Rivanna Water and Sewer Authority

Board of Directors Meeting

June 26, 2018

2:15pm

695 MOORES CREEK LANE
CHARLOTTESVILLE, VA 22902-9016
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BOARD OF DIRECTORS

Regular Meeting of the Board of Directors of the Rivanna Water & Sewer Authority

DATE: **June 26, 2018**

LOCATION: **Conference Room, Administration Building**
695 Moores Creek Lane, Charlottesville, VA

TIME: **2:15 p.m.**

AGENDA

1. ***CALL TO ORDER***

2. ***MINUTES OF PREVIOUS BOARD MEETINGS***
   a. *Minutes of Regular Board Meeting on May 22, 2018*

3. ***RECOGNITION***
   a. *Resolution of Appreciation for Carol Sue Wiles*
   b. *Resolution of Appreciation for Frederick A. Lanzon*
   c. *Resolution of Appreciation for Richard Graham Bond*

4. ***EXECUTIVE DIRECTOR'S REPORT***

5. ***ITEMS FROM THE PUBLIC***

6. ***RESPONSES TO PUBLIC COMMENTS***

7. ***CONSENT AGENDA***
   a. *Staff Report on Finance*

   b. *Staff Report on Ongoing Projects*

   c. *Staff Report on Operations*

   d. *Approval of FY 2019-2023 Capital Improvement Program*

   e. *Approval of Resolution of Official Intent to Reimburse Expenditures with Proceeds of a Borrowing*

8. OTHER BUSINESS

a. Presentation of Storm Impacts on May 31, 2018: Jennifer Whitaker, Director of Engineering & Maintenance and David Tungate, Director of Operations

b. Presentation of 10 Year Financial Model: Lonnie Wood, Director of Finance & Administraion, Michael Maker, MFSG and Ed Donahue, MFSG

9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA

10. CLOSED MEETING

(JOINT CLOSED SESSION WITH THE RSWA; RECONVENE THE RSWA MEETING; MOTION REQUIRED)

11. ***ADJOURNMENT***

GUIDELINES FOR PUBLIC COMMENT AT RIVANNA BOARD OF DIRECTORS MEETINGS

If you wish to address the Rivanna Board of Directors during the time allocated for public comment, please raise your hand or stand when the Chairman asks for public comments.

Members of the public requesting to speak will be recognized during the specific time designated on the meeting agenda for "Items From The Public." Each person will be allowed to speak for up to three minutes. When two or more individuals are present from the same group, it is recommended that the group designate a spokesperson to present its comments to the Board and the designated speaker can ask other members of the group to be recognized by raising their hand or standing. Each spokesperson for a group will be allowed to speak for up to five minutes.

During public hearings, the Board will attempt to hear all members of the public who wish to speak on a subject, but it must be recognized that on rare occasion presentations may have to be limited because of time constraints. If a previous speaker has articulated your position, it is recommended that you not fully repeat the comments and instead advise the Board of your agreement. The time allocated for speakers at public hearings are the same as for regular Board meetings, although the Board can allow exceptions at its discretion.

Speakers should keep in mind that Board of Directors meetings are formal proceedings and all comments are recorded on tape. For that reason, speakers are requested to speak from the podium and wait to be recognized by the Chairman. In order to give all speakers proper respect and courtesy, the Board requests that speakers follow the following guidelines:

- Wait at your seat until recognized by the Chairman.
- Come forward and state your full name and address and your organizational affiliation if speaking for a group;
- Address your comments to the Board as a whole;
- State your position clearly and succinctly and give facts and data to support your position;
- Summarize your key points and provide the Board with a written statement, or supporting rationale, when possible;
- If you represent a group, you may ask others at the meeting to be recognized by raising their hand or standing;
- Be respectful and civil in all interactions at Board meetings;
- The Board may ask speakers questions or seek clarification, but recognize that Board meetings are not a forum for public debate; Board Members will not recognize comments made from the audience and ask that members of the audience not interrupt the comments of speakers and remain silent while others are speaking so that other members in the audience can hear the speaker;
- The Board will have the opportunity to address public comments after the public comment session has been closed;
- At the request of the Chairman, the Executive Director may address public comments after the session has been closed as well; and
- As appropriate, staff will research questions by the public and respond through a report back to the Board at the next regular meeting of the full Board. It is suggested that citizens who have questions for the Board or staff submit those questions in advance of the meeting to permit the opportunity for some research before the meeting.

The agendas of Board meetings, and supporting materials, are available from the RWSA Administration Office upon request or can be viewed on the Rivanna website(s)

Rev. September 22, 2009

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RWSA BOARD OF DIRECTORS
Minutes of Regular Meeting
May 22, 2018

A regular meeting of the Rivanna Water & Sewer Authority (RWSA) Board of Directors was held on Tuesday, May 22, 2018 at 2:15 p.m. in the 2nd floor conference room, Administration Building, 695 Moores Creek Lane, Charlottesville, Virginia.

Board Members Present: Mr. Mike Gaffney, Chair; Ms. Kathy Galvin; Ms. Lauren Hildebrand; Mr. Gary O'Connell; Mr. Maurice Jones; and Mr. Jeff Richardson.

Board Members Absent: Dr. Liz Palmer.

Staff Present: Mr. Mark Brownlee, Mr. Matt Bussell, Ms. Victoria Fort, Mr. Tom Freeman, Mr. Bill Mawyer, Ms. Katie McIlwee, Mr. Philip McKalips, Ms. Betsy Nemeth, Mr. Scott Schiller, Ms. Michelle Simpson, Ms. Andrea Terry, Mr. David Tungate, Ms. Jennifer Whitaker, Mr. Lonnie Wood, and Ms. Devon Yi (intern).

Also Present: Mr. Kurt Krueger, RWSA counsel, and members of the public.

1. CALL TO ORDER

Mr. Gaffney called the regular meeting of the Board of Directors of the Rivanna Water and Sewer Authority at 2:19 p.m.

2. MINUTES OF PREVIOUS BOARD MEETINGS

a. Minutes of Regular Board Meeting on April 24, 2018

Mr. O'Connell moved to approve the minutes of April 24, 2018. Ms. Galvin seconded the motion, which passed unanimously (5-0-1). Dr. Palmer was absent from the meeting and the vote. Mr. Jones abstained, as he was not present at the April 24, 2018 meeting.

3. RECOGNITION

There were no recognitions presented.

4. EXECUTIVE DIRECTOR'S REPORT

Mr. Mawyer introduced Devon Yi, a new intern with Rivanna who is working in the IT group.

He announced that several Rivanna staff members had increased their waterworks operating licenses, meaning they earned a higher class operating license, represented by a decreased number assigned to the class. He stated that in water, Ted Spangler went from a Class III to a Class II, and Chris Wagel went from a Class IV to a Class III; in wastewater, Steve Minnis went from a Class III to a Class II, Duane Houchens went from a trainee to a Class IV, and Matt Bussell became a Class I operator and was promoted by Rivanna to Water Department Manager.

Mr. Mawyer reported that all reservoirs were full as of May 17, although Central Virginia was still in a drought watch – with the only remaining area of concern being groundwater.

Mr. Mawyer reported that the consultant had begun field work earlier in the week on the South Rivanna to Ragged Mountain waterline alignment and would begin going onto properties on May 23, as well as investigating where the pipeline could go. He stated that Rivanna would hold a community meeting on June 19 at 5:30 p.m. at Albemarle High School, inviting all affected residents as well as others who were interested in coming. Mr. Mawyer noted they would have an informational meeting and provide feedback about the project.

Mr. Mawyer stated that they were moving forward with the Crozet drinking water infrastructure project and were scheduled to have a meeting with the Crozet Community Advisory Committee on June 20 at 7 p.m. at the Crozet Library to provide updates on the status of the water treatment plant renovations and pumping station construction. He noted that Rivanna had an interim meeting with the City of Charlottesville and Albemarle County Service Authority on June 4 to discuss the Avon to Pantops waterline, and they had already been doing some modeling to assess where the pipe might go.

Mr. Mawyer reported that Rivanna had held three celebrations of the granular activated carbon (GAC) systems over the last two weeks, and he expressed appreciation for those who had attended. He stated that at South Rivanna, five of the eight vessels were in full service, and the remaining three should come online within the next few weeks. Mr. Mawyer noted that both vessels in Crozet were 100% in operation, both of the two vessels at Scottsville were 100% in operation; and at North Rivanna, one vessel was in operation and they were processing about 85% of the water with GAC – but they were working to improve the rate to 100%.

He stated that Observatory Water Treatment Plant was the only challenge, explaining that the GAC material was delivered in a large tractor-trailer and the drivers have indicated that they have trouble negotiating the roads on Observatory Mountain to access the site. Mr. Mawyer noted that Mr. Tungate would be meeting with them on May 23 to address the issue and determine how the GAC can be delivered so the vessels can be filled.

Ms. Galvin noted that at the GAC celebration in Crozet, they had talked about the idea of filming Observatory before any changes were made so they could establish an historic reference.

Mr. Mawyer confirmed that they intended to do this and were working on it.

He reported that Rivanna would hold the odor control celebration on May 23 at Riverview Park to celebrate completion of the odor control project, and that would include a cookout and picnic at noon.

5. ITEMS FROM THE PUBLIC

Mr. Gaffney opened the floor to items from the public.

There were none offered, and he closed this portion of the agenda.

6. RESPONSES TO PUBLIC COMMENTS

Mr. Mawyer stated that he had a response to public comments from April and noted that a member of the public had suggested that Rivanna remove the South Rivanna Dam and resume river flow. He explained that while Rivanna had not studied that in depth, they felt there would be value in reducing algae by moving from a reservoir to a river, but the loss of capacity that would result from removing the dam would be significant, and on the heels of raising the dam at Ragged Mountain Reservoir – it would not seem logical to eliminate the dam at Rivanna. He added that dam removal would be a significant expense, as would the environmental mitigation of the silt behind the dam, and it was unclear what environmental and regulatory requirements would emerge. Mr. Mawyer noted that staff discussed this as a cursory review and determined that the larger cost and loss of capacity involved with removal seemed to far outweigh any environmental benefits.

Mr. Gaffney commented that an incredible amount of wetlands had been created at the reservoir, and draining that would kill those wetlands.

Mr. Mawyer noted that another point made at a previous meeting was a possible conflict of interest with board members regarding owning property around the Rivanna Reservoir, but as far as the Authority knows, no board member owns property there – although Mr. Gaffney had previously owned property, but sold it in 2012. He stated that Rivanna was not aware of any conflict of interest with board members regarding policy around the reservoir.

Mr. Gaffney stated that he had just built a new home, and in their neighborhood there was a community lot that was located on the reservoir.

Mr. Krueger commented that this was sufficient disclosure under the conflict of interest act, and it would be noted in the record.

7. CONSENT AGENDA

a. Staff Report on Finance

1. Presentation of Wastewater Budget: Lonnie Wood, Director of Finance and Administration

Mr. Mawyer stated that there had been a question in April regarding the wastewater budget meeting the deficit, and Mr. Wood would give a short presentation on that topic.

Mr. Wood reported that the wastewater versus actual budget shows that urban wastewater currently had a $920K deficit, and he referenced to page 3 of a document provided that listed the primary causes of the deficit – with one being revenue-related and one being expense-related. He stated that 70% of the deficit was related to either a shortfall in flow of 9% below budget estimates, which was causing approximately $500K of the deficit. He noted that the other cause was a metering error at the beginning of the year, and the odor control project had needed completion of some work done on the meters coming into the pump stations. Mr. Wood explained that one meter was a recycle meter whereby water coming back into the pump station needed to be backed out of the estimate because it was not true inflow. He stated that this meant that there was overreporting, which meant the billed amount was underreported, representing about $100K of revenue that equated to a shortfall.

Mr. Wood noted that the other three items were expense-related items, with utility bills being higher that previous years – although the budget had been underbudgeted compared to three-year trends. He cited upgrades in the ENR System, the new pump station, and the new odor control process as requiring more energy and raising energy costs, which were about $45K above budget estimates. Mr. Wood also noted that the new pump station may have put on the wrong electrical rate schedule with Dominion Power when it came online, and Rivanna was checking into that to ensure it was placed on the correct rate schedule, which was estimated to save approximately $20K-$30K annually if they could work with Dominion to get it on the right schedule.

Mr. Wood reported that regarding odor control on the Crozet interceptor, they had re-competed the contract the previous year and the new vendor provided a bioxide product to eliminate odors.

Mr. O'Connell remarked that it seemed to be working, although it was expensive.

Mr. Wood agreed, stating they were all working to maximize the effect but minimize the cost. He stated that they had also done several streambank restorations, with one behind Dunlora and another at 5th Street Extended where they were trying to protect a sewer interceptor being threatened by erosion from the adjacent streams.

Mr. Wood noted that he also included in the board packets a memo done in September or October 2017 showing the disposition of the year-end results, which were divided among the six rate centers when the budget was done to keep that separated properly. He stated that the first few years, there were surpluses, and those went into a reserve account in anticipation of a deficit year, due primarily to low flow. Mr. Wood noted that having a surplus on hand meant they would not need to increase rates to make up for the revenue loss.

Mr. Gaffney asked if they could make up the flow from the previous week's rainfall.

Mr. Wood responded that they would make up some of it but not a lot, noting that the previous weekend there had been about 50 million gallons on one day, with 9 MGD being the normal average, although it was now subsiding.

b. Staff Report on Ongoing Projects

c. Staff Report on Operations

d. Recommendation for Approval of Engineering Services for Crozet Flow Equalization Tank and Pumping Station Upgrade, Schnabel Engineering

e. Recommendation for Approval of Engineering Services for Asset Management Plan, GHD, Inc.

f. Recommendation for Approval of Construction Contract Modification for MCAWRRF Digester #2 and #3 Coatings, Lyttle Utilities, Inc.

g. Recommendation for Approval of Work Authorization for Water Treatment Plant Engineering Services, Cornwell Engineering Group

Mr. Jones moved to approve the Consent Agenda as presented. Mr. O'Connell seconded the motion, which passed unanimously (6-0). Dr. Palmer was absent from the meeting and the vote.

8. OTHER BUSINESS

a. Proposed Fiscal Year 2018-2019 Budget Review, Public Hearing and Rate Resolution Adoption: Bill Mawyer, Executive Director

Mr. Mawyer reported that this was reviewed in more detail in March but he wanted to provide a review of the RWSA budget for the coming year. He stated that the total budget was $33.277 million, with the largest component being debt service at $15.7 million, or 47%, which paid for capital projects. Mr. Mawyer noted that personnel costs were the second highest category at 25%, followed by the operations and maintenance budget at 16%, including chemicals and items of that nature. He noted that the general services category helped to pay for utilities, insurance, permits, and professional services and represented 12% of the budget. Mr. Mawyer stated that the budget represented a 7.3% increase from the previous year, or $2.3 million, of which $1 million was designated for operating expenses and $1.3 million was for debt service expenses. He noted that total charges to the City of Charlottesville would be an estimated $14.3 million, an increase of $680K or 5% from the current year's budget; Albemarle County Service Authority charges were about $16.9 million, an increase of $1.6 million or 10%.

Mr. Mawyer stated that on the operating side, there was a 1% overall budget increase, with a 3% merit pool and three new positions – a water operator, instrumentation specialist, and software analyst. Mr. Mawyer stated that they project a health insurance increase of approximately 10%, which is $97K, and there are two bathymetric studies planned to measure the volume at the Ragged Mountain and South Rivanna reservoirs over the next year, at a cost of $175K. He noted they would match this with a safe demand study and would be looking at a new curve of where demand crossed safe yield. Mr. Mawyer stated that there was also a new Rivanna sewer pump

station that required utilities and maintenance funding, and they would continue the chemical additions on the Crozet interceptor line at the current level for the next year. He noted that there was also funding requested for a technology master plan, working within their asset management program, as well as funding for implementation of the strategic plan.

Mr. Mawyer reported that the three positions requested include a software analyst to be located within finance and administration, a water operator to be located within operations, and an instrumentation specialist to be located within engineering and maintenance. He stated that the other portion of the $2.3-million increase in the total budget supported the Rivanna Pump Station, odor control, and other projects moving forward – upgrades to Observatory, Rivanna treatment plants, the Crozet treatment plant, the Avon to Pantops waterline, and the Ragged Mountain to Observatory pipe and pump station replacement project. He added that other projects at Crozet were the water treatment plant upgrade, and the Beaver Creek Dam modifications. Mr. Mawyer stated that the operating expenses represented $17.5 million, with debt service at $15.7 million, and about $16 million was spent on water, in comparison to $17 million for wastewater.

Mr. Mawyer reported that the water rate proposed for the urban area would increase 10 cents per 1,000 gallons and increased from $1.96 per thousand to $2.07 per thousand gallons, or 1 cent per 100 gallons – including reservoir expenses, supply and treatment, and delivery to the City and the ACSA at established connection points. He noted that wastewater rates were proposed at a 19-cent increase, going from $1.95 to $2.14 per thousand gallons. Mr. Mawyer explained that debt service charges were allocated separately from the rates as per-month charges for the City and ACSA for both water and wastewater.

Mr. Mawyer presented the rate resolution as approved by the RWSA Board in March and advertised in newspapers twice, noting that it restated the water rates per 1,000 gallons for the urban area, Crozet and Scottsville; the wastewater rates for the urban area, Glenmore, and Scottsville.

Mr. Gaffney opened the public hearing for the proposed budget.

There being no speakers, he closed the public hearing.

Mr. O'Connell moved to approve the budget as presented. Ms. Galvin seconded the motion, which passed unanimously (6-0). Dr. Palmer was absent from the meeting and the vote.

Mr. O'Connell asked Mr. Mawyer to address the debt profile that had been shown in their board packets, as he had been asked about it several times and wanted to be sure he understood it.

Mr. Mawyer explained that the current debt payments were approximately $12 million per year, but with adoption of the FY19-23 capital improvements program (CIP), the debt payments in 2019 would increase to approximately $15.7 million. He stated that each year of the five-year CIP reflected a debt service increase to fund the $152-million CIP planned for that time period. Mr. Mawyer noted that Mr. Wood was currently planning a new bond issue in the coming year to

start borrowing the money to fund these projects included in the CIP, and that peaked in FY23 at the $19-million level. He noted that they were trying to level the payments at $15.7 million, and the graph illustrated projection of debt capacity below the $15.7 million per year around 2031 or 2032, which was how they developed Alternative A for the Rivanna to Ragged Mountain pipeline project. Mr. Mawyer noted that they anticipated having additional debt capacity around that timeframe but would maintain the same annual debt payments.

Mr. O'Connell asked if this contemplated 10 years' worth of capital projects.

Mr. Mawyer and Mr. Wood responded that it was five years.

Mr. O'Connell noted that any projects in the intervening timeframe could push that up.

Mr. Wood confirmed that they would push it up.

Mr. Mawyer concurred, noting that they usually borrow money for those projects.

Mr. O'Connell noted they would still experience a big drop off in future borrowing capacity.

Mr. Gaffney pointed out that there would be increased revenue every year due to increasing rates.

b. Presentation of Beaver Creek Dam Modification Alternatives: Jennifer Whitaker, Director of Engineering and Maintenance

Ms. Whitaker reported that Rivanna had completed most of the work on this project and would be presenting to the Crozet Community Advisory Committee in June. Ms. Whitaker reported that the dam was built in 1963 and was located in Beaver Creek Park. She explained that the dam had been operating completely in compliance with existing dam safety regulations, but in 2008 the state changed those regulations to take Virginia regulations up to a federally recognized standard. Ms. Whitaker commented that this was a good thing from a public safety perspective, but it meant that dams throughout the state had to spend money for upgrading.

Ms. Whitaker stated that the regulations made some additional changes between 2008 and 2016 due to political pressures, but the Department of Conservation and Recreation issued its final dam regulations in 2016 concerning what dams needed to be upgraded. She noted that DCR had done a study to project maximum theoretical rainfall, and it decreased from almost 36 inches of rain in 24 hours down to 32 inches, which was still a lot of rain. Ms. Whitaker noted that this meant that some of the work previously presented to the RWSA Board had to be modified into a slightly smaller project going forward.

Ms. Whitaker stated that Rivanna had to upgrade the Beaver Creek Dam to go from a half probable maximum precipitation to a 100% probable maximum precipitation, which could be addressed through several alternatives. She presented an overhead photograph of the Beaver Creek reservoir, with the existing intake structure jutting out into the reservoir and a catwalk that served as a popular fishing spot. She noted that the dam itself was visible on either side as you

traveled over Brown's Gap Turnpike, and the area was currently grassed with a pump house at the toe of the dam. Ms. Whitaker stated that the part of the dam people typically consider the park is actually the emergency auxiliary spillway. She provided a photograph and referenced the items mentioned, including the catwalk, intake, and emergency spillway. Ms. Whitaker noted that there was a potential for impacts to the park area as they made improvements.

Mr. O'Connell pointed out that there was no hard surface there.

Ms. Whitaker confirmed this, stating that it was all earth and you did not want water to go over the earth portion of the dam, but the emergency spillway was cut down with the idea of providing preferential flow path to a tremendous storm event so it bypassed the main dam.

Ms. Whitaker reported that she would discuss several ways to solve the issue of passing additional water past, around, and over the dam. She stated that one item considered was a labyrinth spillway, and she explained that a longer surface was needed to pass water over the dam. Ms. Whitaker noted that they were constrained in this particular environment because of the topography, but a labyrinth spillway allowed for water movement in a confined space. She stated that a second option was roller-compacted concrete, which would be applied similarly to asphalt. She presented a picture of a dam in North Carolina with a center roller-compacted step spillway, which would have a set of stairs on the backside of the dam. Ms. Whitaker stated that the third option would be a parapet wall, which essentially raised the water level so it didn't overtop the dam, even in the most extreme events. She noted that parapet walls ranged from one to five feet, and prior to the new storm analysis, they were looking at potentially an eight-foot-tall parapet wall. Ms. Whitaker noted that this impacted the visibility and enjoyment of the park environment.

Ms. Whitaker presented the financial implications of the options, with one alternative having a two-prong approach as a combination of labyrinth spillways in the grass spillway area and some in the dam, with a combination of parapet walls and RCC. She stated that the CIP estimate was based on Alternative 3, which was basically going into the spillway space and putting RCC concrete in the downstream portion. She emphasized that this would have a fairly significant impact on the useable space of the park, and now that the cost impacts were known, they could provide information leading to a decision that best fit community priorities.

Mr. O'Connell asked if the estimated total CIP included other projects like the pump station.

Ms. Whitaker confirmed that it did, noting that it included the new raw water pump station, the hypolimnetic aeration system, and the dam reconstruction. She stated that in some cases where a labyrinth spillway was included, a bridge was also included – so the shorter the spillway, the shorter the bridge that had to go over it. She noted that she had highlighted on a graphic presented the alternatives through the spillway and the options going through the main body of the dam, leaving the earth spillway as a park recreational space.

Ms. Whitaker reported that the reservoir was depicted on the bottom of the picture provided, with the dam at the center and downstream at the top of the picture. She stated that there was a labyrinth spillway with concrete at the backside of it, going over the auxiliary spillway, so this

took about 75% of the useable park space. She stated that Alternative 1B was basically the same thing but in a narrower footprint and with a much taller parapet wall than the one-foot wall reflected in Alternative 1A. She noted that this option impacted the emergency spillway. Ms. Whitaker explained that Alternative 2 was RCC overtopping, so the picture shown reflected concrete in the center of the dam and steps on the downstream, which preserve the recreational space and the lakeside aesthetics. She noted that there would be a concrete face on the downstream side.

Ms. Whitaker reported that Alternative 3 put RCC overtopping down into the spillway with a much wider footprint and a five-foot parapet wall, as well as a concrete step spillway – with significant impacts to the park space. She presented Alternative 4, which she noted staff added after deciding that a new raw water pump station would need to be built. Ms. Whitaker stated that originally, the raw water pump station was going to stay put, which prevented them from being able to look at this alternative. She noted that with the more recent information about the raw water pump station, they decided to go back and consider this alternative. She explained that this was a labyrinth spillway going through the center of the dam, allowing a narrower footprint and requiring a bridge to carry Brown's Gap over the spillway and preserving all recreational space. Ms. Whitaker noted that this had a two-foot parapet wall, and Rivanna staff had discussed reducing the height in further design down to a foot or even possibly eliminating it.

Ms. Whitaker reiterated that there was currently $14.9 million in the CIP for Beaver Creek Dam alterations, including the dam upgrade itself, the new raw water pump station and intake, and the hypolimnetic aeration system. She noted that based on the most recent cost estimates that came with the alternatives analysis, the total project budget would increase from $17.2 to $23.1 million, depending on which alternative was selected. Ms. Whitaker mentioned that engineers were observing a steep increase in dam construction costs – both material and labor costs – and during the economic downturn, some of the competition moved out of the market.

Ms. Whitaker stated that the schedule was to work through with the RWSA Board and community over the next six months to hone in on which alternative they would like to pursue, spending the next year on final design, then pursuing all permits and easements. She noted they would enter construction in 2021, with completion in 2023. Ms. Whitaker reported that immediate next steps included the CCAC meeting on June 20, at which they would discuss project costs and implications, and would have meetings with the County Parks and Recreation Department to get their input. She noted that the dam was initially funded with a variety of funding mechanisms that included recreation, and the hope was to have a preliminary engineering report to DCR by the end of summer or early fall to start bringing the dam into compliance.

Mr. O'Connell asked if all the alternatives took the rowing house building into account.

Ms. Whitaker responded that they did, but there would be some temporary impacts during construction because they would have to reroute traffic, which had several options. She noted the rowing on the reservoir would not be impacted, but getting to the boathouse may have some impacts that needed to be mitigated. Ms. Whitaker emphasized that the boathouse and waterfront use would be preserved.

Mr. O'Connell asked if this was the presentation to be taken to the community meeting.

Mr. Mawyer responded that it was. He encouraged board members to provide feedback on the alternatives, stating that staff would come back to them with a report on what the CCAC meeting generated. He stated that there were essentially two choices – to impact the park or not impact the park, putting it in the middle of the dam.

Mr. O'Connell commented that not impacting the park would cost more money.

Ms. Whitaker confirmed this.

Mr. Gaffney asked why that was the case.

Mr. O'Connell noted that had stemmed from conversations he had been having with the County Executive about projects.

Ms. Galvin asked if the idea was that it would be used for ballfields.

Mr. O'Connell responded that it was intended more for a picnic area, frisbee-throwing area, etc. – but it had a slight slope to it. He confirmed that it was not a program space, other than rowing space, but it was a big enough area for something like soccer and was a pretty space.

Mr. Gaffney noted that for South Fork and rowing, even though ACSA would absorb 100% of the costs there, he wondered if ACSA and the county would work out the difference.

Mr. O'Connell replied that they had not yet had that discussion.

Mr. Krueger clarified that from Rivanna's perspective, this looked like a project that was allocated either in part to the city or to the county – all to one or the other – so Rivanna did not have the ability to obtain money directly from the County for it, but ACSA and the County could agree to how that project was funded if there were recreational aspects to it.

Mr. O'Connell asked if staff's estimates also included road costs.

Ms. Whitaker responded that it did, stating that when Rivanna had talked to VDOT it was an accommodation of the need versus a road project.

Mr. Krueger asked if there was a significant difference in the land over which they would need to have easements or make purchases, as it seemed the existing property border was affected with all the alternatives presented.

Ms. Whitaker confirmed that the property went further down the hill, and the key property issue still to be resolved was the parapet wall, as there were different regulations as to whether flood easements were required all the way to the top of the wall. She stated that they currently did not have flood easements if the dam height were raised by parapet walls, and the state had mixed

opinions as to whether the easements were needed. Ms. Whitaker noted the question remained as to whether Rivanna had to get easements from all the waterfrontproperty owners.

Mr. Gafffney asked if it changed the floodplain.

Ms. Whitaker responded that it didn't change it on the 100-year floodplain analysis, but the issue was if they had 32 inches of rain, which was well beyond that analysis, and this was merely preserving that space so things didn't get built into it. She clarified that this was a 10,000 to 50,000-year storm event, which was the current standard for dam construction – in part because of the potential significant loss of life downstream. Ms. Whitaker pointed out that Hurricane Camille was a 98% predicted maximum flood (PMF), and the 1995 storm at Sugar Hollow in Madison County was an 85% PMF.

Mr. Gaffney asked for clarification of dam lifespan.

Ms. Whitaker responded that the construction ideology was "forever," and they built things in a much more bomb-proof fashion than otherwise, although there was some localized degradation or change in standards such as that at Ragged Mountain. She emphasized that science had progressed, and she would surmise a 75-year lifespan, with the need to make adjustments to certain components of it.

Mr. Gaffney commented that it was the regulations that became outdated.

Ms. Whitaker concurred pointed out that this dam had been constructed fully in compliance, but the regulations stipulated that the dam would now need to withstand full storm amounts, not just half as previously required.

9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA

There were no other items presented.

10. CLOSED MEETING

There was no closed meeting held.

11. ***ADJOURNMENT***

Mr. Jones moved to adjourn the meeting. Mr. Richardson seconded the motion, which passed unanimously (6-0). Dr. Palmer was absent from the meeting and the vote.

The RWSA Board adjourned the meeting at 3:07 p.m.

RIVANNA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS

Resolution of Appreciation for Carol Sue Wiles

WHEREAS, Ms. Wiles has served as an Administrative Assistant for the Rivanna Water and Sewer Authority since July of 1997; and

WHEREAS, over the same period of 21 years, Ms. Wiles has demonstrated leadership in her field and has been a valuable resource to the Authority and its employees; and

WHEREAS, Ms. Wiles's understanding of the Authority's operation and dedication and loyalty to the Authority has positively impacted the Authority, its customers and its employees; and

WHEREAS, the Rivanna Water and Sewer Authority Board of Directors is most grateful for the professional and personal contributions Ms. Wiles has provided to the Rivanna Water and Sewer Authority and to its customers and its employees; and

NOW, THEREFORE, BE IT RESOLVED that the Rivanna Water and Sewer Authority Board of Directors recognizes, thanks and commends Ms. Wiles for her distinguished service, efforts and achievements as a member of the Rivanna Water and Sewer Authority, and presents this Resolution as a token of esteem, with its best wishes in her retirement.

BE IT FURTHER RESOLVED that this Resolution be entered upon the permanent Minutes of the Rivanna Water and Sewer Authority.

Michael Gaffney, Chairman
Kathleen Galvin
Lauren Hildebrand
Maurice Jones
Gary O'Connell
Liz Palmer
Jeff Richardson

RIVANNA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS

Resolution of Appreciation for Frederick A. Lanzon

WHEREAS, Mr. Lanzon has served as a Wastewater Operator for the Rivanna Water and Sewer Authority since July of 1997; and

WHEREAS, over the same period of 21 years, Mr. Lanzon has demonstrated leadership in his field and has been a valuable resource to the Authority and its employees; and

WHEREAS, Mr. Lanzon's understanding of the Authority's operation and dedication and loyalty to the Authority has positively impacted the Authority, its customers and its employees; and

WHEREAS, the Rivanna Water and Sewer Authority Board of Directors is most grateful for the professional and personal contributions Mr. Lanzon has provided to the Rivanna Water and Sewer Authority and to its customers and its employees; and

NOW, THEREFORE, BE IT RESOLVED that the Rivanna Water and Sewer Authority Board of Directors recognizes, thanks and commends Mr. Lanzon for his distinguished service, efforts and achievements as a member of the Rivanna Water and Sewer Authority, and presents this Resolution as a token of esteem, with its best wishes in his retirement.

BE IT FURTHER RESOLVED that this Resolution be entered upon the permanent Minutes of the Rivanna Water and Sewer Authority.

Michael Gaffney, Chairman
Kathleen Galvin
Lauren Hildebrand
Maurice Jones
Gary O'Connell
Liz Palmer
Jeff Richardson

RIVANNA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS

Resolution of Appreciation for Richard Graham Bond

WHEREAS, Mr. Bond has served as a Water Operator for the Rivanna Water and Sewer Authority since August of 1978; and

WHEREAS, over the same period of almost 40 years, Mr. Bond has demonstrated leadership in his field and has been a valuable resource to the Authority and its employees; and

WHEREAS, Mr. Bond's understanding of the Authority's operation and dedication and loyalty to the Authority has positively impacted the Authority, its customers and its employees; and

WHEREAS, the Rivanna Water and Sewer Authority Board of Directors is most grateful for the professional and personal contributions Mr. Bond has provided to the Rivanna Water and Sewer Authority and to its customers and its employees; and

NOW, THEREFORE, BE IT RESOLVED that the Rivanna Water and Sewer Authority Board of Directors recognizes, thanks and commends Mr. Bond for his distinguished service, efforts and achievements as a member of the Rivanna Water and Sewer Authority, and presents this Resolution as a token of esteem, with its best wishes in his retirement.

BE IT FURTHER RESOLVED that this Resolution be entered upon the permanent Minutes of the Rivanna Water and Sewer Authority.

Michael Gaffney, Chairman
Kathleen Galvin
Lauren Hildebrand
Maurice Jones
Gary O'Connell
Liz Palmer
Jeff Richardson

695 MOORES CREEK LANE
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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **EXECUTIVE DIRECTOR'S REPORT**

DATE: **JUNE 26, 2018**

Recognitions

SP GOAL: Workforce Development

The professional qualifications of our staff continue to improve and enhance our services. The following employee has successfully completed the requirements for a higher-level Mechanic license:

- Kenneth Lawhorne - received a Maintenance Mechanic "Journeyman" certification from the Commonwealth of Virginia after completing an 8000-hour apprenticeship.

Facility Films

SP GOAL: Collaboration and Communication

At the suggestion of several Board members, we are moving forward with production of short films to provide information about the history, current condition and planned improvement of our facilities at the Observatory, S. Rivanna and Crozet Water Treatment Plants. We also plan to have a drone video of the SRR – RMR water line alignment. Completion of these short films is anticipated by September 2018, and will be used to inform local Boards, Councils and community groups about major facility projects included in our CIP.

GAC Removal of Disinfection By Products (DBP)

SP GOAL: Operational Optimization

Initial results indicate the new GAC filters are significantly removing DBPs.

Water Supply

SP GOALS: Operational Optimization; Collaboration and Communication

- SRR – RMR water line:
  - I provided an overview of the SRR – RMR water line project and the four timeline options to City Council on June 4, 2018. City Council approved Option B (2027 – 2035) and Option C (2032 – 2040) as the preferred times for final design and construction of the water line.
  - We met with Albemarle County administrators, including two members of the Board of Supervisors, to review alignment alternatives.
  - We met with Albemarle School's Facilities staff to review an alignment which includes Lambs Road and a route behind Greer Elementary School. School staff considered this a reasonable location which would not significantly impact school facilities.
  - We held a Community Information Meeting on June 19, 2018 in Albemarle High School to review the project purpose, scope and preferred alignment with about 48 attendees.
  - We met with UVAF about the alignment through Birdwood GC, construction challenges, and project schedule.

- Modeling Urban Water System safe yield: based on current operating procedures, preliminary water modeling by Hydrologics indicates:
  - Completing the SRR – RMR water line would increase the safe yield from the urban reservoir system by 3.1 mgd.
  - Raising the RMR water level 12 feet (600 mg) would increase the safe yield from the urban water system by 2.6. mgd (without the water line).
  - Completing the water line and raising the water level would increase the safe yield from the urban water system by 5.0 mgd.
  - We are in the process of finalizing this modeling effort, and plan to present additional information to the Board in August 2018.

- Crozet Drinking Water Infrastructure Project:
  - We met with Albemarle County administrators, including two members of the Board of Supervisors, to review dam modification alternatives.
  - On June 20, we provided an update to the Crozet Community Advisory Committee. Our update included:

- Water supply modeling results for Beaver Creek Reservoir indicate the reservoir provides an adequate water supply until 2075.

- Construction of the WTP upgrade from 1 to 2 MGD is scheduled for 2019 – 2020.

- Modifications to the Beaver Creek Dam are required to meet the High Hazard requirements of the State. A labyrinth spillway through the dam may be the preferred option, along with replacement of the raw water pump station and installation of a hypolimnetic oxygenation system ($20 million). Construction is scheduled for 2021 – 2023.

- Construction of the finished water pump station will be completed in September 2018.

- Construction of the wastewater storage tank is scheduled for 2019 – 2021.

Reservoir Water Quality Monitoring

SP GOALS: Environmental Stewardship; Operational Optimization

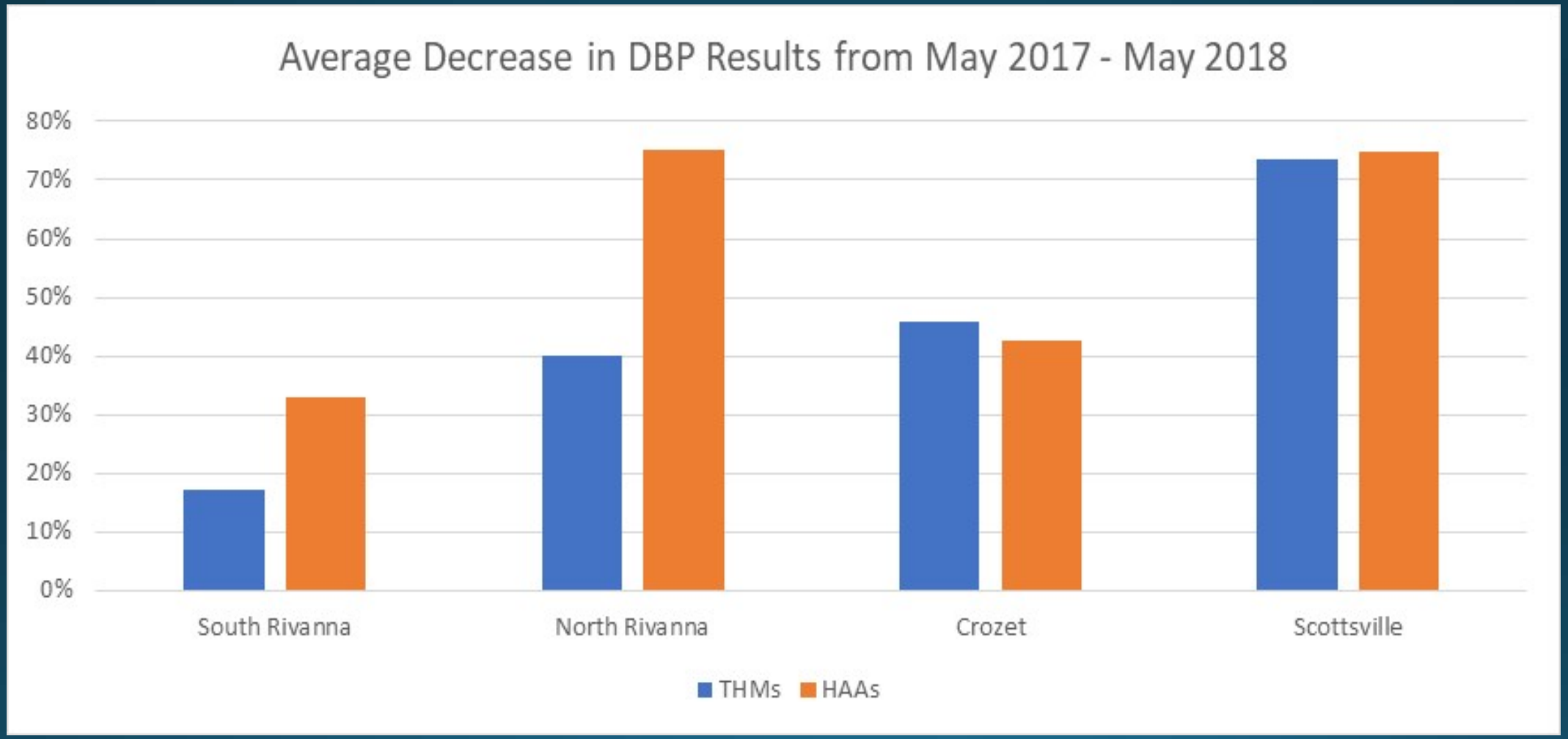
We are conducting our normal bi-weekly water quality monitoring in the RMR and SRR, as well as weekly monitoring in BCR along with periodic monitoring in TCR and SHR. Blue – green algae counts have been above our trigger level in BCR, and two treatments were completed in June. We are collaborating with Albemarle County Parks on recent algae issues.

