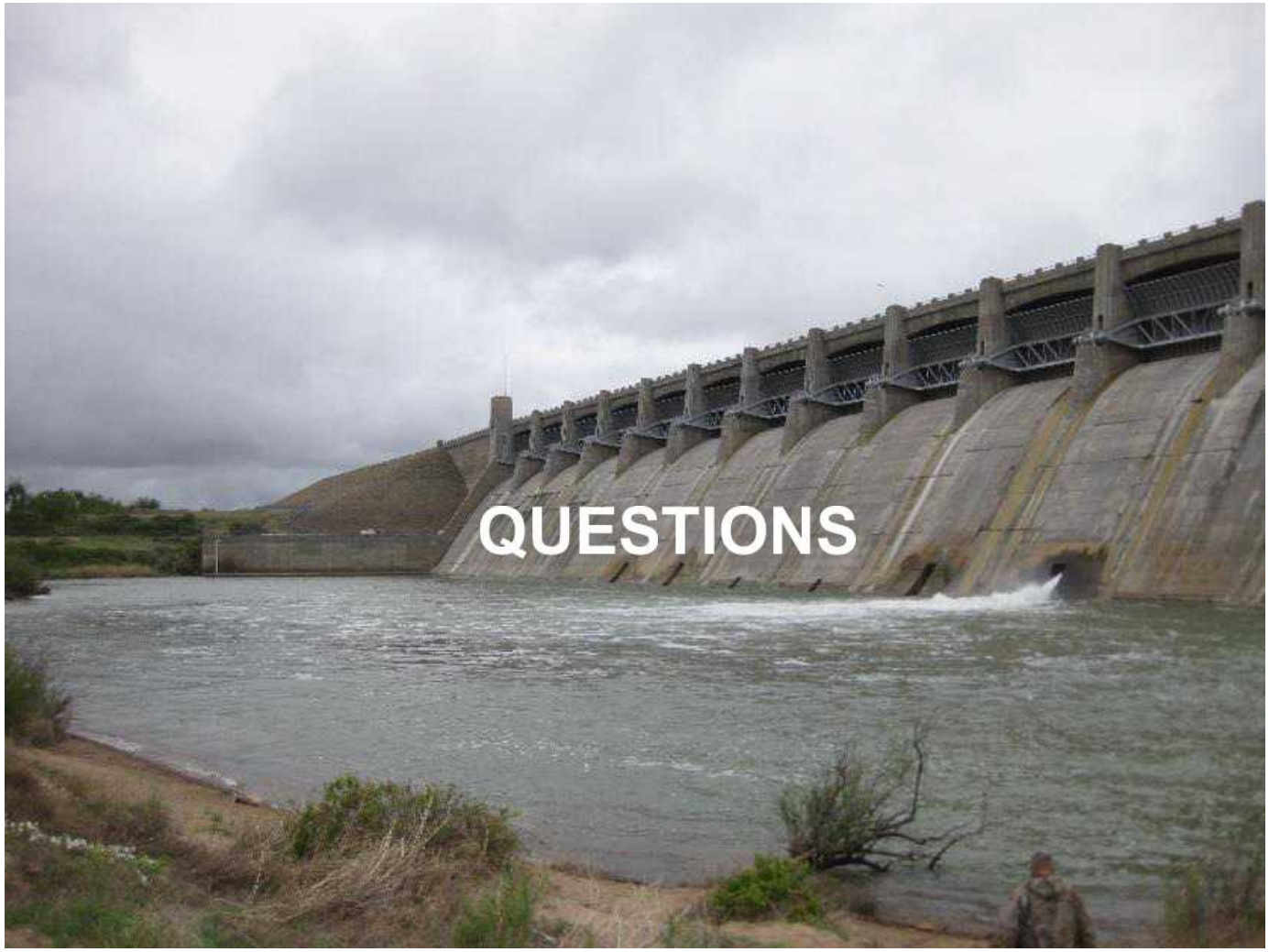

QUESTIONS

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Exhibit E

Annual Meeting

December 9, 2020

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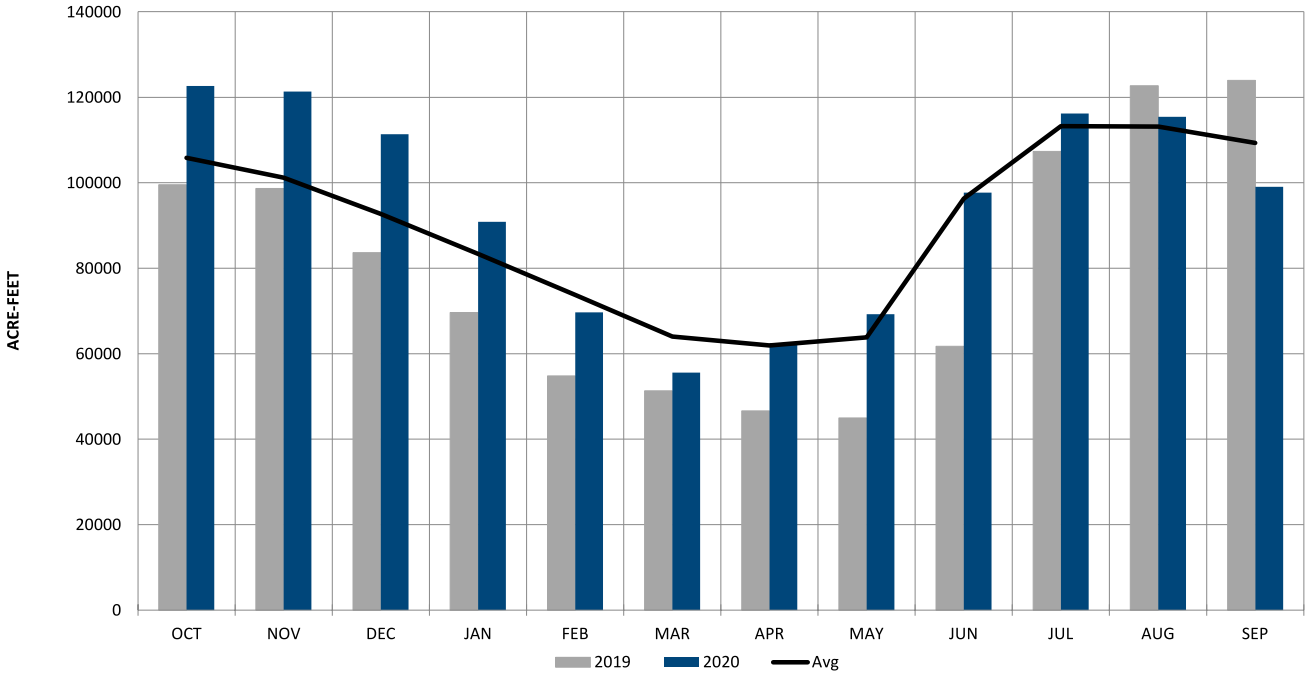
Exhibit E

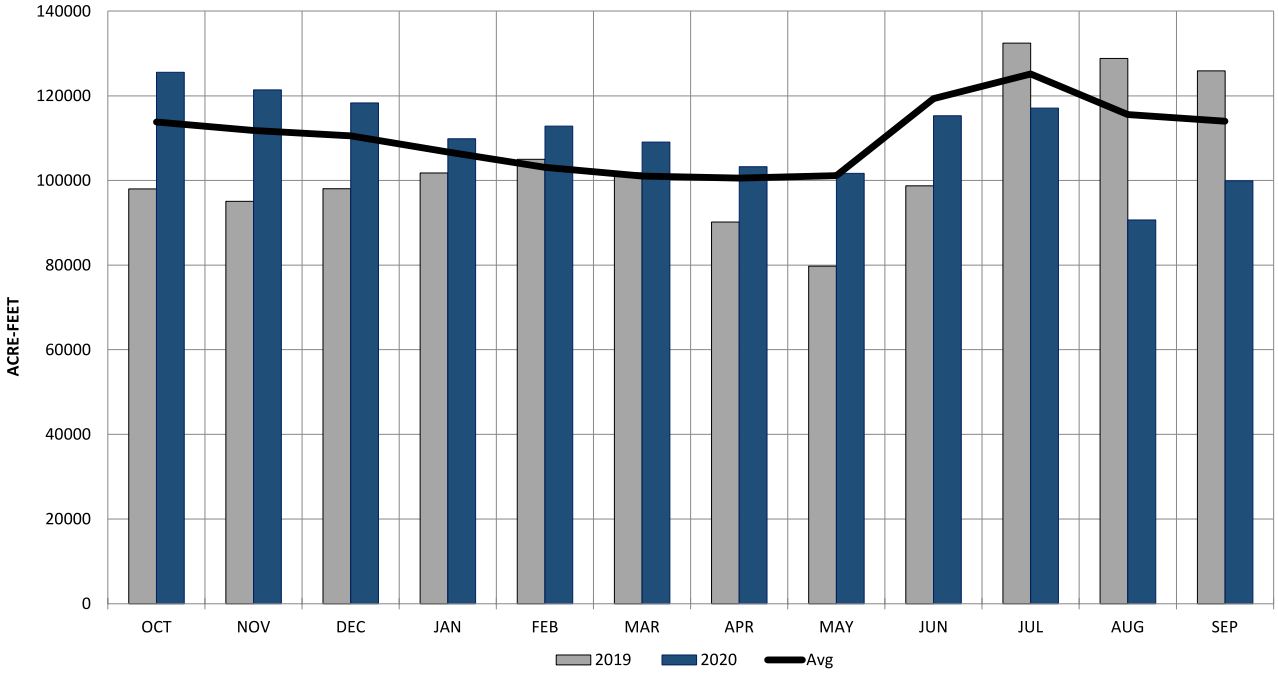
Fry-Ark Project 2020 Water Year

- Imports were slightly below average.
- This is after 4 out of 6 years of above average imports
- Snowpack in the collection system was about average until May, then decreased rapidly with little spring and summer precipitation.
- The collection system opened April 27. Runoff peaked in June and finished by mid-July.