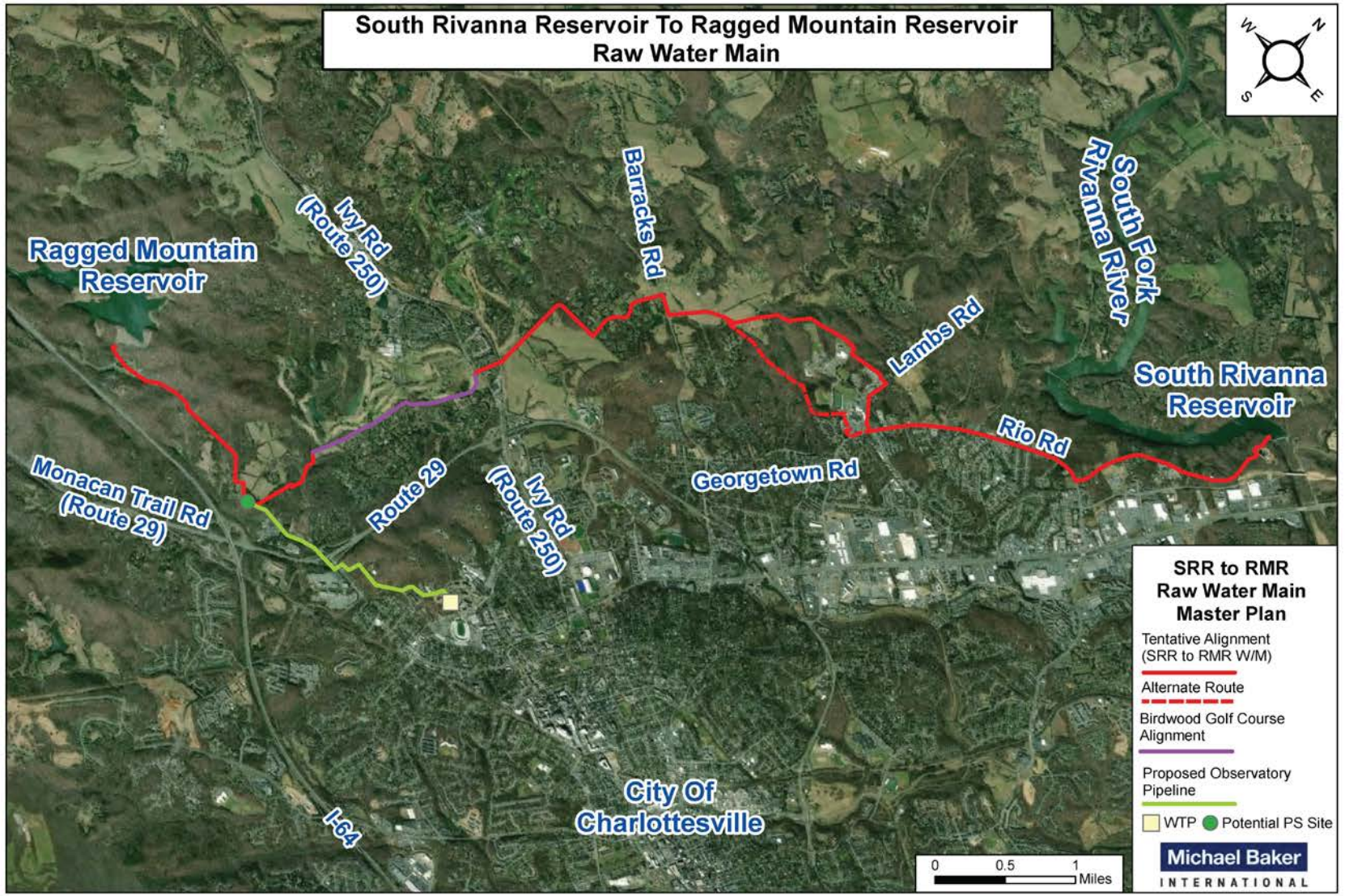
Community Outreach

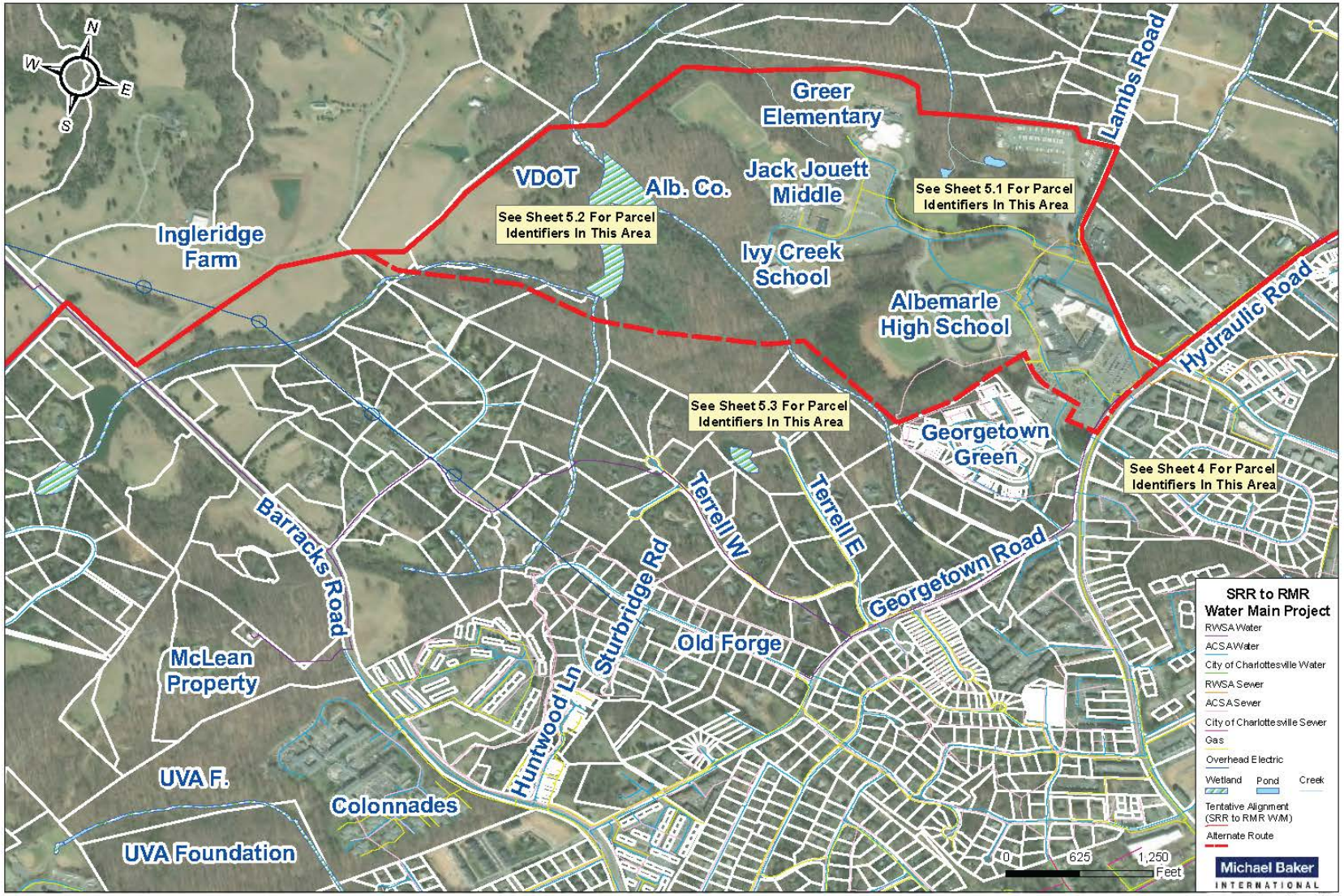
SP GOALS: Communication & Collaboration

Our Director of Operations, Dave Tungate, helped a 5th grade class from Crozet Elementary School create a Public Service Announcement on drinking water in the Crozet community.

Attachments


Average Decrease in DBP Results from May 2017 - May 2018
80%
70%
60%
50%
40%
30%
20%
10%
0%
South Rivanna
North Rivanna
Crozet
Scottsville
THMs
HAAs

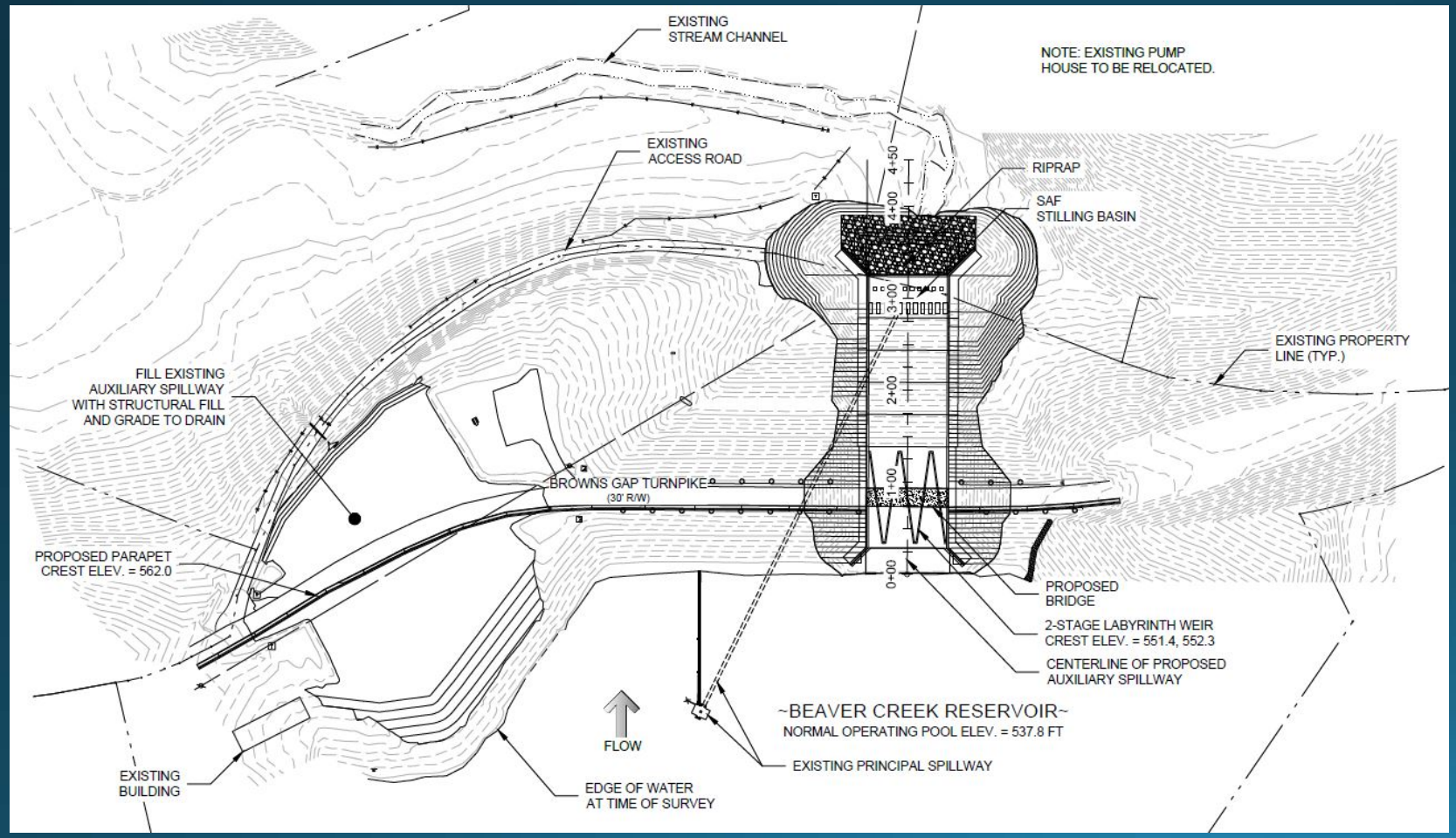

South Rivanna Reservoir To Ragged Mountain Reservoir
Raw Water Main
N
W
E
S
Ragged Mountain Reservoir
Ivy Rd (Route 250)
Barracks Rd
South Fork Rivanna River
Lambs Rd
South Rivanna Reservoir
Rio Rd
Monacan Trail Rd (Route 29)
Route 29
Ivy Rd (Route 250)
Georgetown Rd
City Of Charlottesville
I-64
0
0.5
1
Miles
SRR to RMR
Raw Water Main
Master Plan
Tentative Alignment (SRR to RMR W/M)
Alternate Route
Birdwood Golf Course Alignment
Proposed Observatory Pipeline
WTP
Potential PS Site
Michael Baker
INTERNATIONAL


N
W
E
S
Greer Elementary
Lambs Road
VDOT
Alb. Co.
Jack Jouett Middle
See Sheet 5.1 For Parcel Identifiers In This Area
See Sheet 5.2 For Parcel Identifiers In This Area
Ingleridge Farm
Ivy Creek School
Albemarle High School
Hydraulic Road
See Sheet 5.3 For Parcel Identifiers In This Area
Georgetown Green
See Sheet 4 For Parcel Identifiers In This Area
Barracks Road
Terrell W
Terrell E
Georgetown Road
Sturbridge Rd
Old Forge
Huntwood Ln
McLean Property
UVA F.
Colonnades
UVA Foundation
SRR to RMR Water Main Project
RWSA Water
ACSA Water
City of Charlottesville Water
RWSA Sewer
ACSA Sewer
City of Charlottesville Sewer
Gas
Overhead Electric
Wetland
Pond
Creek
Tentative Alignment (SRR to RMR WM)
Alternate Route
0
625
1,250
Feet
Michael Baker
INTERNATIONAL

Sheet 5 of 10

Beaver Creek Dam Modifications

- Labyrinth Spillway thru the dam with bridge
- Budget: $20 million
- Construction Schedule: 2021 - 2023



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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **LONNIE WOOD, DIRECTOR OF FINANCE AND ADMINISTRATION**

SUBJECT: **MAY MONTHLY FINANCIAL SUMMARY – FY 2018**

DATE: **JUNE 26, 2018**

Urban Water flows and rate revenues are 3% under budget estimates for the first eleven months of this fiscal year, and Urban Wastewater rate revenues are 6% under budget. Revenues and expenses are summarized in the table below:

	Urban Water	Urban Wastewater	Total Other Rate Centers	Total Authority
Operations				
Revenues	$ 6,080,803	$ 6,215,440	$ 1,874,736	$ 14,170,979
Expenses	(6,227,192)	(7,053,099)	(1,766,326)	(15,046,617)
Surplus (deficit)	$ (146,389)	$ (837,659)	$ 108,410	$ (875,638)
Debt Service				
Revenues	$ 5,208,630	$ 7,587,061	$ 772,141	$ 13,567,832
Expenses	(5,165,771)	(7,582,946)	(772,456)	(13,521,173)
Surplus (deficit)	$ 42,859	$ 4,115	$ (315)	$ 46,659
Total				
Revenues	$ 11,289,433	$ 13,802,501	$ 2,646,877	$ 27,738,811
Expenses	(11,392,963)	(14,636,045)	(2,538,782)	(28,567,790)
Surplus (deficit)	$ (103,530)	$ (833,544)	$ 108,095	$ (828,979)

Some expense categories are over the prorated year-to-date budget as follows:

A. Personnel Costs (Administration, Lab – pages 8, 10) – The GIS coordinator's payroll costs were included in the Engineering department's budget, but that position was moved to the Administration department in April, causing a budget overage for Administration. Lab salaries are over budget due to the August 2017 payment of accumulated leave balances to the lab manager upon his retirement, and due to overlapping salaries in July for the former lab manager and his replacement.

B. Other Services & Charges (Scottsville Water, Urban Wastewater, Administration, Maintenance, Engineering - pages 4, 5, 8, 9, 11) - Urban Wastewater is $204,000 over budget on odor control costs for Crozet Interceptor/Pump Stations, and Utility costs are $135,000 higher than budget estimates. Scottsville Water's Utility costs are also exceeding budgeted estimates, and the Maintenance department made some unbudgeted purchases of needed safety supplies. The Administration department is $30,800 over the annual budget on strategic planning costs. The Engineering department made the final quarterly payment to ACSA for this year's water and sewer modeling services in April. The total paid this year is just $2,400 more than budgeted for FY 2018, but ACSA's final quarterly billing of $8,400 for FY 2017 services was posted in July and included in this fiscal year's report.

C. Equipment Purchases (Crozet Water, Scottsville Wastewater – pages 3, 7) – Crozet Water and Scottsville Wastewater made some unbudgeted purchases of needed equipment.

D. Professional Services (Urban Water, Crozet Water, Administration – pages 2, 3, 8) – Urban Water is $145,000 over the total budget for the year for professional services, $49,000 for legal fees related to the Observatory plant lease and $101,000 for engineering and technical services. Crozet Water has spent $56,000 on unbudgeted engineering and technical services. Administration is currently $6,900 over the prorated budget for professional services, but is within the annual budget.

E. Operations and Maintenance (Urban Water, Urban Wastewater, Administration, Maintenance, Lab – pages 2, 5, 8, 9, 10) – Urban Water is over budget in this category due to recent purchases of GAC chemicals. Urban Wastewater is $110,000 over the prorated budget for Pipelines and Appurtenances due to emergency repairs. Urban Wastewater is also over budget on chemical purchases and repairs and maintenance. The Administration, Maintenance, and Lab departments are over budget on repairs.

Attachments

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018
Fiscal Year 2018

Consolidated
Revenues and Expenses Summary

	Notes	*Budget FY 2018*	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Operating Budget vs. Actual						
Revenues						
Operations Rate Revenue		$ 15,403,127	$ 14,119,533	$ 13,457,244	$ (662,289)	-4.69%
Lease Revenue		64,000	58,667	90,642	31,975	54.50%
Admin., Maint. & Engineering Revenue		410,000	375,833	400,716	24,883	6.62%
Other Revenues		534,630	490,078	506,896	16,818	3.43%
Use of Watershed Management Funds		80,000	73,333	87,047	13,714	18.70%
Interest Allocation		15,000	13,750	29,149	15,399	111.99%
Total Operating Revenues		**$ 16,506,757**	**$ 15,131,194**	**$ 14,571,694**	**$ (559,500)**	**-3.70%**
Expenses						
Personnel Cost	**A**	$ 7,841,522	$ 7,002,267	$ 6,650,748	$ 351,519	5.02%
Professional Services	**D**	590,350	541,154	614,069	(72,915)	-13.47%
Other Services & Charges	**B**	2,552,662	2,339,940	2,561,138	(221,198)	-9.45%
Communications		142,605	130,721	126,967	3,754	2.87%
Information Technology		324,400	297,367	221,676	75,691	25.45%
Supplies		44,970	41,223	37,190	4,032	9.78%
Operations & Maintenance	**E**	3,613,450	3,312,329	3,969,035	(656,706)	-19.83%
Equipment Purchases	**C**	336,300	308,275	294,385	13,890	4.51%
Depreciation		788,000	722,333	722,333	(0)	0.00%
Reserve Transfers		272,500	249,792	249,792	0	0.00%
Total Operating Expenses		**$ 16,506,759**	**$ 14,945,401**	**$ 15,447,333**	**$ (501,933)**	**-3.36%**
Operating Surplus/(Deficit)		**$ (2)**	**$ 185,793**	**$ (875,639)**		
Debt Service Budget vs. Actual						
Revenues						
Debt Service Rate Revenue		$ 13,561,158	$ 12,431,062	$ 12,431,067	$ 6	0.00%
Use of Reserves for 2016 Bond DS		600,000	550,000	550,000	-	0.00%
Septage Receiving Support - County		109,440	100,320	109,441	9,121	9.09%
Buck Mountain Surcharge		84,000	77,000	123,100	46,100	59.87%
Buck Mountain Lease Revenue		1,600	1,467	1,309	(158)	-10.77%
Trust Fund Interest		46,400	42,533	34,127	(8,407)	-19.77%
Reserve Fund Interest		100,500	92,125	318,788	226,663	246.04%
Total Debt Service Revenues		**$ 14,503,098**	**$ 13,294,507**	**$ 13,567,831**	**$ 273,325**	**2.06%**
Debt Service Costs						
Total Principal & Interest		$ 12,370,200	$ 11,339,350	$ 11,339,350	$ -	0.00%
Reserve Additions-Interest		100,500	92,125	318,788	(226,663)	-246.04%
Debt Service Ratio Charge		725,000	664,583	664,583	-	0.00%
Reserve Additions-CIP Growth		1,307,400	1,198,450	1,198,450	-	0.00%
Total Debt Service Costs		**$ 14,503,100**	**$ 13,294,508**	**$ 13,521,171**	**$ (226,663)**	**-1.70%**
Debt Service Surplus/(Deficit)		**$ (2)**	**$ (2)**	**$ 46,660**		
Summary						
Total Revenues		$ 31,009,855	$ 28,425,700	$ 28,139,525	$ (286,175)	-1.01%
Total Expenses		31,009,859	28,239,909	28,968,505	(728,596)	-2.58%
Surplus/(Deficit)		**$ (4)**	**$ 185,791**	**$ (828,979)**		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Urban Water Rate Center
Revenues and Expenses Summary

Operating Budget vs. Actual

	Notes	Budget FY 2018	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
Revenues						
Operations Rate Revenue		$ 6,758,077	$ 6,194,904	$ 5,961,018	$ (233,886)	-3.78%
Lease Revenue		35,000	32,083	64,023	31,940	99.55%
Miscellaneous		7,000	6,417	-	(6,417)	-100.00%
Use of Reserves		40,000	36,667	43,524	6,857	18.70%
Interest Allocation		6,300	5,775	12,238	6,463	111.92%
Total Operating Revenues		**$ 6,846,377**	**$ 6,275,846**	**$ 6,080,803**	**$ (195,043)**	**-3.11%**
Expenses						
Personnel Cost		$ 1,828,852	$ 1,635,098	$ 1,550,056	$ 85,042	5.20%
Professional Services	D	142,450	130,579	280,774	(150,195)	-115.02%
Other Services & Charges		606,100	555,592	407,615	147,976	26.63%
Communications		64,690	59,299	58,925	374	0.63%
Information Technology		65,300	59,858	44,127	15,731	26.28%
Supplies		7,000	6,417	6,318	99	1.54%
Operations & Maintenance	E	1,522,660	1,395,772	1,666,362	(270,590)	-19.39%
Equipment Purchases		106,500	97,625	60,351	37,275	38.18%
Depreciation		260,000	238,333	238,333	(0)	0.00%
Reserve Transfers		250,000	229,167	229,167	0	0.00%
Subtotal Before Allocations		$ 4,853,552	$ 4,407,739	$ 4,542,028	$ (134,288)	-3.05%
Allocation of Support Departments		1,992,824	1,784,798	1,685,164	99,633	5.58%
Total Operating Expenses		**$ 6,846,377**	**$ 6,192,537**	**$ 6,227,192**	**$ (34,655)**	**-0.56%**
Operating Surplus/(Deficit)		**$ 0**	**$ 83,309**	**$ (146,389)**		

Debt Service Budget vs. Actual

	Budget FY 2018	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
Revenues					
Debt Service Rate Revenue	$ 5,345,730	$ 4,900,253	$ 4,900,258	$ 6	0.00%
Trust Fund Interest	18,000	16,500	13,412	(3,088)	-18.72%
Reserve Fund Interest	18,000	16,500	170,552	154,052	933.65%
Buck Mountain Surcharge	84,000	77,000	123,100	46,100	59.87%
Lease Revenue	1,600	1,467	1,309	(158)	-10.77%
Total Debt Service Revenues	**$ 5,467,330**	**$ 5,011,719**	**$ 5,208,630**	**$ 196,911**	**3.93%**
Debt Service Costs					
Total Principal & Interest	$ 4,242,130	$ 3,888,619	$ 3,888,619	$ -	0.00%
Reserve Additions-Interest	18,000	16,500	170,552	(154,052)	-933.65%
Debt Service Ratio Charge	400,000	366,667	366,667	-	0.00%
Reserve Additions-CIP Growth	807,200	739,933	739,933	-	0.00%
Total Debt Service Costs	**$ 5,467,330**	**$ 5,011,719**	**$ 5,165,771**	**$ (154,052)**	**-3.07%**
Debt Service Surplus/(Deficit)	**$ -**	**$ -**	**$ 42,859**		

Rate Center Summary

	Budget FY 2018	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
Total Revenues	$ 12,313,707	$ 11,287,565	$ 11,289,433	$ 1,868	0.02%
Total Expenses	12,313,707	11,204,256	11,392,963	(188,707)	-1.68%
Surplus/(Deficit)	**$ 0**	**$ 83,309**	**$ (103,530)**		
Costs per 1000 Gallons	1.99		2.06		
Thousand Gallons Treated	3,432,018	3,146,017	3,027,434	(118,583)	-3.77%
or					
Flow (MGD)	9.403		9.037		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Crozet Water Rate Center
Revenues and Expenses Summary

Operating Budget vs. Actual

	Notes	Budget FY 2018	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
Revenues						
Operations Rate Revenue		$ 915,336	$ 839,058	$ 839,058	$ -	0.00%
Lease Revenues		29,000	26,583	26,618	35	0.13%
Use of Reserves		24,000	22,000	29,229	7,229	32.86%
Interest Allocation		900	825	1,838	1,013	122.82%
Total Operating Revenues		**$ 969,236**	**$ 888,466**	**$ 896,744**	**$ 8,278**	**0.93%**
Expenses						
Personnel Cost		$ 289,212	$ 258,641	$ 243,472	$ 15,170	5.87%
Professional Services	**D**	47,000	43,083	102,906	(59,823)	-138.85%
Other Services & Charges		121,480	111,357	95,363	15,994	14.36%
Communications		4,230	3,878	4,671	(793)	-20.46%
Information Technology		14,200	13,017	549	12,467	95.78%
Supplies		670	614	937	(322)	-52.50%
Operations & Maintenance		233,630	214,161	216,487	(2,326)	-1.09%
Equipment Purchases	**C**	26,400	24,200	34,155	(9,955)	-41.14%
Depreciation		25,000	22,917	22,917	0	0.00%
Reserve Transfers		20,000	18,333	18,333	(0)	0.00%
Subtotal Before Allocations		$ 781,822	$ 710,200	$ 739,789	$ (29,589)	-4.17%
Allocation of Support Departments		187,417	167,853	159,400	8,453	5.04%
Total Operating Expenses		**$ 969,238**	**$ 878,053**	**$ 899,189**	**$ (21,136)**	**-2.41%**
Operating Surplus/(Deficit)		**$ (2)**	**$ 10,413**	**$ (2,445)**		

Debt Service Budget vs. Actual

	Budget FY 2018	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
Revenues					
Debt Service Rate Revenue	$ 691,476	$ 633,853	$ 633,853	$ -	0.00%
Trust Fund Interest	1,800	1,650	1,297	(353)	-21.40%
Reserve Fund Interest	2,700	2,475	4,782	2,307	93.20%
Total Debt Service Revenues	**$ 695,976**	**$ 637,978**	**$ 639,932**	**$ 1,954**	**0.31%**
Debt Service Costs					
Total Principal & Interest	$ 426,977	$ 391,396	$ 391,396	$ -	0.00%
Reserve Additions-Interest	2,700	2,475	4,782	(2,307)	-93.20%
Reserve Additions-CIP Growth	266,300	244,108	244,108	-	0.00%
Total Debt Service Costs	**$ 695,977**	**$ 637,979**	**$ 640,286**	**$ (2,307)**	**-0.36%**
Debt Service Surplus/(Deficit)	**$ (1)**	**$ (1)**	**$ (354)**		

Rate Center Summary

Total Revenues	$ 1,665,212	$ 1,526,444	$ 1,536,676	$ 10,231	0.67%
Total Expenses	1,665,215	1,516,032	1,539,475	(23,443)	-1.55%
Surplus/(Deficit)	**$ (3)**	**$ 10,412**	**$ (2,799)**		
Costs per 1000 Gallons	5.31		5.06		
Thousand Gallons Treated	182,610	167,393	177,825	10,433	6.23%
Flow (MGD)	0.500		0.531		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Scottsville Water Rate Center
Revenues and Expenses Summary

	Notes	*Budget FY 2018*	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Operating Budget vs. Actual						
Revenues						
Operations Rate Revenue		$ 412,236	$ 377,883	$ 377,883	$ -	0.00%
Use of Reserves		16,000	14,667	14,294	(373)	
Interest Allocation		400	367	761	394	107.51%
Total Operating Revenues		**$ 428,636**	**$ 392,916**	**$ 392,938**	**$ 22**	**0.01%**
Expenses						
Personnel Cost		$ 154,467	$ 138,175	$ 128,227	$ 9,949	7.20%
Professional Services		26,000	23,833	17,503	6,331	26.56%
Other Services & Charges	B	19,490	17,866	24,211	(6,346)	-35.52%
Communications		3,210	2,943	3,145	(202)	-6.87%
Information Technology		7,000	6,417	1,131	5,286	82.38%
Supplies		750	688	79	609	88.56%
Operations & Maintenance		66,570	61,023	55,577	5,445	8.92%
Equipment Purchases		14,400	13,200	2,223	10,977	83.16%
Depreciation		17,000	15,583	15,583	(0)	0.00%
Reserve Transfers		2,500	2,292	2,292	0	0.00%
Subtotal Before Allocations		$ 311,387	$ 282,019	$ 249,970	$ 32,049	11.36%
Allocation of Support Departments		117,247	105,028	100,606	4,422	4.21%
Total Operating Expenses		**$ 428,634**	**$ 387,047**	**$ 350,575**	**$ 36,471**	**9.42%**
Operating Surplus/(Deficit)		**$ 2**	**$ 5,870**	**$ 42,362**		
Debt Service Budget vs. Actual						
Revenues						
Debt Service Rate Revenue		$ 129,448	$ 118,661	$ 118,657	$ (4)	0.00%
Trust Fund Interest		400	367	375	9	2.38%
Reserve Fund Interest		1,500	1,375	2,550	1,175	85.48%
Total Debt Service Revenues		**$ 131,348**	**$ 120,402**	**$ 121,583**	**$ 1,180**	**0.98%**
Debt Service Costs						
Total Principal & Interest		$ 129,848	$ 119,027	$ 119,027	$ -	0.00%
Reserve Additions-Interest		1,500	1,375	2,550	(1,175)	
Reserve Additions-CIP Growth		-	-	-	-	
Total Debt Service Costs		**$ 131,348**	**$ 120,402**	**$ 121,578**	**$ (1,175)**	**-0.98%**
Debt Service Surplus/(Deficit)		**$ -**	**$ -**	**$ 5**		
Rate Center Summary						
Total Revenues		$ 559,984	$ 513,319	$ 514,521	$ 1,202	0.23%
Total Expenses		559,982	507,449	472,153	35,296	6.96%
Surplus/(Deficit)		**$ 2**	**$ 5,870**	**$ 42,368**		
Costs per 1000 Gallons		22.39		23.38		
Thousand Gallons Treated		19,143	17,548	14,993	(2,555)	-14.56%
or						
Flow (MGD)		0.052		0.045		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Urban Wastewater Rate Center
Revenues and Expenses Summary

	Notes	*Budget FY 2018*	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Operating Budget vs. Actual						
Revenues						
Operations Rate Revenue		$ 6,680,446	$ 6,123,742	$ 5,695,340	$ (428,402)	-7.00%
Stone Robinson WWTP		27,630	25,328	19,353	(5,974)	-23.59%
Septage Acceptance		390,000	357,500	399,765	42,265	11.82%
Nutrient Credits		100,000	91,667	87,105	(4,562)	-4.98%
Miscellaneous Revenue		10,000	9,167	673	(8,494)	-92.66%
Interest Allocation		6,800	6,233	13,204	6,970	111.83%
Total Operating Revenues		**$ 7,214,876**	**$ 6,613,636**	**$ 6,215,439**	**$ (398,197)**	**-6.02%**
Expenses						
Personnel Cost		$ 1,230,128	$ 1,099,272	$ 985,540	$ 113,732	10.35%
Professional Services		54,000	49,500	15,357	34,143	68.98%
Other Services & Charges	B	1,571,400	1,440,450	1,777,138	(336,688)	-23.37%
Communications		10,430	9,561	9,758	(197)	-2.06%
Information Technology		57,300	52,525	55,784	(3,259)	-6.20%
Supplies		2,700	2,475	1,084	1,391	56.20%
Operations & Maintenance	E	1,390,300	1,274,442	1,694,793	(420,351)	-32.98%
Equipment Purchases		54,000	49,500	49,465	35	0.07%
Depreciation		465,000	426,250	426,250	-	0.00%
Reserve Transfers		-	-	-	-	
Subtotal Before Allocations		$ 4,835,258	$ 4,403,975	$ 5,015,170	$ (611,195)	-13.88%
Allocation of Support Departments		2,379,618	2,131,251	2,037,929	93,322	4.38%
Total Operating Expenses		**$ 7,214,876**	**$ 6,535,226**	**$ 7,053,099**	**$ (517,872)**	**-7.92%**
Operating Surplus/(Deficit)		**$ 0**	**$ 78,410**	**$ (837,659)**		
Debt Service Budget vs. Actual						
Revenues						
Debt Service Rate Revenue		$ 7,384,689	$ 6,769,298	$ 6,769,301	$ 3	0.00%
Use of Reserves for 2016 Bond DS		600,000	550,000	550,000	-	0.00%
Septage Receiving Support - County		109,440	100,320	109,441	9,121	9.09%
Trust Fund Interest		26,200	24,017	19,009	(5,008)	-20.85%
Reserve Fund Interest		77,300	70,858	139,310	68,452	96.60%
Total Debt Service Revenues		**$ 8,197,629**	**$ 7,514,493**	**$ 7,587,061**	**$ 72,568**	**0.97%**
Debt Service Costs						
Total Principal & Interest		$ 7,561,430	$ 6,931,311	$ 6,931,311	$ -	0.00%
Reserve Additions-Interest		77,300	70,858	139,310	(68,452)	-96.60%
Debt Service Ratio Charge		325,000	297,917	297,917	-	0.00%
Reserve Additions-CIP Growth		233,900	214,408	214,408	-	0.00%
Total Debt Service Costs		**$ 8,197,630**	**$ 7,514,494**	**$ 7,582,946**	**$ (68,452)**	**-0.91%**
Debt Service Surplus/(Deficit)		**$ (1)**	**$ (1)**	**$ 4,115**		
Rate Center Summary						
Total Revenues		$ 15,412,505	$ 14,128,130	$ 13,802,500	$ (325,629)	-2.30%
Total Expenses		15,412,506	14,049,720	14,636,045	(586,324)	-4.17%
Surplus/(Deficit)		**$ (1)**	**$ 78,409**	**$ (833,544)**		
Costs per 1000 Gallons		2.11		2.37		
Thousand Gallons Treated		3,424,639	3,139,252	2,970,292	(168,960)	-5.38%
or						
Flow (MGD)		9.383		8.867		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Glenmore Wastewater Rate Center
Revenues and Expenses Summary

	Budget FY 2018	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Operating Budget vs. Actual					
Notes					
Revenues					
Operations Rate Revenue	$ 352,344	$ 322,982	$ 322,982	$ -	0.00%
Interest Allocation	300	275	612	337	122.58%
Total Operating Revenues	**$ 352,644**	**$ 323,257**	**$ 323,594**	**$ 337**	**0.10%**
Expenses					
Personnel Cost	$ 90,823	$ 81,170	$ 72,710	$ 8,460	10.42%
Professional Services	3,000	2,750	-	2,750	
Other Services & Charges	31,490	28,866	29,736	(870)	-3.01%
Communications	2,600	2,383	2,880	(497)	-20.85%
Information Technology	3,500	3,208	119	3,090	96.31%
Supplies	100	92	3	89	96.97%
Operations & Maintenance	121,450	111,329	92,487	18,843	16.93%
Equipment Purchases	3,100	2,842	2,383	458	16.13%
Depreciation	5,000	4,583	4,583	(0)	0.00%
Subtotal Before Allocations	$ 261,063	$ 237,223	$ 204,901	$ 32,322	13.63%
Allocation of Support Departments	91,584	82,072	78,599	3,473	4.23%
Total Operating Expenses	**$ 352,647**	**$ 319,295**	**$ 283,499**	**$ 35,796**	**11.21%**
Operating Surplus/(Deficit)	**$ (3)**	**$ 3,962**	**$ 40,095**		
Debt Service Budget vs. Actual					
Revenues					
Debt Service Rate Revenue	$ 1,582	$ 1,450	$ 1,452	$ 2	0.13%
Trust Fund Interest	-	-	-	-	
Reserve Fund Interest	600	550	956	406	73.88%
Total Debt Service Revenues	**$ 2,182**	**$ 2,000**	**$ 2,408**	**$ 2**	**0.09%**
Debt Service Costs					
Total Principal & Interest	$ 1,582	$ 1,450	$ 1,450	$ -	0.00%
Reserve Additions-Interest	600	550	956	(406)	-73.88%
Total Debt Service Costs	**$ 2,182**	**$ 2,000**	**$ 2,407**	**$ (406)**	**-20.32%**
Debt Service Surplus/(Deficit)	**$ -**	**$ -**	**$ 2**		

Rate Center Summary

Total Revenues	$ 354,826	$ 325,257	$ 326,002	$ 745	0.23%
Total Expenses	354,829	321,295	285,906	35,389	11.01%
Surplus/(Deficit)	**$ (3)**	**$ 3,962**	**$ 40,096**		
Costs per 1000 Gallons	8.12		7.24		
Thousand Gallons Treated	43,412	39,794	39,180	(614)	**-1.54%**
or					
Flow (MGD)	0.119		0.117		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Scottsville Wastewater Rate Center
Revenues and Expenses Summary

Operating Budget vs. Actual

	Notes	Budget FY 2018	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
Revenues						
Operations Rate Revenue		$ 284,688	$ 260,964	$ 260,964	$ -	0.00%
Interest Allocation		300	275	496	221	80.18%
Total Operating Revenues		**$ 284,988**	**$ 261,239**	**$ 261,460**	**$ 221**	**0.08%**
Expenses						
Personnel Cost		$ 90,848	$ 81,193	$ 72,710	$ 8,483	10.45%
Professional Services		2,000	1,833	-	1,833	100.00%
Other Services & Charges		22,900	20,992	21,940	(949)	-4.52%
Communications		2,630	2,411	3,705	(1,294)	-53.69%
Information Technology		4,400	4,033	-	4,033	100.00%
Supplies		100	92	3	89	96.98%
Operations & Maintenance		57,850	53,029	16,629	36,400	68.64%
Equipment Purchases	C	3,400	3,117	30,783	(27,667)	-887.70%
Depreciation		16,000	14,667	14,667	0	0.00%
Subtotal Before Allocations		$ 200,128	$ 181,366	$ 160,437	$ 20,929	11.54%
Allocation of Support Departments		84,858	76,043	72,626	3,417	4.49%
Total Operating Expenses		**$ 284,987**	**$ 257,409**	**$ 233,063**	**$ 24,347**	**9.46%**
Operating Surplus/(Deficit)		**$ 1**	**$ 3,830**	**$ 28,397**		