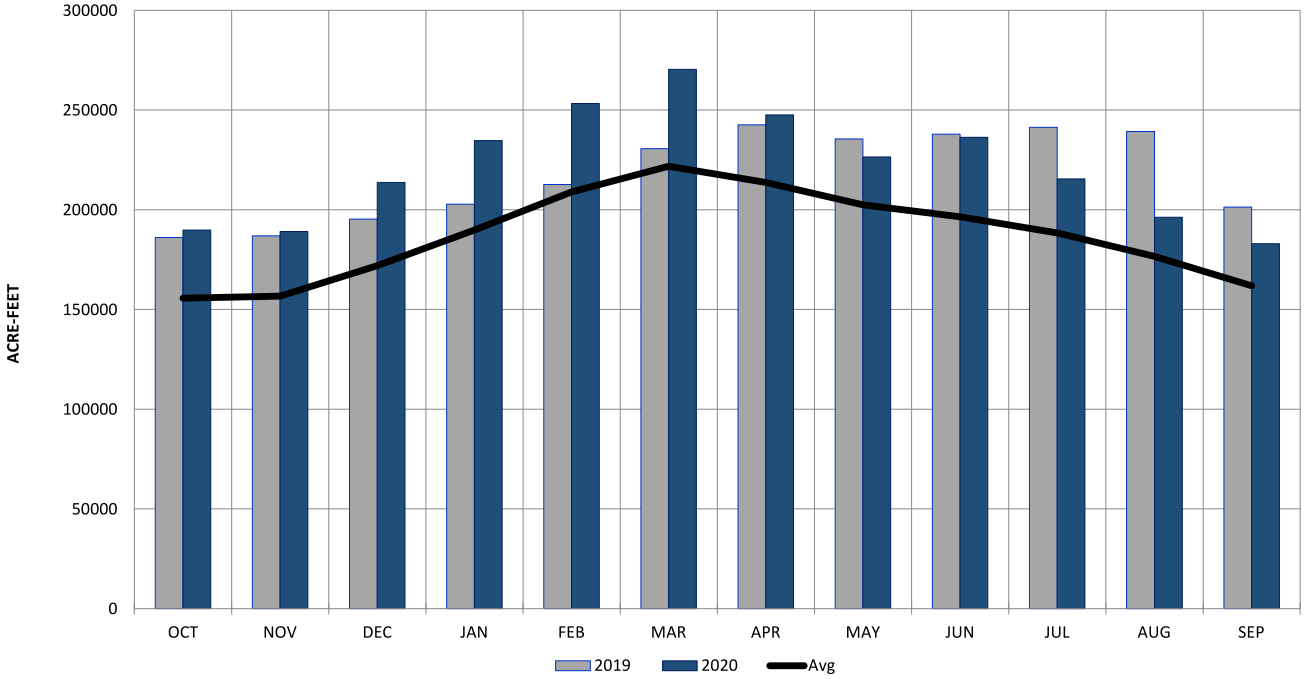
TURQUOISE LAKE

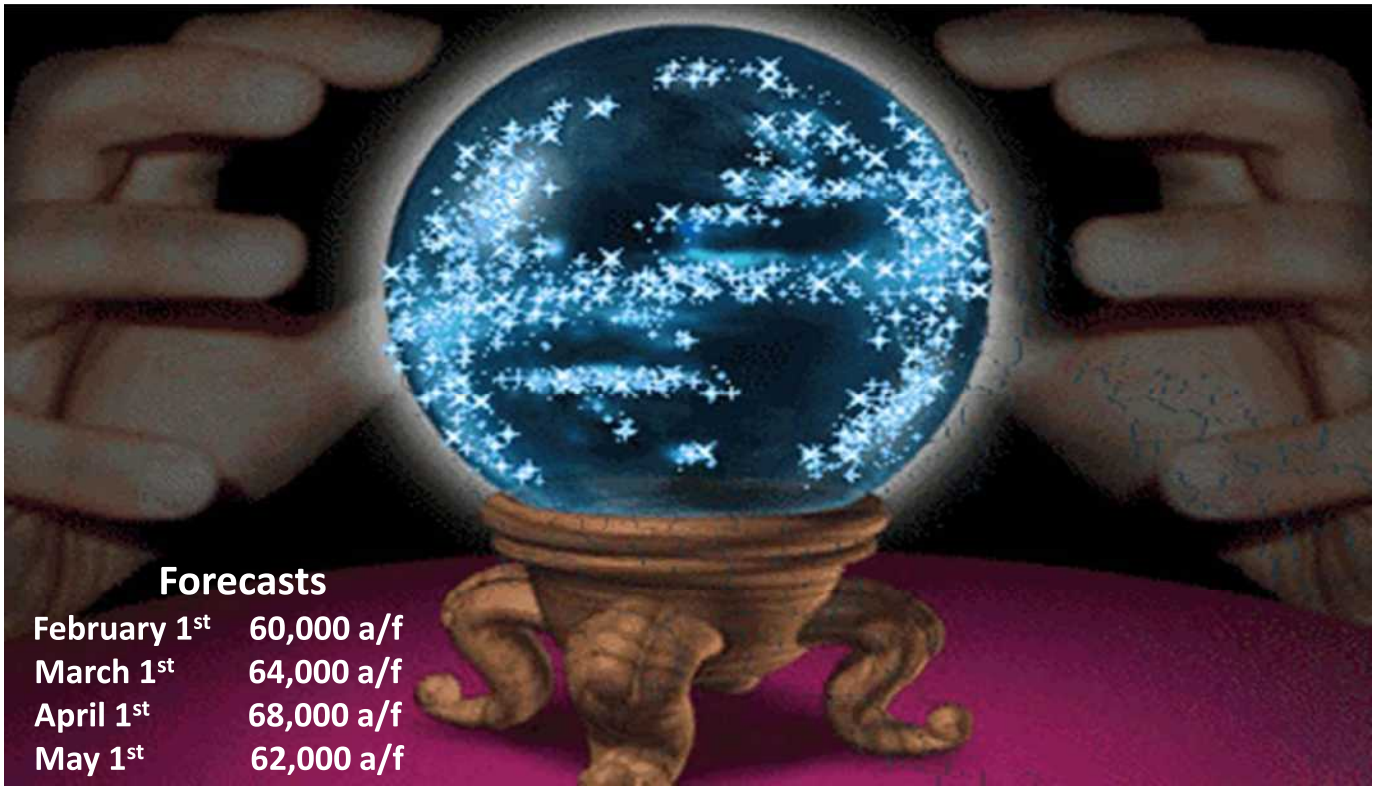


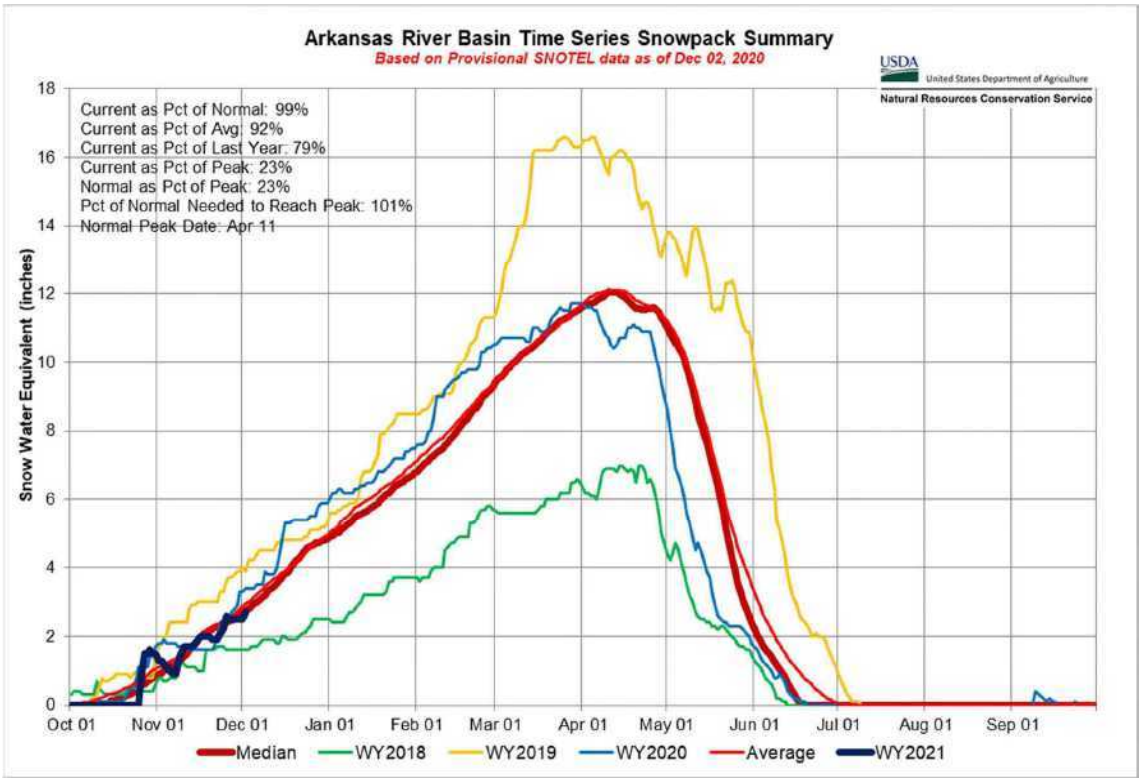
TWIN LAKES

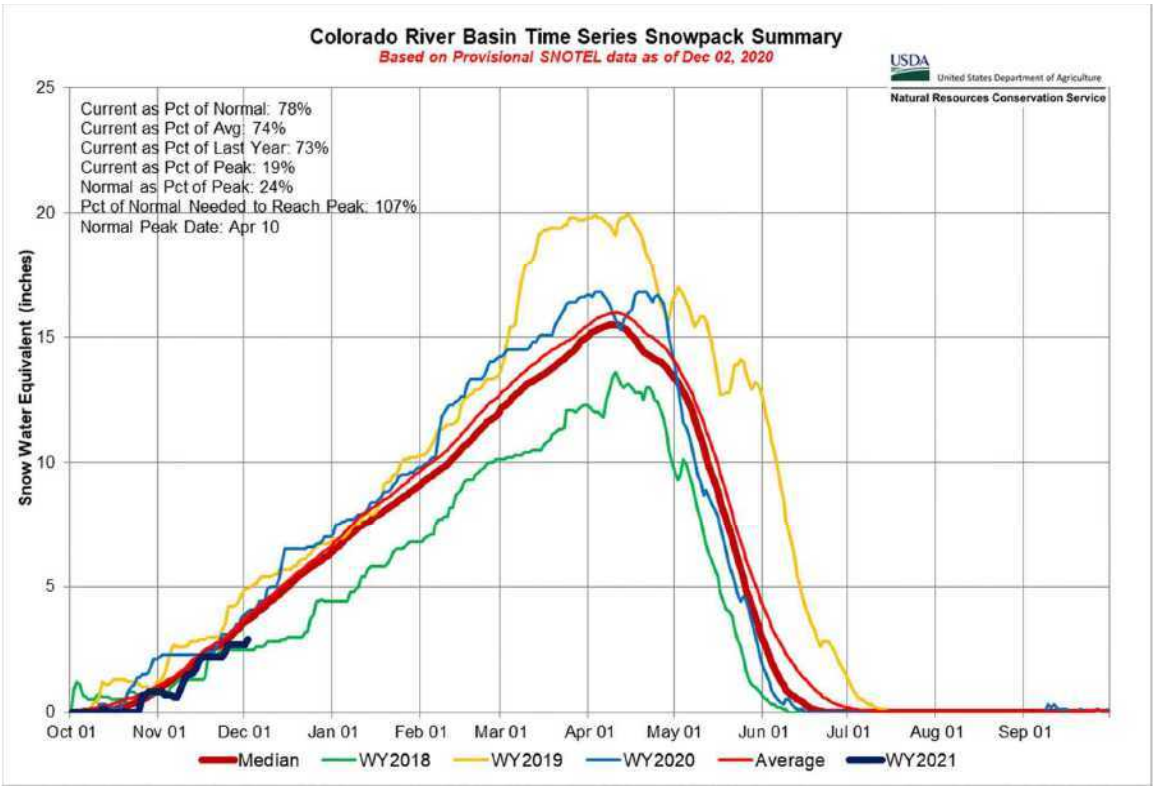


PUEBLO RESERVOIR




Forecasts
February 1st 60,000 a/f
March 1st 64,000 a/f
April 1st 68,000 a/f
May 1st 62,000 a/f


Arkansas River Basin Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Dec 02, 2020
USDA
United States Department of Agriculture
Natural Resources Conservation Service
Current as Pct of Normal: 99%
Current as Pct of Avg: 92%
Current as Pct of Last Year: 79%
Current as Pct of Peak: 23%
Normal as Pct of Peak: 23%
Pct of Normal Needed to Reach Peak: 101%
Normal Peak Date: Apr 11
Snow Water Equivalent (inches)
0
2
4
6
8
10
12
14
16
18
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Median
WY2018
WY2019
WY2020
Average
WY2021



Winter Operations

- **Currently releasing 100 cfs from Twin and 3 cfs from Turquoise to Pueblo.**
- **We anticipate moving a total of 60,000 AF from our upper reservoirs to Pueblo.**
- **Movement of water will be adjusted according to the forecast and customers needs.**

Buttress Joint Repair Project

Mussels

- Facility assessment for the Fry-Ark are complete.
- The action response plans are complete.
- To date we have found no adults on substrate samples, and results were negative this year for mussel larvae Pueblo Reservoir.
- For a copy of the Pueblo assessment/findings reports please contact: Pat McCusker at: *PMcCusker@usbr.gov*

Reclamation General Updates

- Reclamation leadership updates
- Dept of the Interior reorganization update
- 2020 Northern Colorado fire info/updates

Reclamation Arkansas River Basin Activities/Updates

- Reclamation activities with PRWCD and SCWCD
  - Excess Capacity Contracts in Trinidad Reservoir
  - Pueblo Reservoir Recovery of Storage (SCWCD Project)
  - Arkansas Valley Conduit
- Other Activities

Arkansas Valley Conduit

- Project is being cooperatively managed and executed by Reclamation and Southeastern Colorado Water Conservancy District
- Design and construction status:

Boone Reach Contract 1
- First 10 miles of pipeline from Pueblo to Boone.
- Final design in progress – scheduled to complete in June 2021.
- Construction contract award planned in FY 2022.

Dechloramination Facility
- Required water treatment facility to serve entire AVC, located near Boone.
- Final design in progress – scheduled to complete in September 2021.
- Construction contract award planned in FY 2023.

- For questions specific to the project, please contact Sam Braverman at *SBraverman@usbr.gov*

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Exhibit F

Annual Meeting

December 9, 2020

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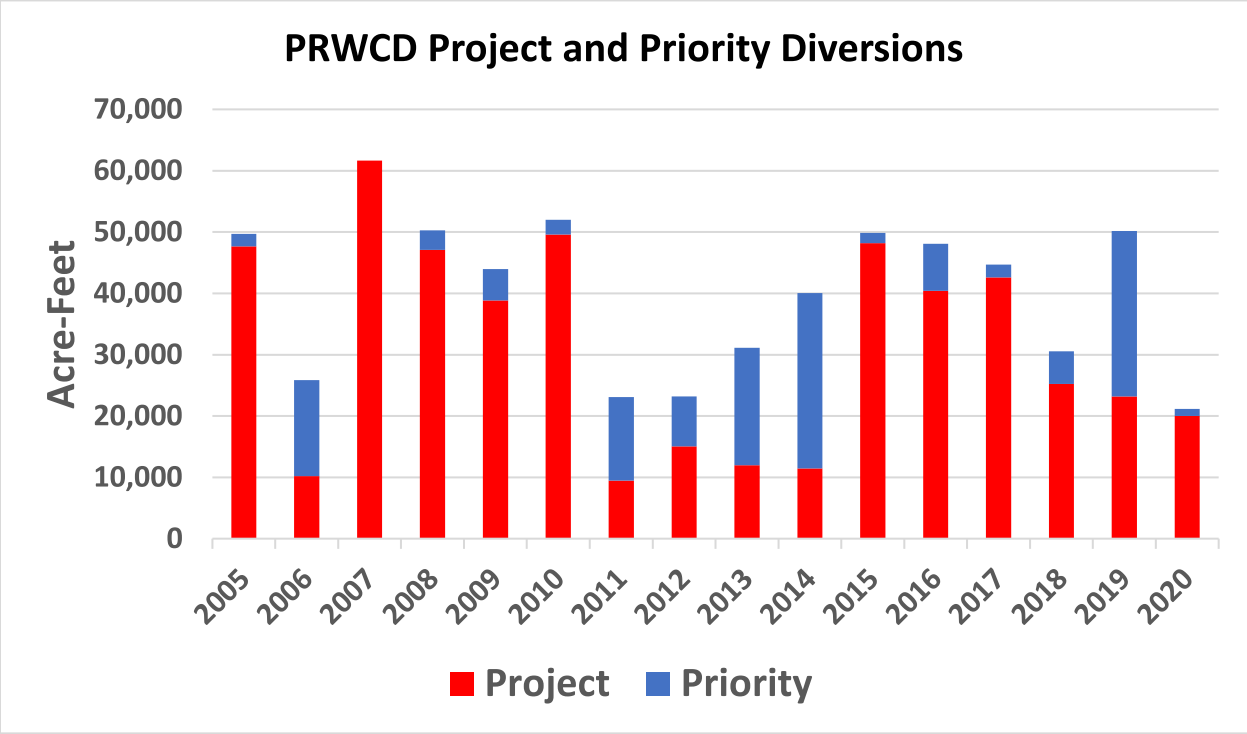
PURGATOIRE RIVER WATER CONSERVANCY DISTRICT

ARKANSAS RIVER COMPACT ADMINISTRATION MEETING PRESENTATION

DECEMBER 9, 2020 - PRWCD OPERATIONS SUMMARY - 2020



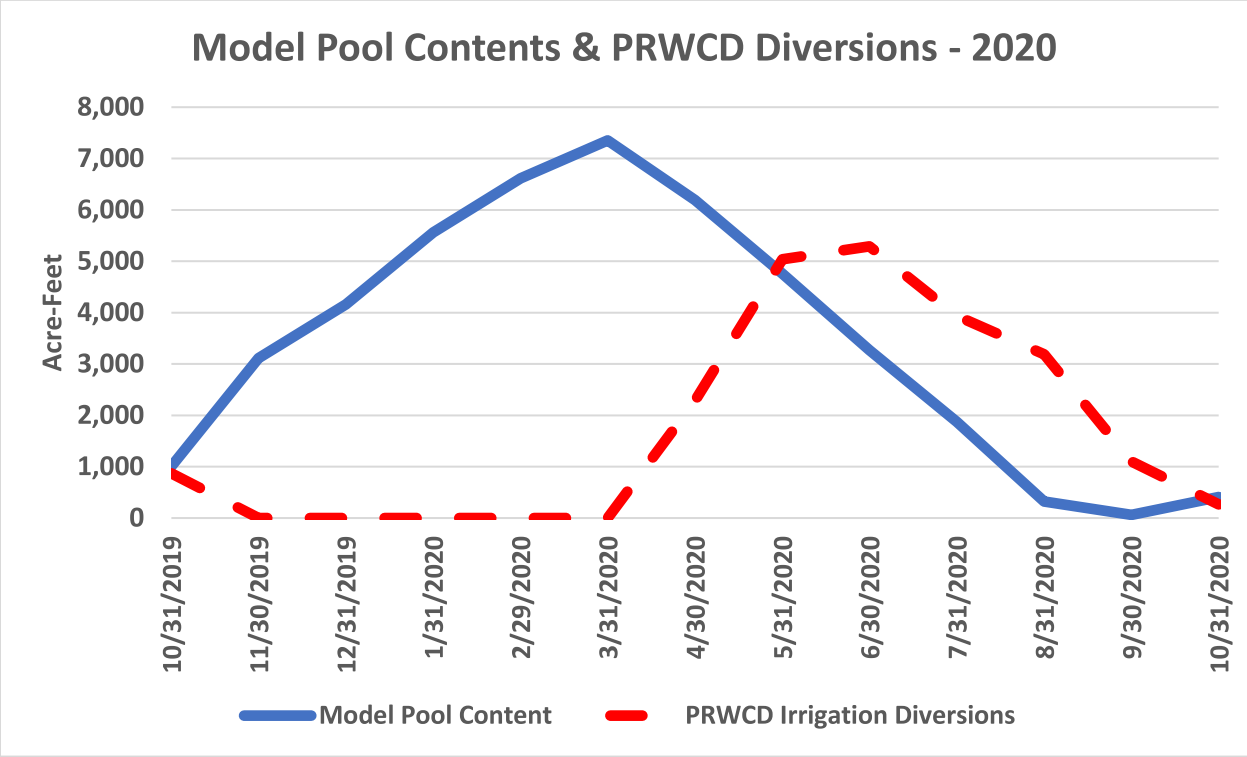
PRWCD 2005-2020 Project and Priority Diversions:

Total PRWCD Diversions: 21,118 ace-feet, 2019 was 50,173 acre-feet, 2005-2020 average is 40,335 acre-feet.

Project Administration Diversion Component = 19,975 acre-feet,

Priority Administration Diversion Component = 1,143 acre-feet. District was classified as being in "Extreme Drought" for most of the irrigation season.

Exhibit F

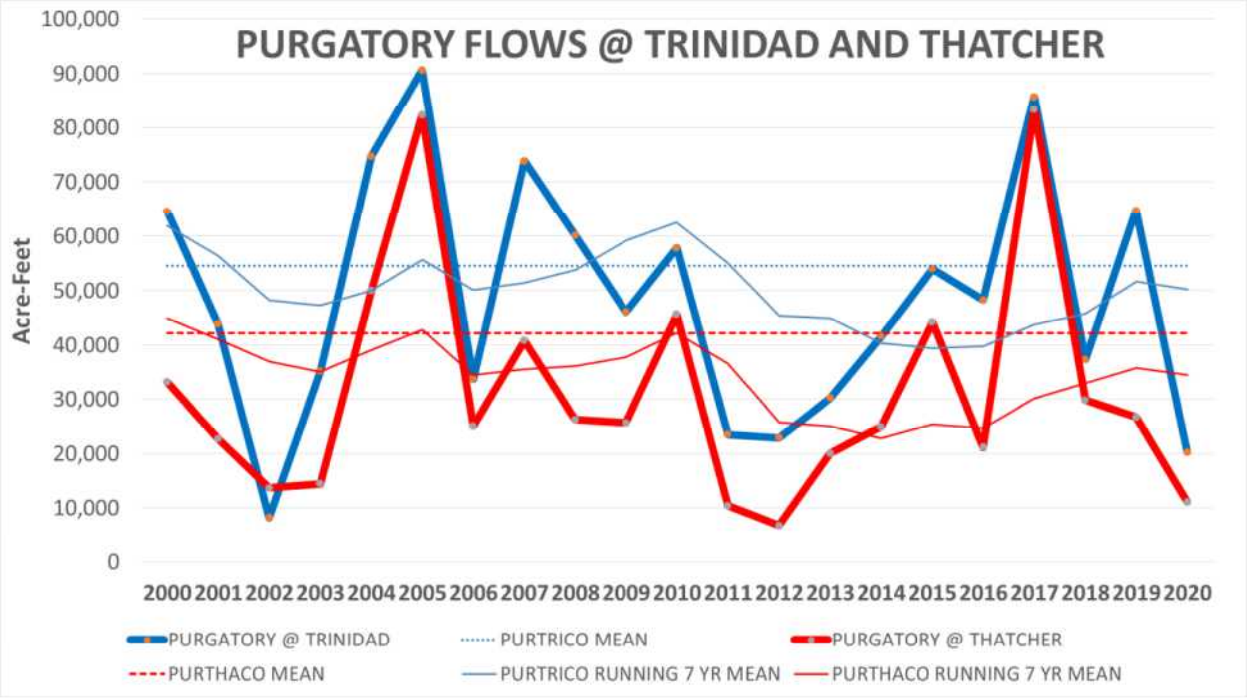


Model Pool Contents & PRWCD Cumulative Diversions for 2020:

Model Pool reached its maximum content of 7,351 acre-feet on April 1, 2020 at which time the irrigation season began.

Difference of total diversions of 21,118 acre-feet and the approximately 7,351 of Model Pool reservoir releases was derived from river inflows, other leased waters and irrigation return flows.

The District reverted to Priority Administration at the end of August as stored water supplies were essentially exhausted.



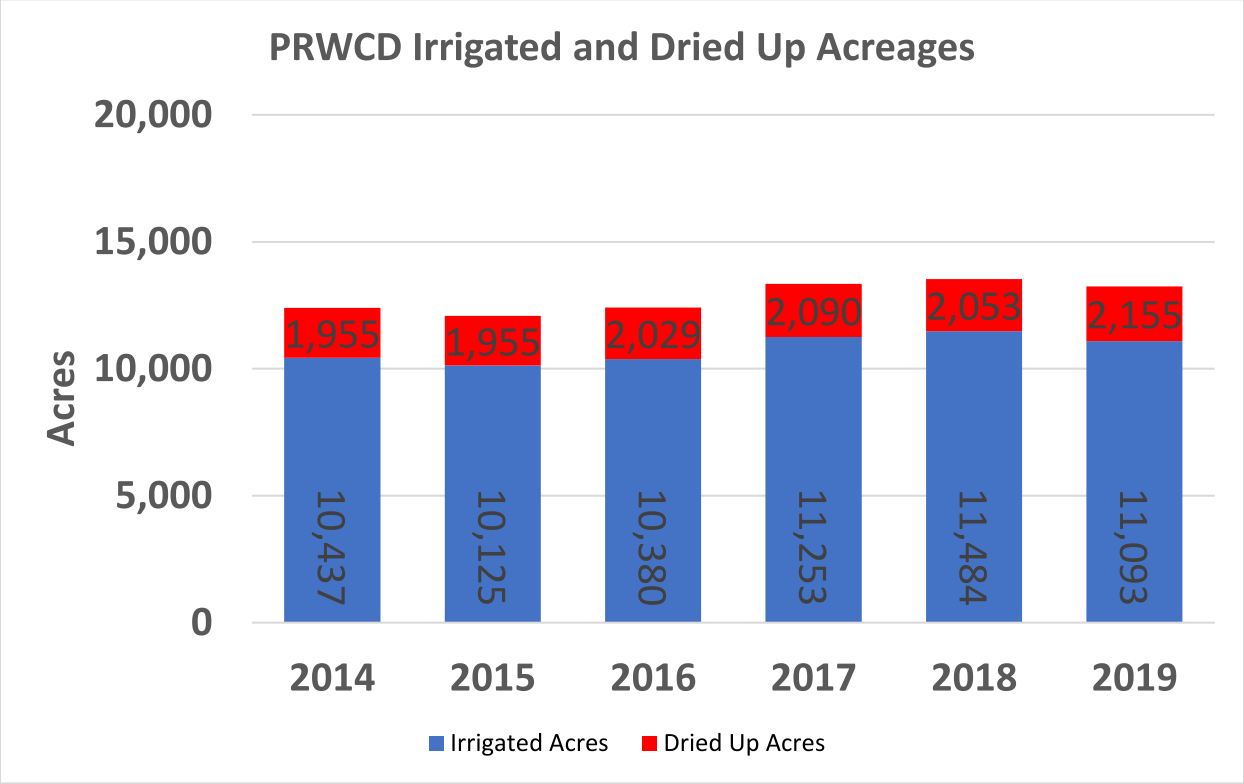
Purgatoire River Gaged Flows – Purgatoire River at the City of Trinidad (PURTRICO) and Purgatoire River at Thatcher (PURTHACO).

Below average water year. Less than 50% of average flows at both gaging sites.

Running 7 year average flows are both below long term average gage flows (1978-2020). Dry period.

PURTRICO flows for 2020 = 20,275 acre-feet, compared with 20,358 acre-feet through the Purgatoire River below Trinidad Reservoir (PURBTRCO), a 0.4% difference.

PURTHACO flows for 2020 = 11,128 acre-feet, very little water was required to be passed through the District to downstream calls and very sparse monsoon moisture for the second year in a row.



Irrigated Acreage Survey Results for 2013-2019.

Irrigated and dried up acreage for 2019 was 13,248 acres. A total of 19,499 acres are allowed to be irrigated by the Trinidad Project pursuant to the Operating Principles.

Survey work by the District and the Water Commissioners was conducted in August and September this year. Results from the Division Engineers Office are anticiplated by this coming February 2021.

Addition Summary Information:

PRWCD Irrigation Improvement Rules Plan:

- Fourth year of the District's Irrigation Improvement Rules Plan.
- 18 center pivot sprinklers were in the plan for 2020. This number is up from 16 in 2019, 14 in 2018 and 2 in 2017.
- A total of 961 acre-feet of water was diverted through these sprinklers in 2020. This value being down from 1,652 acre-feet in 2019.
- Return flow deficit obligations of 76 acre-feet were made up from modeled return flows resultant from irrigation use of leased fully consumable waters.
- Concern for 2021 as market for leasing these same fully consumable waters may not exist due to continuing drought conditions.

Livestock Water Diversions

Livestock water diversions during the 2019-2020 Non-Irrigation Season: 382 acre-feet were diverted by District ditches. A maximum of 1,200 acre-feet is allowed during the Non-Irrigation season pursuant to the Operating Principles. The District attempts to minimize these Non-Irrigation season diversions as they are detrimental to the Irrigation Season water supplies.

Senate Bill S1758:

- Introduced in June 2019, Senator Cory Gardner was sponsor.
- Bill was in Energy & Natural Resource Committee.
- The purpose of this bill was to (1) extend PRWCD's construction loan term from 75 years to 100 years, confirm Reclamation's Excess Capacity contracting authority and to allow any Excess Capacity contracting revenues to go to the District's construction loan obligation and thence towards any operations & maintenance expenses for Trinidad Dam & Reservoir.
- Senator Manchin (committee ranking member) wanted a recommendation from Reclamation as opposed to only proposed legislation from a senator. There was concern that drought effects on federal projects could lead to a large amount of subsequent proposed legislation from other districts. He wanted a reviewed process.
- Transferring future efforts to Senator Bennett's office?

PRWCD Engineering Committee Presentation as New Business (Update):

- Trinidad Reservoir Potential Sedimentation Accounting Update from 2019.

Appreciation is expressed to Division Two and Corps of Engineers staff for their support during 2020.

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Exhibit G

Annual Meeting

December 9, 2020

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Southeastern Colorado Water Conservancy District

Report to the Arkansas River Compact Administration

Wednesday, Dec. 9, 2020 Report to the Arkansas River Compa

Exhibit G

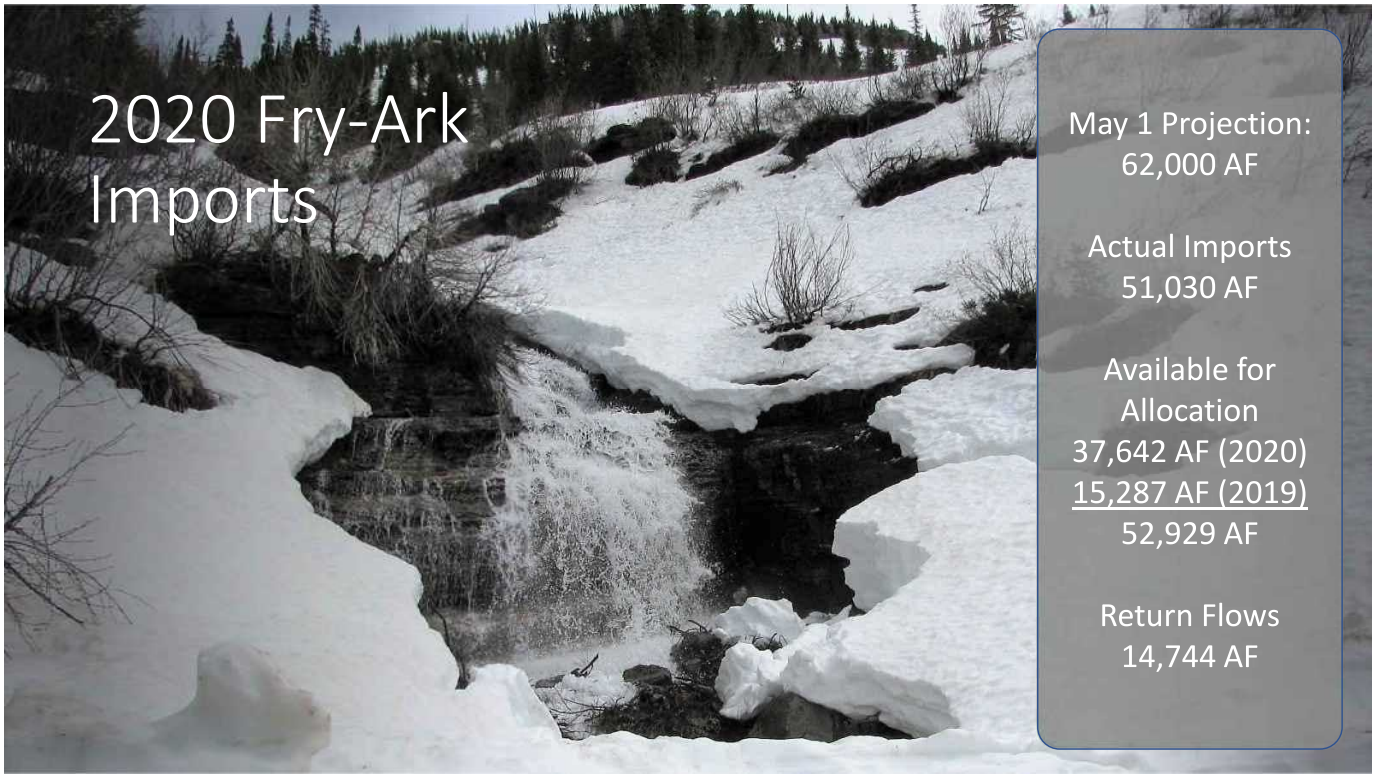
Like everyone, the District had a very challenging year in 2020.