Debt Service Budget vs. Actual

Revenues						
Debt Service Rate Revenue		$ 8,233	$ 7,547	$ 7,546	$ (1)	-0.01%
Trust Fund Interest		-	-	34	34	
Reserve Fund Interest		400	367	638	271	73.87%
Total Debt Service Revenues		**$ 8,633**	**$ 7,914**	**$ 8,218**	**$ 304**	**3.84%**
Debt Service Costs						
Total Principal & Interest		$ 8,233	$ 7,547	$ 7,547	$ -	0.00%
Reserve Additions-Interest		400	367	638	(271)	-73.87%
Estimated New Principal & Interest		-	-	-	-	
Total Debt Service Costs		**$ 8,633**	**$ 7,914**	**$ 8,184**	**$ (271)**	**-3.42%**
Debt Service Surplus/(Deficit)		**$ -**	**$ -**	**$ 33**		

Rate Center Summary

Total Revenues	$ 293,621	$ 269,153	$ 269,677	$ 525	0.19%
Total Expenses	293,620	265,323	241,247	24,076	9.07%
Surplus/(Deficit)	**$ 1**	**$ 3,830**	**$ 28,430**		
Costs per 1000 Gallons	14.27		13.36		
Thousand Gallons Treated	19,967	18,303	17,445	(858)	**-4.69%**
or					
Flow (MGD)	0.055		0.052		

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Administration

Operating Budget vs. Actual

	Notes	*Budget FY 2018*	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Revenues						
Payment for Services SWA		$ 409,000	$ 374,917	$ 374,917	$ (0)	0.00%
Miscellaneous Revenue		1,000	917	5,510	4,594	501.13%
Total Operating Revenues		**$ 410,000**	**$ 375,833**	**$ 380,427**	**$ 4,594**	**1.22%**
Expenses						
Personnel Cost	**A**	$ 1,544,126	$ 1,376,585	$ 1,388,587	$ (12,002)	-0.87%
Professional Services	**D**	171,900	157,575	164,443	(6,868)	-4.36%
Other Services & Charges	**B**	111,940	102,612	128,776	(26,164)	-25.50%
Communications		21,280	19,507	14,284	5,222	26.77%
Information Technology		118,000	108,167	74,124	34,043	31.47%
Supplies		22,000	20,167	21,899	(1,733)	-8.59%
Operations & Maintenance	**E**	36,600	33,550	42,463	(8,913)	-26.57%
Equipment Purchases		8,300	7,608	7,608	(0)	0.00%
Depreciation		-	-	-	-	
Total Operating Expenses		**$ 2,034,146**	**$ 1,825,770**	**$ 1,842,185**	**$ (16,414)**	**-0.90%**

Department Summary

Net Costs Allocable to Rate Centers		**$ (1,624,146)**	**$ (1,449,937)**	**$ (1,461,758)**	**$ 11,821**	**-0.82%**
Allocations to the Rate Centers						
Urban Water	44.00%	**$ 714,624**	**$ 637,972**	**$ 643,173**	**$ (5,201)**	
Crozet Water	4.00%	**$ 64,966**	**57,997**	**58,470**	**(473)**	
Scottsville Water	2.00%	**$ 32,483**	**28,999**	**29,235**	**(236)**	
Urban Wastewater	48.00%	**$ 779,590**	**695,970**	**701,644**	**(5,674)**	
Glenmore Wastewater	1.00%	**$ 16,241**	**14,499**	**14,618**	**(118)**	
Scottsville Wastewater	1.00%	**$ 16,241**	**14,499**	**14,618**	**(118)**	
	100.00%	**$ 1,624,146**	**$ 1,449,937**	**$ 1,461,758**	**$ (11,821)**	

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Maintenance

Operating Budget vs. Actual

	Notes	*Budget FY 2018*	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Revenues						
Miscellaneous Revenue		-	-	4,610	4,610	
Total Operating Revenues		**$ -**	**$ -**	**$ 4,610**	**$ 4,610**	
Expenses						
Personnel Cost		$ 1,150,821	$ 1,027,746	$ 1,008,178	$ 19,568	1.90%
Professional Services		-	-	-	-	
Other Services & Charges	**B**	12,300	11,275	16,439	(5,164)	-45.80%
Communications		15,635	14,332	16,276	(1,944)	-13.57%
Information Technology		6,500	5,958	2,328	3,630	60.93%
Supplies		500	458	221	238	51.83%
Operations & Maintenance	**E**	64,450	59,079	70,439	(11,360)	-19.23%
Equipment Purchases		94,850	86,946	85,355	1,591	1.83%
Depreciation		-	-	-	-	
Total Operating Expenses		**$ 1,345,056**	**$ 1,205,795**	**$ 1,199,236**	**$ 6,559**	**0.54%**

Department Summary

Net Costs Allocable to Rate Centers		**$ (1,345,056)**	**$ (1,205,795)**	**$ (1,194,625)**	**$ (1,949)**	**0.16%**
Allocations to the Rate Centers						
Urban Water	30.00%	**$ 403,517**	**$ 361,738**	**$ 358,388**	**$ 3,351**	
Crozet Water	3.50%	**47,077**	**42,203**	**41,812**	**391**	
Scottsville Water	3.50%	**47,077**	**42,203**	**41,812**	**391**	
Urban Wastewater	56.50%	**759,957**	**681,274**	**674,963**	**6,311**	
Glenmore Wastewater	3.50%	**47,077**	**42,203**	**41,812**	**391**	
Scottsville Wastewater	3.00%	**40,352**	**36,174**	**35,839**	**335**	
	100.00%	**$ 1,345,056**	**$ 1,205,795**	**$ 1,194,625**	**$ 11,169**	

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Laboratory

Operating Budget vs. Actual

	Notes	*Budget FY 2018*	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Revenues						
N/A						
Expenses						
Personnel Cost	**A**	$ 293,948	$ 262,252	$ 293,109	$ (30,857)	-11.77%
Professional Services		-	-	-	-	
Other Services & Charges		10,412	9,544	9,168	376	3.94%
Communications		600	550	1,168	(618)	
Information Technology		2,200	2,017	270	1,747	86.62%
Supplies		1,650	1,513	2,713	(1,201)	-79.37%
Operations & Maintenance	**E**	55,000	50,417	60,265	(9,849)	-19.53%
Equipment Purchases		1,500	1,375	917	458	33.34%
Depreciation		-	-	-	-	
Total Operating Expenses		**$ 365,310**	**$ 327,667**	**$ 367,610**	**$ (39,943)**	**-12.19%**

Department Summary

Net Costs Allocable to Rate Centers		**$ (365,310)**	**$ (327,667)**	**$ (367,610)**	**$ 39,943**	**-12.19%**
Allocations to the Rate Centers						
Urban Water	44.00%	**$ 160,736**	**$ 144,174**	**$ 161,748**	**$ (17,575)**	
Crozet Water	4.00%	**14,612**	**13,107**	**14,704**	**(1,598)**	
Scottsville Water	2.00%	**7,306**	**6,553**	**7,352**	**(799)**	
Urban Wastewater	47.00%	**171,696**	**154,004**	**172,777**	**(18,773)**	
Glenmore Wastewater	1.50%	**5,480**	**4,915**	**5,514**	**(599)**	
Scottsville Wastewater	1.50%	**5,480**	**4,915**	**5,514**	**(599)**	
	100.00%	**$ 365,310**	**$ 327,667**	**$ 367,610**	**$ (39,943)**	

Rivanna Water & Sewer Authority
Monthly Financial Statements - May 2018

Engineering

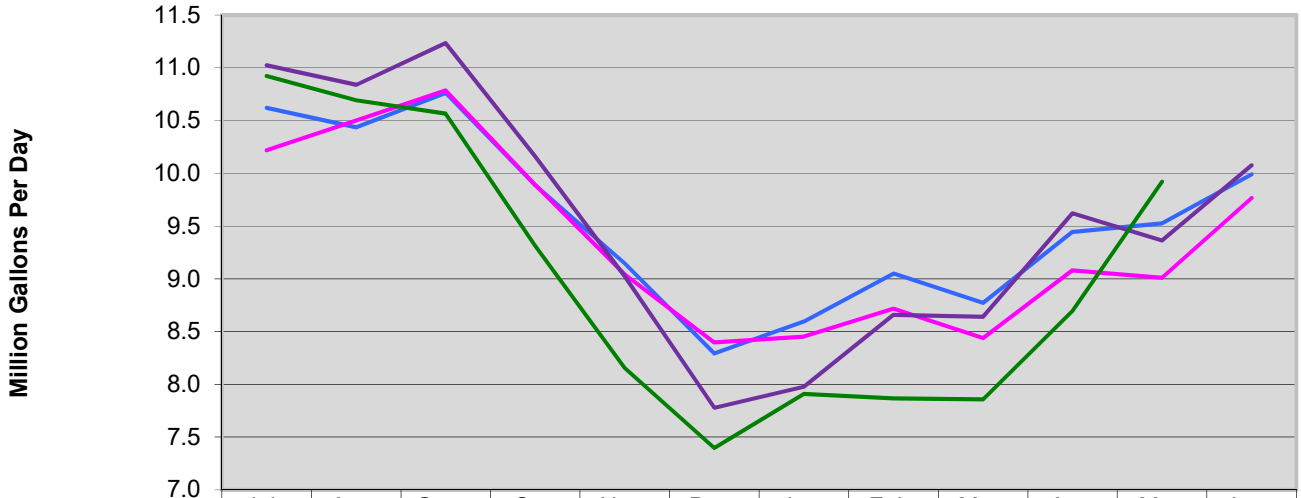
Operating Budget vs. Actual

		Budget FY 2018	*Budget Year-to-Date*	*Actual Year-to-Date*	*Budget vs. Actual*	*Variance Percentage*
Revenues						
Payment for Services SWA		$ -	$ -	$ 15,679	$ 15,679	
Total Operating Revenues		**$ -**	**$ -**	**$ 15,679**	**$ 15,679**	
Expenses						
Personnel Cost		$ 1,168,296	$ 1,042,134	$ 908,160	$ 133,974	12.86%
Professional Services		144,000	132,000	33,086	98,914	74.93%
Other Services & Charges	**B**	45,150	41,388	50,750	(9,363)	-22.62%
Communications		17,300	15,858	12,155	3,704	23.36%
Information Technology		46,000	42,167	43,245	(1,078)	-2.56%
Supplies		9,500	8,708	3,934	4,774	54.82%
Operations & Maintenance		64,940	59,528	53,533	5,995	10.07%
Equipment Purchases		23,850	21,863	21,145	717	3.28%
Depreciation & Capital Reserve Transfers		-	-	-	-	
Total Operating Expenses		**$ 1,519,036**	**$ 1,363,646**	**$ 1,126,009**	**$ 237,637**	**17.43%**

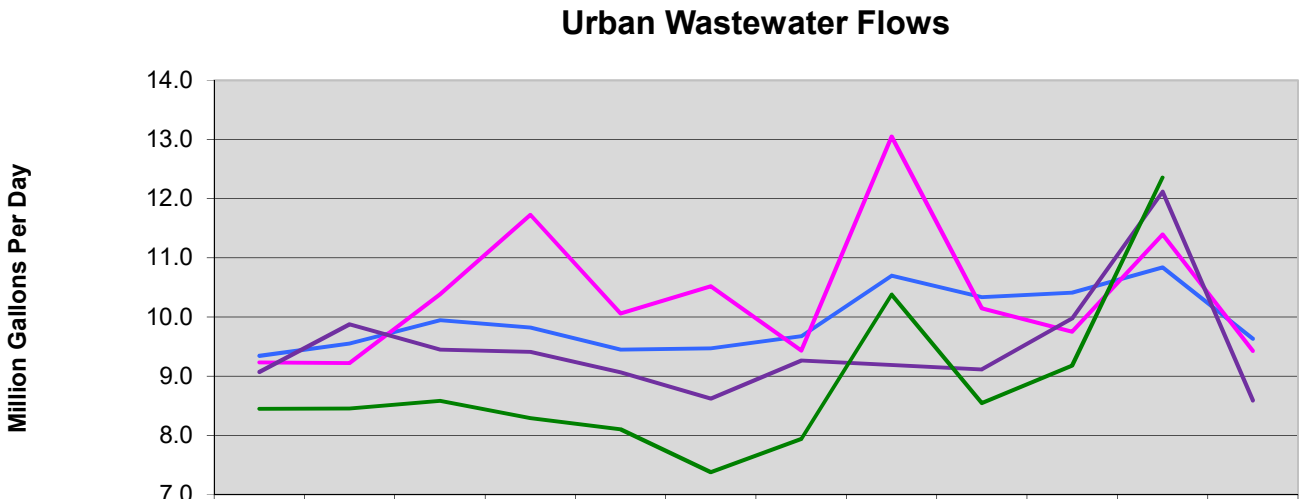
Department Summary

Net Costs Allocable to Rate Centers		**$ (1,519,036)**	**$ (1,363,646)**	**$ (1,110,330)**	**$ (221,958)**	**16.28%**
Allocations to the Rate Centers						
Urban Water	47.00%	**$ 713,947**	**$ 640,913**	**$ 521,855**	**$ 119,058**	
Crozet Water	4.00%	**60,761**	**54,546**	**44,413**	**10,133**	
Scottsville Water	2.00%	**30,381**	**27,273**	**22,207**	**5,066**	
Urban Wastewater	44.00%	**668,376**	**600,004**	**488,545**	**111,459**	
Glenmore Wastewater	1.50%	**22,786**	**20,455**	**16,655**	**3,800**	
Scottsville Wastewater	1.50%	**22,786**	**20,455**	**16,655**	**3,800**	
	100.00%	**$ 1,519,036**	**$ 1,363,646**	**$ 1,110,330**	**$ 253,316**	

Rivanna Water and Sewer Authority
Flow Graphs



	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
5 YR AVG.	10.62	10.44	10.76	9.89	9.15	8.29	8.60	9.05	8.77	9.45	9.53	9.99
FY 2016	10.22	10.50	10.79	9.89	9.04	8.40	8.45	8.72	8.44	9.08	9.01	9.77
FY 2017	11.02	10.84	11.23	10.16	9.02	7.78	7.98	8.66	8.64	9.62	9.36	10.07
FY 2018	10.92	10.69	10.57	9.31	8.16	7.40	7.91	7.87	7.86	8.70	9.92	



	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
5 YR AVG	9.34	9.55	9.95	9.82	9.45	9.47	9.67	10.70	10.33	10.41	10.84	9.63
FY 2016	9.23	9.22	10.38	11.73	10.06	10.52	9.43	13.05	10.15	9.75	11.39	9.43
FY 2017	9.07	9.87	9.45	9.41	9.06	8.62	9.26	9.19	9.12	9.97	12.12	8.59
FY 2018	8.45	8.45	8.59	8.29	8.10	7.38	7.94	10.38	8.54	9.18	12.36	

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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **JENNIFER WHITAKER, DIRECTOR OF ENGINEERING & MAINTENANCE**

REVIEWED BY: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **STATUS REPORT: ONGOING PROJECTS**

DATE: **JUNE 26, 2018**

This memorandum reports on the status of the following Capital Projects as well as other significant operations, maintenance and planning projects.

Under Construction

1. Wholesale Water Master Metering
2. Crozet Finished Water Pump Station
3. Moores Creek AWRRF Roof Replacements
4. Sugar Hollow Reservoir to Ragged Mountain Reservoir Transfer Flow Meter
5. Piney Mountain Tank Rehabilitation
6. Interceptor Sewer & Manhole Repair
7. Urgent and Emergency Repairs

Design and Bidding

8. Observatory Water Treatment Plant Expansion
9. South Rivanna Water Treatment Plant Improvements
10. Crozet Water Treatment Plant Expansion
11. Interconnect Lower Sugar Hollow and Ragged Mountain Raw Water Mains
12. Route 29 Pump Station and Pipeline
13. South Fork Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way
14. Avon to Pantops Water Main
15. Crozet Interceptor Pump Stations Bypass & Isolation Valves
16. Crozet Flow Equalization Tank

Planning and Studies

17. South Rivanna Hydropower Plant Decommissioning
18. Drinking Water Infrastructure Plan – Crozet Area
19. Beaver Creek Dam Alterations

1. Wholesale Water Master Metering

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	Linco, Inc.
Construction Start:	January 2016
Percent Complete:	95%
Base Construction Contract + Change Orders to Date = Current Value:	$2,228,254 - $221,177 = $2,007,077
Expected Completion Date:	August 2018
Total Capital Project Budget:	$3,600,000

Current Status:

Three water treatment plant flow meters, and 23 of 25 distribution system flow meters have been completed. Completion of the Rt. 29 site is scheduled for June. The final remaining site located adjacent to Ivy Road, will be completed by Faulconer Construction Co. by August under the existing on-call contract. An administrative plan to manage this program has been completed and forwarded to the ACSA and the City. RWSA terminated the construction contract with Linco, Inc. on April 2, 2018 and will coordinate the remaining work in-house.

History:

In January 2012, a Water Cost Allocation Agreement was signed by the City of Charlottesville (City) and ACSA designating how the two agencies would share in the financing of the New Ragged Mountain Dam project. Within the agreement is a general provision developed by the ACSA and City to enhance measurement of the water usage by each of the distribution agencies.

The Board authorized staff in August of 2012 to enter into an agreement with Michael Baker International, Inc. (Baker) to complete an engineering study on metering plan alternatives. Baker's study identified several alternatives for a metering plan based on combinations of metering and estimating methodologies. Based on feedback from ACSA, the City, and RWSA, Baker recommended a Jurisdictional Approach which included installation of water meters at 34 locations at the City/County corporate boundary and at each of the three urban water treatment plants at an estimated cost of $6.4 million. At its September 2013 meeting, the RWSA Board of Directors requested staff to proceed with the Jurisdictional Coverage Approach. In February 2014, the Board of Directors authorized Baker to complete preliminary and final design for the project and to provide bid-phase services. The final design includes construction of 25 metering systems in underground vaults and required acquisition of twenty (20) permanent water line easements and one (1) permanent access easement.

Staff met with the ACSA and the City on July 12, 2017 and established a plan for implementation of the new meters in accordance with the 2012 Water Cost Allocation Agreement and the Baker Study.

2. Crozet Finished Water Pump Station

Design Engineer:	Short Elliot Hendrickson (SEH)
Construction Contractor:	Anderson Construction, Inc.
Construction Start:	May 2017
Percent Complete:	90 %
Base Construction Contract + Change Orders to Date = Current Value:	$1,941,000
Expected Completion Date:	September 2018
Total Capital Project Budget:	$2,600,000

Current Status:

Interior piping and controls work is nearly complete. Rough grading for the driveway is complete. Concrete sidewalk and curb and gutter have been placed. Chlorination and bacteria testing for all interior piping is complete. Sod has been placed on most of the site. Start-up and testing of equipment is underway.

History:

Bids were received and opened for the project on March 7, 2017. The apparent low bidder was Anderson Construction, Inc. from Lynchburg, VA. The Board of Directors approved the contract bid award of $1,941,000 at the March 2017 meeting, a Notice of Award was issued on April 10, 2017, and a Notice to Proceed was issued on May 3, 2017.

The filter plant effluent line to the ground storage tank has been installed, tested, disinfected and placed into service. The existing generator and electrical lines have been relocated and placed into a temporary location. The pipeline and generator were relocated in order to make room for the new pump station foundation excavation. Partial removal of old, existing asbestos cement (transite) pipe was completed in July.

As part of the current FY 2016 CIP, the Crozet Water Treatment Plant is being studied to expand the treatment capacity to secure future demand needs of the Crozet community. Prior to any plant expansion, it has been determined that the finished water pumping facilities are in need of replacement. The existing pump station is very small and was constructed as part of the original plant construction in the late 1960s. The pumping equipment and controls are outdated, and reduce operational reliability and efficiency. The pump house is located in a low, poorly drained area near the ground storage clearwell, and drainage issues exist. Due to the age and condition of pumps, electrical systems, building systems and controls, it has been determined that a full station replacement is necessary. An Alternatives Analysis Report was completed in June 2016, and the chosen alternative is to construct a new, larger building uphill from the existing clearwell tank. The new pump station building will be of similar construction as what is being proposed for the GAC facility at Crozet WTP.

3. Moores Creek AWRRF Roof Replacements

Design Engineer:	Hazen and Sawyer
Construction Contractor	Triangle Roofing Services, Inc.
Construction Start:	March 2018
Percent Complete	80%
Base Construction Contract + Change Orders to Date = Current Value:	$818,000
Expected Completion:	September 2018
Total Capital Project Budget:	$1,264,000

Current Status:

Replacement of the Moore's Creek Pump Station Building roof is complete and the contractor is approximately 90% complete with Maintenance Buildings 1 and 2, Sludge Pump Station No. 2, the Sludge Pumping Building and the Blower Building. The only buildings remaining in the contract are the Primary Pump Building and the Effluent Pump Building.

History:

Construction bids were received on September 7, 2017 to replace the metal roof on eight buildings and award of the project was approved by the Board at the September Board Meeting. A Notice of Award was provided to Triangle Roofing Services, Inc. on October 10, 2017. Final Contract Documents have been executed.

The majority of the buildings at the Moores Creek Advanced Water Resource Recovery Facility were constructed in 1981 and 1982 during a major expansion of the existing treatment plant. All buildings constructed at that time were built with a metal roof system. In 2014, deficiencies were identified in the roof at the Administration Building and the roof was replaced. The materials of the original roof at the Administration Building are the same as the roof material on the other buildings. Likewise, many of the buildings have started to experience leaks and structural deficiencies. As a result, the purpose of this project is to replace the roof systems at the following buildings at the Moores Creek AWRRF: Blower Building, Moores Creek Pump Station, Sludge Pump Station No. 2, Maintenance Building 1, and Maintenance Building 2. Following additional review of the conditions of various buildings located at the Moores Creek AWRRF, this project also now includes replacement of the roof systems Sludge Pumping Building, the Primary Pump Building, and the Effluent Pump Building.

In December 2016, the Board of Directors authorized staff to enter into a work authorization with Hazen and Sawyer to design bidding documents to replace the identified roofs at Moores Creek AWRRF. A kick-off meeting was held with plant operations and maintenance staff; asbestos testing was performed to determine impacts during demolition activities; and design is ongoing. An application was submitted to the Albemarle County Architectural Review Board and approval has been obtained.

4. <u>Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter</u>

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	G.L. Howard
Construction Start:	July 2018
Percent Complete	5%
Base Construction Contract + Change Orders to Date = Current Value:	$41,000 (additional value to follow)
Expected Completion:	September 2018
Total Capital Project Budget:	$350,000

<u>Current Status</u>:

This project requires the Sugar Hollow to Ragged Mt. Reservoir transfer line to be out of service for approximately 4 weeks. With the reservoirs at maximum levels, a work authorization was approved with the contractor to initiate the purchase of long lead items while the overall scope of work was confirmed. This project also includes the demolition of the gatekeeper house and other random out-buildings on the property. Required demolition requirements and activities have been confirmed with the City of Charlottesville prior to work beginning on site.

<u>History:</u>

RWSA staff has worked with the design engineers to complete plan and profile design drawings for this project. The project will include installation of a flow meter on the 18-inch diameter Sugar Hollow Reservoir discharge pipe, and a control valve that can be operated remotely through the Observatory WTP SCADA system. The control valve will modulate the amount of flow being transferred between the two reservoirs, the flow meter will record data, and staff will be able to remotely monitor the data through the SCADA system. Additional work has been added to this project including replacement of an existing, original gate valve at the site, demolition of two existing small utility structures that have not been used in many years, demolition of the existing Gatekeeper's House, and a separate control valve vault that will optimize the accuracy of the new flow meter by creating adequate separation distance between the meter and modulating control valve. The structures to be demolished and removed have been inspected and tested for asbestos containing materials and lead based paint. There will be some special abatement work required, and the contractor will have to include these costs in their estimate.

After initial cost estimating discussions with the contractor and RWSA staff, it was found that the current project budget is not enough to complete all of the identified work aspects. The Capital Improvement Program budget will likely have to be increased in order to perform all the work in one project.

5. Piney Mountain Tank Rehabilitation

Design Engineer:	Johnson, Mirmiran & Thompson (JMT)
Construction Contractor:	Utility Service Co, Inc.
Construction Start:	April 2019
Percent Complete:	0%
Base Construction Contract + Change Orders to Date = Current Value:	$251,700 + $12,585 = $264,285
Expected Completion:	July 2019
Total Capital Project Budget:	$500,000

Current Status:

The Piney Mountain Tank Rehabilitation project will require a shutdown of the tank for over three months. Due to unforeseen complications with an extended tank shutdown and other ongoing construction activities in the North Rivanna Water System, construction of the Piney Mountain Tank repairs have been postponed until spring 2019. Utility Service Co., Inc will remain the general contractor for this project.

History:

The project was advertised for bid on November 28, 2017 and bids were opened on January 9, 2018. At its January meeting, the RWSA Board of Directors approved staff's recommendation of award to Utility Service Co., Inc., the apparent low bidder on the project.

The 700,000 gallon Piney Mountain Tank serves the North Rivanna pressure zone. A routine inspection of the Piney Mountain Tank in April of 2012 revealed several deformed roof rafters, indicating the potential for structural deficiency. An in-depth structural inspection was performed in May of 2013 and a list of recommended roof repairs provided. This project includes consultant services for design and bidding of necessary roof repairs and other ancillary items, as well as construction, construction administration, and inspection services. Long term plans for the Rt. 29 service area include the modification or elimination of this facility. The current recommended improvements are needed in order to maintain the existing tank in service for at least the next 10 years.

6. Interceptor Sewer and Manhole Repair

Design Engineer:	Frazier Engineering
Construction Contractor:	IPR Northeast
Construction Start:	November 2017
Percent Complete:	5%
Base Construction Contract + Change Orders to Date = Current Value:	$1,244,337.19
Expected Completion:	2020
Total Capital Project Budget:	$1,962,389

Current Status:

Award of the 2017 Sanitary Sewer Rehabilitation and Repair Contract to IPR Northeast was approved by the Board at the October Board Meeting and a Notice of Award has been provided. Contract Documents have been formally executed, a preconstruction meeting was held with the contractor, and a Notice to Proceed was issued. Frazier Engineering continues to conduct condition assessment activities and has completed a preliminary review of previous CCTV results. Manhole inspections on various interceptors were completed and a report documenting the results is being developed. An initial work authorization with the contractor to perform additional CCTV investigations has been developed and the contractor has reviewed the work to determine any access issues and a schedule for completion. The work authorization is being finalized to account for their field notes and work is anticipated to begin in late June or early July. Additional investigation and rehabilitation work will follow after the initial round of CCTV investigations.

History:

Results from sewer flow monitoring and modeling under the Comprehensive Sanitary Sewer Study provided awareness to specific inflow and infiltration (I&I) concerns in the collection system and resulted in strengthened commitments from the City, ACSA and RWSA to continue professional engineering services to aid in the rehabilitation and repair of the sewer collection system. Engineering services will be used for sewer infrastructure condition assessments and the development of a sewer rehabilitation bid package for the procurement of a contractor to perform the recommended rehabilitation work.

7. Urgent and Emergency Repairs

Staff is currently working on several urgent repairs within the water and wastewater systems as listed below:

Project No.	Project Description	Approx. Cost
2017-03	Crozet Sewer Force Main Air Release Valve Repair	$135,000
2018-01	Rivanna Interceptor – RVI-MH-32 Erosion Repair	$50,000
2018-05	North Rivanna Water Line – Along the North Rivanna River	$250,000

- Crozet Sewer Force Main Air Release Valve Repair

  During routine inspections of the sewer force main, the Maintenance Department identified that the saddle for one of the air release valves was loose and needed to be repaired. Due to the profile of the force main however, it is not possible to dewater the force main and take pressure off the pipe at this location without the installation of line stops. As a result, a contractor was contacted to begin development of a method to address the issue and a site meeting was conducted. The contractor has provided estimated pricing and a work authorization is being developed. This repair will be scheduled sequentially with the Rivanna Interceptor manhole repair this summer.

- Rivanna Interceptor – RVI-MH-32 Erosion Repair

  During routine inspections of the Rivanna Interceptor, the Maintenance Department observed some significant erosion around RVI-MH-32. A site meeting was held with the contractor and the City of Charlottesville to confirm the cause of the erosion and determine the preferred method of repair, as the repair will impact a section of the Rivanna Trail. The contractor has provided estimated pricing and a work authorization is being developed. This repair will be scheduled sequentially with the Crozet Sewer Force Main repair this summer.

- North Rivanna Water Line – Along the North Rivanna River

  Due to high river levels during the severe weather event on May 30, 2018, the river bank adjacent to the North Rivanna River line began to erode away. As a result, a bend in the existing water line near the river bank lost its support and two sections of existing pipe separated causing a significant leak in the North Rivanna Water System. Measures were taken to isolate the leak area and the temporary pump near Kohl's was hooked up to provide water to the North Rivanna System since it was isolated from the North Rivanna WTP as a result of this leak. Faulconer Construction was called in to address this emergency repair and approximately 200 linear feet of new pipe was installed around the area of concern. On June 15, 2018, the water line was placed back in service with additional work to repair and armor the river bank remaining.

8. Observatory WTP Expansion

Design Engineer:	Short Elliot Hendrickson, Inc. (SEH)
Project Start:	October 2017
Project Status:	Preliminary Engineering Report
Construction Start:	2019
Completion:	2022
Total Capital Project Budget:	$18,630,000

Current Status:

The final PER will be completed by the end of June. Design documents will be completed by May 2019.

History:

This project will consider the design and costs for upgrading the plant systems to achieve a consistent 7 MGD plant capacity, as well as consider the costs involved with upgrading the plant to 10 or 12 MGD capacity.
Much of the Observatory Water Treatment Plant is original to the 1953 construction. In an effort to better understand the needed future improvements, a Condition Assessment Report was completed by SEH in October of 2013. The approved Capital Improvement Plan project was based on the findings from this report. A portion of this project was expedited in order to repair and replace old, existing equipment that was not functional. The flocculator systems have been replaced and upgraded as part of the Drinking Water Activated Carbon and WTP Improvements project (GAC). The second flocculator system

was started up in May 2017, and both systems are currently in full service. The contractor needs to address some minor punchlist items in order to reach final completion.

9. South Rivanna Water Treatment Plant Improvements

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	October 2017
Project Status:	Preliminary Engineering Report
Construction Start:	2019
Completion:	2022
Total Capital Project Budget:	$7,500,000

Current Status:

The final PER will be completed by the end of June. Design documents will be completed by May 2019.

History:

The South Rivanna Water Treatment Plant is currently undergoing significant upgrades as part of the Granular Activated Carbon Project. Several other significant needs have also been identified and have been assembled into a single project. The projects herein include: expansion of the coagulant storage facilities; installation of additional filters to meet firm capacity needs; the addition of a second variable frequency drive at the Raw Water Pump Station; the relocation for the electrical gear from a sub terrain location at the Sludge Pumping Station; a new building on site for additional office, lab, control room and storage space; improvements to storm sewers to accept allowable WTP discharges; and the construction of a new metal building to cover the existing liquid lime feed piping and tanks. The scope of this project will not increase plant treatment capacity.

10. Crozet WTP Expansion

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	August 2016
Project Status:	90% Design Complete
Construction Start:	November 2018
Completion:	December 2020
Total Capital Project Budget:	$7,000,000

Current Status:

Construction documents will be completed by the end of June 2018. Drawings and permit applications have been submitted to and reviewed by Albemarle County. Comments by the County have been addressed and the design package has been resubmitted for final approval.

History:

SEH has completed the Preliminary Engineering Report (PER) for this project, and is in the process of addressing comments from the Virginia Department of Health. Some

preliminary watershed modeling and data collection was also performed as part of this work. In addition, raw water jar testing has been performed to finalize the type of treatment parameters necessary for the upgrade work, and the testing results were incorporated into the PER. The proposed new work will provide needed updates to equipment, as well as a plant capacity upgrade to approximately 1.5 - 2.0 million gallons per day.

A new Work Authorization with SEH was executed to perform preliminary and final design documents, as well as construction administration services.

This project was created to analyze the feasibility of increasing the supply capacity of the existing Crozet WTP by modernizing plant systems. The goal is to not drastically increase the plant footprint in regards to existing filter plant, flocculation tanks, and sedimentation basins. By modernizing the outdated equipment within these treatment systems, the plant discharge capacity can be improved by approximately 50-100%. The project currently only includes study and design funding.

11. <u>Interconnection Lower Sugar Hollow and Ragged Mountain Raw Water Mains</u>

Design Engineer:	Dewberry Engineers
Project Start:	October 2017
Project Status:	30% Design
Construction Start:	August 2018
Completion:	November 2018
Total Capital Project Budget:	$225,000

<u>Current Status</u>:

A Work Authorization with Dewberry was executed to evaluate several alignment options and to identify the most suitable alignment. Feasible alignments and construction cost estimates have been submitted and the recommended alignment is being evaluated by RWSA staff. A separate Work Authorization will be written to prepare any final design documents as necessary.

<u>History</u>:

The two 18-inch water mains that supply water from Ragged Mountain Reservoir to Observatory Water Treatment Plant are 71 and 109 years old. The mains are interconnected at the top of the Ragged Mountain Dam, with one serving the 1920's Royal Pump Station and the other serving the more modern Stadium Road Pump Station. Both pump stations provide raw water to the Observatory Water Treatment Plant. This project will serve to interconnect the two raw water lines near the Route 29/Fontaine Avenue Intersection, which will provide improved reliability and operability in the event of raw water line breaks.

12. Route 29 Pump Station and Pipeline

Design Engineer:	Michael Baker International (Baker)
Project Start:	July 2018
Project Status:	Update Existing Design Report
Construction Start:	2019
Completion:	2021
Total Capital Project Budget:	$2,300,000

Current Status:

Work is currently underway to review and update the 2008 preliminary engineering report, including analysis of current water demand projections. Portions of the work have already been completed, including a temporary bypass pumping location near Kohl's department store, and the abandonment of existing pipeline in the median of Rte. 29 from the south end of Hollymead Town Center to Timberwood Boulevard. Other portions of the project have been completed including the Pump Station Site Acquisition and new 24-inch pipeline installed as part of the Rt. 29 VDOT Betterment project. Once the report update has been completed, the preliminary design of the remaining pipeline and the pump station will be started. Preliminary and final design along with construction funding will be included in the 2019-2023 CIP.

History:

This project will include construction of a 2 mgd drinking water pump station and two 1,000,000 gallon ground water storage tanks, as well as completion of a 24-inch diameter pipeline along the Meeting Street corridor. This project has been identified as a need in the County Comprehensive Plan and RWSA Capital Improvement Plan.
A report and technical memorandum on this project was previously completed in 2008. The future pump station and tanks, along with a new transmission pipeline between the pump station and the South Rivanna Water Treatment Plant, will provide an interconnection between the areas presently served by the South Rivanna WTP and the North Rivanna WTP. The interconnection is needed for redundancy of service in the event of an emergency, during drought conditions, and to adequately serve the growing needs of the Rt. 29 area generally north of Hollymead Town Center and Airport Road.

At the May 2017 Board Meeting, a 1.6-acre parcel of land was acquired through condemnation proceedings which included a public hearing. The site location was identified in a prior project report from 2008 (completed by Michael Baker), and is also identified in the current County Comprehensive Plan. The land value of the parcel was estimated through a March 16, 2017 Property Appraisal completed by CRES, Inc., a professional real estate and appraiser company. After negotiations with the current landowner to acquire the property were unsuccessful, and final offers were refused, the land was acquired after a Certificate of Take was recorded. This property will be utilized for future construction of a new drinking water pump station and ground storage tanks.

13. South Fork Rivanna Reservoir to Ragged Mtn. Reservoir Water Line Right-of-Way

Design Engineer:	Michael Baker International (Baker)
Project Start:	October 2017
Project Status:	40 % Complete
Completion:	2021
Total Capital Project Budget:	$2,295,000

Current Status:

The PER will be completed by August 2018. Preliminary design work began in November 2017. Property owners have been contacted to request permission to access properties for topographical surveying. The consultant is in the process of data collection, and review, hydraulic modeling, and field evaluation of alignment options for the Preliminary Engineering Report. A recommendation for a final alignment is expected in July 2018. A community information meeting to discuss the project will be held on June 19, 2018. Easement acquisition negotiations are anticipated by May 2019.

History:

RWSA has negotiated a scope and fee with Michael Baker International for the routing study, preliminary design, plat creation and easement acquisition process.
The approved 50-year Community Water Supply Plan includes the future construction of a raw water line from the South Fork Rivanna Reservoir to the Ragged Mountain Reservoir. This water line will replace the existing Upper Sugar Hollow Pipeline along an alternative alignment to increase raw water transfer capacity in the Urban Water System. The preliminary route for the water line followed the proposed Route 29 Charlottesville Bypass; however, the Bypass project was suspended by VDOT in 2014, requiring a more detailed routing study for the future water line. This project includes a routing study, preliminary design and preparation of easement documents, as well as acquisition of water line easements along the approved route.

14. Avon to Pantops Water Main

Design Engineer:	Michael Baker International (Baker)
Project Start:	August 2017
Project Status:	70% Preliminary Design Complete
Construction Start:	2020
Completion:	2022
Total Capital Project Budget:	$13,000,000

Current Status:

Route alignment determination, hydraulic modeling, and preliminary design are underway. Route alternatives are being developed for review. Additional modeling was completed to incorporate several new ACSA and City water projects, and potential upgrades related to VDOT work. Stakeholder workshops were held with the City and ACSA in early June to discuss the new model results.

History:

An engineering contract has been negotiated and was approved by the Board of Directors in July 2017.

The focus of this project is on the southern half of the urban area water system which is currently served predominantly by the Avon Street and Pantops water storage tanks. The Avon Street tank is hydraulically well connected to the Observatory Water Treatment Plant while the Pantops tank is well connected to the South Rivanna Water Treatment Plant. The hydraulic connectivity between the two tanks, however, is less than desired, creating operational challenges and reduced system flexibility. In 1987, the City and ACSA developed the Southern Loop Agreement which laid out two key phases (with the first being built at the time). The 1987 Agreement and planning efforts will service as a starting point for this current project.

15. Crozet Interceptor Pump Stations Bypass and Isolation Valves

Design Engineer:	Johnson, Mirmiran & Thompson (JMT)
Project Start:	August 2017
Project Status:	100% Design Complete, Bidding Underway
Construction Start:	August 2018
Expected Completion Date:	November 2018
Total Capital Project Budget:	$720,000

Current Status:

The Contract Documents were finalized and the project was advertised for bidding. Bids are due on July 10, 2018 with an anticipated contract award at the July Board Meeting.

History:

There are four pump stations located in the Crozet Interceptor system that help convey flow from the Crozet Area into the Morey Creek Interceptor and the rest of the urban collection system. These pump stations were constructed in the 1980s and provided no means of isolating each pump station from its downstream force main. This condition complicates maintenance-related activities as each time a pump station component needs to be serviced or replaced, the volume of wastewater within the force main must be addressed at the pump station as it drains back to the wet well. In addition, the Crozet Interceptor pump stations also have limited storage within their wet wells, and any reduction of down time as a result of dealing with the impacts of no isolation valves, decreases the amount of time available to work on the equipment. In order to alleviate this condition, temporary valves called "line stops" will be temporarily installed on the force mains downstream of the pump stations to allow enough time for a new isolation valve to be installed. Isolation valves will be located in order to provide the maximum amount of down time available based on current system conditions for future pump station maintenance activities. While line stops are in place, bypass connections will also be provided at each pump station. These will allow staff the option of bringing in bypass pumps for more significant pump station shutdowns required for maintenance activities or repairs for which the isolation valves alone cannot account.