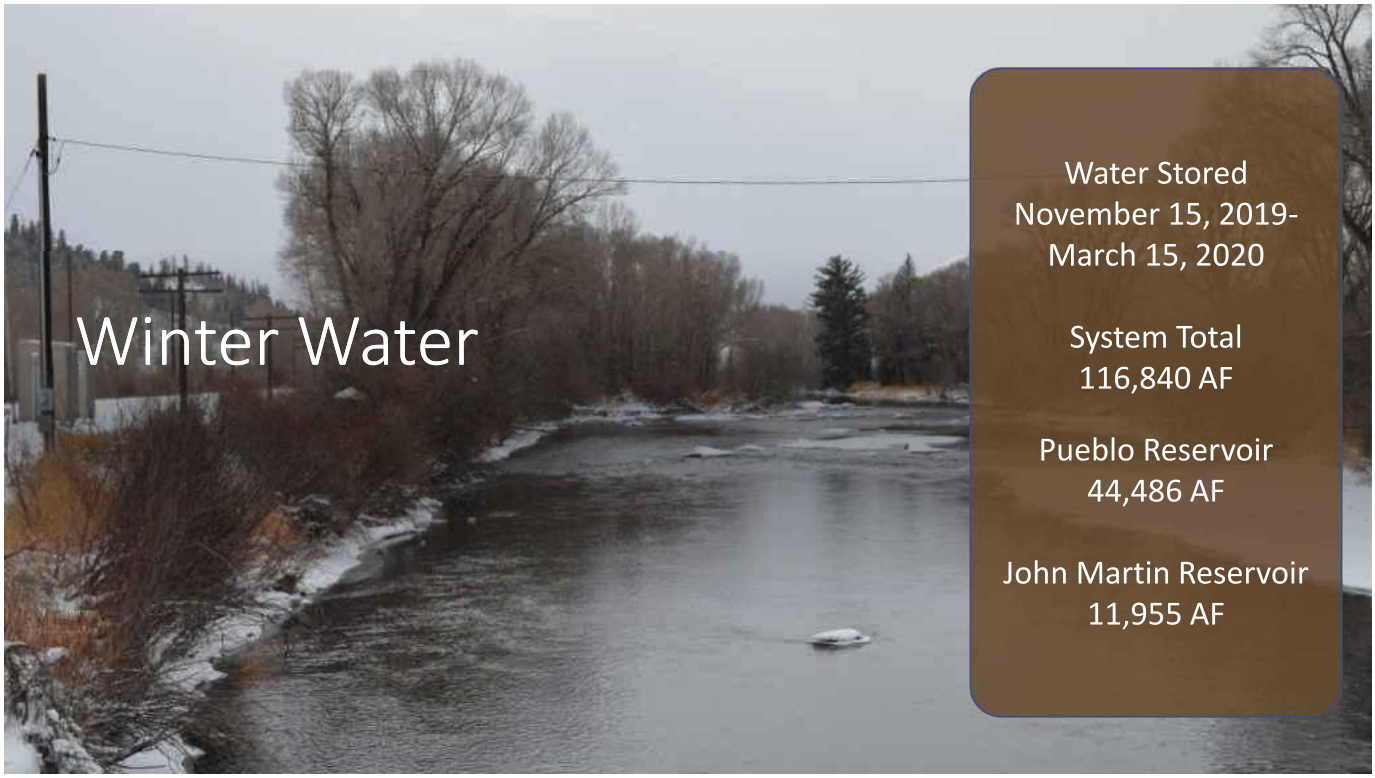
The office was closed in late March and all of April for COVID-19 safety. Access remains restricted.

Most of the staff worked remotely and all Board meetings required a leap in technology.

We still were able to fulfill our mission of providing high-quality, supplemental water to the Arkansas River basin.


Fryingpan-Arkansas Project


2020 Fry-Ark Imports
May 1 Projection:
62,000 AF
Actual Imports
51,030 AF
Available for Allocation
37,642 AF (2020)
15,287 AF (2019)
52,929 AF
Return Flows
14,744 AF



Winter Water

Water Stored
November 15, 2019-
March 15, 2020

System Total
116,840 AF

Pueblo Reservoir
44,486 AF

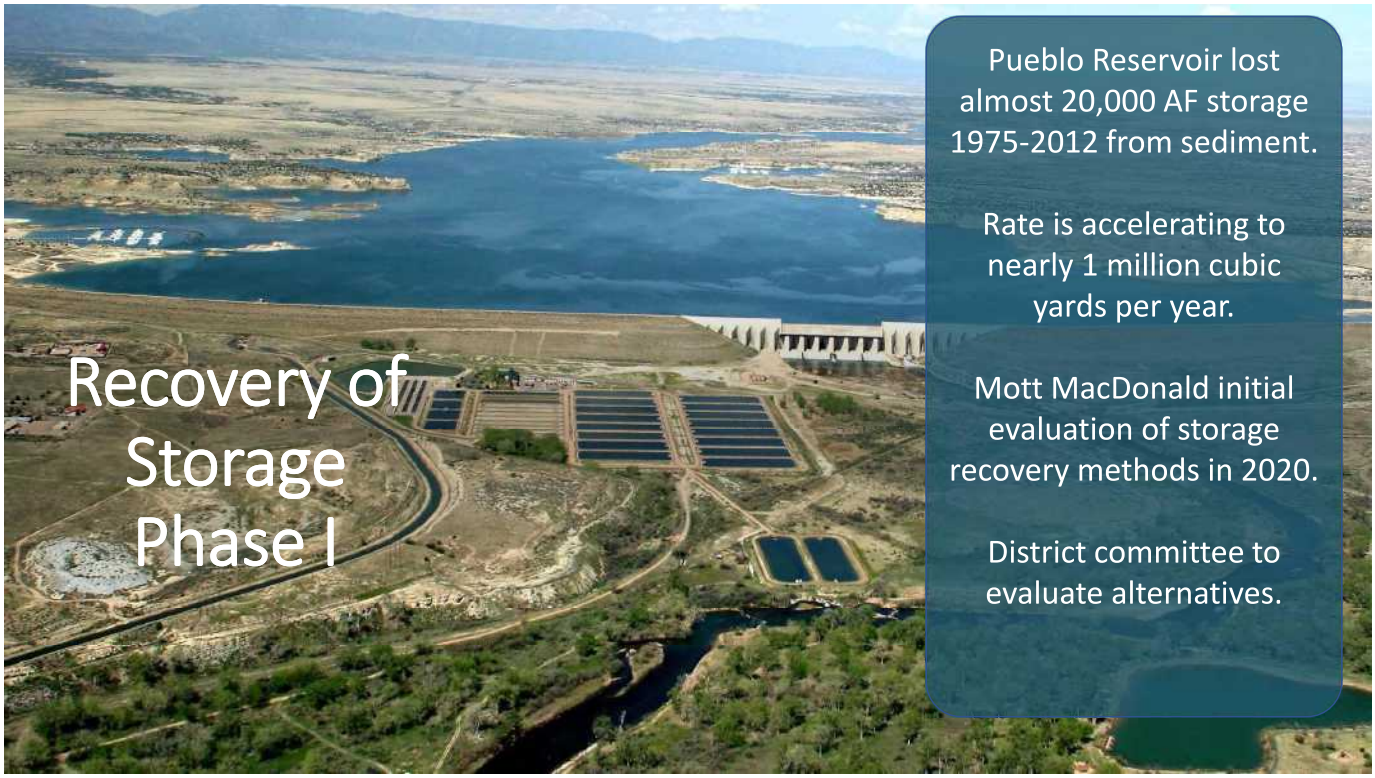
John Martin Reservoir
11,955 AF

Feature & Asset Valuation Study, Phase I

Goal:
To determine the value of Fryingpan-Arkansas Project features and District assets

Phase I:
Providence Infrastructure Consultants reviewed key features and assigned costs.

Phase II:
Refine estimates in 2021 for Condition Assessment study



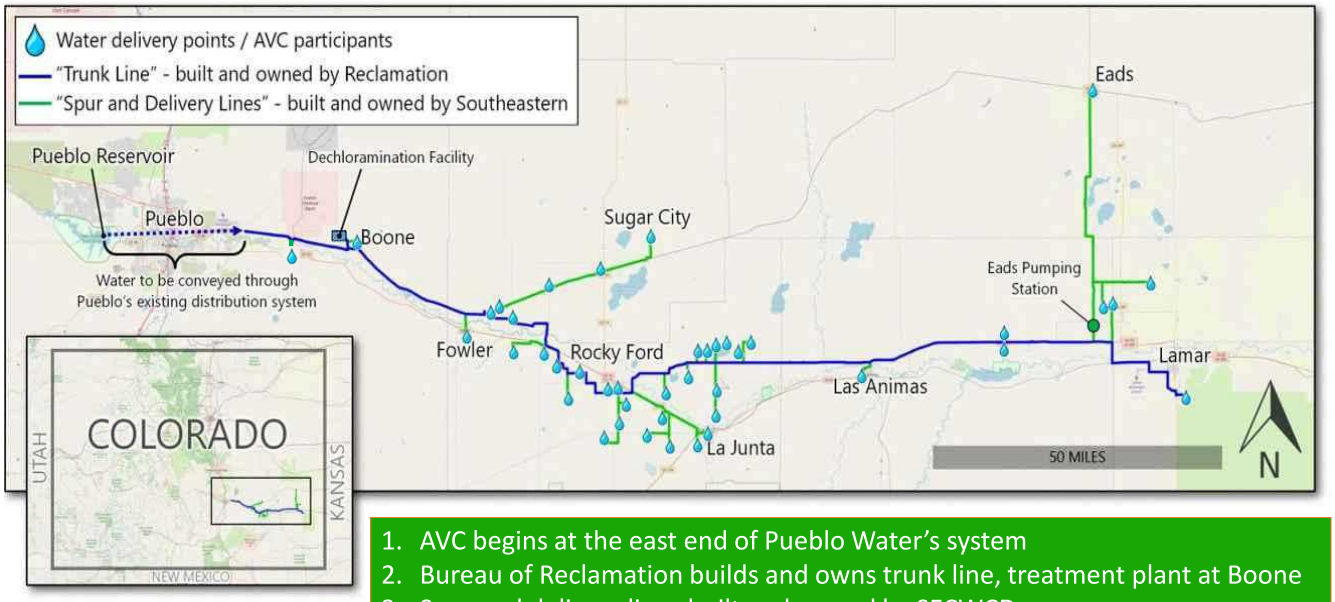
Recovery of Storage Phase I

Pueblo Reservoir lost almost 20,000 AF storage 1975-2012 from sediment.

Rate is accelerating to nearly 1 million cubic yards per year.

Mott MacDonald initial evaluation of storage recovery methods in 2020.

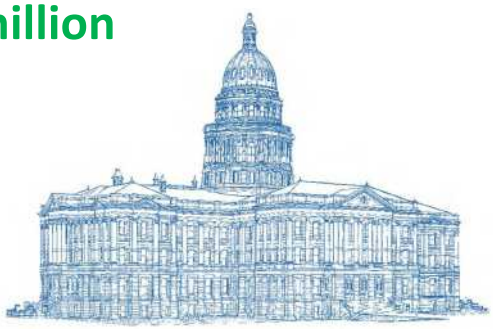
District committee to evaluate alternatives.



1. AVC begins at the east end of Pueblo Water's system
2. Bureau of Reclamation builds and owns trunk line, treatment plant at Boone
3. Spur and delivery lines built and owned by SECWCD
4. Total cost $564-$610 million
5. Completion by 2035 with full funding
6. Deliveries begin as AVC reaches each community

Arkansas Valley Conduit: $540-600 million

Federal: Appropriations, **$28 million** in 2020, **$8 million** in 2021, Prior years (2011-2019) total: **$30 million**.



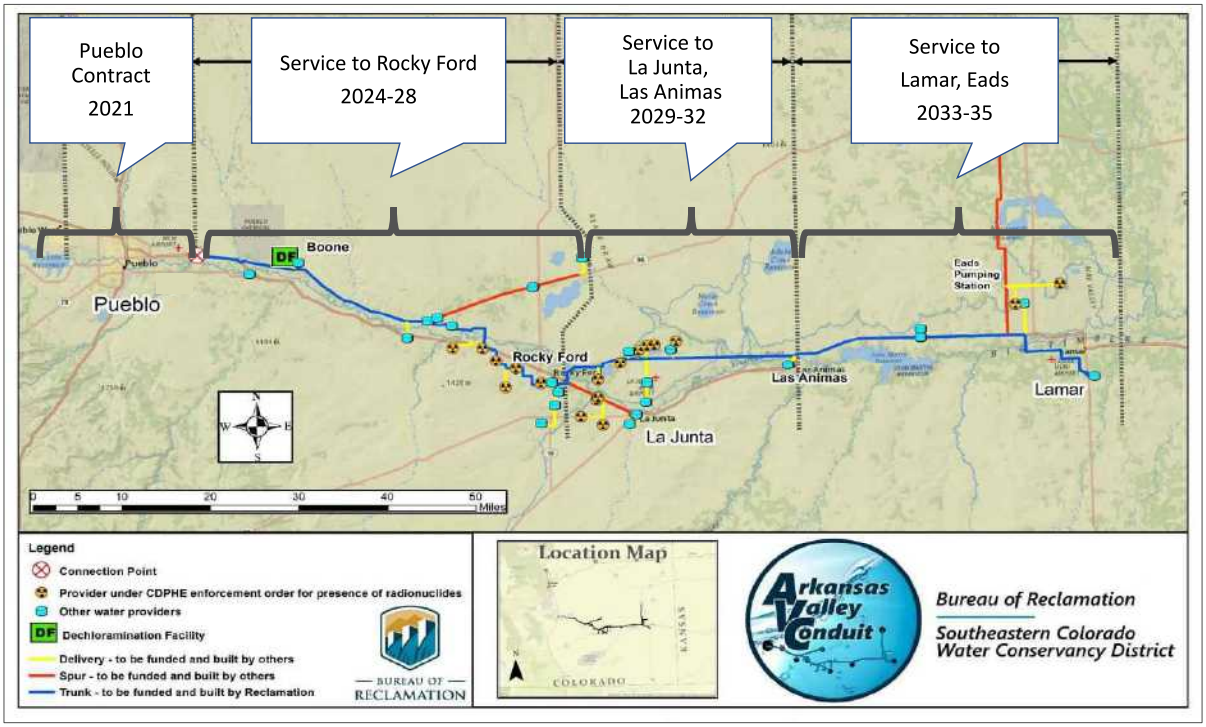
State: **$90 million** CWCB loan, **$10 million** grant (pledged)

Fry-Ark Miscellaneous Revenues: **$3.4 million** annually beginning in 2022, increasing to **$12.5 million** annually by 2070. For construction or to repay construction costs, including the local portion

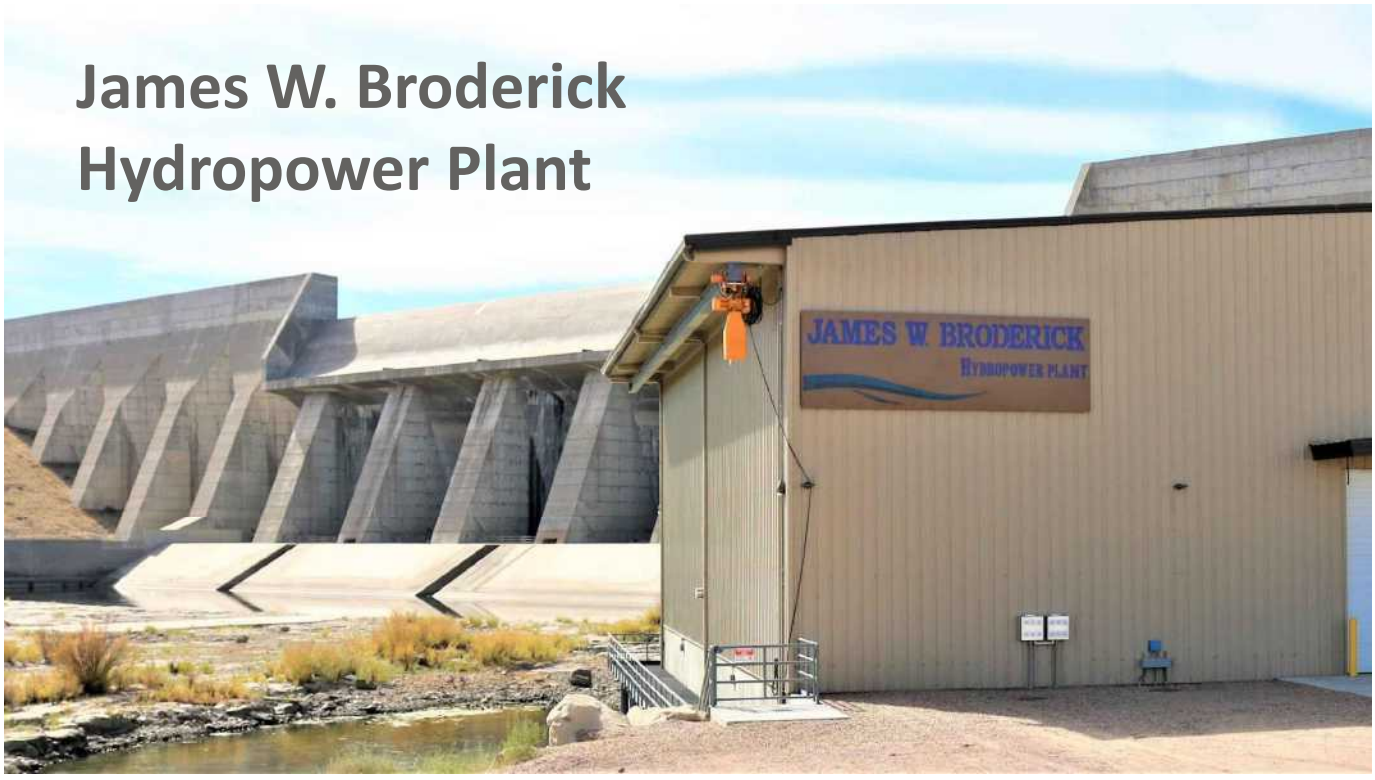
Participants:
$1 million since 2011, 100% of OM&R

Southeastern District Funding: **$4.8 million** reserve fund created from 2003 IGA Aurora payments. **$1.2 million** annually for OM&R from the James W. Broderick Hydropower Plant **($20 million)**.

PL 111-11 requires 35% local match



James W. Broderick Hydropower Plant



First full year of operation in 2020

High production rates through July 2020

Reduced flows in the second half of the year

Will meet income projections in 2020

Revenues will defray AVC OM&R costs in future years

Excess Capacity Master Contract

Fourth year of operation in 2020; 40-year contract

Allows participants to store water in Pueblo Reservoir

6,575 AF maximum storage in 2020; average storage 3,000 AF


Questions?

Exhibit H

Annual Meeting

December 9, 2020

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DECEMBER 2020 ARKANSAS RIVER COMPACT ADMINISTRATION ANNUAL MEETING

MIKE WEBER AND AMBER WEBER

LOWER ARKANSAS VALLEY WATER CONSERVANCY DISTRICT

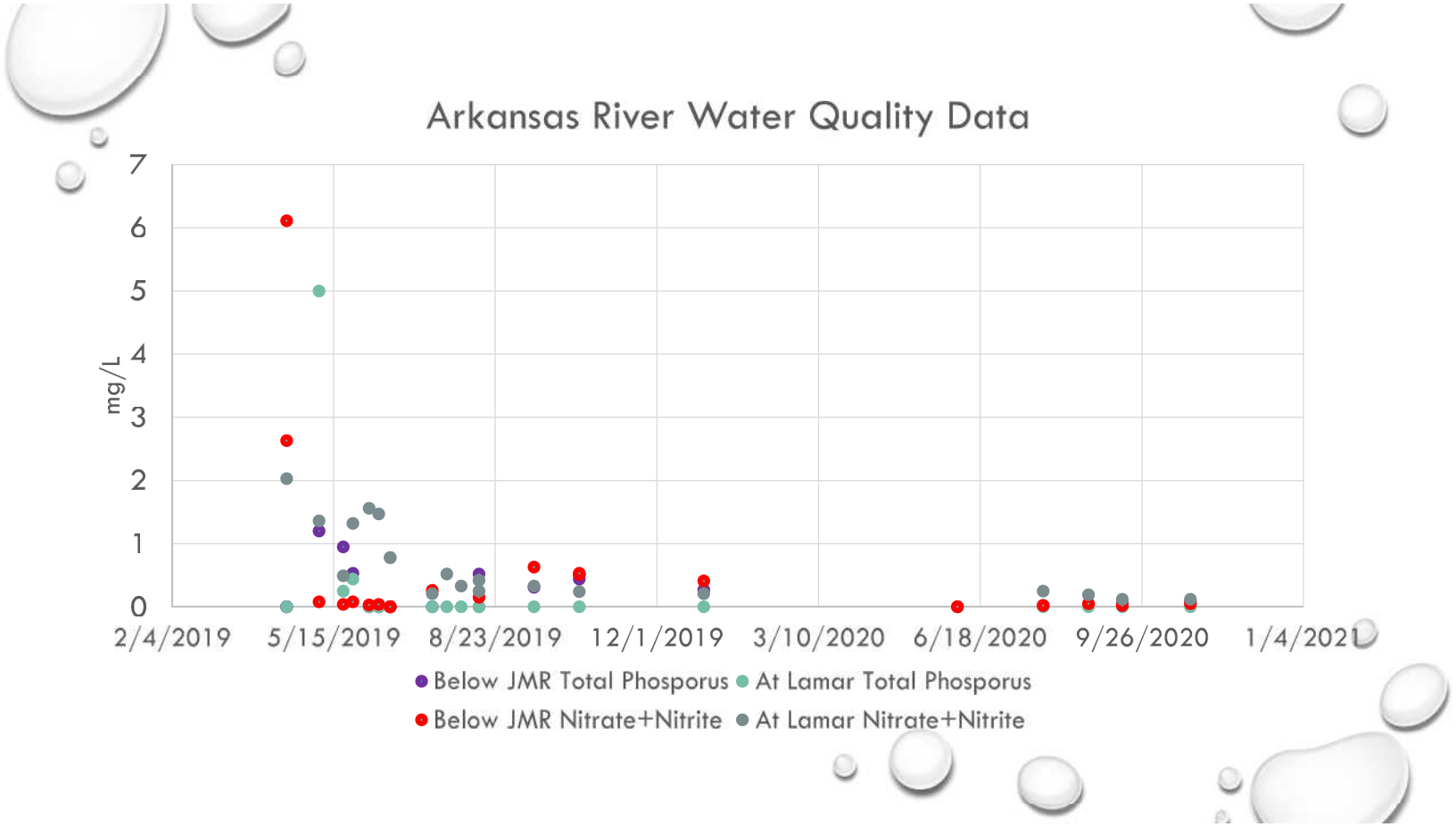
Exhibit H

CURRENT WATER QUALITY PROJECTS

- LATERAL LINING (X3)
- HEAD-STABILIZATION POND LINING (X7)
- COVER CROPPING AND IRRIGATION APPLICATION (X3)
- EDGE OF FIELD BUFFER STRIPS (X3)
- ROTATIONAL/LEASE FALLOWING (X5)
- REDUCED FERTILIZER APPLICATION
- IRRIGATION EFFICIENCY PROJECTS (X4)






Arkansas River Water Quality Data
mg/L
7
6
5
4
3
2
1
0
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020
9/26/2020
1/4/2021
Below JMR Total Phosporus
At Lamar Total Phosporus
Below JMR Nitrate+Nitrite
At Lamar Nitrate+Nitrite

FUTURE/PLANNED WATER QUALITY PROJECTS

- COVER CROP AND MULCHING PROJECTS
- IRRIGATION EFFICIENCY
- WETLAND RESTORATION
- EDGE OF FIELD BUFFER STRIPS
- WATER SCHEDULING
- SOIL HEALTH/WATER QUALITY NEXUS PROJECTS

THE SOIL AND WATER NEXUS

Through Water Quality we have shown reductions in nutrients and selenium.

Now we are rolling out demo plots to show this connection through the five NRCS soil health principles

Soil Armour – Residue	Minimal Disturbance	Diversity	Living Plants/roots	Livestock Incorporation

PROJECTS

SOIL AND WATER QUALITY MONITORING

Producers spread across LARV

Lower Arkansas Valley Best Management Project Implementation

Nonpoint Source Program

Lower Arkansas Valley Water Conservancy District | August 10, 2020

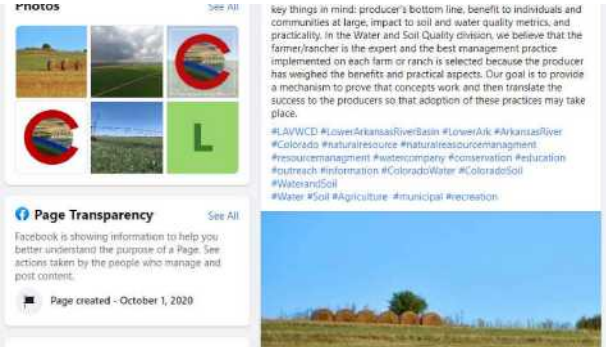
Lower Arkansas Valley Best Management Project Implementation
Edit story

1 Soil Health Site #1

The first of three soil health sites in this grant, this project was developed to increase organic matter in the soil through cover crops, grazing techniques, and a walking sprinkler for irrigation efficiency. The theory behind this project is that by increasing organic matter in the soil, there will be less nutrient and selenium runoff.

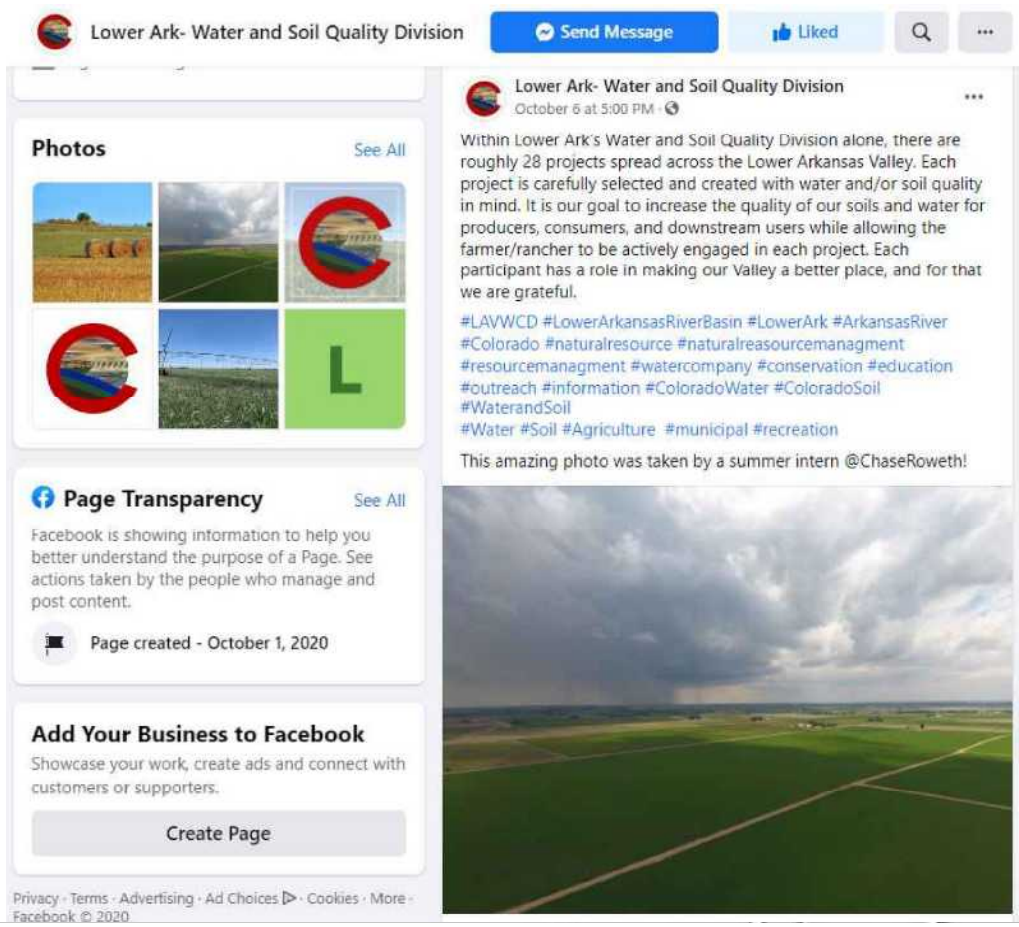
01 / 11

The project is the furthest West and located on a ditch system with a fairly senior water right. This



FACEBOOK
@LOWERARK

INSTAGRAM
@LAVWCD



THE COLORADO COLLABORATIVE FOR HEALTHY SOILS (CCHS) IS A BOTTOM-UP AND BIG-TENT ORGANIZATION BRINGING THE AGRICULTURAL COMMUNITY TOGETHER AROUND SOIL HEALTH. AS A COLLABORATIVE, WE ARE COMMITTED TO BE PRODUCER-CENTERED, SCIENCE-BASED, ACTION-ORIENTED, AND TO PURSUE SOLUTIONS THAT ARE VOLUNTARY AND INCENTIVE-BASED. OVER THE LAST YEAR, THE COLLABORATIVE HAS BROUGHT TOGETHER OVER 250 STAKEHOLDERS TO EXPLORE A NEW DIRECTION FOR SOIL HEALTH FOR COLORADO BY CONDUCTING LISTENING SESSIONS, BRINGING NEW AND EXISTING SOIL HEALTH PROGRAMS TO THE STATE, AND CONNECTING SCIENCE AND PRACTICE.