16. Crozet Flow Equalization Tank

Design Engineer:	Schnabel Engineering
Project Start:	October 2016
Project Status:	Siting Study 100% Complete
Construction Start:	2019
Completion:	2020
Total Capital Project Budget:	$3,300,000

Current Status:

Due to procurement requirements, a work authorization with Greeley and Hansen could not be finalized. Schnabel Engineering was a part of the Greeley and Hansen design team, and it was determined that shifting primary contractual responsibilities to Schnabel Engineering was in the best interest of RWSA and the design team. Schnabel Engineering's geotechnical evaluation is a critical component to the tank design, construction and installation process. Greeley and Hansen will still have a significant role in this project as a subconsultant to Schnabel Engineering. A revised work authorization has been submitted to continue the project through construction which was approved by the Board last month.

History:

G&H has submitted a work authorization to continue the project through construction which was approved by the Board during the December meeting. G&H has completed a report documenting potential tank locations within the drainage basin. A meeting was held with ACSA on October 9, 2017 and a tank location was agreed upon for additional investigation work and preliminary engineering activities.

A Work Authorization with G&H to perform a siting study for the flow equalization tank project was issued in October 2016 and with completion expected in 2017. These services include the sizing of the flow equalization tank and the pumping station based on information from the updated model, a preliminary site selection process based on the sizing requirements identified in order to narrow down the number of sites, and an alternatives analysis performed for each selected site to evaluate the feasibility of locating the facility. This is the first step in the site selection process and will be followed by a more in depth analysis of the potential tank locations and the eventual selection of a final site. As part of the first task, pump tests are being performed at all four Crozet Pump Stations to confirm existing capacities.

Rehabilitation work in the RWSA and Albemarle County Service Authority sewer systems is on-going to meet inflow and infiltration (I&I) reduction goals in the Crozet Interceptor sewer basin based on the flow metering and modeling results of the Comprehensive Sanitary Sewer Model and Study conducted in 2006. The intent was to reduce I&I in the system to meet the 2020 two-year storm flow targets.

A 2016 update to the 2006 model was completed which evaluated the I&I reduction goals previously established and future capital project needs. Based on the results of that study, it was determined that the Crozet Interceptor system and namely the existing Crozet Pump

Stations (1 through 4) have adequate capacity to handle the 2015 peak wet weather flow from the Crozet Service Area during a two-year storm. However, as projected growth in the service area occurs, peak wet weather flows in the area under the storm conditions established in the updated model will begin to exceed the firm capacities of the pump stations by 2025. Additional I&I reductions in order to reduce flows enough to not exceed the pump station firm capacities are not feasible and as a result, the construction of a flow equalization tank was identified as the best method to alleviate wet weather capacity issues.

While the study indicates that capacity should not be an issue until 2025, a flow equalization tank would also provide a significant benefit to the maintenance of the Crozet Pumping Station system which currently lacks system storage necessary to allow adequate time to perform repairs on the pumps and the associated force mains while the system is down. As a result, it is important to progress into the siting study for the flow equalization tank to ensure that it can be constructed in time for the 2025 flow targets but also to facilitate less complicated and more thorough maintenance on the system that has not been possible previously.

17. South Rivanna Hydropower Plant Decommissioning

Consultant:	Gomez and Sullivan
Project Start:	October 2016
Project Status:	Exemption Surrender Process – Phase 2 Underway
Construction Start:	2019
Completion:	2020
Total Capital Project Budget:	$1,000,000

Current Status:

A consultation document was provided to local regulatory agencies and a meeting was held on May 21, 2018 with the agencies to discuss the decommissioning process. Minor comments were provided by those agencies and development of the surrender application for submission to FERC is underway.

History:

Work associated with the first phase of the exemption surrender process with Gomez and Sullivan and Van Ness Feldman was completed confirming with FERC what the next steps in the surrender process would include. A work authorization with Gomez and Sullivan for Phase 2 of the exemption surrender process was finalized in August 2017 and includes tasks to manage the local regulatory agencies consultation process and development of the surrender application and decommissioning plan.

RWSA constructed a hydropower plant at the South Fork Rivanna Dam in 1987. Power generation at the plant was limited for a number of years due to various mechanical issues and has been completely offline for the past four years. In December 2011, RWSA retained HDR to perform a mechanical and electrical equipment assessment and to provide recommendations for capital expenditures and continued operation. This assessment identified the need to perform a number of mechanical and electrical modifications to improve operation of the hydropower plant. On June 16, 2013, while the

plant was down for testing associated with repairs to the speed reducer and generator, the powerhouse flooded during a heavy rainfall event. A post-flood inspection indicated that the rising water damaged the electrical equipment. In addition to electrical system issues, the turbine blades were "stuck" and inoperable prior to the flood event. Prior to beginning any rehabilitation work on the hydropower plant, it was determined that a feasibility study should be performed that reviewed previous recommendations and took into account interaction with the Federal Energy Regulatory Commission (FERC) to determine if it was cost effective for RWSA to rehabilitate the facility. The feasibility study was conducted by Gomez and Sullivan and concluded that rehabilitation of the facility would most likely not provide a return on investment based on current market conditions. Staff recommended that RWSA proceed with surrendering the exemption to licensure with FERC and decommission the facility. During the meeting on October 25, 2016, the Board of Directors agreed with the recommendation and staff began to proceed with the surrender process.

18. <u>Drinking Water Infrastructure Plan – Crozet Area</u>

Design Engineer:	Hazen and Sawyer
Project Start:	June 2017
Project Status:	85% Complete
Completion:	Fall 2018
Total Capital Project Budget:	$300,000

<u>Current Status</u>:

Staff met with VDEQ and other State and Federal Agencies on March 12, 2018 to provide a pre-application project overview as well as Safe Yield and Minimum Instream Flow information. Hazen is gathering final information needed to support water supply, treatment, distribution and dam modification plans when we provide an update to the Crozet Community Advisory Committee on June 20, 2018.

<u>History</u>:

A progress meeting was completed in October, and additional meetings with the County of Albemarle Planning Department and the VADEQ are scheduled for November.

Hazen is currently reviewing RWSA and ACSA historical average and peak day water demand data, as well as County zoning and land use data, to develop water demand forecasts. RWSA staff has provided Hazen with existing data, reports and service area history to start their analysis. A design team kick-off meeting has been held, and additional meetings with county staff and the VA DEQ will be scheduled this Fall, when future demand analyses have been completed. Field investigation of hydraulic data was scheduled. Hydrant flow testing were suspended until the Drought Watch restrictions were lifted.

Preliminary meetings with an Albemarle County Board member and Community Development representatives were held in May 2017. A meeting with the Crozet Community Advisory Committee was held on June 21, 2017.

This project was previously entitled the Crozet Water Master Plan, and is identified in the current Capital Improvement Plan as such. The project name has been changed to avoid confusion with the separate Crozet Master Plan document. The Crozet water service area continues to see expanded growth in the average and maximum day water demands. Discussion with county and ACSA officials have confirmed recent growth trends that water use is increasing in Crozet. While some projects ae currently underway to address the immediate need in Crozet, this project will develop a comprehensive mid and long range plan (50 years) for the entire water system including; raw water supply, raw water pumping and conveyance, finished water treatment, finished water pumping, and finished water distribution and storage. Future water demand projections will be an important part of this project. At the June 27, 2017 Board Meeting, it was approved to award this planning project to the consulting engineering firm of Hazen and Sawyer. An Engineering Services Agreement was executed on July 5, 2017, as well as Work Authorization No. 1 for the fee of $269,120.

19. <u>Beaver Creek Dam Alterations</u>

Design Engineer:	Schnabel Engineering
Project Start:	February 2018
Project Status:	Preliminary Design and Community Outreach
Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	$20,000,000

<u>Current Status</u>:

Schnabel Engineering has completed an alternatives analysis and is awaiting selection of the desired alternative prior to completion of a Preliminary Engineering Report. Schnabel along with RWSA staff, will be presenting the dam upgrade plan to the Crozet Community Advisory Committee on June 20, 2018. An update on the project is due to DCR by June 30, 2018 along with the Operation and Maintenance Certificate renewal application.

<u>History</u>:

RWSA operates the Beaver Creek Dam and reservoir as the sole raw water supply for the Crozet Area. In 2011, an analysis of the Dam Breach inundation areas and changes to Virginia Department of Conservation and Recreation (DCR) *Impounding Structures Regulations* prompted a change in hazard classification of the dam from Significant to High Hazard. This change in hazard classification requires that the capacity of the spillway be increased. This CIP project includes investigation, preliminary design, public outreach, permitting, easement acquisition, final design, and construction of the anticipated modifications. Also included in this project are a new relocated raw water pump station and intake and a reservoir oxygenation system.

Schnabel Engineering developed three alternatives for upgrading the capacity of the Beaver Creek Dam Spillway in 2012. Following the adoption of a new Probable Maximum Precipitation (PMP) Study on December 9, 2015 and the release of DCR guidelines for

implementing the PMP study in March of 2016, RWSA determined it would proceed with an updated alternatives analysis and Preliminary Engineering Report for upgrading the dam spillway. In 2017, RWSA entered into a term contract with Schnabel Engineering for dam-related engineering services. The preliminary design work for this project is being completed under Schnabel's term contract.

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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **DAVE TUNGATE, DIRECTOR OF OPERATIONS**

REVIEWED BY: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **OPERATIONS REPORT FOR MAY 2018**

DATE: **JUNE 26, 2018**

WATER OPERATIONS:

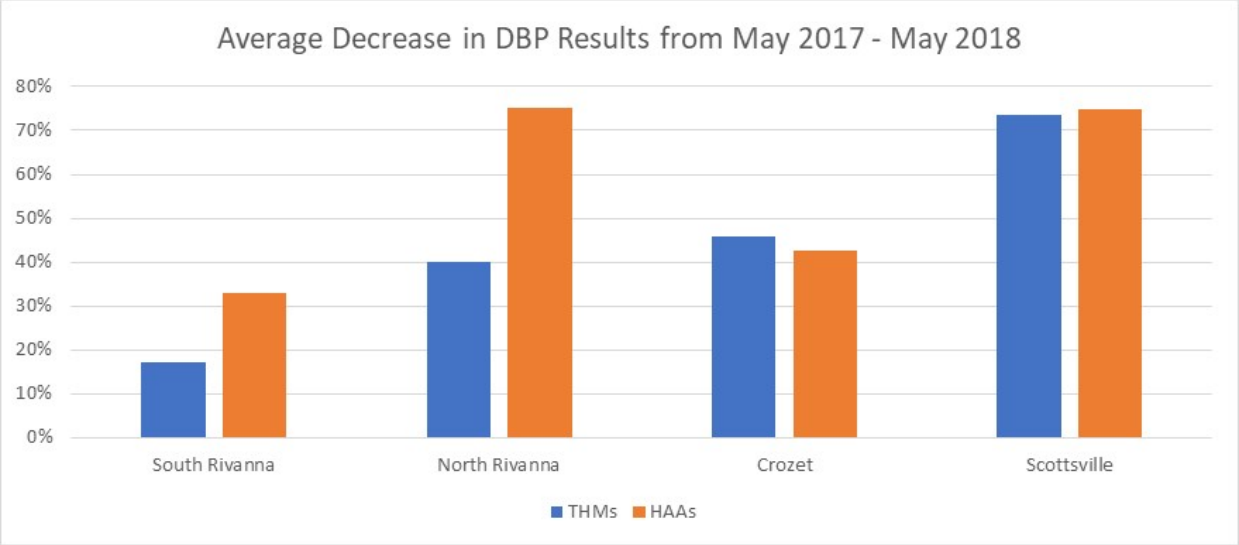
The average daily/monthly total water distributed for May 2018 was as follows:

Water Treatment Plant	***Average Daily Production (MGD)***	***Total Monthly Production (MG)***	***Maximum Daily Production in the Month (MGD)***
Observatory	1.17	36.42	---
South Rivanna	8.39	260.06	---
North Rivanna	0.36	11.08	---
Urban Total	9.92	307.56	11.27 (5/25/18)
Crozet	0.57	17.88	0.811 (5/09/18)
Scottsville	0.044	1.38	0.066 (5/13/18)
RWSA Total	10.54	326.82	---

- All RWSA water treatment facilities were in regulatory compliance during the month of May.

Status of Reservoirs (as of June 20, 2018):

- Urban Reservoirs: 100 % of Total Useable Capacity
- Ragged Mountain Reservoir is full (100%)
- Sugar Hollow Reservoir is full (100%)
- South Rivanna Reservoir is full (100%)
- Beaver Creek Reservoir is full (100%)
- Totier Creek Reservoir is full (100%)



The above graph illustrates the DBP removal percentages comparing May 2017 and May 2018 results by water treatment plant. Total Trihalomethane removal ranged from 17% at South Rivanna to 73% at Scottsville. Haloacetic acid removal ranged from 33% at South Rivanna to 75% at North Rivanna. At the time of the May 2018 sampling event, all water at Crozet, Scottsville and North Rivanna was processed through the GAC vessels. South Rivanna WTP had five of the eight GAC vessels in service and none of the GAC vessels were in service at Observatory WTP.

WASTEWATER OPERATIONS:

All RWSA Water Resource Recovery Facilities (WRRFs) were in regulatory compliance with their effluent limitations during the month of May 2018. Performance of the WRRFs in May was as follows compared to the respective VADEQ permit limits:

WRRF	***Average Daily Effluent Flow (mgd)***	***Average $CBOD_5$ (ppm)***		***Average Total Suspended Solids (ppm)***		***Average Ammonia (ppm)***	
		RESULT	***LIMIT***	***RESULT***	***LIMIT***	***RESULT***	***LIMIT***
Moores Creek	12.0	0.7	10	0.9	22	0.15	2.0
Glenmore	0.165	1.4	15	3.7	30	0.31	NL
Scottsville	0.081	4.0	25	4.9	30	0.38	NL
Stone Robinson	0.002	NR	30	NR	30	NR	NL

NR = Not Required
NL = No Limit
<QL: Less than analytical method quantitative level (2 ppm for CBOD, and 1 ppm for TSS) is reported as zero.

Nutrient discharges at the Moores Creek AWRRF were as follows for May 2018:

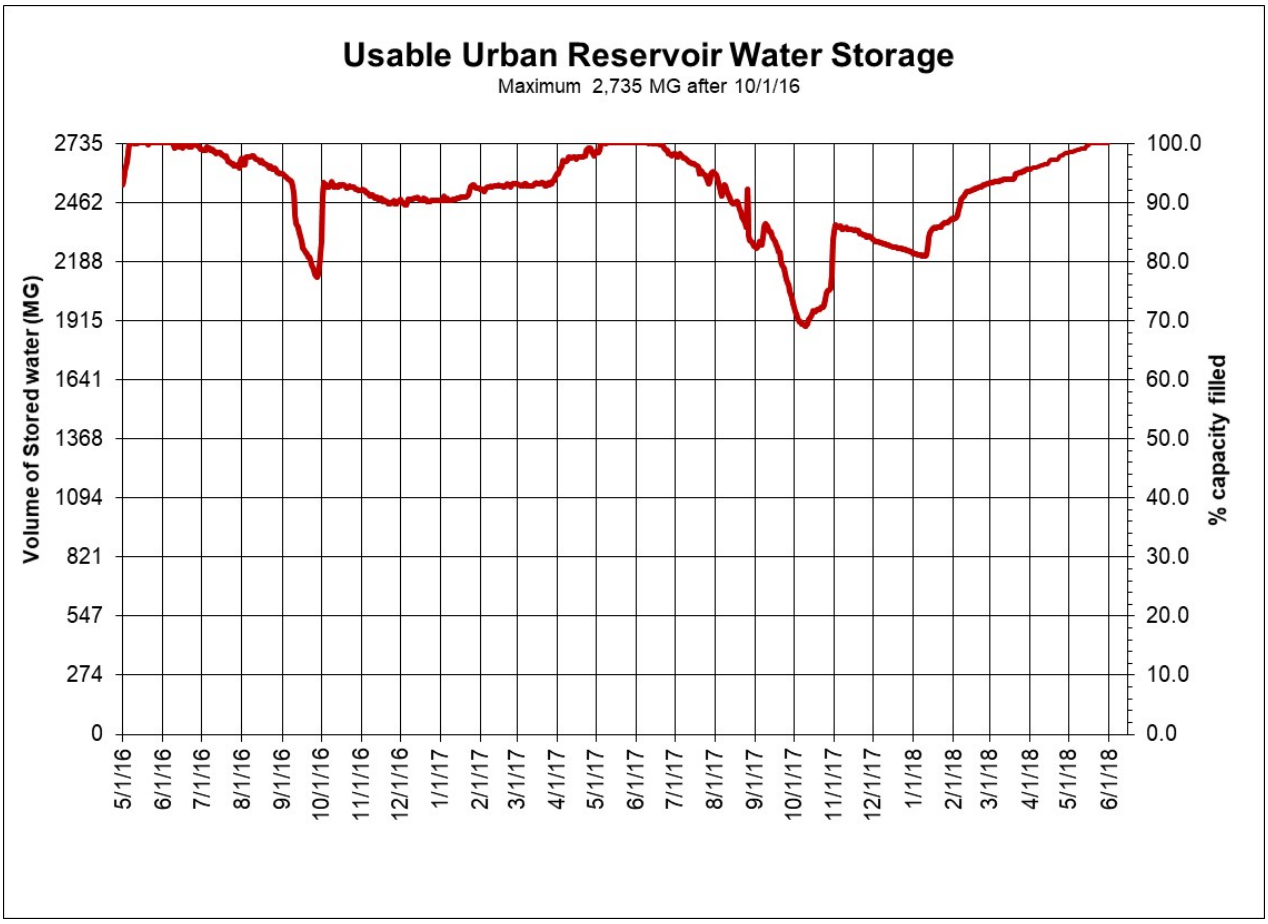
State Annual Allocation (lb./yr.)		***Average Monthly Allocation (lb./mo.)****	***Moores Creek Discharge (lb./mo.)***	***Performance as % of Average Allocation****
Nitrogen	282,994	23,583	11,709	50%
Phosphorous	18,525	1,544	371	25%

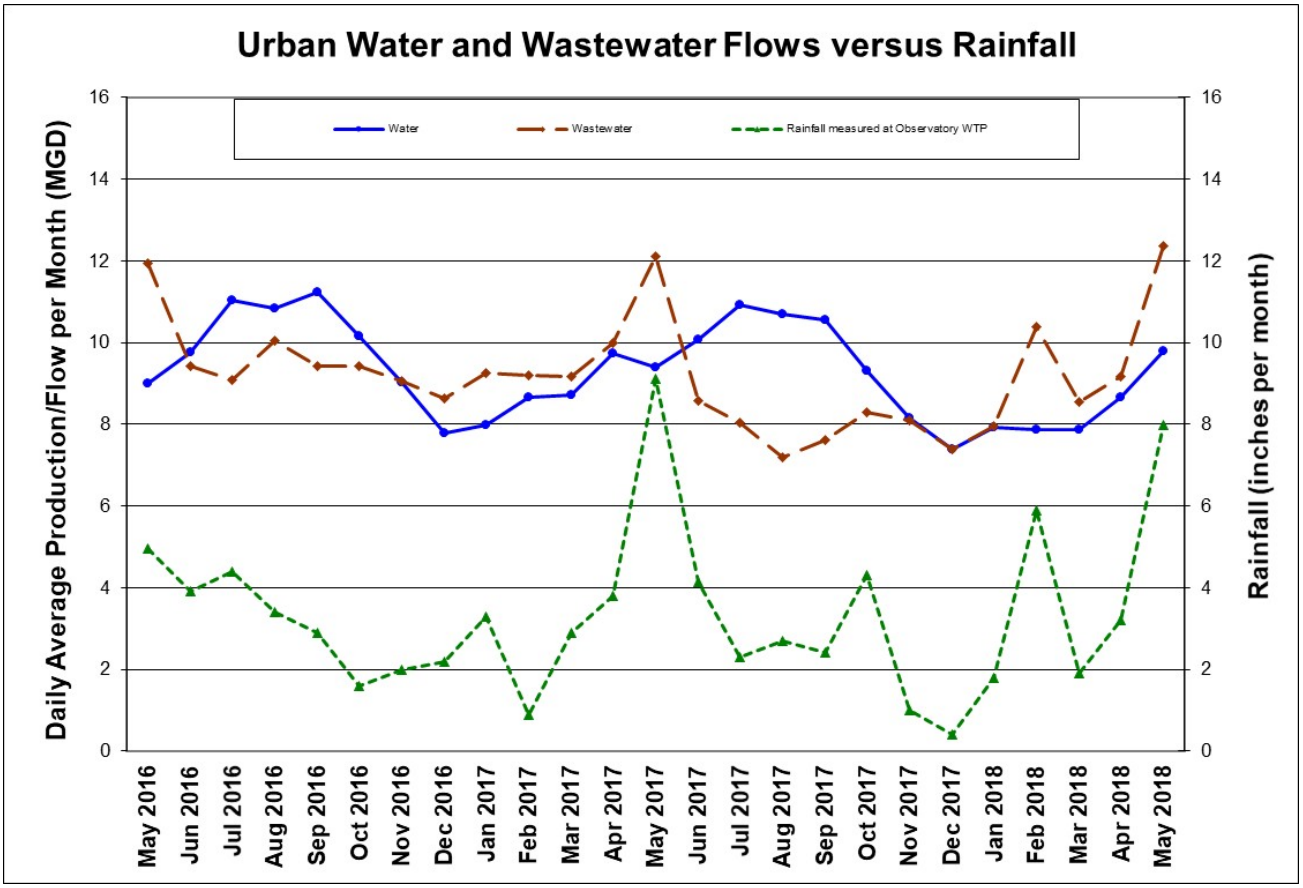
*State allocations are expressed as annual amounts. One-twelfth of that allocation is an internal monthly benchmark for comparative purposes only.

WATER AND WASTEWATER DATA:

The following graphs are provided for review:

- Usable Urban Reservoir Water Storage
- Urban Water and Wastewater Flows versus Rainfall




Urban Water and Wastewater Flows versus Rainfall
Water
Wastewater
Rainfall measured at Observatory WTP
Daily Average Production/Flow per Month (MGD)
Rainfall (inches per month)
0
2
4
6
8
10
12
14
16
May 2016
Jun 2016
Jul 2016
Aug 2016
Sep 2016
Oct 2016
Nov 2016
Dec 2016
Jan 2017
Feb 2017
Mar 2017
Apr 2017
May 2017
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Jul 2017
Aug 2017
Sep 2017
Oct 2017
Nov 2017
Dec 2017
Jan 2018
Feb 2018
Mar 2018
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May 2018

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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **FIVE-YEAR CAPITAL IMPROVEMENT PLAN (CIP) FY 2019 – 2023**

DATE: **JUNE 26, 2018**

The Five-Year Capital Improvement Plan (CIP) for FY 2019 – 2023 was introduced at the regular meeting of the Board in February 2018. In order to fund the CIP for the next five years, mainly for debt issuance purposes, it is requested that the Board take official action to approve the FY 2019 – 2023 CIP.

The Board adopted the annual Operating Budget for FY 2018-2019 and the related Rate Schedule at the May 2018 meeting. The rates and corresponding budget supports the debt service rates and revenues charges that fund the CIP.

There have been no changes to the CIP document since the February introduction. Staff will be ready to address any questions.

Board Action Requested:

Approval of the attached Five-Year FY 2019 – 2023 CIP.

Attachment

Capital Improvement Plan

Fiscal Years 2019 – 2023

DRAFT June 2018

Rivanna Water & Sewer Authority

695 Moores Creek Lane, Charlottesville, Virginia 22902

Introduction

The Capital Improvement Plan (CIP) for Fiscal Years 2019-2023 has been prepared as a strategic and financially responsible plan for the Rivanna Water and Sewer Authority (RWSA) to complete major infrastructure construction projects. The projects included in the CIP are necessary to achieve the RWSA's core mission of providing safe, high-quality drinking water and environmentally responsible wastewater treatment services for the City of Charlottesville and the Albemarle County Service Authority (ACSA). The CIP is a 5-year planning document which provides an estimated budget and schedule for projects as they advance through the design and construction process.

The infrastructure requirements of the Capital Improvement Plan are developed through our Asset Management and Master Planning programs to address water and wastewater capacity demands, regulatory mandates and rehabilitation needs. Each year, these projects are reviewed and prioritized by the RWSA management team and brought forth for review by the Board of Directors.

During the past year, several capital projects were very near completion or are no longer needed, and as such are being removed from the 2019-2023 CIP. These projects account for approximately $38.5 million or 28.3% of FY 17-21 CIP. These projects include:

- Ragged Mountain Reservoir to Observatory WTP Pipeline Condition Assessment
- Stillhouse Tank Repairs and System Improvements
- Rt. 29 Pipeline – VDOT Betterment (Rt. 29 & Berkmar)
- South Rivanna WTP Leaf Screen
- South Rivanna WTP Filter Press Rehabilitation
- Scottsville WTP High Service Pump Station Upgrade
- Rivanna Pump Station and Tunnel
- Crozet Interceptor Pump Station Automatic Bar Screens
- Moores Creek AWRRF Administration Building Repairs

The total 5-year 2019-2023 CIP is approximately $153.9 million, with the previous expenditures on active projects totaling approximately $34.0 million, leaving a net proposed 5-year projected expenditure of $119.9 million.

There are several new projects added to the CIP this year, with a total estimated expenditures of $23.31 million from 2019-2023, including:

- Ragged Mountain Reservoir to Observatory WTP Raw Water Line ($4.1 million)
- Ragged Mountain Reservoir to Observatory WTP Pump Station ($2.4 million)
- Water Demand Projection and Safe Yield Study ($0.1 million)
- South Fork Rivanna River Crossing and North Rivanna Transmission Main ($5.3 million)
- Rt. 29 Pump Station ($2.3 million)
- Urban Finished Water System Master Plan ($0.15 million)

- Maury Hill Branch Sewer Upgrade ($0.29 million)
- Crozet Interceptor Pump Station Rehabilitation ($0.53 million)
- Engineering and Administration Building ($3.0 million)
- MCAWRRRF Digester Sludge Storage Improvements ($0.265 million)
- MCAWRRF Aluminum Slide Gate Replacement ($0.470 million)
- Moores Creek AWRRF Facility Master Plan ($0.1 million)
- Moores Creek AWRRF Mechanical Thickeners ($1.2 million)
- Scottsville WRRF Grinder and Air Control Improvements ($0.1 million)
- Glenmore WRRF Secondary Clarifier Coating ($0.05 million)
- Information Technology Enhancement for Asset Management ($0.5 million)
- Security Enhancements ($2.4 million)

There are a few projects where the proposed budgets have been modified based on the anticipated project requirements and necessitate funding adjustments. The projects with changes include:

- Observatory WTP Improvements ($10.0 million existing / $18.63 million proposed)
- Interconnect Lower Sugar Hollow and Ragged Mountain Raw Water Mains ($0.225 million existing / $0.331 million proposed)
- Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter ($0.150 million existing / $0.315 million proposed)
- Wholesale Water Master Metering ($3.6 million existing / $3.2 million proposed)
- Avon to Pantops Water Main ($5.5 million existing / $13.2 million proposed)
- South Rivanna Hydropower Plant Decommissioning ($1.0 million existing / $0.4 million proposed)
- South Rivanna WTP Improvements ($5.43 million existing / $7.5 million proposed)
- Beaver Creek Dam Alteration ($6.07 million existing / $14.93 million proposed)
- Crozet WTP Expansion ($0.25 million existing / $6.9 million proposed)
- Interceptor and Manhole Repair ($1.34 million existing / $1.94 million proposed)
- Crozet Flow Equalization Tank ($3.75 million existing / $3.3 million proposed)
- Moores Creek AWRRF Odor Control Phase 2 ($10.1 million existing / $11.1 million proposed)

FINANCIAL SUMMARY

MAJOR SYSTEM CATEGORIES

FINANCIAL SUMMARY
Major System Categories – Water

	Five-Year Capital Program			Projected Future Expenses by Year						
System Description	**Current CIP**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress**
Urban Water (UW)										
Community Water Supply Plan	$2,432,558	$6,398,442	$565,249	$275,000	$870,000	$1,420,751	$1,853,000	$3,847,000	$8,831,000	$25,254
Observatory WTP & Ragged Mountain/Sugar Hollow Reservoir System	$11,315,000	$8,901,000	$1,479,198	$1,870,000	$4,128,000	$8,871,000	$3,867,802		$20,216,000	$1,042,198
Finished Water Storage/Distribution	$36,245,494	$15,190,000	$30,050,494	$1,770,000	$2,001,000	$8,067,000	$8,830,000	$717,000	$51,435,494	$21,028,805
South & North Fork Rivanna Water System	$6,430,442	$1,469,558	$302,332	$691,668	$2,411,000	$4,398,000	$97,000		$7,900,000	$82,332
Security & Technology		$1,450,000	$25,000	$210,000	$660,000	$555,000			$1,450,000	
Subtotal (UW)	$56,423,494	$33,409,000	$32,422,273	$4,816,668	$10,070,000	$23,311,751	$14,647,802	$4,564,000	$89,832,494	$22,178,589
Non-Urban Water (NUW)										
Crozet Water System	$13,839,390	$15,509,000	$7,058,095	$4,084,000	$5,056,181	$2,307,000	$8,584,000	$2,259,114	$29,348,390	$3,285,369
Scottsville Water System	$1,615,000		$1,615,000						$1,615,000	$1,216,510
Subtotal (NUW)	$15,454,390	$15,509,000	$8,673,095	$4,084,000	$5,056,181	$2,307,000	$8,584,000	$2,259,114	$30,963,390	$4,501,879
WATER TOTAL	$71,877,884	$48,918,000	$41,095,368	$8,900,668	$15,126,181	$25,618,751	$23,231,802	$6,823,114	$120,795,884	$26,680,468

FINANCIAL SUMMARY
Major System Categories – Wastewater

	Five-Year Capital Program			Projected Future Expenses by Year						
System Description	**Current CIP**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress**
Urban Wastewater (UWW)										
Wasterwater Interceptors and Pumping Stations	$13,095,324	($1,214,324)	$1,610,945	$2,187,000	$3,053,385	$3,672,670	$822,000	$535,000	$11,881,000	$342,401
Moores Creek AWRRF	$13,513,000	$6,051,151	$13,513,000	$1,751,151	$215,000	$1,210,000	$1,375,000	$1,500,000	$19,564,151	$6,944,485
Security & Technology		$1,450,000	$25,000	$210,000	$660,000	$555,000			$1,450,000	
Subtotal (UWW)	$26,608,324	$6,286,827	$15,148,945	$4,148,151	$3,928,385	$5,437,670	$2,197,000	$2,035,000	$32,895,151	$7,286,886
Non-Urban Wastewater (NUWW)										
Scottsville WRRF		$100,000			$30,000	$70,000			$100,000	
Glenmore WRRF	$61,000	$50,000		$25,000	$25,000	$61,000			$111,000	
Subtotal (NUWW)	$61,000	$150,000		$25,000	$55,000	$131,000			$211,000	
WASTEWATER TOTAL	$26,669,324	$6,436,827	$15,148,945	$4,173,151	$3,983,385	$5,568,670	$2,197,000	$2,035,000	$33,106,151	$7,286,886
TOTAL	$98,547,208	$55,354,827	$56,244,313	$12,973,819	$19,109,566	$31,287,421	$25,428,802	$8,858,114	$153,902,035	$33,967,349

PROJECT DETAILS

Completed Projects

During fiscal years 2017 and 2018, several capital improvement projects were completed, were advanced to the final phases of close-out, or were determined to be no longer necessary. As such they will be removed from consideration in future planning documents. Presented in the table below are the twelve (12) completed projects, pertinent information on the adopted budgets, as well as the projected final costs and any anticipated savings. There was a total completed projects cost savings of $1.8 million.

4. Ragged Mountain Reservoir to Observatory Water Treatment Plant Pipeline Condition Assessment: The 18-inch Ragged Mountain and Lower Sugar Hollow raw water pipelines run in parallel to each other from the Ragged Mountain Reservoir to the Observatory Water Treatment Plant. These pipelines are constructed mostly of cast iron and are 109 and 71 years old, respectively. Originally an assessment was planned to update information on the condition of these pipelines and aid in planning for future conveyance of raw water from Ragged Mountain to the urban areas. This project included using non-destructive acoustic technologies to identify existing leaks and remaining pipe wall thickness as well as to determine the remaining service of these pipelines. Due to the addition of replacement pipe in the CIP, this project is no longer required.

11. Stillhouse Tank Repairs and System Improvements: The Stillhouse Mountain pressure zone currently has one ground storage tank with a capacity of 0.70 million gallons. This project focused on structural improvements and interior painting, consisting of removal and replacement of the tank roof rafters, repainting of the tank interior, and other ancillary items. The project budget included design, bid-phase services, construction, and construction administration and inspection services. Construction of the tank improvements were completed fall of 2016.

14. Rt. 29 Pipeline – VDOT Betterment (Rt. 29 & Berkmar): The VDOT Rt. 29 Solutions projects include widening of Rt. 29 (Seminole Trail) from a four-lane divided highway to a six-lane divided highway from Polo Grounds to Town Center Drive at Hollymead Town Center. Improvement of this 1.8-mile-long section required relocation of RWSA's existing 12-inch cast iron water main for the entire length of the project. RWSA had previously identified through master planning that a 24-inch water main will be needed from the South Rivanna Water Treatment Plant to Hollymead Town Center to meet future water demands. This project included the betterment cost to have VDOT and its Design-Build Contractor relocate the existing 12-inch water main as a 24-inch water main as well as funds to construct a section of 24-inch waterline adjacent to the new Berkmar Drive Extension for future use. Construction began in December 2016 and was completed in summer 2017. This project also includes funding for an update to the Airport Zone Study report by Michael Baker International to reassess future water system needs and update cost estimates for the North Rivanna Service Area.

17. South Fork Water Treatment Plant Leaf Screen: At the South Rivanna Water Treatment Plant, the raw water pump station and intake are integral to the dam and abutments. Water flows through a bar screen and then a mechanical band screen (leaf screen) into the raw water

pump station wet well. The existing leaf screen was original to the 1964-1965 construction. Historically, the mechanical screen has been quite reliable, but recently had allowed significant debris to enter and damage the raw water pumps. An evaluation of the leaf screen determined that it has reached the end of its service life and needed to be replaced. Likewise, a detailed alternative analysis determined that the most cost-effective approach is to fabricate and install a replacement mechanical band screen. Design of a replacement leaf screen began in June 2016 and construction was completed in July 2017.

18. South Fork Water Treatment Plant Filter Press Rehabilitation: The South Rivanna Water Treatment Plant belt press is used to dewater sludge removed from the water treatment train. The current belt press has been in continuous operation since 1992. This project was to perform a complete factory overhaul to ensure reliable service and to preempt potential future mechanical failures. The project was completed in June 2017.

23. Crozet Ground Storage Tank Repairs and Upgrades: The 500,000-gallon Crozet Ground Storage Tank serves as the wet well for the finished water pumps at the Crozet Water Treatment Plant as well as one of two water storage tanks in the Crozet Service Area. A routine inspection of the Crozet Tank in April of 2012 revealed several deformed roof rafters, indicating the potential for structural deficiency. An in-depth structural inspection was performed in January 2013 and a list of recommended roof repairs provided. In addition to the structural repairs and other ancillary work, the project also included repainting of the tank interior and installation of an active mixing system to improve system-wide water quality by increasing circulation and minimizing tank stratification. The project budget included consultant services for design and bidding of necessary roof repairs and other ancillary items, as well as construction, construction administration, and inspection services. Construction of the tank improvements began in the spring of 2016 and was completed in the summer of 2016.

24. Crozet Water Treatment Plant - Miscellaneous Repairs: Staff identified several repairs needed within the Crozet water system within the next two years. These items have been consolidated into a single project and include new stem guides, valves and trash racks at the raw water pump station, a new backwash supply pump, a new overflow pipe for the backwash tank, and new walkways and handrails. The work anticipated within this project has been combined into the Crozet WTP upgrade project and therefore is no longer needed as a separate project.

29. Scottsville High Service Pump Station Upgrades: Currently, the high service pumps at the Scottsville water treatment plant pump water to the RWSA Scottsville Storage Tank and then an ACSA booster station pumps water to the ACSA tank, which serves the majority of the Scottsville service area. This project was to evaluate and replace the high service pumps at the Scottsville WTP so that water can be pumped directly from the WTP to the ACSA tank, eliminating the need for the ACSA booster pump station and the RWSA Scottsville Storage Tank. Based on preliminary feedback from ACSA, this project has been eliminated from further consideration and the correct configuration will remain.

31. Rivanna Pump Station and Tunnel: Pumping capacity between the Rivanna Interceptor in Riverview Park and the Moores Creek Advanced Water Resource Recovery Facility required expansion for wet weather peak flow, from a capacity of 24.5 mgd to a firm capacity of 53

mgd in accordance with RWSA's DEQ Consent Order. Following a lengthy public process and study of alternatives, the RWSA Board selected to move forward with a final design in December 2011. The project included construction of approximately 1,620 linear feet of a tunnel with a tunnel-boring machine which will connect the existing Rivanna Interceptor in Riverview Park to a new pump station located on the RWSA MCAWRRF property. The final design included pumps capable of delivering a peak pumping rate equivalent to 53 mgd, electrical gear, influent grinders, self-cleaning wet well, air collection for odor control, back-up power generation, SCADA control and integration, tie-ins to the existing systems, site and permitting work, storage building demolition and electrical relocation work, as well as architectural, structural and mechanical systems. The existing pump station at the entrance to Riverview Park was demolished once the new pump station and tunnel were complete and in service. Construction began in March 2014 and was completed in late summer 2017.

35. Crozet Interceptor Pump Station Automatic Bar Screens: There are currently two automatic bar screens at Crozet Pump Station No. 4. These units were original to the pump station which was constructed in the mid-1980s. Prior to 2014, one of the units was operational, with the second unit no longer serviceable. The first screen was replaced as part of the CIP in 2014. This project involved replacement of the second unit in summer 2017.

38. Moores Creek AWRRF Administration Building Repairs: The RWSA Administration Building was constructed in 1978 as part of the Moores Creek wastewater treatment facility, with the addition of an elevator and office space in 1995. Over the past several years there have been several significant building maintenance issues. As a result, in October 2012, staff commissioned an architectural, mechanical, electrical, and plumbing evaluation of the building, which identified several near, mid, and long-term repair needs. This project included the replacement of the entire roof with a standing seem aluminum material, gutter and downspout replacement, electrical circuit mapping and rewiring, window replacement, and building exterior painting which have been capitalized via completed projects.

Completed Projects

		Five-Year Capital Program			
No.	**Project Description**	**Adopted Budget 3/2017**	**Previous Expenditures (7/1/2017)**	**Final Projected Costs**	**Savings**
4	Ragged Mountain Reservoir to Observatory Water Treatment Plant Pipeline Condition	$285,000			$285,000
11	Stillhouse Tank Repairs and System Improvements	$600,000	$51,397	$362,466	$237,534
14	Rt. 29 Pipeline - VDOT Betterment (Rt. 29 & Berkmar)	$2,900,000	$1,714,749	$2,600,000	$300,000
17	South Fork Water Treatment Plant Leaf Screen	$471,000		$432,086	$38,914
18	South Fork Water Treatment Plant Filter Press Rehabilitation	$150,000		$165,242	($15,242)
23	Crozet Ground Storage Tank Repairs and Upgrades	$351,610	$30,922	$315,739	$35,871
24	Crozet Water Treatment Plant Miscellaneous Repairs	$105,890			$105,890
29	Scottsville High Service Pump Station Upgrades	$100,000			$100,000
31	Rivanna Pump Station and Tunnel	$32,200,000	$30,040,496	$31,500,000	$700,000
35	Crozet Interceptor Pump Station Automatic Bar Screens	$75,000		$75,000	
38	Moores Creek AWRRF Administration Building Repairs	$84,746		$38,591	$46,155
	TOTAL	$37,323,246	$31,837,564	$35,489,124	$1,834,122

CIP 17-21 Total	**CIP 17-21 Completed**	**CIP 19-23 Remaining**	**CIP 19-23 New Funding**	**CIP 19-23 New Total**
$135,870,454	($37,323,246)	$98,547,208	$55,354,827	$153,902,035

Community Water Supply Plan

The Community Water Supply Plan represents the program developed with substantial community input to fulfill RWSA's contractual obligation to the City of Charlottesville (City) and the Albemarle County Service Authority (ACSA) to provide adequate drinking water for their future needs. An initiative started in 2003 to find a long-term solution that could achieve both local support and meet federal and state requirements. After multiple community meetings, updates with local officials, and frequent consultations with federal and state agencies, local support was obtained to apply for federal and state permits to expand the Ragged Mountain Reservoir and build a future pipeline between the South Rivanna and Ragged Mountain Reservoirs, with stream and wetlands mitigation to be provided through property in the Buck Mountain Creek area and property adjacent to a lower reach of Moores Creek near its confluence with the Rivanna River. Federal and state permits were granted in 2008, and amended in 2011.

The first phase of this long-term program centered around the expansion of the Ragged Mountain Reservoir, a project that would simultaneously address a legal obligation to correct safety deficiencies on the existing site. Through a combination of technical investigations, engineering evaluations, and continued public discussion, a decision was reached in February 2011 through the City Council and Board of Supervisors to build the new dam as an earthen dam, with the initial phase raising the reservoir pool height by 30 feet. The decision also outlined an objective of the further pursuit of water conservation through the City and ACSA, and the pursuit of opportunities for dredging of the South Rivanna Reservoir, with the second phase of reservoir expansion in the future as necessary.

Project Descriptions:

1. South Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way: The approved 50-year Community Water Supply Plan includes the future construction of a new raw water pipeline from the South Rivanna River to the Ragged Mountain Reservoir. This new pipeline will replace the Upper Sugar Hollow Pipeline along an alternative alignment to increase raw water transfer capacity in the Urban Water System. The preliminary route for the pipeline followed the proposed Route 29 Charlottesville Bypass; however, the Bypass project was suspended by VDOT in 2014, requiring a more detailed routing study for the future pipeline. This project includes a routing study, preliminary design and preparation of easement documents, and acquisition of water line easements along the approved route. Prior expenditures covered a review of the 2009 conceptual design that was requested by the Board.

2. South Rivanna Reservoir Dredging: The South Rivanna Reservoir stores raw water for treatment at the South Rivanna Water Treatment Plant and in the future, is proposed to provide water for transfer to the enlarged Ragged Mountain Reservoir. River flow into the reservoir is from a drainage area, almost entirely within Albemarle County, of approximately 259 square miles. Soil erosion from natural events, from land use in the agricultural area, from land disturbances in the developed areas, and from re-suspension of flood plain deposits created during the 19th century (stream bank erosion), are likely the causes of sediment becoming trapped within the reservoir. The initial design of the reservoir anticipated the accumulation of

these sediments, and a significant portion of the total storage volume was designated for this purpose. Currently the sediment stored does not exceed the available capacity.

The January 2012 Ragged Mountain Dam Project Agreement outlines that "the City and ACSA agree to direct, and RWSA agrees, to perform such dredging projects at the South Fork Rivanna Reservoir as may be specified jointly by the City and ACSA pursuant to the Water Cost Allocation Agreement." The Cost Allocation Agreement stipulates that target maintenance dredging shall be performed, and that the dredging be market driven, cost effective, and opportunistic and shall not exceed $3.5M. In 2012 and 2013, RWSA, via the Public-Private Education Facilities and Infrastructure Act (PPEA) process, solicited proposals to provide maintenance dredging. In July 2013, the one qualified PPEA proposer withdrew its proposal, citing difficulties in obtaining necessary land agreements.

Future Board decisions on the project contracting approach will dictate the next steps. This project remains in the CIP as the fulfillment of a contractual obligation from the January 2012 Ragged Mountain Dam Cost Allocation Agreement, and RWSA counsel has offered an opinion that consent to amend the Agreement from the City and ACSA is required before the RWSA Board amend or cancel the project.

3. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line: Raw water is transferred from the Ragged Mountain Reservoir (RMR) to the Observatory Water Treatment Plant by way of two 18-inch cast iron pipelines, which have been in service for more than 110 and 70 years respectively. The increased frequency of emergency repairs and expanded maintenance requirements are one impetus for replacing these pipelines. The proposed water line will be able to reliably transfer water to the expanded Observatory plant, which will have the capacity to treat 10-12 million gallons per day (mgd). The new pipeline is expected to be constructed of 36-inch ductile iron and will be on the order of 14,000 feet in length. The opportunity to integrate the Observatory WTP raw water supply line with the proposed South Rivanna Reservoir to RMR raw water main project is currently being investigated as part of the approved 50-year Community Water Supply Plan.

4. Ragged Mountain Reservoir to Observatory Raw Water Pump Station: The Ragged Mountain Reservoir (RMR) to Observatory WTP raw water pump station is planned to replace the existing Stadium Road and Royal pump stations, which in part have exceeded their design lives or will require significant upgrades with the Observatory WTP expansion. The pump station will pump up to 10 mgd to the Observatory WTP. Integration of the new pump station with the planned South Rivanna Reservoir (SRR) to RMR pipeline is being considered in the interest of improved operational and cost efficiencies. An integrated pump station would also include the capacity to transfer up to 16 million gallons per day (mgd) of raw water from RMR back to the SRR WTP. The location of this pump station will be recommended as part of the SRR to RMR raw water main preliminary engineering study, which is currently under way.

Community Water Supply Plan

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
1	South Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way	$2,295,000		$565,249	$275,000	$870,000	$584,751			$2,295,000	$25,249
2	Rivanna Reservoir Dredging	$137,558	($127,558)				$10,000			$10,000	
3	Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line		$4,116,000				$426,000	$1,453,000	$2,237,000	$4,116,000	
4	Ragged Mountain Reservoir to Observatory Raw Water Pump Station		$2,410,000				$400,000	$400,000	$1,610,000	$2,410,000	
	TOTAL	$2,432,558	$6,398,442	$565,249	$275,000	$870,000	$1,420,751	$1,853,000	$3,847,000	$8,831,000	$25,249

Observatory WTP and Ragged Mountain/Sugar Hollow Reservoir System

The Observatory Water Treatment Plant (WTP) and Ragged Mountain/Sugar Hollow Reservoir System is comprised of the water treatment facility on Observatory Mountain and the associated raw water infrastructure that stores and conveys source water to the plant. The raw water storage system includes the new Ragged Mountain Dam (constructed in 2014, with a useable raw water storage capacity of 1.5 billion gallons) and the Sugar Hollow Dam (originally constructed in 1947, upgraded in 1999 and downstream discharge improvements completed in September 2014, with a useable raw water storage capacity of 339 million gallons as updated by a 2015 bathymetric survey). The system also includes 17.6 miles of 18-inch raw water cast-iron mains, originally installed in 1908, 1922, and 1946. The Sugar Hollow Raw Water Main historically conveyed water from the Sugar Hollow Dam to the Observatory Water Treatment Plant, however, as a result of the New Ragged Mountain Dam project, the main now discharges directly into Ragged Mountain Reservoir. The remaining downstream section of the Sugar Hollow main now conveys raw water from the Ragged Mountain Reservoir to the treatment plant. The line crosses the Mechums River (where an abandoned pumping station is sited) on its way to Ragged Mountain Reservoir, and eventually passes through the Royal Pumping Station and terminates at the Observatory WTP. The Ragged Mountain Raw Water Main conveys water from the Ragged Mountain Reservoir through the Stadium Road Pumping Station and terminates at the Observatory Water Treatment Plant.

Project Descriptions:

5. Observatory Water Treatment Plant Improvements: The Observatory Water Treatment Plant is the oldest of the three urban plants. Early planning for the Community Water Supply envisioned that the plant would undergo a wholesale upgrade. This upgrade will concentrate on specific improvements to critical elements, identified by a Needs Assessment Study as improvements to the flocculators, filters, sedimentation basins, and chemical feed facilities to enhance future reliability. In addition, the existing reinforced concrete flume, which conveys treated water from the sedimentation basins to the filters, is in need of repair or possible replacement. Also, old piping control valves will be replaced and modernized, as well as upgrading electrical and SCADA control systems.

   The Observatory Water Treatment Plant was originally constructed in the mid-1950s. Since that time very little has been replaced or upgraded at the facility. The sixty-year-old facility has much of the original equipment that is inefficient, prone to unexpected failure, and does not have readily accessible replacement parts. A portion of the project was completed in the 2016-2017 fiscal year. The flocculator systems were completely upgraded with new mechanical and electrical equipment, including variable speed motor drives for optimum efficiency. The upgraded flocculators have been in service since May 2017.

   In addition to providing needed equipment upgrades, the existing plant will also be considered for an upgrade in capacity. Upgrading the plant capacity during the proposed construction project may be economically feasible and beneficial. In order to determine the feasibility of a capacity upgrade, it will be necessary to thoroughly study all aspects of the treatment plant process, including raw water and finished water conveyance to and from the plant. This analysis will be performed in a detailed Preliminary Engineering Report (PER) as part of the

initial engineering for the project. Current funding assumes a future 10 million gallon a day capacity.

It should be noted that the Observatory Water Treatment Plant is sited on land leased to RWSA by the University of Virginia. The terms of the existing lease expire on April 17, 2021. Prior to construction of the remaining improvements, the terms of a new lease may be needed with RWSA and the University as participants. The new lease is currently under negotiation.

6. Interconnect Lower Sugar Hollow and Ragged Mountain Raw Water Mains: The two 18-inch water mains that supply water from Ragged Mountain Reservoir to Observatory Water Treatment Plant are 72 and 110 years old, respectively. The mains are interconnected at the top of the Ragged Mountain Dam, with one serving the 1920's Royal Pump Station and the other serving the more modern Stadium Road Pump Station. Both pump stations provide water to the Observatory Water Treatment Plant. This project will interconnect the two raw water lines near the Rt. 29/Fontaine Avenue interchange, which will provide improved reliability and operability during raw water line maintenance or repairs prior to the anticipated construction and completion of the new replacement line.

7. Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter: The Sugar Hollow raw waterline is an 18-inch diameter cast iron pipeline which conveys water from Sugar Hollow Reservoir to Ragged Mountain Reservoir. The pipe discharges directly into the Ragged Mountain Reservoir is used to supplement inflow. Currently, the control valve to regulate flow between the two reservoirs is located near the old Gatekeeper's House at Sugar Hollow dam. The valve is a manual gate valve which requires RWSA staff to travel to the Sugar Hollow dam in order to operate it. In addition, there is currently no flow meter equipment in place to monitor and record flow transferred between the two reservoirs. This project proposes to install a new 18-inch flow meter, a modulating control valve, and new power and SCADA control wiring, to provide the means to regulate the flow between the two reservoirs. The new equipment will allow remote operation via SCADA from the RWSA water treatment plants. This project will allow RWSA staff to efficiently and remotely maintain the two reservoirs at optimal levels. In addition to this work, an old 18-inch diameter gate valve will be replaced or repaired, two abandoned out-buildings and a house will be demolished and removed.

8. Sugar Hollow Dam – Rubber Crest Gate Replacement & Intake Tower Repairs: In 1998 the Sugar Hollow Dam underwent a significant upgrade to improve structural stability and spillway capacity. The original metal spillway gates were replaced with a manufactured five-foot-high inflatable rubber dam that is bolted to the existing concrete structure. This rubber dam allows for the normal storage of water in the reservoir with the ability to be lowered during extreme storm events. The rubber dam has an approximate service life of twenty years and is therefore now due for replacement. The aging intake tower structure will be inspected and evaluated. Recommended repairs may include issues relating to the intake gate valves and tower walls, including repair or replacement of intake trash racks, and sealing/grouting of minor concrete wall cracks.

Observatory Water Treatment Plant and Ragged Mountain/Sugar Hollow Reservoir System

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
5	Observatory Water Treatment Plant Improvements	$10,000,000	$8,630,000	$1,207,198	$1,441,000	$3,655,000	$8,459,000	$3,867,802		$18,630,000	$1,042,198
6	Interconnect Lower Sugar Hollow and Ragged Mountain Raw Water	$225,000	$106,000	$91,000	$240,000					$331,000	
7	Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter	$150,000	$165,000	$181,000	$134,000					$315,000	
8	Sugar Hollow Dam - Rubber Crest Gate Replacement & Intake	$940,000			$55,000	$473,000	$412,000			$940,000	
	TOTAL	$11,315,000	$8,901,000	$1,479,198	$1,870,000	$4,128,000	$8,871,000	$3,867,802	$0	$20,216,000	$1,042,198

Finished Water Storage/Transmission – Urban System

The urban finished water storage and transmission system serves to provide transmission of treated water from the three RWSA water plants (Observatory, South Rivanna, and North Rivanna Rivanna) to the distribution networks of the Albemarle County Service Authority, the City of Charlottesville, and the University of Virginia. The system includes approximately 40 miles of pipeline, six water storage tanks: Avon Street (2 MG), Pantops (5 MG), Piney Mountain. (0.7 MG), Stillhouse (0.7 MG), Observatory (3 MG), and Lewis Mountain (0.5 MG), and the Alderman Road and Stillhouse pumping stations.

Project Descriptions:

9. Rt. 29 Pump Station Site Acquisition: This project provided site acquisition for a new Rt. 29 Pump Station and Storage Tank to be built at a later time in the general area south of Airport Road and north of Hollymead Towncenter on TMP No. 32-41 as identified in the Albemarle County Comprehensive Plan. The future pump station and tank, along with a new transmission pipeline between the proposed pump station and the South Rivanna Water Treatment Plant, will provide an interconnection between the areas presently served by the South Rivanna Water Treatment Plant and the North Rivanna Water Treatment Plant. The interconnection is needed for redundancy of service in the event of an emergency, during drought conditions, and to adequately serve the growing needs of the 29 area generally north of the Forest Lakes subdivision. Multiple meetings and negotiations took place with the property's land owner in an effort to acquire the needed property. The negotiations were not successful, and the property was acquired through condemnation proceedings authorized at the May 2017 RWSA Board Meeting. Final legal proceedings are anticipated to be completed by the end of FY 2018.

10. Valve Repair - Replacement (Phase 2): Isolation valves are critical for normal operation of the water distribution system and timely emergency response to water main breaks. Staff continuously review results from an ongoing valve exercising and condition assessment program. his project will replace the highest-priority valves that are identified during the condition assessment as not operable and not repairable.

11. Urban Water Granular Activated Carbon and Water Treatment Improvements: The U.S. Environmental Protection Agency (EPA) regulates maximum contaminant levels (MCL) for total trihalomethanes (THMs) and haloacetic acids (HAAs) in drinking water under the Disinfectant/Disinfection Byproducts Rule (D/DBPR). In the early 1990s Stage 1 of the rule was implemented and RWSA, ACSA and the City of Charlottesville are in compliance with Stage 1. Stage 2 of the D/DBPR was to be effective for the Urban distribution system in October 2012, but the three agencies obtained a two-year extension that shifted the implementation to October 2014. The Stage 2 D/DBPR involved a major change in how THM and HAA levels are calculated and is more stringent than the Stage 1 requirements. A study concluded that complete compliance with the Stage 2 D/DBPR cannot be met consistently with minor modification of existing processes but would instead require significant capital improvements.

    In July 2012, the Board decided to pursue the installation of Granular Activated Carbon (GAC) contactors to achieve Stage 2 D/DBPR compliance in the Urban System. The GAC will adsorb

organic matter from the water, thereby reducing the precursors to THMs and HAAs. As decided by the Board in December 2013, the GAC systems have been sized at a lower capacity than the current rated plant capacities (the "Hybrid GAC" approach). The GAC contactors are expected to be on-line and operational by the end of 2017, after the EPA-mandated compliance date. For the interim, a Risk Reduction Plan was developed, outlining interim methods to reduce trace natural organic matter from the source water thereby reducing DBPs. This project budget includes $631,000 to fund the capital needs of the Risk Reduction Plan. The plan includes installation of Powder Activated Carbon (PAC) feed systems at various treatment plants. The PAC treatment is adequate treatment for the new regulations in the interim time period before GAC completion. The PAC systems were completed in 2015, and are currently in operation as needed.

Also included in the Urban Water GAC project are various improvements at the South Rivanna WTP including construction of additional clearwell storage, replacement of the lime feed system, upgrades to the filter underdrains and backwash system, replacement of the filter media, sound attenuation and ventilation improvements for the high service pump station, installation of a variable frequency drive for the raw water pump station, installation of a new raw water flow meter and several improvements to the residuals management facilities. Included in the Urban Water GAC project are various improvements at the North Rivanna WTP including new filter control valves, new pump control valves, new filter sludge removal equipment, new electrical system upgrades throughout the plant, and the installation of a surge relief mechanism. The final site included in this project is the Observatory WTP with various improvements such as a new chlorine contact tank, improved potable water service piping to the filter building and upgraded finished water discharge piping. Construction of the projects started in late 2015 and will be complete mid-2018.

12. Wholesale Water Master Metering: The January 2012 Water Cost Allocation Agreement designated how the City of Charlottesville (City) and ACSA share in the financing of the New Ragged Mountain Dam project. Within the agreement is a general provision developed by the ACSA and City to enhance measurement of the water usage by each of the distribution agencies. In an effort to meet this obligation, the RWSA Board of Directors authorized staff in August of 2012 to complete an engineering study on metering plan alternatives. The study identified several alternatives for a metering plan based on combinations of metering and estimating methodologies. A Jurisdictional Approach was recommended which included installation of water meters at locations at the City/county corporate boundary plus one meter at each of the three urban water treatment plants. At its September 2013 meeting the Board directed that staff proceed with the Jurisdictional Coverage Approach. The final design includes 25 remote meter locations plus the three finished water flow meters at the water treatment plants. This project budget includes preliminary and final project design, right-of-way acquisition and negotiations, legal fees and permitting, bid-phase services, construction, and construction administration and inspection services. Construction of the 25 remote meter locations began in early 2016 and is expected to be completed in mid-2018. The three finished water flow meters were installed in 2015 as part of the Urban Water Granular Activated Carbon Project.

13. Piney Mountain Tank Rehabilitation: The 700,000-gallon Piney Mountain Tank serves the North Rivanna pressure band. A routine inspection of the Piney Mountain Tank revealed several deformed roof rafters, indicating the potential for structural deficiency. An in-depth structural inspection was performed and a list of recommended roof repairs provided. This project includes consultant services for design and bidding of necessary roof repairs and other ancillary items, as well as construction, construction administration, and inspection services. Long term plans for the Rt. 29 service area include the modification or elimination of this facility. The current recommended improvements are needed to maintain the existing tank in service for at least the next 10 years.

14. Avon to Pantops Water Main: The southern half of the Urban Area water system is currently served by the Avon Street and Pantops storage tanks. The Avon Street tank is hydraulically well connected to the Observatory Water Treatment Plant while the Pantops tank is well connected to the South Rivanna Water Treatment Plant. The hydraulic connectivity between the two tanks, however, is less than desired, creating operational challenges and reducing system flexibility. In 1987, the City and ASCA developed the Southern Loop Agreement, outlining project phasing and cost allocations, as envisioned at the time. The first two phases of the project were constructed shortly thereafter. The third phase, known as the "Eastern Branch" is the subject of the current project. The initial funding for this project is to prepare an updated routing study and Preliminary Engineering Report to identify the scope, phasing, route and cost of the project, and a consultant has been selected for this work to begin in fall 2017. Additional funding is to perform design, easement acquisition and to begin construction.

15. Water Demand Projection and Safe Yield Study: In January 2012, the City of Charlottesville, Albemarle County Service Authority, and RWSA entered into the Ragged Mountain Dam Project Agreement. Within the agreement are provisions to monitor the bathymetric capacity of the Urban water reservoirs as well as a requirement to conduct reoccurring demand analysis, demand forecasting and safe yield evaluations. The bathymetric survey of the South Rivanna Reservoir and the Ragged Mountain Reservoir are currently funded in the FY2019 O&M Budget. Subsequent to collecting the reservoir survey data, this study will evaluate and calculate current and future demands and present safe yield. Per the project agreement, these analyses shall be completed by calendar year 2020.

16. South Rivanna River Crossing and North Rivanna Transmission Main: RWSA has previously identified through master planning that a 24-inch water main will be needed from the South Rivanna Water Treatment Plant (SRWTP) to Hollymead Town Center to meet future water demands. Two segments of this water main were constructed as part of the VDOT Rt. 29 Solutions projects, including approximately 10,000 LF of 24-inch water main along Rt. 29 and 600 LF of 24-inch water main along the new Berkmar Drive Extension, behind the Kohl's department store. To complete the connection between the SRWTP and the Airport Road Pump Station Site, RWSA plans to construct a new river crossing at the South Fork Rivanna River and two "gap" sections of 24-inch water main between the already completed sections. Much of the new water main route is within VDOT right-of-way; however, acquisition of right-of-way will be required at the river crossing and on the Kohl's Property at Hollymead Town

Center. This project includes funding for construction as well as engineering design, easement acquisition, bid-phase services, and construction administration and inspection services.

17. Rt. 29 Pump Station: The Rt. 29 Pipeline and Pump Station master plan was developed in 2007 and originally envisioned a multi-faceted project that reliably connected the North and South Rivanna pressure bands; reduced excessive operating pressures, and developed a new Airport pressure zone to serve the highest elevations near the Airport and Hollymead Town Center. The master plan is currently being updated to reflect the changes in the system and demands since 2007. This project, along with project 15 above will provide a reliable and redundant finished water supply to the North Rivanna area. The proposed pump station will be able to serve system demands at both the current high pressure and a future low pressure condition. These facilities will also lead to future phase implementation which will include a storage tank and the creation of the Airport pressure zone.

18. Finished Water System Master Plan: As identified in the 2107 Strategic Plan, the Authority has a goal to plan, deliver and maintain dependable infrastructure in a financially responsible manner. Staff has identified asset master planning as a priority strategy to improve overall system development. There are asset classes where comprehensive and ongoing plans exist or are in development (e.g. wastewater collection, raw water supply, Crozet water, etc.). In the case of the urban finished water system, many of the previously identified projects are in design or construction. As such, staff have identified a need to develop a current and ongoing finished water master plan.

Finished Water Storage/Transmission – Urban System

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
9	Rt. 29 Pump Station Site Acquisition	$1,220,000		$1,220,000						$1,220,000	$466,416
10	Valve Repair - Replacement (Phase 2)	$500,000		$250,000	$250,000					$500,000	
11	Urban Water GAC and Water Treatment Plant Improvements	$24,925,494		$24,925,494						$24,925,494	$18,292,018
12	Wholesale Water Master Metering	$3,600,000	($400,000)	$3,200,000						$3,200,000	$2,270,371
13	Piney Mountain Tank Rehabilitation	$500,000		$280,000	$220,000					$500,000	
14	Avon to Pantops Water Main	$5,500,000	$7,700,000	$175,000	$1,200,000	$1,800,000	$5,400,000	$4,625,000		$13,200,000	
15	Water Demand Projection and Safe Yield Study		$100,000		$100,000					$100,000	
16	South Fork Rivanna River Crossing and North Rivanna Transmission		$5,340,000				$843,000	$3,930,000	$567,000	$5,340,000	
17	Rt. 29 Pump Station		$2,300,000			$201,000	$1,824,000	$275,000		$2,300,000	
18	Finished Water System Master Plan		$150,000						$150,000	$150,000	
	TOTAL	$36,245,494	$15,190,000	$30,050,494	$1,770,000	$2,001,000	$8,067,000	$8,830,000	$717,000	$51,435,494	$21,028,805

South Rivanna Water System

The South Rivanna Water System is comprised of the source water, storage, conveyance and treatment infrastructure currently serving the urban area from the South Fork Rivanna River. The system includes the South Fork Rivanna Reservoir and Dam (built in 1966). The Dam is co-located with the raw water intake and pump station, as well as a small hydroelectric generation facility. The source water from the South Rivanna Reservoir is treated at the South Rivanna treatment plant (12-mgd rated capacity).

Project Descriptions:

19. South Rivanna Hydropower Plant Decommissioning: The South Fork Hydropower Plant is a small hydroelectric generating facility constructed in 1987. The plant has historically operated intermittently, as river flows allow. The generated power is used at the South Rivanna Water Treatment Plant, thereby reducing power purchased off the electric grid. During an effort to troubleshoot and repair the turbine, a large rain and lightning event caused unexpected flooding into the facility. Insurance paid damages to more recent improvements, but not the pre-existing needs to repair the turbine. Engineering investigations in 2013 associated with the failed mechanical equipment and flood event confirmed the need for further disassembly and inspection of the turbine shaft and blade linkages from a remote factory location.

    Due to the complexity of possible rehabilitation, the associated Federal Energy Regulatory Commission (FERC) dam permitting, and the numerous variables in the economic analysis, proposals were solicited from national hydropower experts to initiate a feasibility study to determine the cost effectiveness of rehabilitating the hydropower plant while making sure to account for FERC-related costs and issues. The feasibility study was completed in May 2016 and determined that rehabilitation of the facility had a small likelihood for a positive return on investment. This conclusion was brought to the Board of Directors along with a recommendation to initiate the surrender of the exemption to licensure and decommission the facility. The Board approved this recommendation and staff has begun the exemption surrender process. The budget includes regulatory support as well as physical improvements such as removing defunct electrical components, sealing the penstock and the turbine.

20. South Rivanna Water Treatment Plant Improvements: The South Rivanna Water Treatment Plant is currently undergoing significant upgrades as part of the Urban Granular Activated Carbon project. Several other significant needs have also been identified and have been assembled into a single project within this Capital Plan. The projects identified herein include an expansion of the coagulant storage facilities; installation of additional filters to meet firm capacity needs; the addition of a second variable frequency drive at the Raw Water Pump Station; the relocation for the electrical gear from a sub terrain location at the Sludge Pumping Station, a new building on site for additional office, lab, control room and storage space, and improvements to storm sewers to accept allowable WTP discharges. Currently this facility operates at 80-90% of capacity and the identified upgrades will improve reliability and resiliency, particularly at higher flow rates.

South Rivanna Water System

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
19	South Rivanna Hydropower Plant Decommissioning	$1,000,000	($600,000)	$167,332	$232,668					$400,000	$82,332
20	South Rivanna Water Treatment Plan Improvements	$5,430,442	$2,069,558	$135,000	$459,000	$2,411,000	$4,398,000	$97,000		$7,500,000	
	TOTAL	$6,430,442	$1,469,558	$302,332	$691,668	$2,411,000	$4,398,000	$97,000	$0	$7,900,000	$82,332

Crozet Water System

The Crozet Water System includes the source water, raw water conveyance, finished water treatment, transmission and storage infrastructure for the Crozet community in western Albemarle County. The source water for this system is the Beaver Creek Reservoir and Garnett Dam which was built in 1964 with a current useable storage capacity of 521 million gallons. Raw water is treated at the Crozet Water Treatment Plant (1.0 mgd rated capacity) and provides finished water to the Albemarle County Service Authority. The system includes the Crozet Elevated (Waterball) Tank (0.05 MG) for water treatment plant backwash; the Crozet Ground Storage Tank (0.5 MG) and pump station, and the Buck's Elbow Storage Tank (2.0 MG).

Project Descriptions:

21. Beaver Creek Dam Alteration: From 2008-2014 the Virginia Department of Conservation and Recreation (DCR) adopted revised *Impounding Structures Regulation* which imposed new, more rigorous, evaluations of dams within the Commonwealth. As a result, the Beaver Creek Dam has been reclassified as a high hazard dam, thereby requiring a higher spillway design storm criteria. The higher design storm cannot be accommodated with the existing structure, and will require future modifications. Subsequently the Virginia Soil and Water Conservation Board adopted a new Probable Maximum Precipitation (PMP) Study on December 9, 2015. In March 2016, DCR published guidance documents on implementing the new PMP Study. This project includes investigation, preliminary design, public outreach, permitting, easement acquisition, final design, and construction of the anticipated modifications. Also included in this project are a new relocated raw water pump station, intake and oxygenation system. A revised Preliminary Engineering Report is due to DCR by June 2018.

22. Buck's Elbow & Crozet Waterball Tank Painting: The two million-gallon Bucks Elbow Ground Storage Tank provides finished water storage for the Crozet Area while the 50,000 gallon Crozet Waterball Tank serves as filter backwash storage at the Crozet Water Treatment Plant. Routine inspections of these tanks in 2012 indicated that the tanks would require recoating by 2020. The project includes recoating the interior and top-coating the exterior of both tanks as well as installation of an active mixing system at the Bucks Elbow Tank to decrease stratification and improve overall water quality in the Crozet area. Minor repairs and improvements to both tanks will also be included in this work. This project includes consultant services for design of project specifications, as well as construction, construction administration, and inspection services. Construction of the tank improvements are expected to begin in the spring of 2020.

23. Crozet Water Granular Activated Carbon and Water Treatment Improvements: The U.S. Environmental Protection Agency regulates maximum contaminant levels (MCL) for total trihalomethanes (THMs) and haloacetic acids (HAAs) in drinking water under the Disinfectant/Disinfection Byproducts Rule (D/DBPR). In the early 1990s Stage 1 of the rule was implemented and RWSA and ACSA are in compliance with Stage 1. Stage 2 of the D/DBPR would normally be effective for the Crozet distribution system in November 2014; however, a two-year extension was granted by Virginia Department of Health and Stage 2 became effective for Crozet in November 2016. The Stage 2 D/DBPR involved a major change in how THM and HAA levels are calculated and is more stringent than the Stage 1

requirements. A study concluded that complete compliance with the Stage 2 D/DBPR cannot be continuously met with minor modification of existing processes (water production facilities combined with ASCA distribution system) but would instead require significant capital improvements.

For the Crozet water system, installation of granular activated carbon (GAC) contactor units was selected due to the start/stop operation of the water treatment plant and the relatively higher water age in the distribution system. The GAC will adsorb organic matter from the water, thereby reducing the precursors to THMs and HAAs. Included in the Crozet WTP GAC project are various improvements including upgrade of the chlorine feed system to a modern hypochlorite feed system, as well as replacing the existing fluoride and corrosion inhibitor chemical feed systems. The new chemical feed systems will be housed in additional rooms in the proposed GAC contactor building. This new location will also allow for shorter chemical feed lines. Construction of the project started in 2016.

24. Crozet Water Treatment Plant Expansion: The Crozet water treatment system is currently permitted and rated to supply up to 1.0 million gallons per day (mgd) of water to the ACSA distribution system. Over the past several years, average day usage of water has increased steadily, with maximum day demand approaching plant capacity. The current lease agreement with ACSA for land at this facility stipulates that a 5-year notice must be given prior to altering or terminating the lease. As such, it is imperative that RWSA begin evaluating how a future plant expansion would be accomplished and any impacts on the ACSA lease. In addition, much of the existing plant systems are the same as when the plant was constructed in the 1960's.

    Expanding the plant capacity at Crozet WTP would require a new Virginia Department of Environmental Quality Water Withdrawal Permit, and could include possible stream release requirements. In order to fully analyze all aspects of the design required for this project, and honor plant upgrade notification requirements to ACSA, select elements of the preliminary design have been completed. These elements include a Preliminary Engineering Report (PER), plant field testing, and preliminary permitting work and coordination with pertinent regulators. The results of the PER state that the current treatment plant can be upgraded, and the capacity increased, through installation of newer, and more technologically advanced equipment into the existing footprint of the filter plant. Upgrading the system within the existing plant footprint would not impact the existing ACSA lease at the property. Proposed work will include preliminary/final design, bidding and construction of several upgraded treatment plant systems including general building rehabilitation, filter improvements, sedimentation expansion and improvements, chemical feed improvements, flocculator expansion, alum storage/containment improvements and waste sludge handling and removal improvements.

25. Crozet Water Treatment Plant Finished Water Pump Station: As noted in the above project description, the Crozet water treatment facilities will require an expansion to secure future needs of the Crozet community. The Finished Water Pump Station is the final step in the treatment and conveyance process. The Crozet Pump Station is original to the plant and has numerous design and operational impediments or challenges that severely limit its operational reliability. A new pump station at the site is required for both current and future service needs.

The project includes evaluation, permitting, design, construction and construction management.

26. Drinking Water Infrastructure Plan: The Crozet drinking water service area continues to see expanded growth, and recent discussions with Albemarle County and Albemarle County Service Authority (ACSA) personnel have confirmed that recent growth trends indicate that water use demands in Crozet are on the rise. While some projects are currently underway to address the immediate needs in Crozet, RWSA staff has concluded that it is pertinent to develop a comprehensive mid and long-range plan for the entire water system, including analysis of water supply, treatment, distribution, storage and raw water conveyance. The project will evaluate and analyze all of these parameters, and develop a Drinking Water Infrastructure Plan for the Crozet Service Area's water supply and distribution needs and recommended improvements for the next 50-year design period (Year 2070).

Crozet Water System

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/17)**
21	Beaver Creek Dam Alteration	$6,071,000	$8,859,000	$294,886	$660,000	$970,000	$2,162,000	$8,584,000	$2,259,114	$14,930,000	$133,886
22	Buck's Elbow & Crozet Waterball Tank Painting	$1,200,000			$60,000	$995,000	$145,000			$1,200,000	
23	Crozet Water GAC and Water Treatment Improvements	$3,418,390		$3,418,390						$3,418,390	$2,665,401
24	Crozet Water Treatment Plant Expansion	$250,000	$6,650,000	$528,819	$3,280,000	$3,091,181				$6,900,000	$90,419
25	Crozet Water Treatment Plant - Finished Water Pump Station	$2,600,000		$2,542,000	$58,000					$2,600,000	$395,663
26	Drinking Water Infrastructure Plan	$300,000		$274,000	$26,000					$300,000	
	TOTAL	$13,839,390	$15,509,000	$7,058,095	$4,084,000	$5,056,181	$2,307,000	$8,584,000	$2,259,114	$29,348,390	$3,285,369

Scottsville Water System

The Scottsville Water System is comprised of the raw water conveyance, finished water treatment, transmission and storage infrastructure for the Town of Scottsville in southern Albemarle County. The source water for this system is the Totier Creek Intake, and the backup supply is the Totier Creek Reservoir, which was built in 1971 with a current useable capacity of 182 million gallons. Raw water is treated at the Scottsville Water Treatment Plant (0.25 mgd rated capacity) and provides finished water to the Albemarle County Service Authority. The system includes the Scottsville Storage Tank (0.25 MG).

Project Description:

27. Scottsville Water Granular Activated Carbon: The U.S. Environmental Protection Agency regulates maximum contaminant levels (MCL) for total trihalomethanes (THMs) and haloacetic acids (HAAs) in drinking water under the Disinfectant/Disinfection Byproducts Rule (D/DBPR). In the early 1990s Stage 1 of the rule was implemented and RWSA and ACSA are in compliance with Stage 1. Stage 2 of the D/DBPR was effective for the Scottsville distribution system in November 2014. The Stage 2 D/DBPR involved a major change in how THM and HAA levels are calculated and are more stringent than the Stage 1 requirements. After a study, it was concluded that complete compliance with the Stage 2 D/DBPR cannot consistently be met with minor modification of existing processes (water production facilities combined with ASCA distribution system) but would instead require significant capital improvements.

    For the Scottsville water system, installation of granular activated carbon (GAC) contactor units was selected due to the start/stop operation of the water treatment plant and the higher water age in the distribution system. The GAC will adsorb organic matter from the water, thereby reducing the precursors to THMs and HAAs. Construction on the project started in 2016.

Scottsville Water System

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
27	Scottsville Water Granular Activated Carbon	$1,615,000		$1,615,000						$1,615,000	$1,216,510
	TOTAL	$1,615,000	$0	$1,615,000	$0	$0	$0	$0	$0	$1,615,000	$1,216,510

Wastewater Interceptors/Pumping Stations

The RWSA wastewater interceptors and pumping stations serve to convey wastewater from the collection systems of the City of Charlottesville and Albemarle County Service Authority to the Moores Creek Advanced Water Resource Recovery Facility (MCAWRRF). This grouping includes: the Crozet Interceptor and four associated pumping stations; the Moores Creek Interceptor and Relief Sewer; the Morey Creek, Maury Hills, Powell Creek, Meadow Creek, Schenks Branch, Woodbrook and Rivanna Interceptors; as well as the Albemarle-Berkley Interceptor and associated Albemarle Pumping Station. Also included in this system are the two primary pump stations into the MCAWRRF, the Rivanna and Moores Creek Pump Stations.

Project Descriptions:

28. Upper Schenks Branch Interceptor: The Schenks Branch Interceptor is located in the eastern part of the City of Charlottesville and ties into the Meadowcreek Interceptor. The interceptor was constructed in the mid-1950s of 21-inch clay and concrete pipe. The existing interceptor is undersized to serve present and future wet weather flows as determined by the City, and is to be upgraded to 30-inch pipe. The Upper Schenks Branch Interceptor consists of two sections along McIntire Road. Both of these sections have been designed with the first phase of this project located in the City's Schenks Branch Greenway, completed in early 2016. The second phase of the Upper Schenks Interceptor will be replaced by RWSA in coordination with the City of Charlottesville's sewer upgrades once easement negotiations with Albemarle County are complete (or the City authorizes the second phase project be constructed under McIntire Road). Project costs include design, permitting, easement acquisition, construction, construction observation/administration by the engineering consultant; and project contingencies.

29. Interceptor Sewer and Manhole Repair: This project is used to conduct assessment of various interceptors as well as rehabilitation of interceptors that do not have a separate CIP project. Planned projects include condition assessments and assumed rehabilitation of the Morey Creek Interceptor and Powell Creek Interceptor as well as rehabilitation efforts identified for the Moores Creek Interceptor and the Moores Creek Relief Interceptor that have been identified from previous condition assessment efforts. A sewer rehabilitation contract has been developed under this project as well which will procure a dedicated contractor for all rehabilitation work. This project will also provide an allowance in budgeted funds to carry out future repairs. The intent of this project is to complete a condition assessment of all RWSA interceptors (except those replaced during the period with new pipe) and perform as-needed rehabilitation work by the end of 2020. Such periodic assessments of all sewer pipe reflects industry best practices and the maintenance expectations of federal and state regulators as a part of avoiding sanitary sewer overflows.

30. Crozet Interceptor Sewer and Manhole Repairs: The Crozet Interceptor is located in western Albemarle County and serves the Crozet area. Flow metering indicated that the interceptor experienced substantial inflow and infiltration and requires rehabilitation. In order to minimize future infrastructure improvements, ACSA and RWSA have agreed to aggressively rehabilitate this interceptor and the sewers that flow to the interceptor. The initial phase of rehabilitation to repair defects in manholes and pipelines contributing to the inflow and infiltration in the

interceptor upstream of Crozet Pump Station No. 4 has been completed. The current budget accounts for condition assessment work and assumed rehabilitation needs for the lower portions of the interceptor. While wet weather flows have moderately improved based on the initial phase of work, the ACSA and RWSA continue to investigate and remediate deficiencies along the entire interceptor.