OUR STORY

"If you want to go fast, go alone. If you want to go far, go together". So goes a famous proverb that has informed the Colorado

too important to rush. Better to take our time and get all the right people in the room before deciding what to do. With this in mind, we spent the summer reaching out to producers and producer groups across the state. The result was

health program. The Incentives and Policy group took what was learned from that outreach and worked within the Collaborative to write a proposal for a Colorado Soil Health Program based on those ideas. That proposal has

COLLABORATIVE CORE PRINCIPLES

- Producer-centered
- Science-based
- Participatory
- Action-oriented
- Pursue only policies and programs that are voluntary/ incentive-based

"IF YOU WANT TO GO FAST, GO ALONE. IF YOU WANT TO GO FAR,

Figure 1: Yellow is producers on Producer Advisory Council; blue is listening sessions, orange is tabling opportunities, green is full Collaborative meetings

PROPOSAL FOR A SOIL HEALTH PROGRAM

This proposal draws from what was learned through listening sessions, interviews and other stakeholder engagement and suggest several policy ideas to assist landowners with soil health. These ideas have been developed through CCHS working groups, in conversations with key stakeholders, at the CO-CEWL summit, and in consultation with the Producer Advisory Council.

01 SOIL HEALTH GRANT

GRANTS FOR PRODUCERS, CONSERVATION DISTRICTS AND OTHER ORGANIZATIONS FOR DEMONSTRATION, EDUCATION, RESEARCH AND IMPLEMENTATION ACTIVITIES.

02 INCREASED CAPACITY FOR NRCS AND CDA

FUNDING TO HIRE ADDITIONAL SOIL HEALTH TECHNICIANS TO WORK ON BEHALF OF THE STATE TO SUPPORT COLORADO FARMERS AND RANCHERS.

03 BRINGING ESTABLISHED PROGRAMS TO COLORADO

FUNDING TO BRING THE ILLINOIS STAR PROGRAM AND THE SOIL HEALTH PARTNERSHIP TO COLORADO

04 SOIL HEALTH INVENTORY

COMPREHENSIVE REPORT COVERING CURRENT IMPLEMENTATIO SOIL HEALTH PRACTICES, PAST SUCCESSES AND CHALLENGES REGION. GEOSPATIAL ASSESSMENT OF STATE OF OUR SOILS. IM ON WATER QUANTITY AND QUALITY, AND ESTIMATES OF POSSIBL TURE CARBON SEQUESTRATION ON AGRICULTURAL LANDS.

05 SOIL HEALTH TESTING

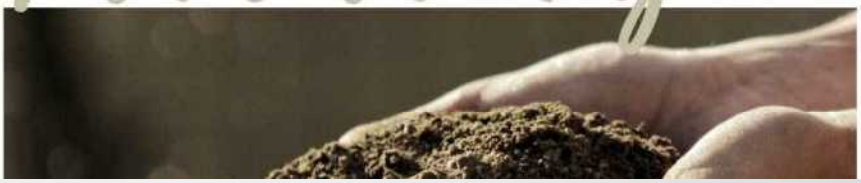
FREE/REDUCED-COST SOIL HEALTH TESTING PROGRAM TO HE PRODUCERS UNDERSTAND THE STATE OF THEIR SOILS, PROVID ONRAMP TO ACCESS NEW REVENUE STREAMS, AND ASSIST RESE ERS IN IMPROVING SOIL HEALTH TESTING AND LINKING MANAGE PRACTICES TO OUTCOMES.

SHORT-TERM GOALS

- CONTINUE TO GIVE INPUT TO CDA ABOUT A SOIL HEALTH PROGRAM
- ENSURE THERE IS ADEQUATE FUNDING FOR SOIL HEALTH ACTIVITIES IN TI STATE (INCLUDING FOR A SOIL HEALTH PROGRAM)
- BE A FORUM FOR PARTICIPANTS TO LEARN FROM EACH OTHER

Table of
CONTENTS

Colorado's
SOIL HEALTH
Inventory



SOIL HEALTH RESOURCE GUIDE

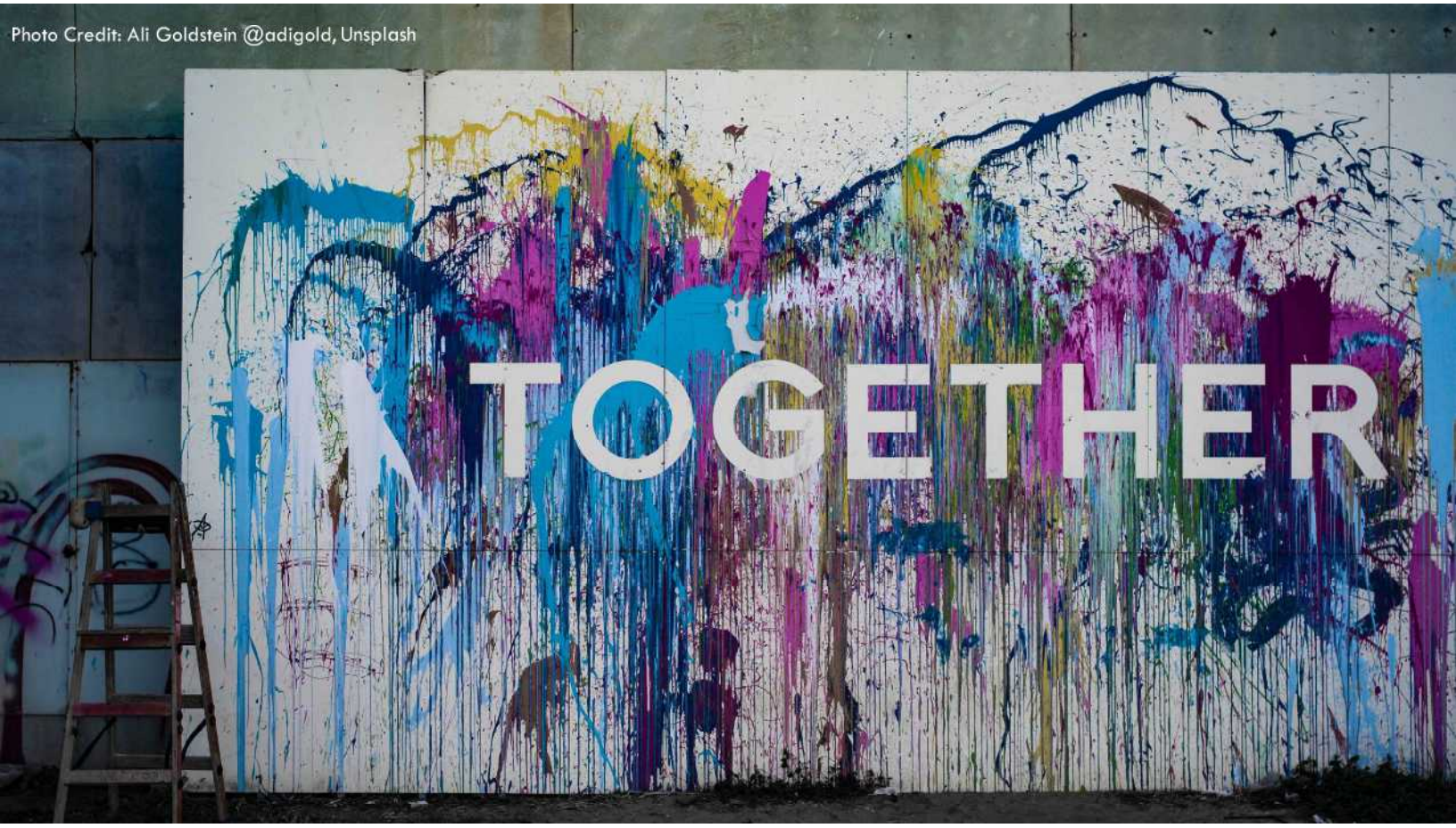


Photo Credit: Ali Goldstein @adigold, Unsplash

THANK YOU!

ARKVALLEYWPS@GMAIL.COM
MWEBER@LOWERARK.COM

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Exhibit I

Annual Meeting

December 9, 2020

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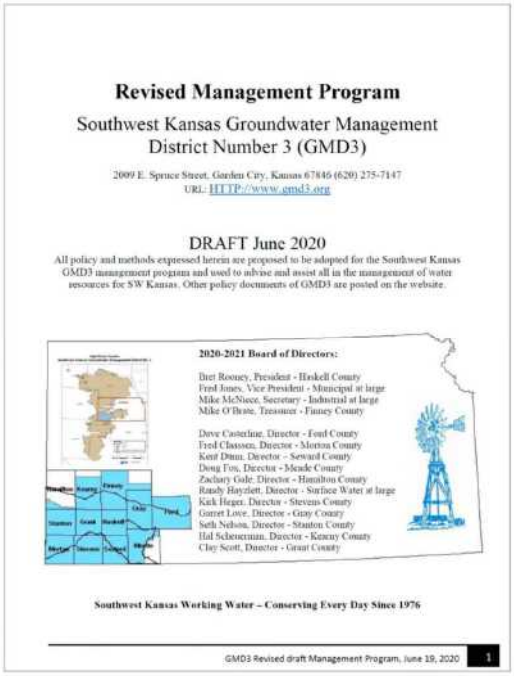
Exhibit I

SW KS GMD3 Report comment summary

- Updating our Management Program
- Efforts for assistance to address poor river water quality
- Some study activity
- Water quality element of compact entitlements
- GMD3 request to ARCA and member states

GMD3 Management Program Update



Revised Management Program

Southwest Kansas Groundwater Management District Number 3 (GMD3)

2009 E. Spruce Street, Garden City, Kansas 67846 (620) 275-7147
URL: HTTP://www.gmd3.org

DRAFT June 2020

All policy and methods expressed herein are proposed to be adopted for the Southwest Kansas GMD3 management programs and used to advise and assist all in the management of water resources for SW Kansas. Other policy documents of GMD3 are posted on the website.

2020-2021 Board of Directors:

Bret Rooney, President - Haskell County
Fred Jones, Vice President - Municipal at large
Mike McNiece, Secretary - Industrial at large
Mike O'Brate, Treasurer - Finney County

Dave Casterline, Director - Ford County
Fred Classsen, Director - Morton County
Kent Dinn, Director – Seward County
Doug Fox, Director - Meade County
Zachary Gale, Director - Hamilton County
Randy Hayzlett, Director - Surface Water at large
Kirk Heger, Director - Stevens County
Garret Love, Director - Gray County
Seth Nelson, Director - Stanton County
Hal Scheuerman, Director - Kearny County
Clay Scott, Director - Grant County

Southwest Kansas Working Water – Conserving Every Day Since 1976

GMD3 Revised draft Management Program, June 19, 2020 1

Water

http://www.gmd3.org/what-we-do/management-program/

GMD3 efforts

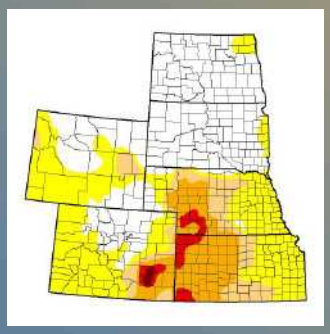
- For years we have been looking for ways to encourage improvement on basin surface water quality conditions and the contaminating flow effects on native groundwater storage.
- The receipts of contaminated Arkansas River flows into local groundwater storage can require users to use additional fresh groundwater to mitigate poor surface water flows or to pass on use to avoid injury to crops.
- Poor quality river flows contaminate the groundwater supply of the users and communities of SW Kansas.

RECLAMATION
Managing Water in the West

Stakeholder Meetings
February 25 & 26, 2014

Agenda

Welcome and Introductions
Problems and Needs-Local Perspective
USBR Background
Upper Ark River Public Water Supply Analysis



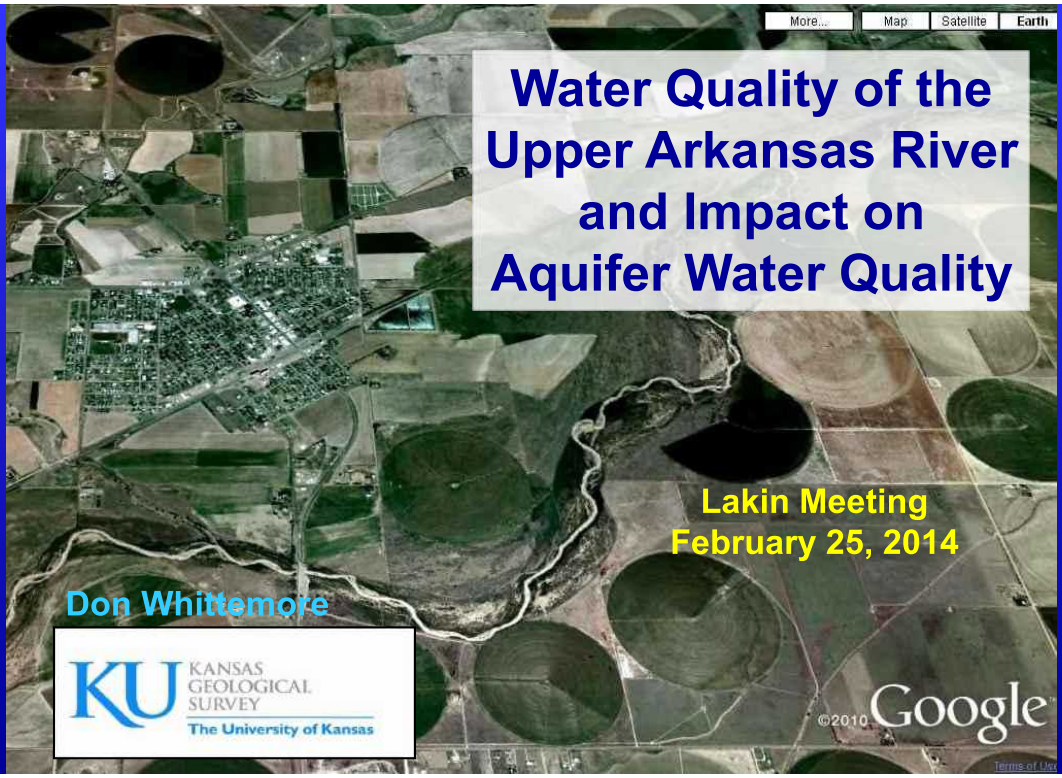
U.S. Drought Monitor
High Plains
January 28, 2014

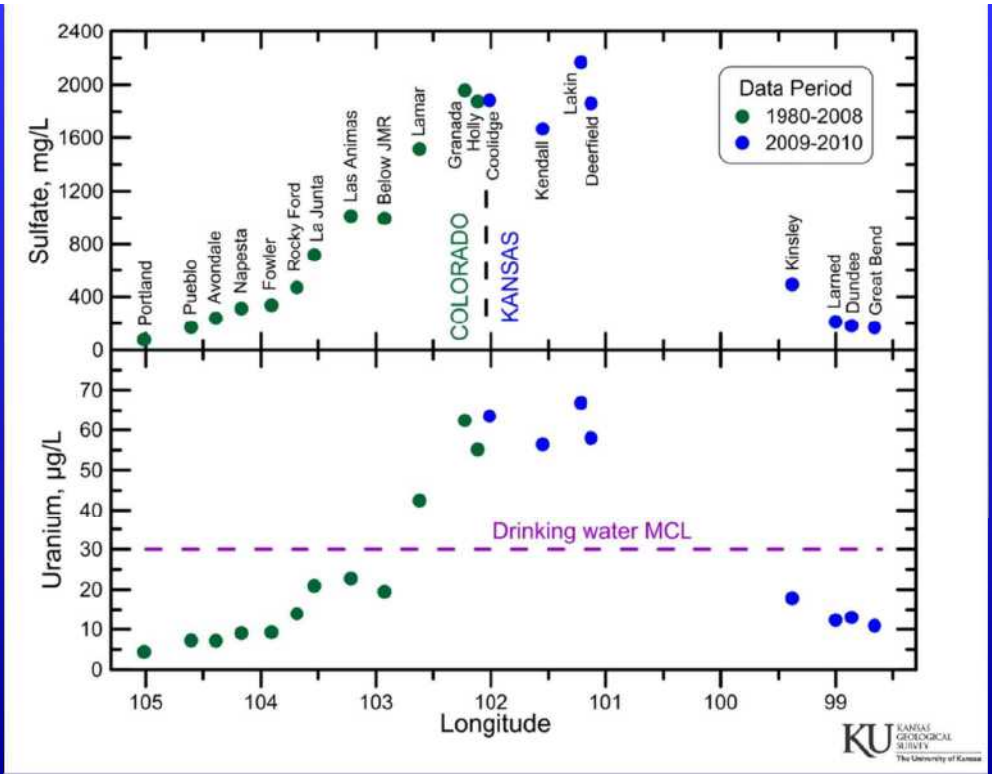
U.S. Department of the Interior
Bureau of Reclamation

Problems and Needs
Local Perspective

Water Quality Concerns

RECLAMATION


More...
Map
Satellite
Earth
Water Quality of the Upper Arkansas River and Impact on Aquifer Water Quality
Lakin Meeting
February 25, 2014
Don Whittemore
KU KANSAS GEOLOGICAL SURVEY
The University of Kansas
©2010 Google


Sulfate, mg/L
2400
2000
1600
1200
800
400
0
Portland
Pueblo
Avondale
Napesta
Fowler
Rocky Ford
La Junta
Las Animas
Below JMR
Lamar
Granada
Holly
Coolidge
Kendall
Lakin
Deerfield
Kinsley
Larned
Dundee
Great Bend
COLORADO
KANSAS
Data Period
1980-2008
2009-2010
Uranium, µg/L
70
60
50
40
30
20
10
0
Drinking water MCL
105
104
103
102
101
100
99
Longitude
KU KANSAS GEOLOGICAL SURVEY The University of Kansas

• **SOURCE OF SALINITY AND URANIUM IN RIVER**

Main natural source: Weathering of marine Cretaceous shales containing gypsum and sulfides in Colorado.

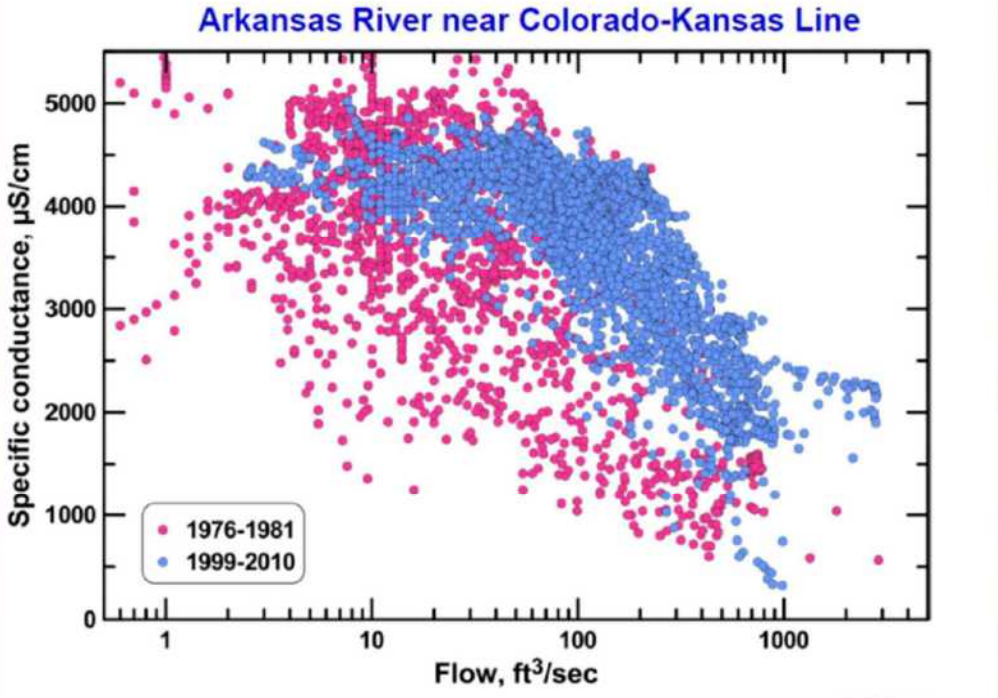
Human sources: Insignificant.

• **CAUSE OF HIGH SALINITY AND URANIUM LEVELS**

Human: Concentration of dissolved salts by consumption of water by evapotranspiration associated with extensive irrigated agriculture and shallow reservoirs.

Natural: In absence of human activities, salinity and uranium concentration would be 3 to 4 times lower.

KU KANSAS GEOLOGICAL SURVEY The University of Kansas



KU KANSAS GEOLOGICAL SURVEY The University of Kansas

Arkansas River Basin Plan of Study - Where do we go from here?

- **Challenges**
- **Competitive program**
- **Input from Colorado**

- **Completion Date - August 2014**

RECLAMATION

Bridging the federal Stateline basin barrier

- ARCA has a federal role to support the purposes of the Compact.
- Viable federal assistance in addressing basin water quality problems across the Kansas-Colorado Stateline depends on overcoming boundaries of federal partners.
- Each office developed its own set of stakeholder partners not normally involved in issues outside of their region.
- Federal regional boundaries change at the Colorado-Kansas Stateline: US Army Corps of Engineers, EPA, Department of Interior (DOI) - Reclamation, and US Geological Survey.
  - To further complicate these boundaries, Kansans is in DOI region 5, but Arkansas River basin work projects are with staff in DOI region 6.
- The Ark Valley Conduit EIS and GMD3 Basin Plan of Study example.
  - Significant cross-boundary collaborating needed to address all basin needs.

2019 - HR 6018 & SR 1729
Provided to ARCA

Water contamination reduces usability.

Year	Average annual Sp.C., µS/cm	Average annual uranium concentration, µg/L	Average annual flow, ft³/sec	Annual uranium load, ton/yr	Annual uranium load, lbs/yr
2012	4,271	73.0	28.7	2.07	4,140
2013	4,395	75.9	26.9	2.01	4,020
2014	3,813	62.7	92.1	5.68	11,400
2015	3,230	50.1	196.1	9.68	19,400
2016	3,285	51.3	201.5	10.20	20,400
2017	3,324	52.1	234.6	12.03	24,100
2018	3,409	53.9	206.6	10.96	21,900

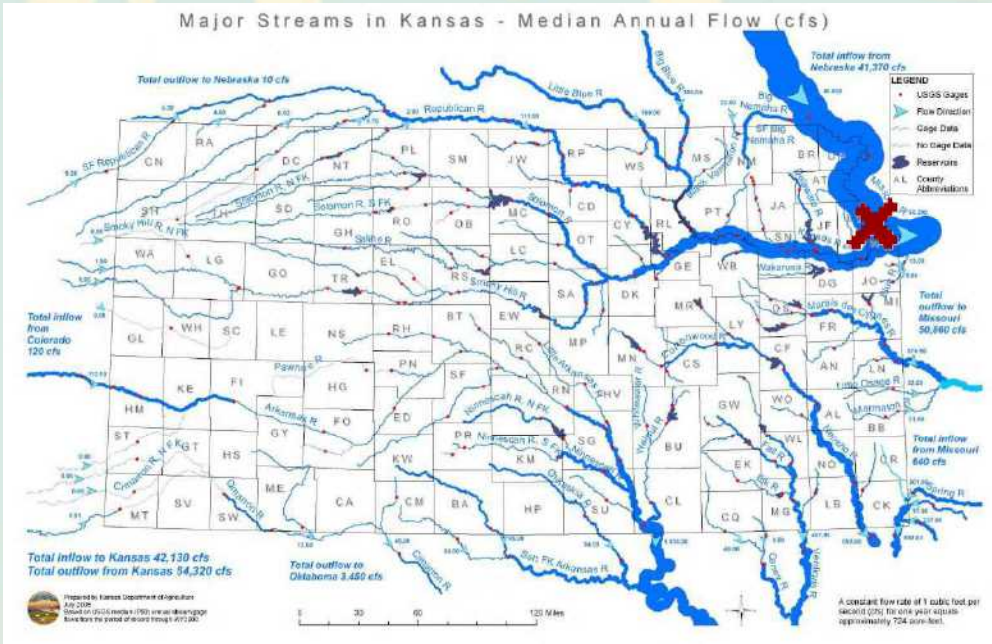
KGS Open-File Report 2017-2, updated January 2019.
Uranium/ mineralization concern

River flow into Kansas - a Stateline functional equivalent point source discharge.

GMD3 Evaluations

- Additional work by GMD3 to address basin water supply concerns will include:
  - Collect water quality samples in the GMD3 portion of the basin.
  - Conduct a Preferred Interstate Supply Evaluation to determine Kansas water user needs from the interstate supply.
  - Execute small interstate water transfer Proof-of-Concept (POC) projects.
    - Demonstrate elements of importing supply to mitigate quantity and quality deficits from other areas into western Kansas, eastern Colorado and into other states.

Small POC Water Transfer Sources



15

ARCA Compact - 1949 basin condition

- Article IV-D express terms prohibit future beneficial development which involve the improved or prolonged functioning of existing works and which materially deplete the waters of the Arkansas River in usable quantity or availability for use to water users.

ARCA Compact - Water Quality

- Some may view Compact language in the agreement as lacking direct reference to water quality and therefore water quality is not a compact compliance concern, but the purposes and language of the compact are not so limiting.
- It is well established that usable water supply has both quantity and quality elements.
- Upstream post compact development and use practices incrementally and over time may have dropped the quality of the 1949 basin supply, affecting Compact allocations.

GMD3 Request to ARCA

- Under the equal dignity of each state in questions of compact enforcement, we raise the question of Compact compliance and harm to basin water users for ARCA and member states to investigate the changes to 1949 water quality conditions and affects on Compact allocations.

QUESTIONS

ARCA Annual Meeting
December 2020

Exhibit J

Annual Meeting

December 9, 2020

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Ten-year Accounting of Depletions and Accretions to Usable Stateline Flow
2010 - 2019

1	2	3	4	5	6	7	8	9
Year of Ten-year Cycle	Model Year	H-I Model Usable Depletion/ Accretion[1]	Offset Account Credits[2]					Remaining Usable Depletion/ Accretion[6]
			Stateline Delivery to Kansas	Evaporation Credit	Gross Credit[3]	Applied to Post-1985 Depletions[4]	Net Credit[5]	
1	2010	410	10,241	0	10,241	1,548	8,693	-8,283
2	2011	1,841	6,436	0	6,436	1,717	4,719	-2,878
3	2012	4,044	0	0	0	1,479	-1,479	5,523
4	2013	2,594	0	0	0	1,505	-1,505	4,099
5	2014	4,332	2,728	0	2,728	1,635	1,093	3,239
6	2015	2,779	2,695	0	2,695	2,337	358	2,421
7	2016	4,328	4,044	0	4,044	3,043	1,001	3,327
8	2017	-1,916	8,847	0	8,847	3,300	5,547	-7,463
9	2018	-9,062	4,543	0	4,543	3,346	1,197	-10,259
10	2019	11,807	8,045	0	8,045	3,756	4,289	7,518
Total		21,157	47,579	0	47,579	23,666	23,913	**-2,756**
	Shortfall for 2020							0

Water Quantities are in acre-feet.

1 Positive values in Columns 3 and 9 reflect depletions; negative values, accretions. H-I Model results in Column 3 for 2019 are based on input file UPDATE19_June20.dat.

[2] Positive values in Columns 4, 5, 6, and 8 reflect credits; negative values, debits.

[3] Column 6 is the sum of Columns 4 and 5.

[4] Column 7, a positive value, is the amount of Offset Credit applied to Post-1985 depletions, determined pursuant to Appendix A.3 of the 2009 Judgment and Decree in KS v CO.

[5] Column 8 is Column 6 minus Column 7.

[6] Column 9 is Column 3 minus Column 8.

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Exhibit K

Annual Meeting

December 9, 2020

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COLORADO
Division of Water Resources
Department of Natural Resources

2020 Annual Presumptive Stream Depletion Factor (PDF) Evaluation Report
Hydrologic Institutional (H-I) Model Area, Arkansas River Basin

August, 2020

Introduction and Summary

Presumptive depletion factors, or PDFs, are used by the Colorado Division of Water Resources Division 2 in the administration of water replacement plans in the Arkansas River Basin to relate amounts of groundwater pumping from a well to amounts of stream depletions. Colorado's 1996 Use Rules define groundwater-only PDFs for flood and sprinkler irrigation. However, Amended Appendix A.4 of the Kansas v. Colorado decree directs the state of Colorado to conduct an annual evaluation of the PDF for supplemental flood/furrow irrigation following the annual update of the Hydrologic Institutional Model (H-I Model).