31. Crozet Flow Equalization Tank: Rehabilitation work in the RWSA and ACSA sewer systems is on-going to meet the I&I reduction goals in the Crozet Interceptor. This is based on the flow metering and modeling results of the Comprehensive Sanitary Sewer Model & Study conducted in 2006 and as part of the Crozet Interceptor CIP project. The results of the 2006 study were updated in 2016 to evaluate I/I reduction goals and future capital project needs. The need to proceed with construction of a flow equalization tank in the Crozet area was confirmed as a result of this study update, which will took into account recent flow monitoring data that had been collected following previous I/I reduction efforts. Based on those results, a preliminary engineering evaluation of a flow equalization tank upstream of Crozet Pump Station No. 4 has begun. Progressing into the preliminary engineering phase of the flow equalization tank is necessary to ensure that the facility can be sited, designed, permitted, constructed and ready for operation by 2020 in order to meet the two-year storm flow targets. The budget for this project includes estimates for the preliminary engineering, final design, property acquisition, legal assistance, construction costs and construction management services.

32. Crozet Interceptor Pump Station Bypass Isolation Valves: There are four pump stations located in the Crozet Interceptor system that help convey the flow from the Crozet area into the Morey Creek Interceptor and the rest of the urban collection system. These pump stations were constructed in the 1980s and provided no means of isolating each pump station from its downstream force main. This condition complicates maintenance-related activities as each time a pump station component needs to be serviced or replaced, the volume of wastewater within the force main must be addressed at the pump station as it drains back to the wet well. In addition, the Crozet Interceptor Pump Stations also have limited storage within their wet wells, and any reduction of down time as a result of dealing with the impacts of no isolation valves, decreases the amount of time available to work on the equipment. In order to alleviate this condition, temporary valves called “line stops” will be temporarily installed on the force mains downstream of the pump stations to allow enough time for a new isolation valve to be installed. This isolation valve location will provide the maximum amount of down time available based on current system conditions for future pump station maintenance activities. While line stops are in place, bypass connections will also be provided at each pump station. These will allow staff the option of bringing in bypass pumps for more significant pump station shutdowns required for maintenance activities or repairs that the isolation valves alone cannot account for. Design services for this project were initiated in August 2017 with completion of construction anticipated for summer 2018.

33. Maury Hill Branch Sewer Upgrade: Based on the sewer study performed by Greeley and Hansen in 2016, the Maury Hill Branch Sewer was targeted for capacity upgrades around 2020. This project would include an upgrade from 8-inch diameter sewer to 12-inch diameter sewer

along with all new manholes. Moving forward with this project would supersede other anticipated rehabilitation work on this interceptor that would be necessary otherwise.

34. Crozet Interceptor Pump Station Rehabilitation: The Crozet Interceptor Pump Stations were constructed in the 1980's and many of the components are still original. This project would include the replacement of pumps and valves at Pump Station 2 in order to improve pumping capabilities at this location and provide spare parts for the pumps at Pump Station 1. It would also include roof replacements at all four pump stations, siding replacement for the wet well enclosure at Pump Station 3, and installation of a new water well at Pump Station 3.

Urban Wastewater Interceptors/Pumping Stations

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
28	Upper Schenks Branch Interceptor	$6,667,935	($2,182,935)	$20,000		$128,000	$3,515,000	$822,000		$4,485,000	
29	Interceptor Sewer and Manhole Repair	$1,337,389	$603,611	$496,330	$592,000	$695,000	$157,670			$1,941,000	$124,330
30	Crozet Interceptor Sewer and Manhole Repairs	$625,000		$252,615	$142,000	$230,385				$625,000	$180,715
31	Crozet Flow Equalization Tank	$3,745,000	($445,000)	$238,000	$1,062,000	$2,000,000				$3,300,000	$37,356
32	Crozet Interceptor Pump Stations Bypass Isolation Valves	$720,000		$604,000	$116,000					$720,000	
33	Maury Hill Branch Sewer Replacement		$285,000						$285,000	$285,000	
34	Crozet Interceptor Pump Station Rehabilitation		$525,000		$275,000				$250,000	$525,000	
	TOTAL	$13,095,324	($1,214,324)	$1,610,945	$2,187,000	$3,053,385	$3,672,670	$822,000	$535,000	$11,881,000	$342,401

Moores Creek Advanced Water Resource Recovery Facility

The Moores Creek Advanced Water Resource Recovery Facility (MCAWRRF) is the largest wastewater treatment facility within the RWSA system. The plant was originally constructed in 1958 and upgraded and expanded in 1981 and 1982, and currently has a rated capacity of 15 mgd. From 2009 thru 2012 the facility was upgraded to provide enhanced nutrient removal, and increased wet weather pumping and treatment capacity. This site includes the infrastructure for the wastewater treatment process as well as the RWSA administration facilities.

Project Descriptions:

35. Bridge Repairs: The bridge crossing Moores Creek located at the Advanced Water Resource Recovery Facility was constructed in the early 1980s. In late 2011, staff commissioned a detailed inspection of the bridge. The inspection results indicated that the bridge was in good condition, but required maintenance repairs to assure continued safe operation. This work includes sealing the expansion joints, scupper installation to drain the bridge deck, repairs to the steel plate girders and their bearings, catwalk and steel corrosion repair and repainting, and minor concrete repair. This work will be completed by the spring of 2018 in conjunction with the Moores Creek Odor Control Improvements project.

36. Odor Control Phase 2: As part of the implementation of the next phase of the 2007 Odor Control Master Plan at the MCAWRRF, operations audits were performed, liquid and vapor phase sampling was conducted, and a computerized dispersion model was developed from 2013 to 2014. Recommendations for odor control improvements that would significantly control odors from traveling beyond the MCAWRRF fence line were presented to the RWSA Board of Directors in December 2014 and the CIP project for $9.33M was approved at the January 2015 Meeting. The budget was later increased to $9.85M. The final design for odor control improvements includes covering the head works and screening channels, installing grit facilities, constructing a bypass line through one equalization basin, covering the primary clarifiers, building additional odor scrubbing facilities to treat the foul air from the covered sources, removing the post-digestion clarifiers from service, modifying the handling, hauling and storage of bio solids, cleaning the equalization basins and holding ponds, and coating the interior of the digesters. The design for the Odor Control Improvements Project was completed in November 2015. An award of construction contract and associated engineering construction administration and inspection occurred in April 2016. Construction of the Odor Control project has been very challenging with many change orders needed to address unforeseen circumstances, and therefore, additional funding has been requested for contingency funding. Final project completion is expected in spring 2018. The digester coating project was bid in August 2017 and the bids were much higher than anticipated, accounting for an additional project need in excess of $1M. The basin cleaning project will be managed by RWSA staff through a separate contract anticipated in summer 2018.

37. Roof Replacements: The majority of the buildings at the Moores Creek Advanced Water Resource Recovery Facility were constructed in 1981 and 1982 during a major expansion of the existing treatment plant. All buildings constructed at that time were built with a metal roof system. In 2014, deficiencies were identified in the roof at the Administration Building and

the roof was replaced. The materials of the original roof at the Administration Building are the same as the roof material on the other buildings. Likewise, many of the buildings have started to experience leaks and structural deficiencies. As a result, the purpose of this project is to replace the roof systems at the following buildings at the Moores Creek AWRRF: Blower Building, Moores Creek Pump Station, Sludge Pump Station No. 2, Maintenance Building 1, and Maintenance Building 2, Sludge Pumping Building, Primary Pump Building, and the Effluent Pump Building. Design of these improvements began in March 2017 with completion of construction anticipated for May 2018.

38. Second Centrifuge: The Moores Creek AWRRF currently operates a high-speed centrifuge to process and dewater digested bio solids from the treatment process. The centrifuge was constructed during the 2009-2012 Nutrient Upgrade project and served to replace an older plate and frame filter press operation (which was removed during installation of the centrifuge), with a second plate and frame press serving as backup. An evaluation of the remaining filter press concluded that extensive repairs would be required to maintain this as a backup dewatering system and the repairs would not be cost-effective as purchasing a second centrifuge. Without the utility of the second press the facility does not have a redundant process, and thus during planned or emergency outages a portable back-up unit must be rented or leased. A second centrifuge will allow for continued bio solids dewatering during planned or emergency repairs to one of the two centrifuges, for higher-rate processing by operating both units simultaneously during other periods (thus saving on staff time), and for better maintenance of proper solids flow through the plant.

39. Engineering and Administration Building: RWSA currently has its administrative headquarters in two buildings on the grounds of the Moores Creek Advanced Water Resource Recovery Facility. The two-story Administration Building was constructed in the early 1980's and houses offices, IT server space, meeting space and a full service laboratory. The second building is a series of four trailers installed in between 2003-2010 that house the engineering department. The Administration building is located at the head of the wastewater treatment plant and is surrounded by underground piping and process functions that may conflict with existing parking and/or the building in a future plant expansion. There is currently a need to house additional staff; increase office and meeting space; plan for the replacement of the trailers; bring the IT server workrooms to modern standards; provide classroom space for education outreach. Staff is procuring a consultant to perform a space needs analysis and provide recommendations on how to address future building needs.

40. Digester Sludge Storage Improvements: With the second centrifuge installation almost complete, additional capacity for storage of digested sludge would provide the Authority operational flexibility it does not currently have. Additionally, the sole sludge storage tank at the MCAWRRF was constructed in 1959 of reinforced concrete and is in need of repairs. This project would convert one of the three existing anaerobic digesters into a sludge storage tank through piping modifications, and would provide redundancy to the existing sludge storage tank so it can be removed from service, cleaned, inspected, and repaired with minimal impact to the existing sludge dewatering operations. The piping configuration would also allow flexibility for the anaerobic digester to be used as either an anaerobic digester or sludge storage tank as needed for operations. The scope of work would include piping modifications,

hydraulic improvements, tank safety improvements such as handrail and lights, and structural improvements to the existing sludge storage tank roof.

41. Aluminum Slide Gate Replacement: Several large aluminum slide gates are located at the influent side of the Moores Creek Pump Station. These gates allow staff to stop or divert flow to perform maintenance activities. After repeated attempts to access and repair the gates, it is now necessary to replace and modify the gate arrangement. The replacement includes new gates for greater flexibility and resiliency as well as significant flow bypass pumping. Likewise there are several gates at the Ultraviolent disinfection facility that leak water, causing a reduced capacity of the facility. Replacement of these gates will restore the process to full capacity.

42. Moores Creek AWRRF Master Plan: The majority of the Moores Creek Water Resource Recovery Facility was constructed in the early 1980's. At the time, the plant layout was develop with space held open for future process expansion. With the Enhanced Nutrient Removal (ENR) project in 2009, the operation and layout of the plant was fundamentally altered, as needed to meet the new regulation. The project did anticipate the need for future expansion and some of the processes have readily available space. However, a full expansion plan was not developed at the time. As identified in the 2107 Strategic Plan, the Authority has a goal to plan, deliver and maintain dependable infrastructure in a financially responsible manner. Staff has identified asset master planning as a priority strategy to improve overall system development. As such, this project will serve to evaluate and plan for future space and process needs to accommodate capacity expansion and/or anticipated regulatory changes.

43. Mechanical Thickener: During the design of the Moores Creek AWRRF Phase 2 Odor Control project, the consultants conducted a detailed evaluation of all facility odor sources. One of the key sources identified, was the post-digestion clarifiers. These clarifiers are two round open-topped tanks of digested wastewater sludge, located on the north side of the plant. During the ENR upgrade, the characteristics of the post-aeration sludge changed. This change has led to less predictable sludge handing through the existing gravity thickeners. This change in the post-aeration sludge characteristics has made obtaining a clear thickener overflow more difficult without chemical addition. Removing the post-digestion clarifiers from service combined with solids carryover from the existing gravity thickeners create a number of downstream consequences in primary clarification, sludge digestion and solids dewatering. Removing these facilities from service reduces the sludge thickness and therefore the plant's ability to adequately process it. This project includes the design and installation of a mechanical thickener prior to digestion that will increase plant solids processing reliability and capacity.

44. Radio Upgrades: The regional 800 MHz Public Safety Communication System, in which the Rivanna Water and Sewer Authority participates to provide internal and emergency radio communication, is expected to reach the end of its service life in 2018. Because of technology changes (software and hardware) the Charlottesville-UVA-Albemarle County Emergency Communications Center (ECC) will need to upgrade or replace the system to keep it useable. This project plans for the upgrade or replacement of major technology components and equipment of the existing system include: electronic components at all tower sites and the

prime site at the ECC facility; new console equipment at the regional ECC; equipment such as tower site generators and UPS systems; an additional tower site (to improve service in southern Albemarle County); microwave backbone; and replacement of the system recording facilities. The project will take 24 months to complete and will be completed in Fiscal Year 2018. RWSA is being apportioned a part of the $18.8M project cost proportionately based on the number of radios (2.4% of the total project cost). In addition to this assessment from the ECC, the Authority will also be required to undertake programing upgrades to its fleet of stationary, mobile, and portable radios.

Moores Creek Advanced Water Resource Recovery Facility

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
35	Bridge Repairs	$330,000		$330,000						$330,000	$37,391
36	Odor Control Phase 2	$10,108,000	$1,016,151	$10,108,000	$1,016,151					$11,124,151	$6,669,061
37	Roof Replacements	$1,264,000		$1,264,000						$1,264,000	$61,492
38	Second Centrifuge	$1,290,000		$1,290,000						$1,290,000	$172,974
39	Engineering and Administration Building		$3,000,000			$65,000	$60,000	$1,375,000	$1,500,000	$3,000,000	
40	Digester Sludge Storage Improvements		$265,000		$265,000					$265,000	
41	Aluminum Slide Gate Replacements		$470,000		$470,000					$470,000	
42	Moores Creek AWRRF Master Plan		$100,000			$50,000	$50,000			$100,000	
43	Mechanical Thickener		$1,200,000			$100,000	$1,100,000			$1,200,000	
44	Radio Upgrades	$521,000		$521,000						$521,000	$3,567
	TOTAL	$13,513,000	$6,051,151	$13,513,000	$1,751,151	$215,000	$1,210,000	$1,375,000	$1,500,000	$19,564,151	$6,944,485

Scottsville Wastewater System

The Scottsville Wastewater System includes the influent pumping station, the water resource recovery facility constructed in 1983, and the historical treatment lagoon (now incorporated into the plant operation). The water resource recovery facility has a rated capacity of 0.2 mgd.

Project Descriptions:

45. Grinder and Air Control Improvements: Currently the influent raw water pump station does not have a means to prevent large material from impacting the pumps, resulting in frequent clogging and maintenance. The space within the pump station is very limited and therefore does not allow for screening. This project will design and install an inline grinder within the influent pump channel. In addition, this project will evaluate methods to automate air control for the biological treatment process. The current method of air control produces inconsistent results, adversely impacting treatment and operations.

Scottsville Water Resource Recovery Facility

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
45	Grinder and Air Control Improvements		$100,000			$30,000	$70,000			$100,000	
	TOTAL	$0	$100,000	$0	$0	$30,000	$70,000	$0	$0	$100,000	$0

Glenmore Wastewater System

The 0.381-mgd water resource recovery facility, located within the Glenmore subdivision, is operated by RWSA. The facility includes an influent pumping station located immediately adjacent to the treatment facility.

Project Descriptions:

46. Influent Pump & VFD Addition: The Glenmore WRRF is predicted to see additional dry and wet weather flows as construction within the service area continues. Future wet weather flows will require higher influent pumping capacity and an additional pump and electrical variable frequency drive will be required to maintain firm capacity.

47. Secondary Clarifier Coating: The secondary clarifiers at the Glenmore facility were painted over 10-years ago. The clarifier environment is a particularly harsh environment subject to corrosive gasses, grit abrashion and mechanical wear. Based on observations by operations staff, the coating system is in need of replacement to prevent deterioration and failure of the underlying metal superstructure. This project includes the cleaning and full coating of the clarifier.

Glenmore Water Resource Recovery Facility

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
46	Influent Pump & VFD Addition	$61,000					$61,000			$61,000	
47	Secondary Clarifier Coating		$50,000		$25,000	$25,000				$50,000	
	TOTAL	$61,000	$50,000	$0	$25,000	$25,000	$61,000	$0	$0	$111,000	$0

All Systems

Project Descriptions:

48. Information Technology Enhancement (Asset Management): Asset management is the practice of managing our infrastructure to minimize the total cost of owning and operating these assets while providing desired service levels. In doing so, it is used to make sure planned maintenance activities take place and that capital assets are replaced, repaired or upgraded at the right time, while ensuring that the money necessary to perform those activities is available. The Rivanna Water and Sewer Authority (RWSA) has some components of an asset management program in place (i.e. GIS, work order system), but has identified the need to further develop the program as part of our Strategic Planning process. In order to continue to build the program, a consultant will be procured to assist with a three-phase process that will include facilitation and development of an asset management strategic plan, development and management of a pilot study where the results of the strategic plan will be applied to a specific class of assets, and assistance through a full implementation process. As part of this three-phase process, the consultant will also assist RWSA with the procurement of a software package to facilitate the overall program.

49. Security Enhancements: As required by the federal Bioterrorism Act of 2002, water utilities must conduct vulnerability assessments (VA) and have emergency response plans. Rivanna Water and Sewer Authority (RWSA) recently completed a VA of our water system in collaboration with other regional partners and identified a number of security improvements that could be applied to both our water system and our wastewater system. The purpose of this project will be to install security improvements at RWSA facilities including additional security gate and fencing components, vehicle bollards, facility signage, camera system enhancements, additional security lighting, intrusion detection systems, door and window hardening, installation of industrial strength locks, communication technology and cable hardening, and an enhanced access control program.

All Systems

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	**Project Description**	**Current CIP Adopted 3/2017**	**Proposed Changes**	**Current Capital Budget**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Recommended CIP**	**Work-in-Progress (Prev. Expenses 6/30/2017)**
48	Information Technology Enhancement (Asset Management)		$500,000	$50,000	$250,000	$200,000				$500,000	
49	Security Enhancements		$2,400,000		$170,000	$1,120,000	$1,110,000			$2,400,000	
	TOTAL	$0	$2,900,000	$50,000	$420,000	$1,320,000	$1,110,000	$0	$0	$2,900,000	$0

APPENDICES

CIP Financial Summary

Water System Summary

Wastewater System Summary

CIP Financial Summary

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	Project Description	Current CIP Adopted 3/2017	Proposed Changes	Current Capital Budget	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2017)
1	South Rivanna Reservoir to Ragged Mountain Reservoir	$2,295,000		$565,249	$275,000	$870,000	$584,751			$2,295,000	$25,249
2	Rivanna Reservoir Dredging	$137,558	($127,558)				$10,000			$10,000	
3	Ragged Mountain Reservoir to Observatory Water		$4,116,000				$426,000	$1,453,000	$2,237,000	$4,116,000	
4	Ragged Mountain Reservoir to Observatory Raw Water		$2,410,000				$400,000	$400,000	$1,610,000	$2,410,000	
5	Observatory Water Treatment Plant Improvements	$10,000,000	$8,630,000	$1,207,198	$1,441,000	$3,655,000	$8,459,000	$3,867,802		$18,630,000	$1,042,198
6	Interconnect Lower Sugar Hollow and Ragged Mountain Raw	$225,000	$106,000	$91,000	$240,000					$331,000	
7	Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter	$150,000	$165,000	$181,000	$134,000					$315,000	
8	Sugar Hollow Dam - Rubber Crest Gate Replacement & Intake	$940,000			$55,000	$473,000	$412,000			$940,000	
9	Rt. 29 Pump Station Site Acquisition	$1,220,000		$1,220,000						$1,220,000	$466,416
10	Valve Repair - Replacement (Phase 2)	$500,000		$250,000	$250,000					$500,000	
11	Urban Water Granular Activated Carbon and Water Treatment	$24,925,494		$24,925,494						$24,925,494	$18,292,018
12	Wholesale Water Master Metering	$3,600,000	($400,000)	$3,200,000						$3,200,000	$2,270,371
13	Piney Mountain Tank Rehabilitation	$500,000		$280,000	$220,000					$500,000	

CIP Financial Summary
(Continued)

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	Project Description	Current CIP Adopted 3/2017	Proposed Changes	Current Capital Budget	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2017)
14	Avon to Pantops Water Main	$5,500,000	$7,700,000	$175,000	$1,200,000	$1,800,000	$5,400,000	$4,625,000		$13,200,000	
15	Water Demand Projection and Safe Yield Study		$100,000		$100,000					$100,000	
16	South Fork Rivanna River Crossing and North Rivanna		$5,340,000				$843,000	$3,930,000	$567,000	$5,340,000	
17	Rt. 29 / Airport Road Pump Station		$2,300,000			$201,000	$1,824,000	$275,000		$2,300,000	
18	Finished Water System Master Plan		$150,000						$150,000	$150,000	
19	South Fork Rivanna Hydropower Plant Decommissioning	$1,000,000	($600,000)	$167,332	$232,668					$400,000	$82,332
20	South Fork Water Treatment Plan Improvements	$5,430,442	$2,069,558	$135,000	$459,000	$2,411,000	$4,398,000	$97,000		$7,500,000	
21	Beaver Creek Dam Alteration	$6,071,000	$8,859,000	$294,886	$660,000	$970,000	$2,162,000	$8,584,000	$2,259,114	$14,930,000	$133,886
22	Buck's Elbow Tank & Crozet Waterball Painting	$1,200,000			$60,000	$995,000	$145,000			$1,200,000	
23	Crozet Water GAC and Water Treatment Improvements	$3,418,390		$3,418,390						$3,418,390	$2,665,401
24	Crozet Water Treatment Plant Expansion	$250,000	$6,650,000	$528,819	$3,280,000	$3,091,181				$6,900,000	$90,419
25	Crozet Water Treatment Plant Finished Water Pump Station	$2,600,000		$2,542,000	$58,000					$2,600,000	$395,663

CIP Financial Summary
(Continued)

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	Project Description	Current CIP Adopted 3/2017	Proposed Changes	Current Capital Budget	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2017)
26	Drinking Water Infrastructure Plan	$300,000		$274,000	$26,000					$300,000	
27	Scottsville Water Granular Activated Carbon	1,615,000		1,615,000						1,615,000	1,216,510
28	Upper Schenks Branch Interceptor	$6,667,935	($2,182,935)	$20,000		$128,000	$3,515,000	$822,000		$4,485,000	
29	Interceptor Sewer and Manhole Repair	$1,337,389	$603,611	$496,330	$592,000	$695,000	$157,670			$1,941,000	$124,330
30	Crozet Interceptor Sewer and Manhole Repairs	$625,000		$252,615	$142,000	$230,385				$625,000	$180,715
31	Crozet Flow Equalization Tank	$3,745,000	($445,000)	$238,000	$1,062,000	$2,000,000				$3,300,000	$37,356
32	Crozet Interceptor Pump Station Bypass Isolation Valves	$720,000		$604,000	$116,000					$720,000	
33	Maury Hill Branch Sewer Replacement		$285,000						$285,000	$285,000	
34	Crozet Interceptor Pump Station Rebuilds		$525,000		$275,000				$250,000	$525,000	
35	Bridge Repairs	$330,000		$330,000						$330,000	$37,391
36	Moores Creek AWRRF Odor Control Phase 2	$10,108,000	$1,016,151	$10,108,000	$1,016,151					$11,124,151	$6,669,061
37	Moores Creek AWRRF Roof Replacements	$1,264,000		$1,264,000						$1,264,000	$61,492

CIP Financial Summary
(Continued)

		Five-Year Capital Program			Projected Future Expenses by Year						
Proj. No.	Project Description	Current CIP Adopted 3/2017	Proposed Changes	Current Capital Budget	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2017)
38	Moores Creek AWRRF Second Centrifuge	$1,290,000		$1,290,000						$1,290,000	$172,974
39	Engineering and Administration Building		$3,000,000			$65,000	$60,000	$1,375,000	$1,500,000	$3,000,000	
40	Digester Sludge Improvements		$265,000		$265,000					$265,000	
41	Aluminum Slide Gate Replacements		$470,000		$470,000					$470,000	
42	MCAWRRF Master Plan		$100,000			$50,000	$50,000			$100,000	
43	Mechanical Thickener		$1,200,000			$100,000	$1,100,000			$1,200,000	
44	Radio Upgrades	$521,000		$521,000						$521,000	$3,567
45	Grinder and Air Control Improvements		$100,000			$30,000	$70,000			$100,000	
46	Influent Pump & VFD Addition	$61,000					$61,000			$61,000	
47	Secondary Clarifier Coating		$50,000		$25,000	$25,000				$50,000	
48	Information Technology Enhancement (Asset Management)		$500,000	$50,000	$250,000	$200,000				$500,000	
49	Security Enhancements		$2,400,000		$170,000	$1,120,000	$1,110,000			$2,400,000	
	Total	$98,547,208	$55,354,827	$56,244,313	$12,973,819	$19,109,566	$31,287,421	$25,428,802	$8,858,114	$153,902,035	$33,967,349

Water System Summary

Urban Water System	Summary: Current CIP	Summary: Proposed Changes	Current Capital Budget	Projected Future Expenses by Year: FY19	FY20	FY21	FY22	FY23	Recommended CIP	Work-in-Progress
PROJECT COSTS										
Community Water Supply Plan	$ 2,432,558	$ 6,398,442	$ 565,249	$ 275,000	$ 870,000	$ 1,420,751	$ 1,853,000	$ 3,847,000	$ 8,831,000	$ 25,249
Observatory WTP/Ragged Mtn/Sugar Hollow Systems	11,600,000	8,616,000	1,479,198	1,870,000	4,128,000	8,871,000	3,867,802	-	20,216,000	1,042,198
Finished Water Storage/Distribution - Urban System	39,745,494	11,690,000	30,050,494	1,670,000	2,001,000	8,167,000	8,830,000	717,000	51,435,494	21,028,805
South & North Fork Rivanna WTP and Reservoir System	7,051,442	848,558	302,332	691,668	2,411,000	4,398,000	97,000	-	7,900,000	82,332
Security & Asset Management	-	1,450,000	25,000	210,000	660,000	555,000	-	-	1,450,000	-
Total Projects Urban Water Systems	**$ 60,829,494**	**$ 29,003,000**	**$ 32,422,273**	**$ 4,716,668**	**$ 10,070,000**	**$ 23,411,751**	**$ 14,647,802**	**$ 4,564,000**	**$ 89,832,494**	**$ 22,178,584**
Completed or Closed Projects	$ (4,406,000)	$ (4,406,000)								
Adjusted	**$ 56,423,494**	**$ 33,409,000**								
FUNDING SOURCES URBAN SYSTEM - TO DATE										
Work-in-Progress			$ 22,178,584	$ -	$ -	$ -	$ -	$ -	$ 22,178,584	
Debt Proceeds Available 2015B			6,363,105		-	-	-	-	6,363,105	
Capital Cash Fund Designated			3,880,584	-	-	-	-	-	3,880,584	
SUBTOTAL			32,422,273	-	-	-	-	-	32,422,273	
FUNDING SOURCES URBAN SYSTEM - NEEDS										
Future Cash reserve transfer to Capital Fund				$ 1,000,000	$ 1,000,000	$ 250,000	$ -	$ -	$ 2,250,000	
New Debt Needed			-	3,716,668	9,070,000	23,161,751	14,647,802	4,564,000	55,160,221	
SUBTOTAL			-	4,716,668	10,070,000	23,411,751	14,647,802	4,564,000	57,410,221	
TOTAL URBAN WATER FUNDING			**$ 32,422,273**	**$ 4,716,668**	**$ 10,070,000**	**$ 23,411,751**	**$ 14,647,802**	**$ 4,564,000**	**$ 89,832,494**	
									$89,832,494	
Estimated Bond Issues					**$12,786,700**		**$42,373,600**			

Non-Urban Water System	Summary: Current CIP	Summary: Proposed Changes	Current Capital Budget	Projected Future Expenses by Year: FY19	FY20	FY21	FY22	FY23	Recommended CIP	Work-in-Progress
PROJECT COSTS										
Crozet Water System	$ 14,296,890	$ 15,051,500	$ 7,058,095	$ 4,084,000	$ 5,056,181	$ 2,307,000	$ 8,584,000	$ 2,259,114	$ 29,348,390	$ 3,285,369
Scottsville Water System	1,715,000	(100,000)	1,615,000	-	-	-	-	-	1,615,000	1,216,510
Total Rural Water Systems	**$ 16,011,890**	**$ 14,951,500**	**$ 8,673,095**	**$ 4,084,000**	**$ 5,056,181**	**$ 2,307,000**	**$ 8,584,000**	**$ 2,259,114**	**$ 30,963,390**	**$ 4,501,879**
Completed or Closed Projects	$ (557,500)	$ (557,500)								
Adjusted Current CIP	**$ 15,454,390**	**$ 15,509,000**								
Non-URBAN FUNDING SOURCES										
Work in Progress			$ 4,502,000	$ -	$ -	$ -	$ -	$ -	$ 4,502,000	
Debt Proceeds 2012A/2015A Bond			1,269,200	-	-	-	-	-	1,269,200	
Future Cash reserve transfer to Capital Fund			-	400,000	-	-	-	-	400,000	
New Debt Needed			2,901,895	3,684,000	5,056,181	2,307,000	8,584,000	2,259,114	24,792,190	
TOTAL NON-URBAN WATER FUNDING			**$ 8,673,095**	**$ 4,084,000**	**$ 5,056,181**	**$ 2,307,000**	**$ 8,584,000**	**$ 2,259,114**	**$ 30,963,390**	
									$ 30,963,390	
Estimated Bond Issues				**$11,642,100**			**$13,150,100**			

Wastewater System Summary

Urban Wastewater System	Summary: Current CIP	Summary: Proposed Changes	Current Capital Budget	Projected Future Expenses by Year: FY19	FY20	FY21	FY22	FY23	Recommended CIP	Work-in-Progress
PROJECT COSTS										
Wastewater Interceptor/Pumping Stations	$ 45,370,324	$ (33,489,324)	$ 1,610,945	$ 2,187,000	$ 3,053,385	$ 3,672,670	$ 822,000	$ 535,000	$ 11,881,000	$ 342,401
Moores Creek WWTP	13,597,746	5,966,405	13,513,000	1,751,151	215,000	1,210,000	1,375,000	1,500,000	19,564,151	6,944,485
Security & Asset Management	-	1,450,000	25,000	210,000	660,000	555,000	-	-	1,450,000	-
Total Urban Wastewater Systems	**$ 58,968,070**	**$ (26,072,919)**	**$15,148,945**	**$4,148,151**	**$3,928,385**	**$5,437,670**	**$2,197,000**	**$2,035,000**	**$32,895,151**	**$7,286,886**
Completed or Closed Projects	$ (32,359,746)	$ (32,359,746)								
Adjusted Current CIP	**$ 26,608,324**	**$6,286,827**								
FUNDING SOURCES URBAN SYSTEM - IN PLACEA										
Work-in-Progress			$ 7,286,886	$ -	$ -	$ -	$ -	$ -	$ 7,286,886	
Debt Proceeds - 2016			3,598,000	-	-	-	-	-	3,598,000	
Capital Cash on hand			3,822,000	-	-	-	-	-	3,822,000	
SUBTOTAL			14,706,886	-	-	-	-	-	14,706,886	
FUNDING SOURCES URBAN SYSTEM - NEEDS										
Future Cash Reserves			$ -	$ 750,000	$ 500,000	$ -	$ -	$ -	$ 1,250,000	
New Debt Needed			442,059	$3,398,151	3,428,385	5,437,670	2,197,000	2,035,000	16,938,265	
SUBTOTAL			442,059	$4,148,151	3,928,385	5,437,670	2,197,000	2,035,000	18,188,265	
TOTAL URBAN WASTEWATER FUNDING			**$ 15,148,945**	**$ 4,148,151**	**$ 3,928,385**	**$ 5,437,670**	**$ 2,197,000**	**$ 2,035,000**	**$ 32,895,151**	
Estimated Bond Issues					**$ 7,268,600**		**$ 9,669,700**			

Non-Urban Wastewater System	Summary: Current CIP	Summary: Proposed Changes	Current Capital Budget	Projected Future Expenses by Year: FY19	FY20	FY21	FY22	FY23	Recommended CIP	Work-in-Progress
PROJECT COSTS										
Glenmore WWTP	$ 61,000	$ 50,000	$ -	$ 25,000	$ 25,000	$ 61,000	$ -	$ -	$ 111,000	$ -
Scottsville WWTP	-	100,000	-	-	30,000	70,000	-	-	100,000	-
Total Rural Wastewater Systems	**$61,000**	**$150,000**	**$ -**	**$ 25,000**	**$ 55,000**	**$ 131,000**	**$ -**	**$ -**	**$ 211,000**	**$ -**
FUNDING SOURCES RURAL SYSTEM - NEEDS										
Future Cash Reserve			$ -	$ 25,000	$ 55,000	131,000			211,000	
TOTAL RURAL WASTEWATER FUNDING			**$ -**	**$ 25,000**	**$ 55,000**	**$ 131,000**	**$ -**	**$ -**	**$ 211,000**	
Estimated Bond Issues			$ -		$ -					

Rivanna Water and Sewer Authority
CIP 2019-2023
Summary Information - Proposed5/9/2018

	2019 - 2023 Proposed CIP	2017-2021 Adopted CIP	Change $
Project Cost			
Urban Water Projects	$ 89,832,494	$ 60,829,494	$ 29,003,000
Urban Wastewater Projects	32,895,150	58,968,070	(26,072,920)
Non-Urban Projects	31,174,400	16,072,890	15,101,510
Total Project Cost Estimates	**$ 153,902,044**	**$ 135,870,454**	**$ 18,031,590**
Funding in place			
Work-in-Progress (paid for)	$ 33,967,484	$ 37,841,713	(3,874,229)
Debt Proceeds Used	11,230,300	41,251,626	(30,021,326)
Cash-Capital Available	7,702,384	9,682,421	(1,980,037)
	$ 52,900,168	$ 88,775,760	$ (35,875,592)
Financing Needs			
Possible Future Reserves	$ 4,861,000	7,830,344	(2,969,344)
New Debt	96,140,650	39,264,350	56,876,300
	$ 101,001,650	$ 47,094,694	$ 53,906,956
Total Funding	**$ 153,901,818**	**$ 135,870,454**	**$ 18,031,364**

Percentage of funding in place	34.4%	65.3%
Ratio of debt to expense	91.8%	87.1%
Ratio of cash to expense	8.2%	12.9%

Rivanna Water and Sewer Authority
CIP 2019-2023
Summary Information - Proposed5/9/2018

Detail by Major Systems	Total Proposed 1/31/2018 CIP	Urban Water Projects	Urban Wastewater Projects	Water Non-Urban Projects	Wastewater Non-Urban Projects
Project Cost					
Urban Water Projects	$ 89,832,494	$ 89,832,494	$ -	$ -	$ -
Urban Wastewater Projects	32,895,150	-	32,895,150	-	-
Non-Urban Projects	31,174,400	-	-	30,963,400	211,000
Total Project Cost Estimates	**$ 153,902,044**	**$ 89,832,494**	**$ 32,895,150**	**$ 30,963,400**	**$ 211,000**
Funding in place					
Work-in-Progress (paid for)	$ 33,967,484	$ 22,178,584	$ 7,286,900	$ 4,502,000	$ -
Debt Proceeds available	11,230,300	6,363,100	3,598,000	1,269,200	-
Cash-Capital Available	7,702,384	3,880,384	3,822,000	-	-
	$ 52,900,168	$ 32,422,068	$ 14,706,900	$ 5,771,200	$ -
Financing Needs					
Possible Future Reserves	$ 4,861,000	3,000,000	1,250,000	400,000	211,000
New Debt	96,140,650	54,410,200	16,938,250	24,792,200	-
	$ 101,001,650	$ 57,410,200	$ 18,188,250	$ 25,192,200	$ 211,000
Total Funding	**$ 153,901,818**	**$ 89,832,268**	**$ 32,895,150**	**$ 30,963,400**	**$ 211,000**
Percentage of funding in place	34.4%	36.1%	44.7%	18.6%	0.0%
Ratio of debt to expense	91.8%	67.7%	62.4%	84.2%	0.0%
Ratio of cash to expense	8.2%	7.7%	15.4%	1.3%	100.0%

	Urban Water	Urban Wastewater	Non-Urban	Total
Current Adopted CIP 2017 - 2021	$ 60,829,494	$ 58,968,070	$ 16,072,890	$ 135,870,454
Changes:				
Completed or Closed Projects	(4,406,000)	(32,359,746)	(557,500)	(37,323,246)
Adjustments on existing Projects	17,543,000	(1,008,173)	15,509,000	32,043,827
New Projects	15,866,000	5,845,000	1,600,000	23,311,000
Total Changes	29,003,000	(27,522,919)	16,551,500	18,031,581
Total Proposed CIP 2019 - 2023	$ 89,832,494	$ 31,445,151	$ 32,624,390	$ 153,902,050

Rivanna Water and Sewer Authority
CIP 2019-2023
Summary Information - Proposed5/9/2018

PROPOSED 5-YEAR CIP
CHARGE ANALYSIS ESTIMATES

Note - this fixed rate (charge) analysis is intended to show the effect of the draft CIP on the current adopted debt service charges. It is meant to provide a comparison of the next five years. It is not setting fixed rates for the next 5 years.