For the 2020 Annual PDF Evaluation, Colorado concludes that a supplemental flood/furrow irrigation PDF of **36.0%** is most appropriate and should be used by Division 2 for replacement plans in year 2021. PDFs for supplemental flood/furrow irrigation for recent water replacement plan years are shown in the following table.

Presumptive Depletion Factors for Water Replacement Plan Years

Replacement Plan Year	PDF for Supplemental Flood/Furrow Irrigation
2012	39.0%
2013	38.1%
2014	36.5%
2015	36.0%
2016	35.5%
2017	36.0%
2018	36.0%
2019	36.0%
2020	36.0%
2021	**36.0%**

Note: Other PDFs are 50% for sole-source flood/furrow, 75% for sprinkler, and 100% for drip irrigation

Methods and Results

Amended Appendix A.4 provides a methodology framework for the annual PDF evaluations, but the methodology is updated and more fully described in a report titled "Annual Presumptive Stream Depletion Factor (PDF) Evaluation Methodology for the Hydrologic Institutional Model Area, Arkansas River Basin, Colorado" (PDF Evaluation Methodology, 2015 revised 2020). The

methodology incorporates updates to the H-I Model; primarily those acknowledging higher groundwater irrigation application efficiencies from sprinkler and drip systems.

The process described in the PDF Evaluation Methodology Document was followed to complete the 2020 PDF Evaluation. The GWAM model was used to determine idealized reach replacements given PDF values which were provided to a modified version of the HI model with a revised update file. Annual depletions and accretions to usable stateline flow were estimated from historic (with actual pumping and ideal replacements represented) and compact (without pumping or replacements) runs of the modified HI model. Supplemental irrigation PDFs were tested until the minimum PDF was found which produced no cumulative shortfall to usable stateline flows over any 10-year period. Annual and ten-year sums of accretions and depletions for the limiting PDF values are shown in the following table.

2019 PDF Evaluation Results

Year of Review Period	Calendar Year	Annual Usable Stateline Depletions (+)/ Accretions (-) (acre-feet)		10-Year Period	10-year Sum of Usable Stateline Depletions (+) / Accretions (-) (acre-feet)	
		SF.PDF: 35.0%	SF.PDF: 36.0%		SF.PDF: 35.0%	SF.PDF: 36.0%
1	2000	-321	-377			
2	2001	-779	-904			
3	2002	-946	-1134			
4	2003	1224	1127			
5	2004	-191	-273			
6	2005	-409	-490			
7	2006	-488	-598			
8	2007	-573	-646			
9	2008	-1754	-1856			
10	2009	-1573	-1699	2000-2009	-5810	-6850
11	2010	24	-60	2001-2010	-5465	-6533
12	2011	223	124	2002-2011	-4463	-5505
13	2012	2185	2104	2003-2012	-1332	-2267
14	2013	1151	1084	2004-2013	-1405	-2310
15	2014	1110	1049	2005-2014	-104	-988
16	2015	-242	-285	2006-2015	**63**	-783
17	2016	-3073	-3234	2007-2016	-2522	-3419
18	2017	-14279	-14617	2008-2017	-16228	-17390
19	2018	-1122	-1157	2009-2018	-15596	-16691
20	2019	494	435	2010-2019	-13529	-14557

Note: indicated PDF is for supplemental flood/furrow irrigation
PDF of 50% sole-source flood/furrow, 75% for sprinkler, and 100% for drip irrigation used
PDF of 35.0% indicates shortfall in bold and is insufficient while PDF of 36.0% is sufficient

Exhibit L

Annual Meeting

December 9, 2020

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Arkansas River Compact Administration
Operations Committee
Meeting Summary and Action Items
December 8, 2020
Virtual

The committee requested Rachel Duran and Andrew Rickert produce a meeting summary and a list of recommendations.

Meeting Summary

The committee received the Compact Year (CY) 2020 reports of the Operations Secretary (Bill Tyner, CDWR) and Assistant Operations Secretary (Kevin Salter, KDWR).

Rachel Zancanella, CDWR provided an update on the 2020 Offset Account and permanent pool operations.

Kevin Salter and Bill Tyner presented the 2012-2016 Joint Report of the States regarding Review of Offset Account Operations.

Rachel Zancanella provided an update on the implementation of the Irrigation Improvement Rules.

There was some discussion of holding an Operations Committee meeting in 2021 to apprise the Committee of the issues that are holding up approval of the Operations Secretary reports.

Committee Recommendations to ARCA

1. Committee defers the 2020 Operations Secretary report to the Special Engineering Committee to work towards resolution of issues that are holding up unapproved OS reports.

As this meeting was held virtually, this summary was provided on December 8, 2020 following the completion of the committee meeting to both Troy Dumler (chair) and Lane Malone (member) who reviewed and accepted the summary.

Exhibit L

Arkansas River Compact Administration
Engineering Committee
Meeting Summary and Action Items
December 8, 2020
Virtual

The committee requested Rachel Duran and Andrew Rickert produce a meeting summary and a list of recommendations.

Meeting Summary

Brian Macpherson, CDWR, provided an update on progress related to the Arkansas Decision Support System (ArkDSS). This included the elements for GIS, Modeling, Task Memos, Administrative Tools completed under Phase I. This project is beginning to move into Phase II of planning, which includes enhancements to the Colors of Water tool, additional Statemod modeling to satisfy Trinidad Reservoir 10-year review requirements, Dakota Aquifer mapping, and compiling existing aquifer information and well log information to produce maps.

Bill Tyner, CDWR, and Kevin Salter, KDWR, provided an update on the discussions related to the proposed Colorado multipurpose account in JMR. Negotiations between Kansas and Colorado are moving forward.

Kevin Salter provided an update on efforts to replace the Frontier ditch flume. Several contractors have been identified and efforts to obtain cost estimates in the upcoming year will persist.

Garret Ross, USACE, presented to the committee the 2020 reservoir operations for Trinidad and John Martin Reservoirs. Maintenance done at John Martin included work on outlet works conduits and gates and repairs to the spillway tainter gates. Additional water quality monitoring efforts are underway at both reservoirs, including the installation of new monitoring sites.

Jeffrey Rieker, USBR, provided an update to the committee on the status of the Dept. of the Interior reorganization and Reclamation's efforts in the Arkansas River Basin. Three activities of note were the Excess Capacity contracts in Trinidad Reservoir, the Pueblo Reservoir Recovery of Storage (SECWCD Project), and the Arkansas Valley Conduit.

Krystal Brown, USGS, reported on the USGS/ARCA Cooperative Streamgage Program noting beaver issues at the Big Sandy gage.

Steve Kastner, PRWCD, informed the committee that the PRWCD has entered into a draft letter agreement with USBR on excess capacity contracts. An update on the concepts for Trinidad Reservoir Sedimentation Modeling was provided.

As this meeting was held virtually, this summary was provided on December 8, 2020 following the completion of the committee meeting to both Scott Brazil (chair) and Earl Lewis (member) who reviewed and accepted the summary.

Arkansas River Compact Administration
Administrative & Legal Committee
Meeting Summary and Action Items
December 8, 2020
Virtual

The committee requested Rachel Duran and Andrew Rickert produce a meeting summary and a list of recommendations.

Meeting Summary

The committee reviewed the Annual meeting agenda; no changes were suggested.

Rachel Duran noted 1999 and 2019 Annual meeting transcripts, and 2020 Special meeting summary were complete and ready for consideration. With that the committee heard an update on the status of the remaining ARCA annual reports.

Andrew Rickert noted that the 1997 ARCA Annual report had been submitted earlier and was ready for consideration. With the approval of this report, it is the goal to generate four to five reports a year to get caught up.

Stephanie Gonzales, ARCA Recording Secretary and Treasurer, provided her report, noting that the ARCA laptop will need to be replaced, that the state assessments have gone out, and the process for paying the USGS Joint Funding Agreements (JFAs) is improving.

The USGS JFAs and budget for FY20-21 were discussed. There was no modifications needed for the FY20-21 budget.

The proposed FY21-22 ARCA budget was reviewed. This included discussion on renewal of the Colorado SMS contract, renewal of the cost-share agreement with CSU on the operation and maintenance of CoAgMet Weather Stations and data collection in the Arkansas Basin, and replacing the laptop used for ARCA business.

Two proposed resolutions were put before the committee, entitled *Honoring David W. Barfield* and *In Memoriam Robert Buerkle*.

Nominations of ARCA officers and committee chair appointments were done within this committee.

There was discussion on possible dates and locations for the 2021 ARCA Annual meeting.

The auditor, Ronny Farmer, presented the audit report.

Committee Recommendations to ARCA

1. Recommend ARCA approve the 1999 and 2019 annual meeting minutes and the 2020 special meeting summary.

2. Recommend ARCA approve the 1997 annual report.

3. Recommend ARCA authorize Stephanie Gonzales to sign the Colorado and Kansas USGS Joint Funding Agreements (JFA), the Colorado SMS contract for Fiscal Year (FY) 2021-2022 and the cost-share agreement with CSU on the CoAgMet funding.

4. Recommend ARCA approve the Fiscal Year (FY) 2021-2022 Budget and Assessment.

5. Recommend ARCA approve the resolution titled *Honoring David W. Barfield*.

6. Recommend ARCA approve the resolution titled *In Memoriam Robert Buerkle.*

7. Recommend ARCA approve the following slate of officers for CY 2021:

    a. Vice-chairman…….....Randy Hayzlett
    b. Recording/Secretary- Treasurer……...…Stephanie Gonzales
    c. Operations Secretary……...…….……..Bill Tyner
    d. Assistant Operations Secretary…….….Kevin Salter

8. Recommends the following committee chairs for CY 2021 (does not need an ARCA vote to adopt):

    a. Engineering…….……...……..…..… Earl Lewis as Chair (Scott Brazil as member)
    b. Operations……...…. Lane Malone as Chair (Troy Dumler as member)
    c. Admin & Legal……... Rebecca Mitchell as Chair (Randy Hayzlett as member)

9. Recommend ARCA approve the dates of December 08, 2021 for the committee meetings and December 09, 2021 for the annual meeting. Both meetings to be held in Garden City, Kansas.

10. Recommend ARCA approve the Fiscal Year (FY) 2019-20 Auditor's Report and authorize Stephanie Gonzales to sign the engagement letter for the auditor's services.

As this meeting was held virtually, this summary was provided on December 8, 2020 following the completion of the committee meeting to both Randy Hayzlett (chair) and Rebecca Mitchell (member) who reviewed and accepted the summary.

ARCA 2020 ANNUAL MEETING
RESOLUTIONS

NUMBER	Description
2020-02	*Honoring David W. Barfield*
2020-03	*In Memoriam Robert Buerkle*

*Note: ARCA Resolution No. 2020-01 *Regarding the Location of the 2020 ARCA Annual Meeting* was adopted at the Special meeting held on October 13, 2020 and can be located within that meeting summary or on ARCA's website

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Resolution 2020-02

Annual Meeting

December 9, 2020

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ARKANSAS RIVER COMPACT ADMINISTRATION

Lamar, Colorado 81052

For Colorado	Chair and Federal Representative	For Kansas
Rebecca Mitchell, Denver Lane Malone, Holly Scott Brazil, Vineland	James T. Rizzuto, Swink	Earl Lewis, Manhattan Randy Hayzlett, Lakin Troy Dumler, Garden City

RESOLUTION 2020 - 02

HONORING
DAVID W. BARFIELD

WHEREAS, David W. Barfield of Lawrence, Kansas, retired February 29, 2020, as Kansas Chief Engineer after 35 years with the Kansas Department of Agriculture; 12 of those years as the Chief Engineer; and

WHEREAS, David's retirement brought his duties as a Kansas Representative to the Arkansas River Compact Administration (Administration) to a close after having served the interests of the State of Kansas and its water users along the Arkansas River Valley faithfully for 12 years; and

WHEREAS, as member of the Engineering and Special Engineering Committees of the Administration, David worked diligently to resolve issues before those committees, the authorization of a reliable water supply for the John Martin Reservoir Permanent Pool being one he was particularly pleased with; and

WHEREAS, David facilitated many discussions with local stakeholders in Kansas to provide water users with a better understanding of the Arkansas River Compact, Kansas's work to protect its interests, and efforts made to resolve issues between the States.

NOW THEREFORE, BE IT RESOLVED that the Administration does hereby express its appreciation and sincerest gratitude for the contributions of David W. Barfield to this Administration and extends to him the best wishes for continued good health and happiness in all his future endeavors.

BE IT FURTHER RESOLVED that the Administration honors Mr. Barfield's service by including this resolution and appropriate dedicatory remarks in the Administration's annual report for 2020 and hereby instructs the Recording Secretary to send copies of this resolution to Mr. Barfield and the Governor of Kansas.

ADOPTED by the Arkansas River Compact Administration at its 2020 Annual Meeting on December 09, 2020.

James T. Rizzuto, Chair
Arkansas River Compact Administration

Stephanie Gonzales, Recording Secretary
Arkansas River Compact Administration

1 of 6 originals

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Resolution 2020-03

Annual Meeting

December 9, 2020

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ARKANSAS RIVER COMPACT ADMINISTRATION

Lamar, Colorado 81052

For Colorado	Chair and Federal Representative	For Kansas
Rebecca Mitchell, Denver	James T. Rizzuto, Swink	Earl Lewis, Manhattan
Lane Malone, Holly		Randy Hayzlett, Lakin
Scott Brazil, Vineland		Troy Dumler, Garden City

RESOLUTION 2020 - 03

In Memoriam Robert Buerkle

WHEREAS, Robert Buerkle served on the Arkansas River Compact Administration as a representative of the State of Kansas and the water users of the Arkansas River Valley in Kansas from December 1994 through December 1998. The Administration was saddened to learn of Mr. Buerkle's passing on October 12, 2020.

WHEREAS, the current members wish to express their gratitude for Mr. Buerkle's service and offer their condolences at his passing.

NOW, THEREFORE, BE IT RESOLVED by the Arkansas River Compact Administration that this statement be placed into the record of the 2020 Arkansas River Compact Administration Annual meeting and a copy is to be sent to the family of Robert Buerkle.

ADOPTED by the Arkansas River Compact Administration at its 2020 Annual Meeting on December 09, 2020.

James T. Rizzuto, Chair
Arkansas River Compact Administration

Stephanie Gonzales, Recording Secretary
Arkansas River Compact Administration

1 of 6 originals