	Annual Debt Service FY 2018	Current Charge Debt Service FY 2018 Per Month	FY 2019 Per Month	FY 2020 Per Month	FY 2021 Per Month	FY 2022 Per Month	FY 2023 Per Month	Total Per Month
URBAN WATER								
CITY								
Urban Water - Current Adopted	1,920,500	$ 160,039						
Monthly DS Growth Charge (additional)			$ 20,969	$ 22,375	$ 22,375	$ 22,375	$ 22,375	$ 110,469
New Charge estimate			$ 181,008	$ 203,383	$ 225,758	$ 248,133	$ 270,508	$ 270,508
Annual percentage change			13.1%	12.4%	11.0%	9.9%	9.0%	
Total percentage change								69.0%
ACSA								
Urban Water - Current Adopted	3,425,300	$ 285,439						
Monthly DS Growth Charge (additional)			$ 22,159	$ 28,000	$ 28,000	$ 28,000	$ 28,000	$ 134,159
New Rate estimate			$ 307,598	$ 335,598	$ 363,598	$ 391,598	$ 419,598	$ 419,598
Annual percentage change			7.8%	9.1%	8.3%	7.7%	7.2%	
Total percentage change								47.0%
URBAN WASTEWATER								
CITY								
Urban WWater - Current Adopted	4,714,100	$ 392,841						
Monthly DS Growth Charge (additional)			$ 15,420	$ 20,790	$ 12,460	$ 12,460	$ 12,460	$ 73,590
New Rate estimate			$ 408,261	$ 429,051	$ 441,511	$ 453,971	$ 466,431	$ 466,431
Annual percentage change			3.9%	5.1%	2.9%	2.8%	2.7%	
Total percentage change								18.7%
ACSA								
Urban WWater - Current Adopted	2,670,600	$ 222,550						
Monthly DS Growth Charge (additional)			$ 23,760	$ 20,240	$ 10,340	$ 10,340	$ 10,340	$ 75,020
New Rate estimate			$ 246,308	$ 266,548	$ 276,888	$ 287,228	$ 297,568	$ 297,570
Annual percentage change			10.7%	8.2%	3.9%	3.7%	3.6%	
Total percentage change								33.7%

		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
City of Charlottesville								
Urban Water								
Operating Rate	Per 1000 gal.	1.833	1.969	2.070	2.174	2.282	2.396	2.516
	% Change		7.4%	5.1%	5.0%	5.0%	5.0%	5.0%
Debt Service Charge	Per month	$ 162,968	$ 160,039	181,008	203,383	225,758	248,133	270,508
			-1.8%	13.1%	12.4%	11.0%	9.9%	9.0%
Revenue Requirements:								
Operating Rate Revenue	Annual	$ 3,270,700	$ 3,514,200	$ 3,590,700	$ 3,770,235	$ 3,958,747	$ 4,156,684	$ 4,364,518
Debt Service Revenues	Annual	1,955,600	1,920,500	2,172,100	2,440,596	2,709,096	2,977,596	3,246,096
Total		**$ 5,226,300**	**$ 5,434,700**	**$ 5,762,800**	**$ 6,210,831**	**$ 6,667,843**	**$ 7,134,280**	**$ 7,610,614**
	$ Change		**$ 208,400**	**$ 328,100**	**$ 448,031**	**$ 457,012**	**$ 466,437**	**$ 476,334**
	% Change		**4.0%**	**6.0%**	**7.8%**	**7.4%**	**7.0%**	**6.7%**
Urban Wastewater								
Operating Rate	Per 1000 gal.	1.835	1.951	2.146	2.253	2.366	2.484	2.608
	% Change		6.3%	10.0%	5.0%	5.0%	5.0%	5.0%
Debt Service Charge	Per month	$ 369,037	$ 392,841	408,261	429,051	441,511	453,971	466,431
			6.5%	3.9%	5.1%	2.9%	2.8%	2.7%
Revenue Requirements:								
Operating Rate Revenue	Annual	$ 3,267,300	$ 3,540,600	$ 3,678,900	$ 3,862,845	$ 4,055,987	$ 4,258,787	$ 4,471,726
Debt Service Revenues	Annual	4,428,400	4,714,100	4,899,100	5,148,612	5,298,132	5,447,652	5,597,172
Total		**$ 7,695,700**	**$ 8,254,700**	**$ 8,578,000**	**$ 9,011,457**	**$ 9,354,119**	**$ 9,706,439**	**$ 10,068,898**
	$ Change		**$ 559,000**	**$ 323,300**	**$ 433,457**	**$ 342,662**	**$ 352,319**	**$ 362,459**
	% Change		**7.3%**	**3.9%**	**5.1%**	**3.8%**	**3.8%**	**3.7%**
Total City All Revenues		**$ 12,922,000**	**$ 13,689,400**	**$ 14,340,800**	**$ 15,222,288**	**$ 16,021,962**	**$ 16,840,719**	**$ 17,679,512**
	$ Change		**$ 767,400**	**$ 651,400**	**$ 881,488**	**$ 799,674**	**$ 818,757**	**$ 838,794**
	% Change		**5.9%**	**4.8%**	**6.1%**	**5.3%**	**5.1%**	**5.0%**

		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
ACSA Charges From RWSA								
Urban Water								
Operating Rate	Per 1000 gal.	1.833	1.969	2.070	2.174	2.282	2.396	2.516
	% Change		7.4%	5.1%	5.0%	5.0%	5.0%	5.0%
Debt Service Charge	Per month	$ 284,031	$ 285,439	307,598	335,598	363,598	391,598	419,598
			0.5%	7.8%	9.1%	8.3%	7.7%	7.2%
Revenue Requirements:								
Operating Rate Revenue	Annual	$ 3,019,100	$ 3,243,900	$ 3,449,900	$ 3,622,395	$ 3,803,515	$ 3,993,690	$ 4,193,375
Debt Service Revenues	Annual	3,408,400	3,425,300	3,691,200	4,027,180	4,363,180	4,699,180	5,035,180
Total		**$ 6,427,500**	**$ 6,669,200**	**$ 7,141,100**	**$ 7,649,575**	**$ 8,166,695**	**$ 8,692,870**	**$ 9,228,555**
	$ Change		**$ 241,700**	**$ 471,900**	**$ 508,475**	**$ 517,120**	**$ 526,176**	**$ 535,685**
	% Change		**3.8%**	**7.1%**	**7.1%**	**6.8%**	**6.4%**	**6.2%**
Urban Wastewater								
Operating Rate	Per 1000 gal.	1.835	1.951	2.146	2.253	2.366	2.484	2.608
	% Change		6.3%	10.0%	5.0%	5.0%	5.0%	5.0%
Debt Service Charge	Per month	$ 222,280	$ 222,550	246,308	266,548	276,888	287,228	297,568
			0.1%	10.7%	8.2%	3.9%	3.7%	3.6%
Revenue Requirements:								
Operating Rate Revenue	Annual	$ 3,015,900	$ 3,139,800	$ 3,534,600	$ 3,711,330	$ 3,896,897	$ 4,091,741	$ 4,296,328
Debt Service Revenues	Annual	2,667,400	2,670,600	2,955,700	3,198,580	3,322,660	3,446,740	3,570,820
Total		$ 5,683,300	$ 5,810,400	$ 6,490,300	$ 6,909,910	$ 7,219,557	$ 7,538,481	$ 7,867,148
	$ Change		**$ 127,100**	**$ 679,900**	**$ 419,610**	**$ 309,647**	**$ 318,925**	**$ 328,667**
	% Change		**2.2%**	**11.7%**	**6.5%**	**4.5%**	**4.4%**	**4.4%**
Non-Urban Rate Centers								
Operating Rate Revenue	Annual	$ 1,877,100	$ 1,964,600	2,066,200	2,169,510	2,277,986	2,391,885	2,511,479
Debt Service Revenues	Annual	716,900	830,700	1,134,400	1,429,400	1,724,400	2,019,400	2,314,400
Total		**$ 2,594,000**	**$ 2,795,300**	**$ 3,200,600**	**$ 3,598,910**	**$ 4,002,386**	**$ 4,411,285**	**$ 4,825,879**
				$ 405,300	**$ 398,310**	**$ 403,476**	**$ 408,899**	**$ 414,594**
				14.5%	**12.4%**	**11.2%**	**10.2%**	**9.4%**
Total ACSA All Revenues		**$ 14,704,800**	**$ 15,274,900**	**$ 16,832,000**	**$ 18,158,395**	**$ 19,388,637**	**$ 20,642,637**	**$ 21,921,582**
	$ Change		**$ 570,100**	**$ 1,557,100**	**$ 1,326,395**	**$ 1,230,242**	**$ 1,254,000**	**$ 1,278,946**
	% Change		**3.9%**	**10.2%**	**7.9%**	**6.8%**	**6.5%**	**6.2%**

Rivanna Water and Sewer Authority
CIP 2017-2021
Summary Information - Adopted 3/28/17

Non-Urban Rate Impacts

(all rates are monthly)

		Current Charges	Monthly Increase						
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total	5-Year Avg. Annual Increase
Crozet Water	Operations	$ 76,278							
	Debt Service	57,623							
		$ 133,901	$ 25,768	$ 25,768	$ 25,768	$ 25,768	$ 25,768	$ 128,840	**$ 25,768**
			19.2%	19.2%	19.2%	19.2%	19.2%	96.2%	
Scottsville Water	Operations	34,353							
	Debt Service	10,787							
		$ 45,140	143	143	144	144	145	$ 719	**$ 144**
			0.3%	0.3%	0.3%	0.3%	0.3%	1.6%	
Glenmore Wastewater	Operations	29,362							
	Debt Service	132							
		$ 29,494	122	$ 122	$ 123	$ 123	$ 123	$ 613	**$ 123**
			0.4%	0.1%	0.1%	0.1%	0.1%	0.5%	
Scottsville Wastewater	Operations	23,724							
	Debt Service	686							
		$ 24,410	99	$ 99	$ 100	$ 100	$ 100	$ 498	**$ 100**
			0.4%	0.4%	0.4%	0.4%	0.4%	2.0%	
All Non-Urban Rate Centers Monthly		**$ 163,717**							
		$ 69,228							
		$ 232,945	**$ 26,132**	**$ 26,132**	**$ 26,135**	**$ 26,135**	**$ 26,136**	**$ 130,670**	**$ 26,134**
			11.2%	**11.2%**	**11.2%**	**11.2%**	**11.2%**	**56.1%**	**11.2%**

Summary of Charges - Annually		FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total
Current FY2018	**$ 2,795,340**						
Annual Additional Revenue Needs		**$ 313,588**	**$ 313,584**	**$ 313,620**	**$ 313,620**	**$ 313,632**	**$ 1,568,044**
Total Annual Charge for Debt Service		$ 3,108,928	$ 3,422,512	$ 3,736,132	$ 4,049,752	$ 4,363,384	$ 4,363,384
		11.2%	10.1%	9.2%	8.4%	7.7%	56.1%

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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **LONZY E. WOOD, DIRECTOR OF FINANCE AND ADMINISTRATION**

REVIEWED BY: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **REIMBURSEMENT RESOLUTION – CIP FUNDING**

DATE: **JUNE 26, 2018**

The Authority, with the adoption of the Capital Improvement Plan (CIP) earlier in the current regular June meeting, is in a period of significant financing activity to fund many of the projects identified in the plan. We are currently using several sources of financing for these projects including cash, 2015B and 2016 Series bonds. However, as detailed in the approved CIP document, there are still needs for additional debt funding for several projects over the next 5 years that are not covered in the current bonds.

The attached Resolution of Official Intent (reimbursement resolution) and Exhibit A provide an estimate that as much as $96.9 million in new debt funding may be needed to finance project costs, which can be implemented in multiple issuances over several years as needed. After adding issuance cost requirements, a total of up to $98 million is estimated. As projects start up, we use 100 percent cash from the capital fund. Occasionally, we use temporary financing before bond sales to fund the projects. Then, after permanent financing is in place, bond proceeds are used to partially pay back cash to the capital fund (or pay off temporary financing) - in essence pay ourselves back. This capability to pay ourselves back as each debt issuance takes place is very important to provide the financial flexibility and continuity as projects are implemented while also complying with debt covenants and regulations (e.g. arbitrage requirements).

In order to perform this reimbursement with tax exempt borrowings, the Authority needs to have a "Reimbursement Resolution" in place. The attached resolution does this and does not specifically authorize the issuance of the debt at this time. This resolution does not fix the exact amount of the future debt we will issue, although it is important that we not issue debt in amounts larger than the amount stated in this resolution. The attached resolution states the official intention of the Board to fund projects with debt, and additionally states that some proceeds of this debt, when issued for the purposes of funding projects in the CIP, will be used to pay for costs incurred prior to the date of the debt being issued.

The Authority has routinely adopted reimbursement resolutions in the past and adopted one similar to this following the last several updates of the CIP that were approved by the Board. The

reimbursement resolution included with the Board agenda item is required for tax-exempt bond issues.

Board Action Requested:

After consideration by the Board, it is requested that the attached *Resolution Of Official Intent To Reimburse Expenditures With Proceeds of a Borrowing* be approved.

Attachment

RESOLUTION OF OFFICIAL INTENT TO REIMBURSE EXPENDITURES WITH PROCEEDS OF A BORROWING

WHEREAS, Rivanna Water and Sewer Authority (the "Borrower") intends to acquire, construct and equip improvements to its water and sewer system, including without limitation the capital improvement projects described in Exhibit A attached hereto (collectively, the "Project"); and

WHEREAS, plans for the Project have advanced and the Borrower expects to advance its own funds to pay expenditures related to the Project (the "Expenditures") prior to incurring indebtedness and to receive reimbursement for all or a portion of such Expenditures from proceeds of tax-exempt bonds or taxable debt, or both;

BE IT RESOLVED BY THE RIVANNA WATER AND SEWER AUTHORITY:

1. The Borrower intends to utilize the proceeds of tax-exempt bonds (the "Bonds") or to incur other debt, in an amount not currently expected to exceed $98,000,000 to pay all or a portion of the costs of the Project.

2. The Borrower intends that the proceeds of the Bonds be used to reimburse the Borrower for Expenditures with respect to the Project made on or after the date that is no more than 60 days prior to the date hereof. The Borrower reasonably expects on the date hereof that it will reimburse the Expenditures with the proceeds of the Bonds or other debt.

3. Each Expenditure was or will be, unless otherwise approved by bond counsel, either (a) of a type properly chargeable to a capital account under general federal income tax principles (determined in each case as of the date of the Expenditure), (b) a cost of issuance with respect to the Bonds, (c) a nonrecurring item that is not customarily payable from current revenues, or (d) a grant to a party that is not related to or an agent of the Borrower so long as such grant does not impose any obligation or condition (directly or indirectly) to repay any amount to or for the benefit of the Borrower.

4. The Borrower intends to make a reimbursement allocation, which is a written allocation by the Borrower that evidences the Borrower's use of proceeds of the Bonds to reimburse an Expenditure, no later than 18 months after the later of the date on which the Expenditure is paid or the Project is placed in service or abandoned, but in no event more than three years after the date on which the Expenditure is paid. The Borrower recognizes that exceptions are available for certain "preliminary expenditures," costs of issuance, certain de minimis amounts, expenditures by "small issuers" (based on the year of issuance and not the year of expenditure) and expenditures for construction of at least five years.

5. The Borrower intends that the adoption of this resolution confirms the "official intent" within the meaning of Treasury Regulations Section 1.150-2 promulgated under the Internal Revenue Code of 1986, as amended.

6. This resolution shall take effect immediately upon its passage.

June 26, 2018.

EXHIBIT A

Summary of the Capital Improvement Plan and financing plan as adopted on June 26, 2018:

	2019 - 2023 Adopted CIP	2017-2021 Adopted CIP	Change $
Project Cost			
Urban Water Projects	$ 89,832,485	$ 60,829,494	$ 29,002,991
Urban Wastewater Projects	32,895,150	58,968,070	(26,072,920)
Non-Urban Projects	31,174,400	16,072,890	15,101,510
Total Project Cost Estimates	**$ 153,902,035**	**$ 135,870,454**	**$ 18,031,581**
Funding in place			
Work-in-Progress (paid for)	$ 33,967,484	$ 37,841,713	(3,874,229)
Debt Proceeds Used	11,230,305	41,251,626	(30,021,321)
Cash-Capital Available	7,702,584	9,682,421	(1,979,837)
	$ 52,900,373	$ 88,775,760	$ (35,875,387)
Financing Needs			
Possible Future Reserves	$ 4,111,000	7,830,344	(3,719,344)
New Debt	96,890,662	39,264,350	57,626,312
	$ 101,001,662	$ 47,094,694	$ 53,906,968
Total Funding	**$ 153,902,035**	**$ 135,870,454**	**$ 18,031,581**
Percentage of funding in place	34.4%	65.3%	
Ratio of debt to expense	92.3%	87.1%	
Ratio of cash to expense	7.7%	12.9%	

*The undersigned Secretary of the Rivanna Water and Sewer Authority hereby certifies that the foregoing is a true and correct copy of the resolutions adopted by the Board of Directors of the Authority at the regular meeting of the Board of Directors held on **June 26, 2018**.*

_____

Name: Jeff Richardson

Title: Secretary, Rivanna Water and Sewer Authority

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MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **JENNIFER WHITAKER, DIRECTOR OF ENGINEERING & MAINTENANCE; DAVID TUNGATE, DIRECTOR OF OPERATIONS**

REVIEWED BY: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **STORM EVENT AND FLOOD: MAY 30-31, 2018**

DATE: **JUNE 26, 2018**

The recent storm significantly challenged our water and wastewater facilities. Through timely and experienced responses by our staff, major impacts to our infrastructure were minimized.

This presentation is to provide an overview of the storm event.

Board Action Requested:

No action needed

Attachment - Presentation

Storm Event & Flood : May 30-31, 2018

Response, Mitigation, and Recovery

RIVANNA
WATER & SEWER AUTHORITY

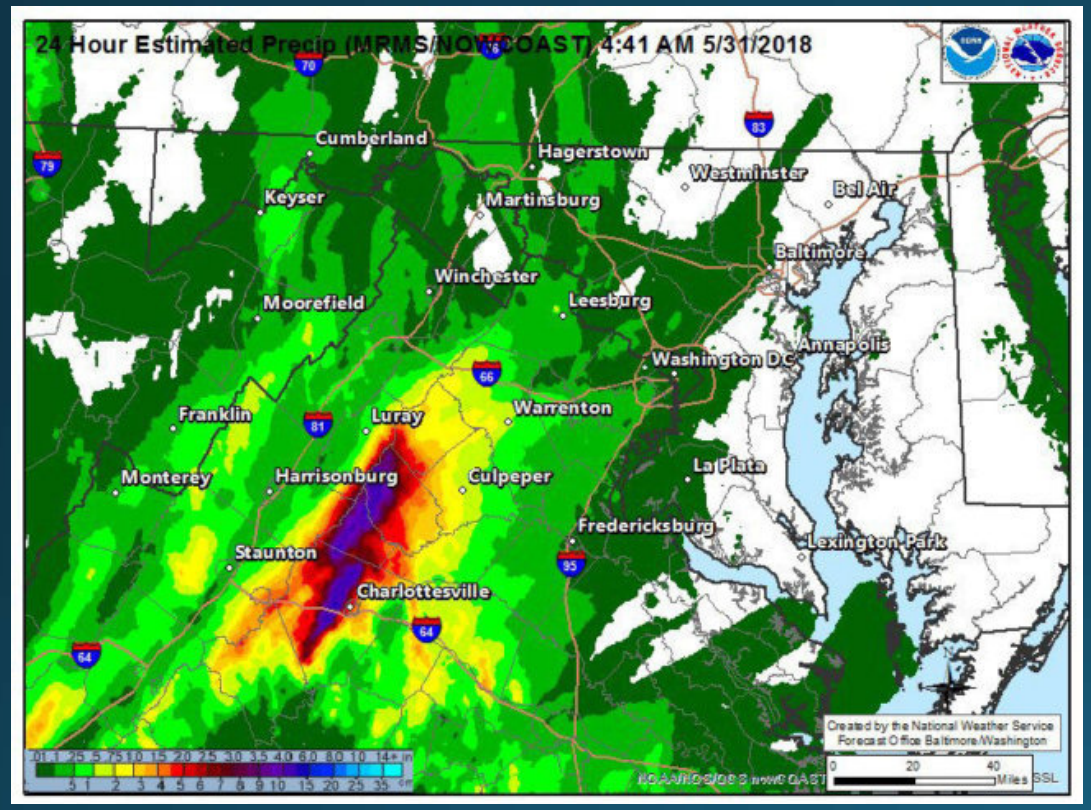
Presented By:

Jennifer Whitaker, Director of Engineering & Maintenance

David Tungate, Director of Operations

June 26, 2018

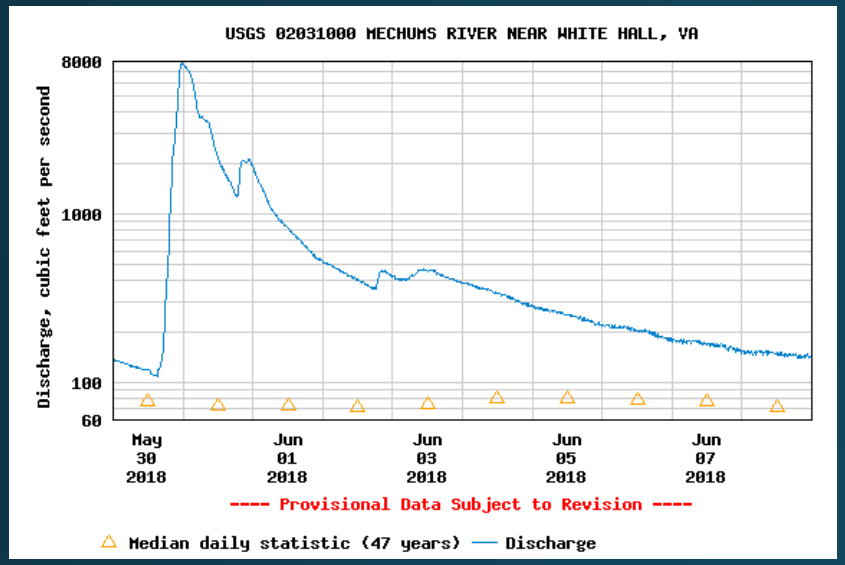
The Storm



- Intense Thunderstorm Activity begins late afternoon Wednesday May 30th
- Locally 8”-10” of rainfall

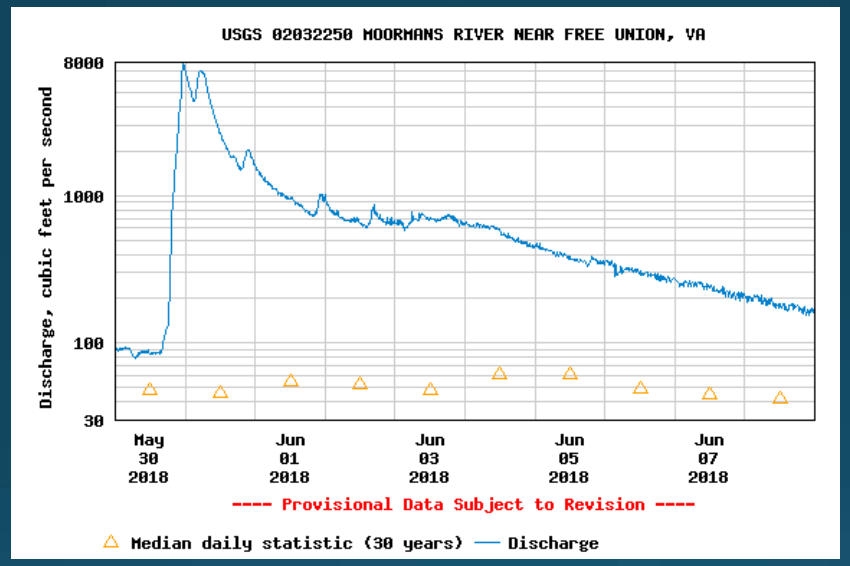
The Storm

- Intense Thunderstorm Activity begins late afternoon Wednesday May 30th
- Locally 8”-10” of rainfall



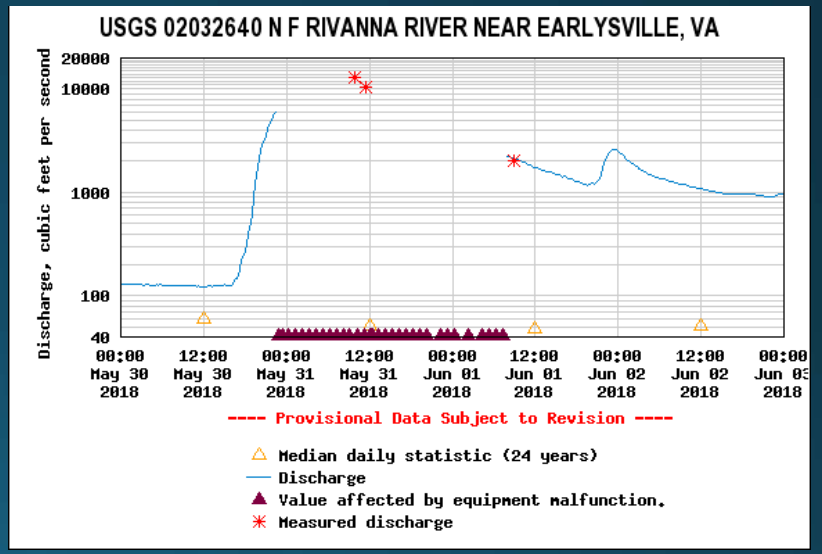
Mechums River rose from
5 feet > 17 feet in 7.25 hours

120 cfs to 8,000 cfs



Moormans River rose from
4 feet to > 15 feet in 5.5 hours

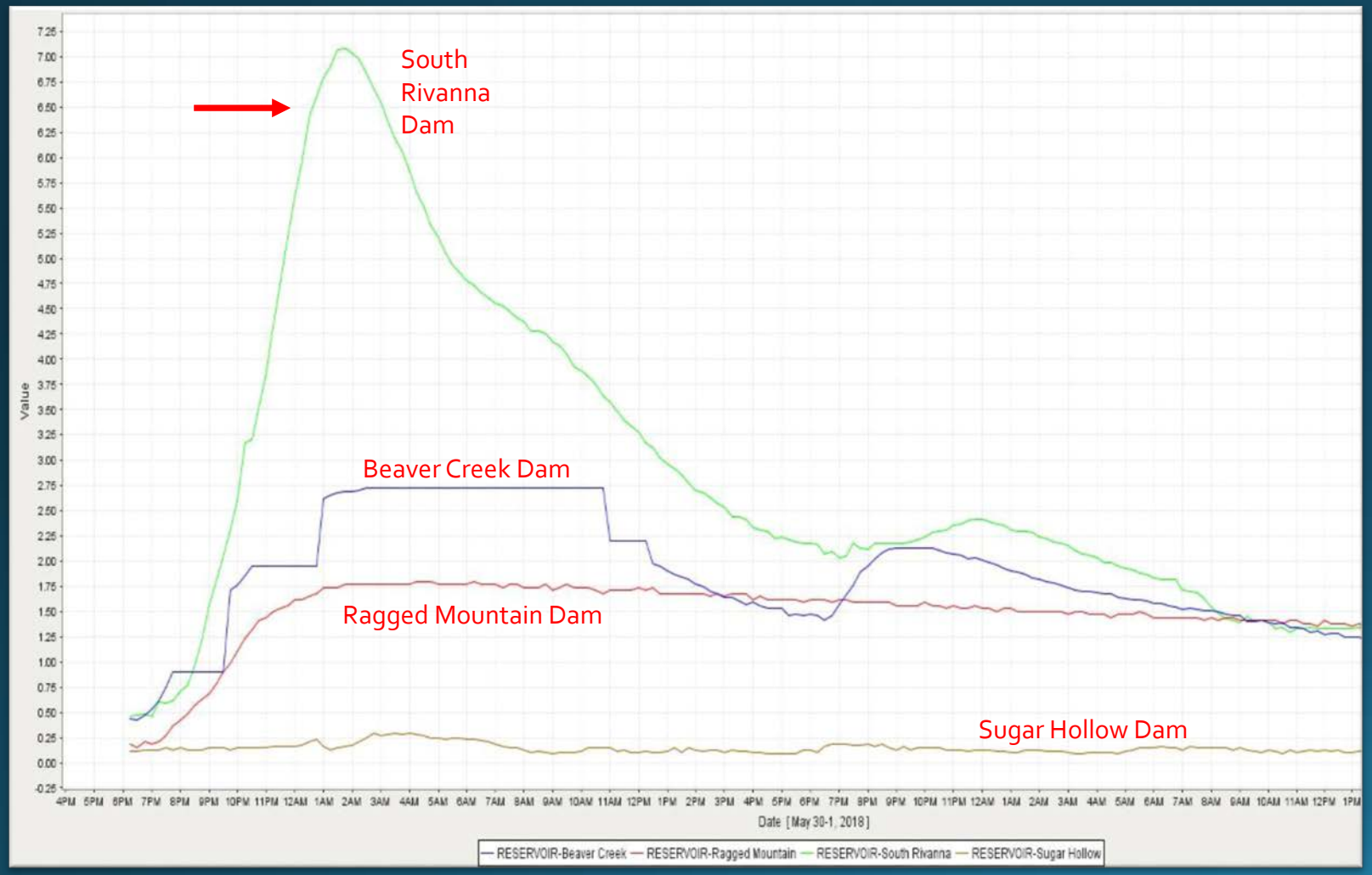
90 cfs to 8,000 cfs



North Rivanna River rose from
2 feet to > 18 feet in 8 hours

120 cfs to 20,000 cfs

Dam Safety Program



- Remote Monitoring of All Dams
- On Site Monitoring at SRD
- Activation of Emergency Action Plan for South Rivanna Dam at 6.5 feet
- On-site Dam Inspection

Beaver Creek Dam

Sugar Hollow Dam

5/31/18

6/1/18

Ragged Mountain Dam

South Rivanna Dam

7/23/2017

South Rivanna Dam

Approx. 4 feet in spillway

9 am on 5/31/18

South Rivanna Dam

South Rivanna Water Treatment Plant

- In a normal week, South Rivanna WTP will process approximately 75,000 pounds of water treatment residuals
  - This equals three (3) roll off boxes with 25,000 pounds of dried sludge in each box

- Since May 31, a full roll off box has been processed every day; equaling 175,000 pounds of sludge a week
  - This equals an extra 100,000 pounds of sludge a week and went on for 18 straight days after the storm

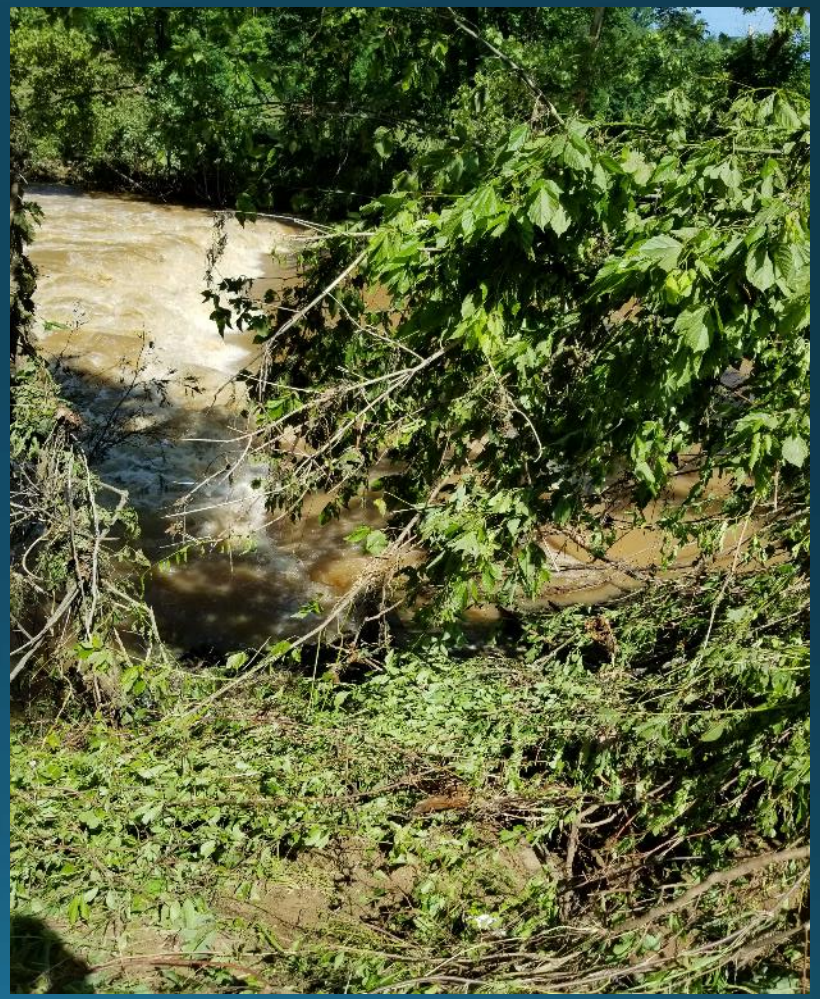
South Rivanna WTP Chemical Feed System

- South Rivanna pre lime feed system in operation before GAC upgrades could dose dry lime 530 grams/minute

- New liquid lime pre feed system met lime dose needed to treat high turbidity water from storm, which was 1,930 grams/minute

North Rivanna Raw Intake

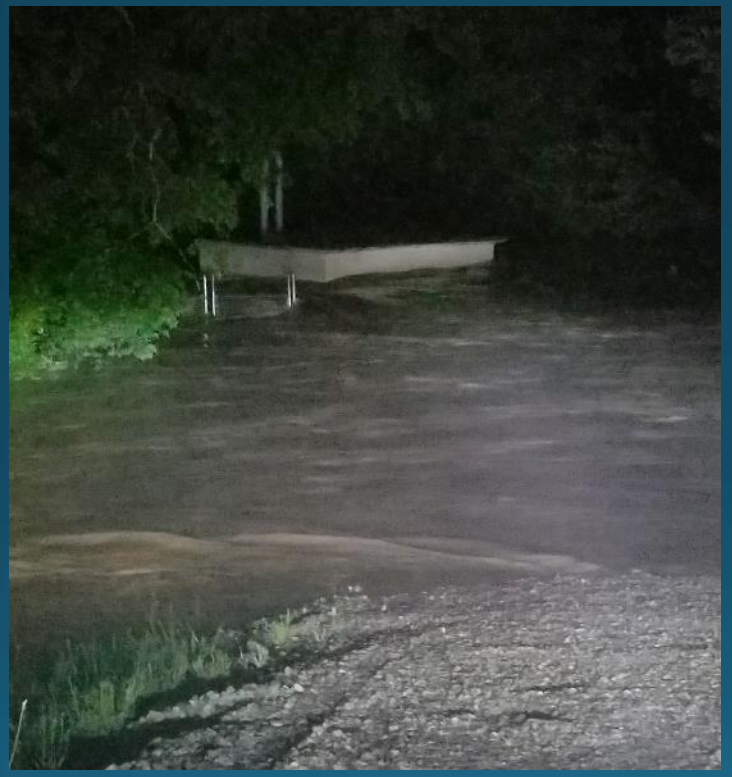
Normal Condition
September 2016



6/1/18

North Rivanna WTP – Raw Water PS

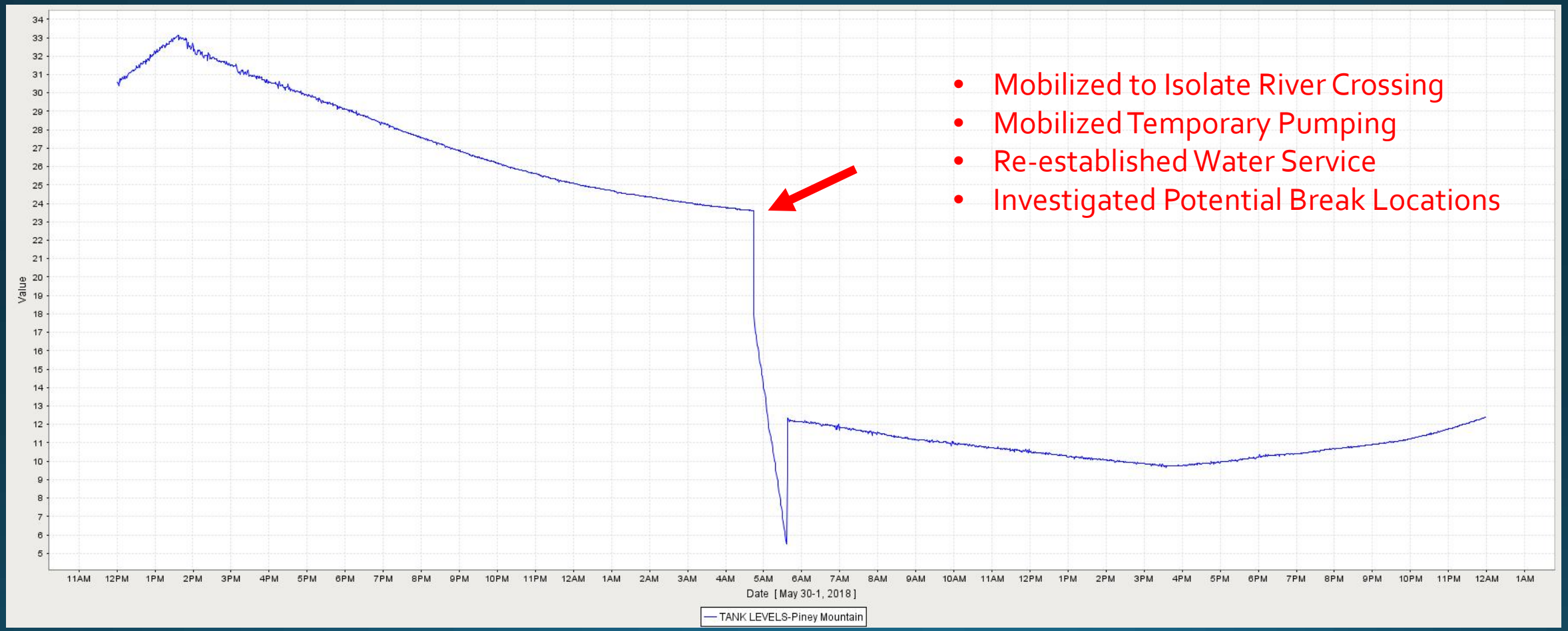
Normal Condition



3:45am on 5/31/18

9am on 5/31/18

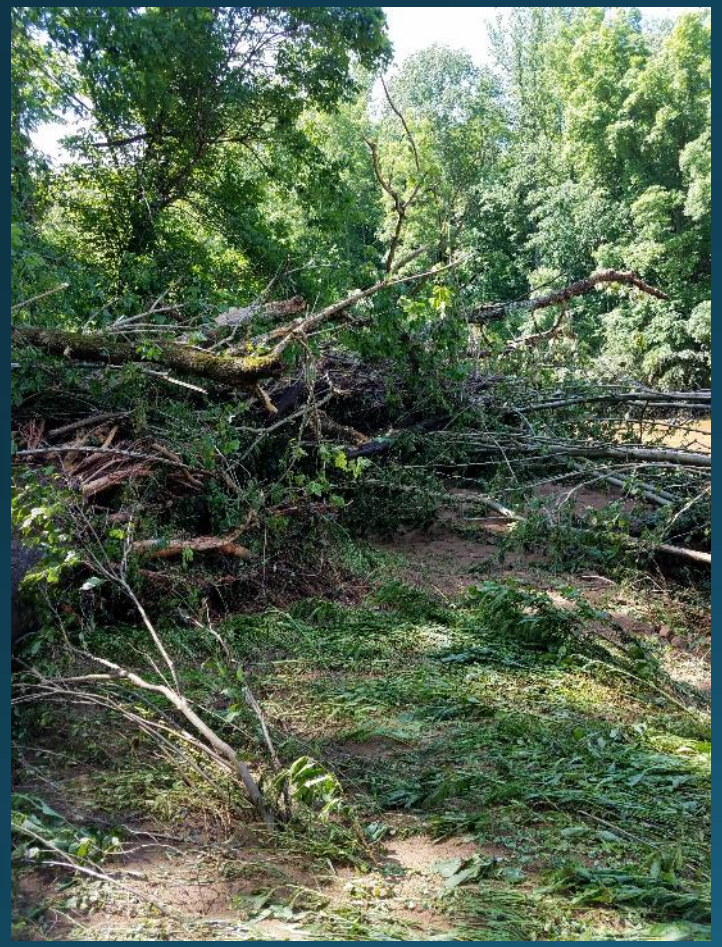
Piney Mountain Tank



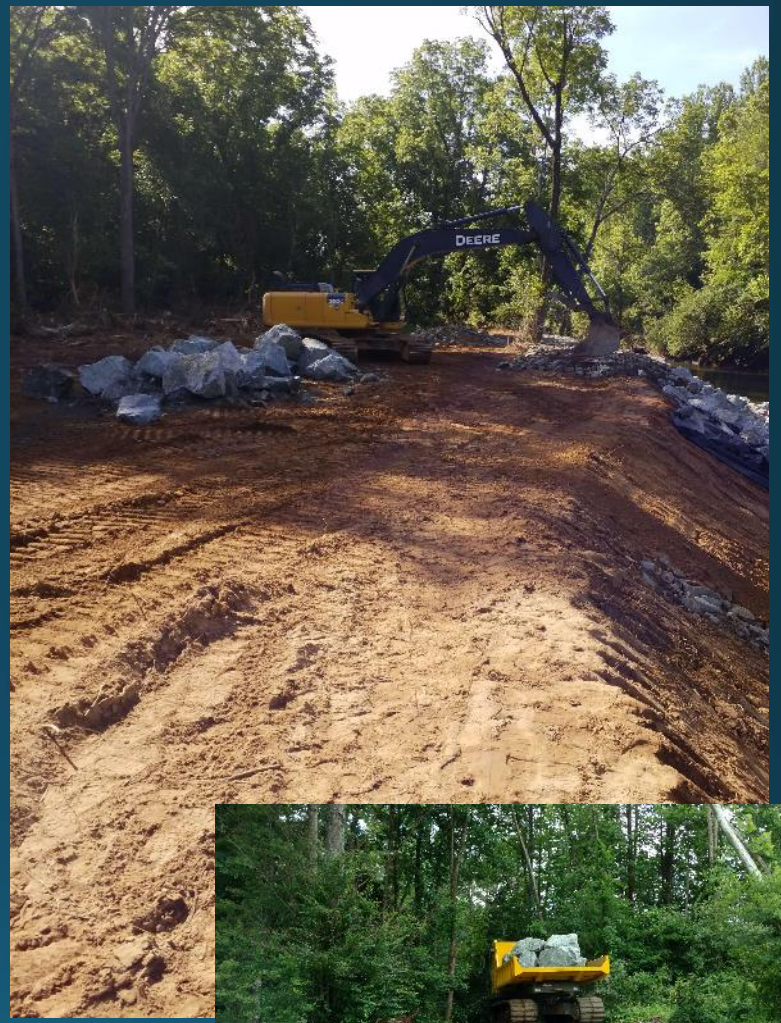
- Mobilized to Isolate River Crossing
- Mobilized Temporary Pumping
- Re-established Water Service
- Investigated Potential Break Locations

South Rivanna Operators noticed the drop in Piney Mountain Tank at 4:45 am

North Rivanna Water Line Break



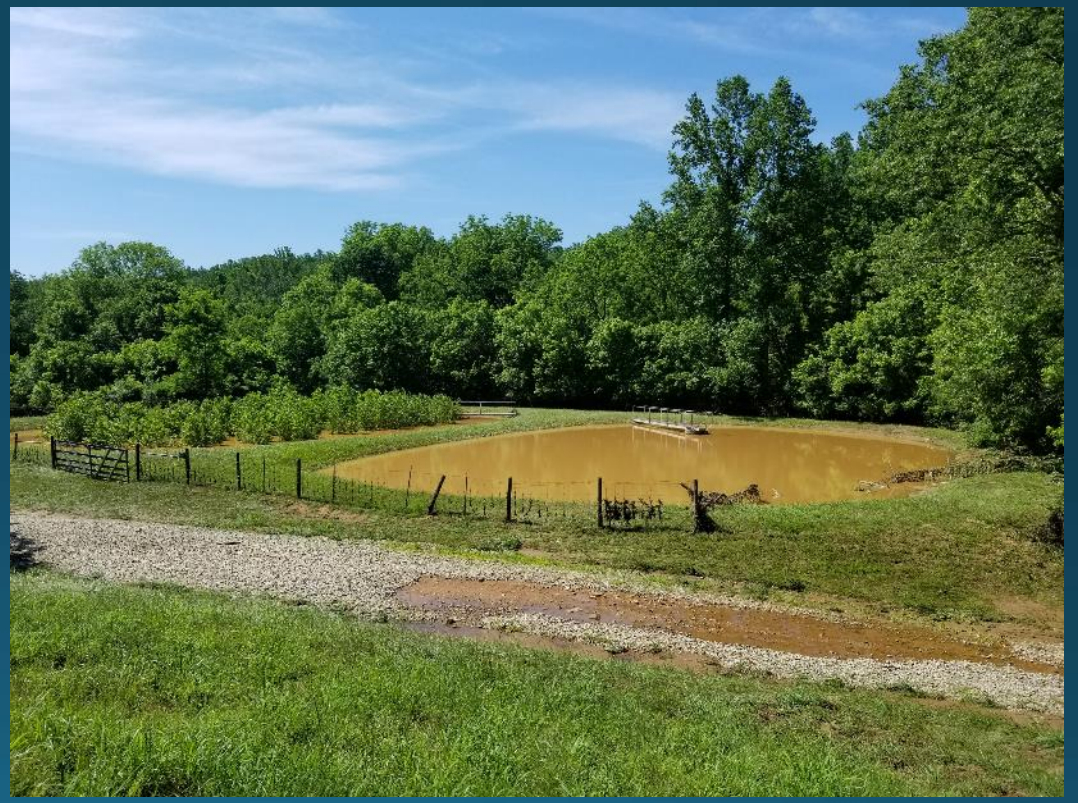
Temporary Pump at Hollymead TC



- Constructed access and debris removal
- Replaced 200 feet of 14-inch pipe
- Relocated further away from stream bank
- Shaped and armored stream bank

North Rivanna WTP – Backwash Lagoons

Backwash Lagoons – Normal operation



Backwash Lagoons – Inundated after the North Rivanna River receded

North Rivanna Raw Pump Station

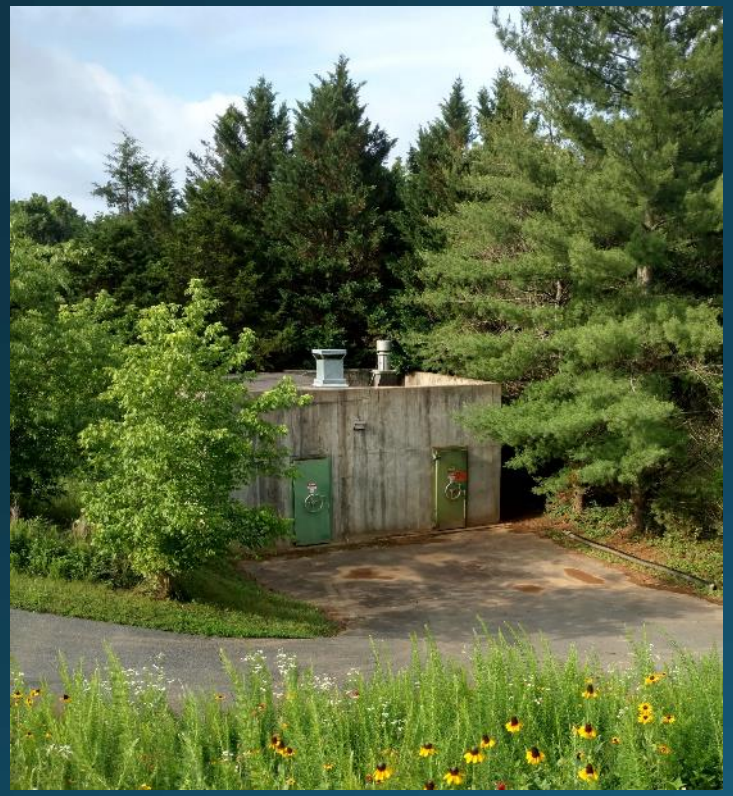
North Rivanna Backwash Lagoons

Rivanna WW Pump Station

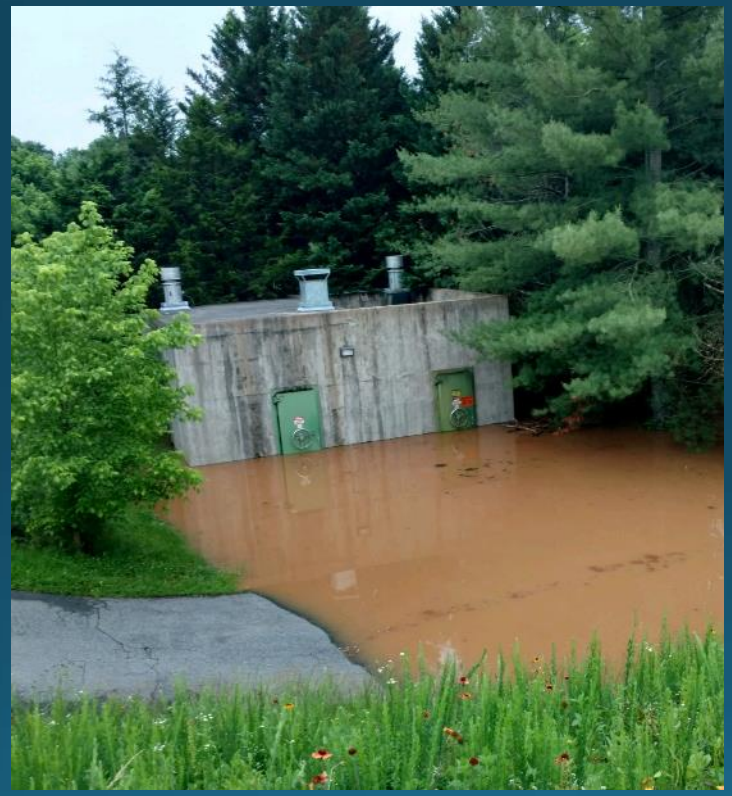
- Rivanna sewer pump station relocated out of flood prone area
- Capacity increased to over 50 MGD
- Zero storm related sewer overflows
- Original pump station would have been overwhelmed during the storm event

Historical Location of RPS

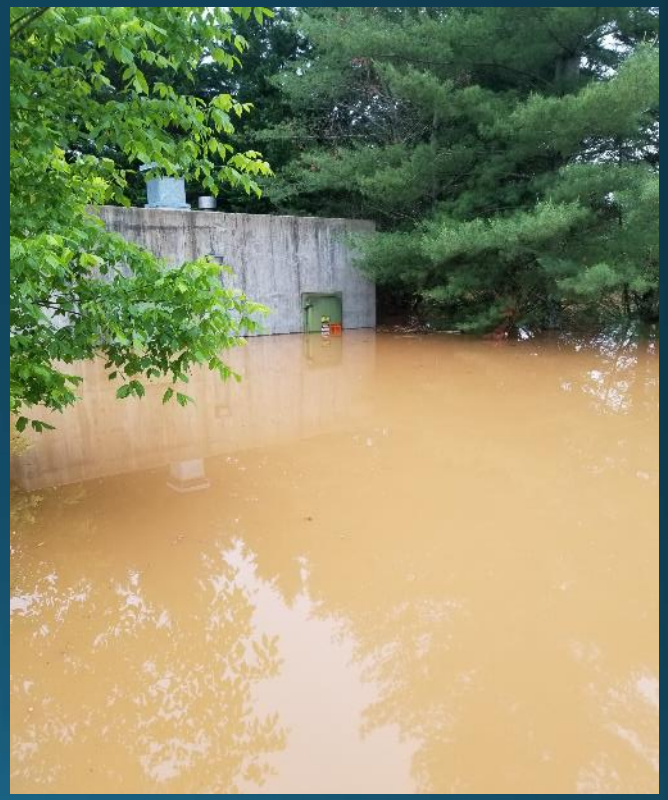
Glenmore WW Pump Station



Normal Condition



6am on 5/31/18

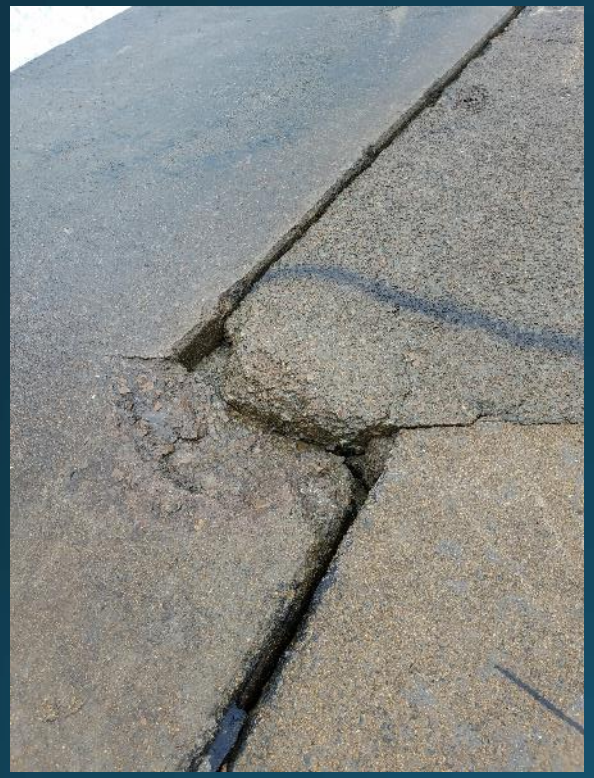


9am on 5/31/18

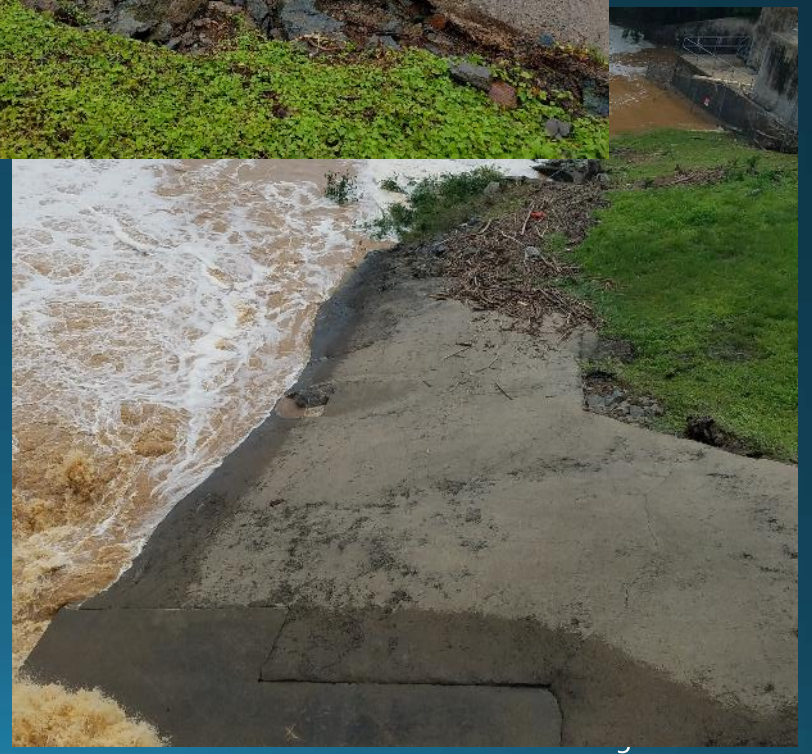
Ivy MUC

- Storm related leachate hauling from Ivy to Moores Creek was 94,350 gallons
- The road to the leachate pond had to be regraded
  - 225 tons of gravel were added
- Free acceptance of storm related vegetative debris from residents started on June 1st and will run until June 16th
  - Approximately 39 tons collected

Future Repair & Mitigation



- Downstream Concrete Apron Repair



Future Repair & Mitigation

- Downstream River Bank Repair

Costs

• Response labor and equipment:	$45,000
• Repair of North Rivanna water line:	$275,000
• Repairs to South Rivanna dam facilities:	$200,000
	$520,000

695 MOORES CREEK LANE
CHARLOTTESVILLE, VA 22902-9016
TEL: 434.977.2970
FAX: 434.293.8858
WWW.RIVANNA.ORG

MEMORANDUM

TO: **RIVANNA WATER & SEWER AUTHORITY BOARD OF DIRECTORS**

FROM: **LONZY E. WOOD, DIRECTOR OF FINANCE AND ADMINISTRATION**

REVIEWED BY: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **REVENUE MODEL**

DATE: **JUNE 26, 2018**

The Authority hired Municipal Finance Services Group, LLC (MFSG) last winter to review our rate setting process relative to our financial policies and produce a model that will show our revenue requirements looking forward ten years. The model considers the impact of the recently adopted Five-Year CIP (FY 2019-2023) and the next five-year period (FY 2024 – 2028) with all projects identified by staff included in the model, which tallied up to $24.6 million in capital projects for that period. This review also took into consideration key components of our financial policies such as debt service coverage, reserves and operating cash.

This model will be a good analysis tool to review the future financial impact of major projects like the Ragged Mountain to South Fork Rivanna Pipeline project, and to help our two customers prepare for future revenue requirements. Michael Maker and Ed Donahue from MFSG will be at the Board meeting to give a presentation of the financial model and answer any questions.

Board Action Requested:

No action needed

Attachment - Presentation

Rivanna Water & Sewer Authority

Water and Sewer Ten-Year Revenue Model Recommendations

Michael Maker, Senior Manager
Edward Donahue, President

June 26, 2018

RIVANNA WATER & SEWER AUTHORITY

Municipal & Financial Services Group

Guiding Principles and Objective

- The water and wastewater systems must each be financially self-supporting
- The Authority should maintain reserves to provide for contingencies and unplanned expenses
- Water and wastewater rates and charges should be kept as low as possible *over time*
- The Authority should invest annually in regular planned maintenance, rehabilitation and replacement of infrastructure

Objective: Ensure operating rates and debt service charges are stable through sound financial management and system maintenance

- ✓ Review water and wastewater funds to maintain financial stability
- ✓ Prepare long-term financial plan that includes capital investments required for a sustainable system

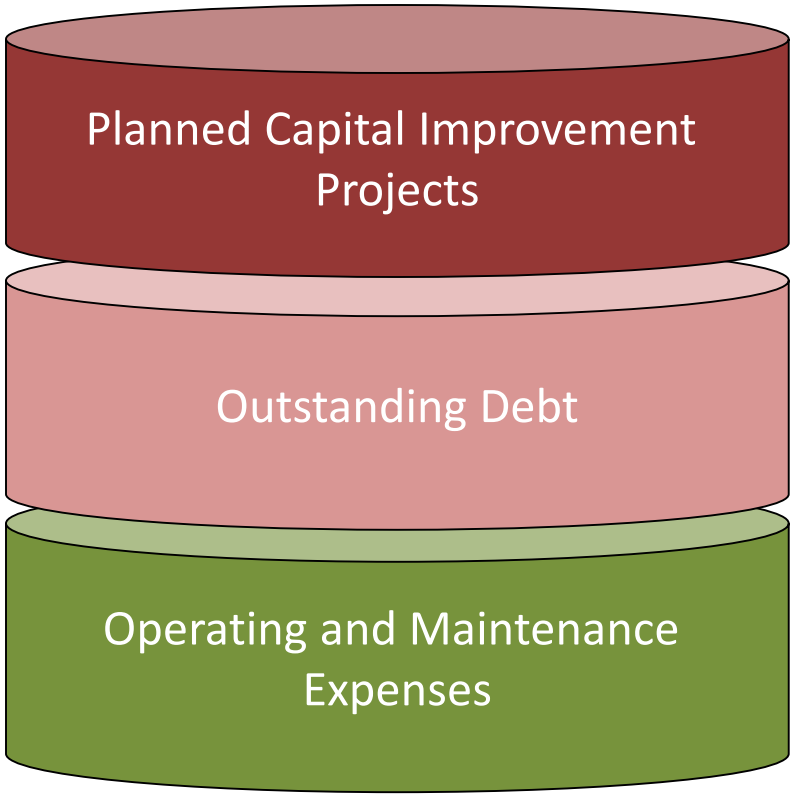
Municipal & Financial Services Group

Factors Affecting Rates and Charges

- Operating and maintenance expense changes
  - escalation rates vary by expense type (labor, benefits, services, supplies, etc.)
- Capital improvement plans
  - investment in the various water and wastewater systems
- Debt service
  - existing and future debt
- Customer and flow changes
  - no growth
  - allocations between City / County have been gradually shifted from City to County
- Miscellaneous revenue changes
  - no growth
- Minimum cash balance
  - 90 days of operating expenses
- Debt service coverage
  - maintain coverage of 1.25 with goal of 1.50

Municipal & Financial Services Group

What is the “Revenue Requirement”?



Capital Revenue Requirement (Debt Service Charges)

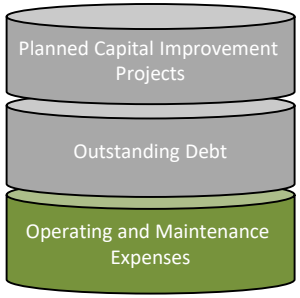
Operating Revenue Requirement (Operating Rates)

Developed for the following cost centers:

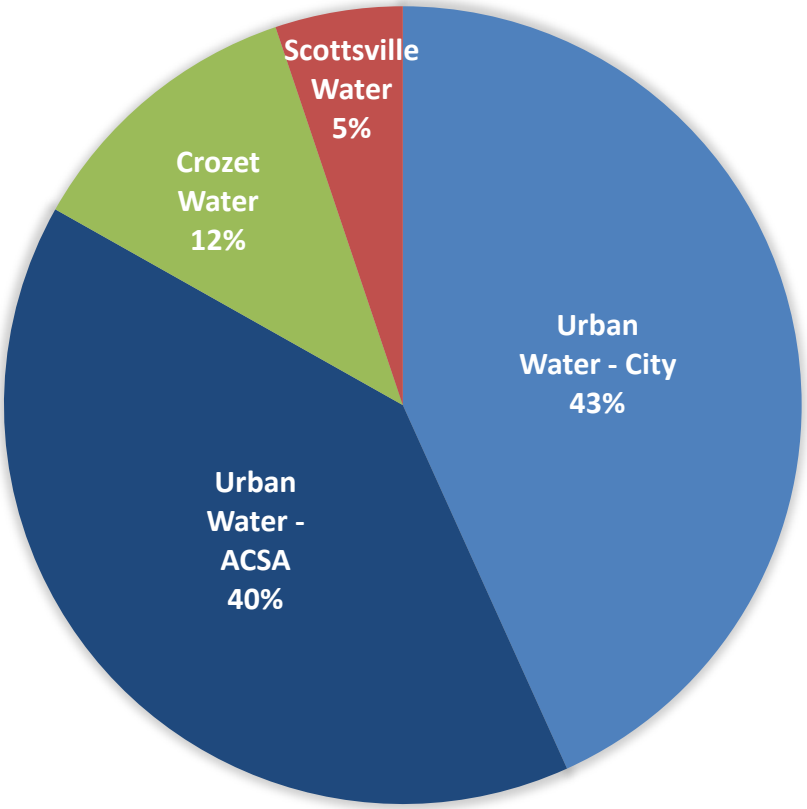
- Urban Water - City
- Urban Water - ACSA
- Urban Wastewater - City
- Urban Wastewater - ACSA
- Crozet Water
- Scottsville Water
- Glenmore Wastewater
- Scottsville Wastewater

Municipal & Financial Services Group

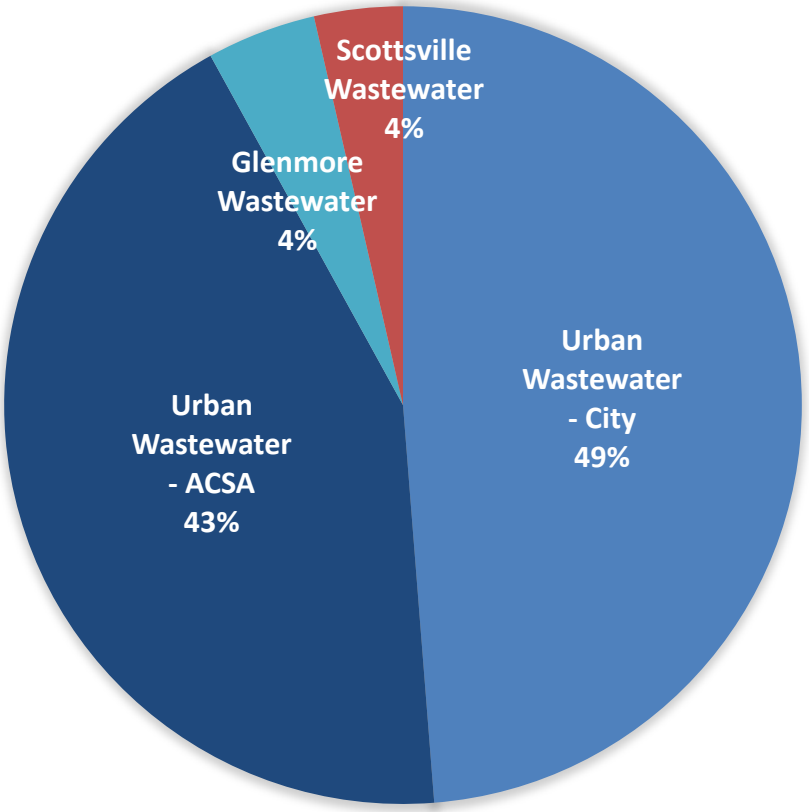
Current O&M Expenses (FY 2019)



Water
($8.78 million total)



Wastewater
($8.72 million total)



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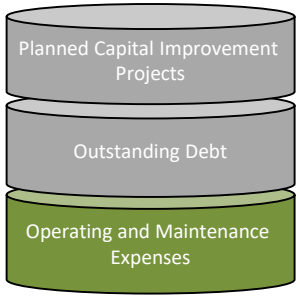
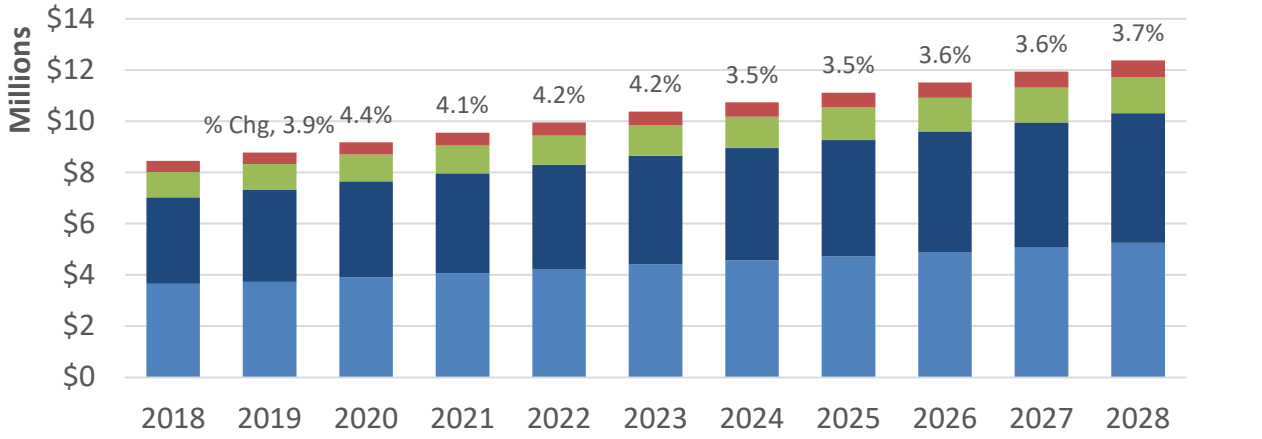
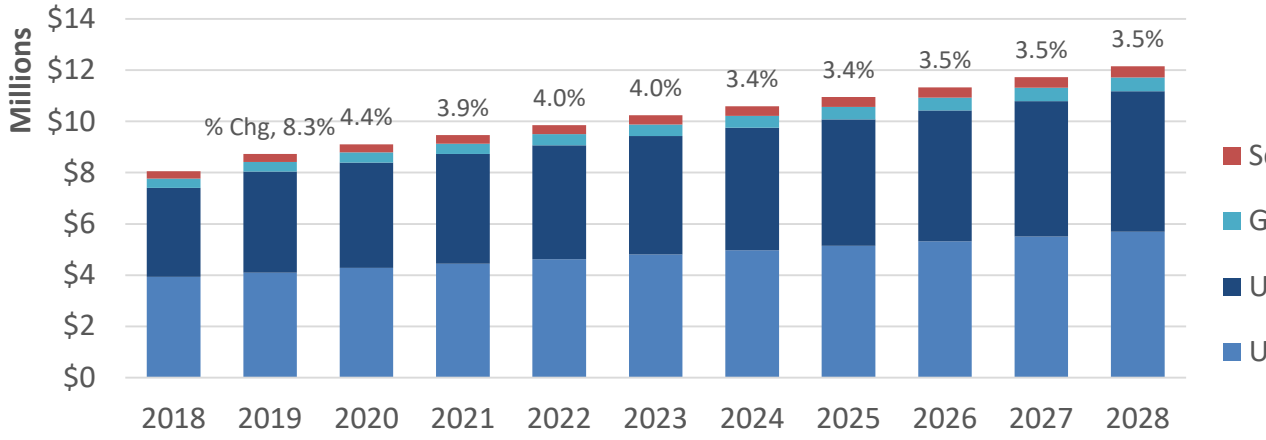
Forecast O&M Expenses



Water

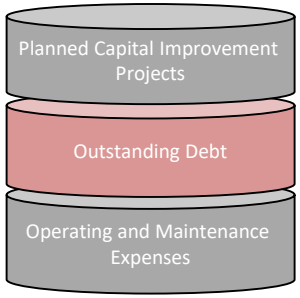


Wastewater

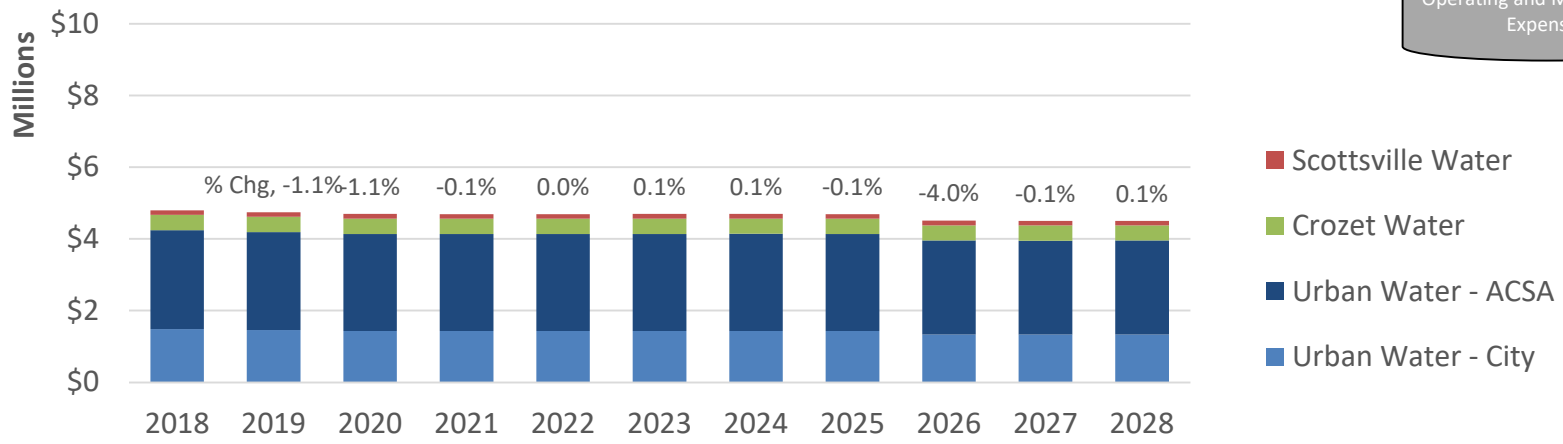


Municipal & Financial Services Group

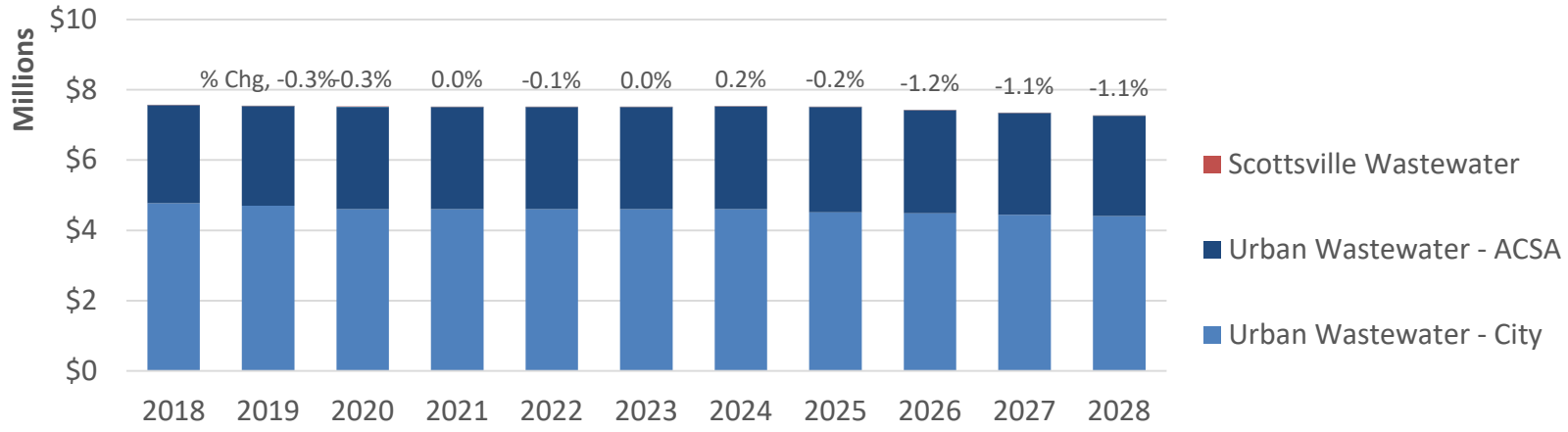
Current Debt Payments



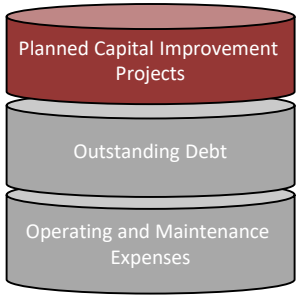
Water



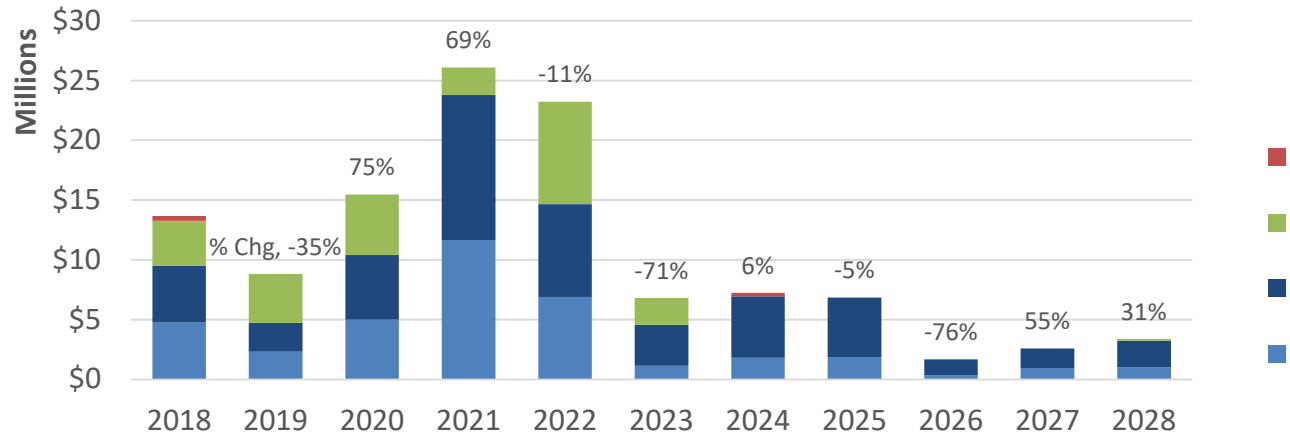
Wastewater



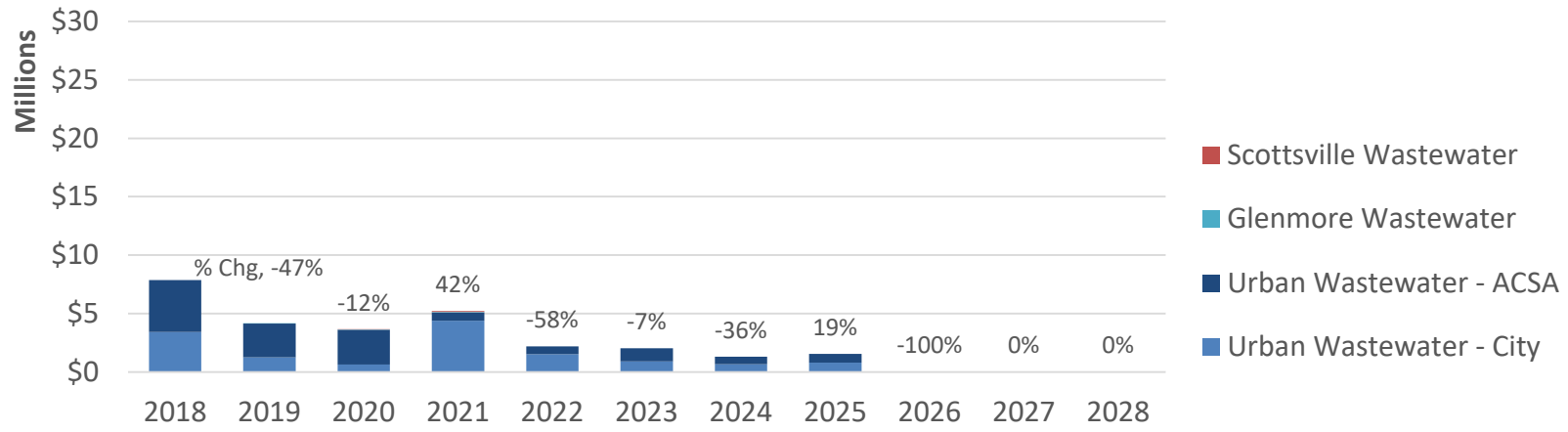
Planned Capital Projects



Water

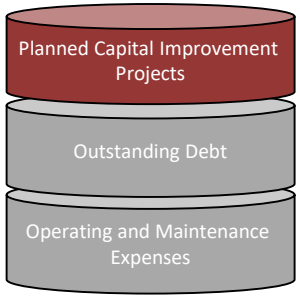


Wastewater

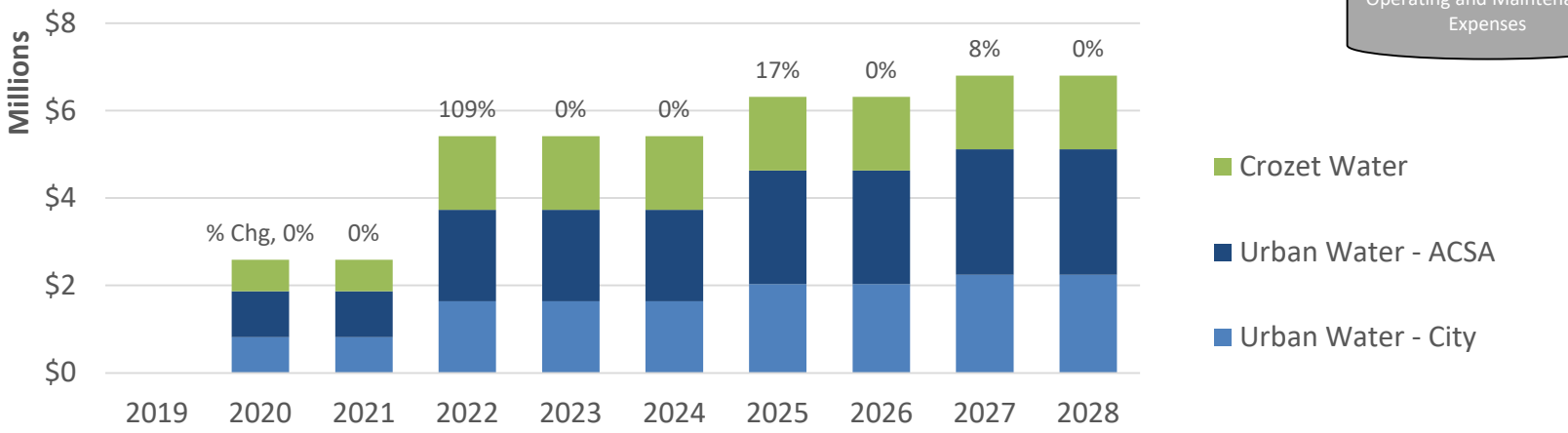


The majority of projects are anticipated to be debt funded.

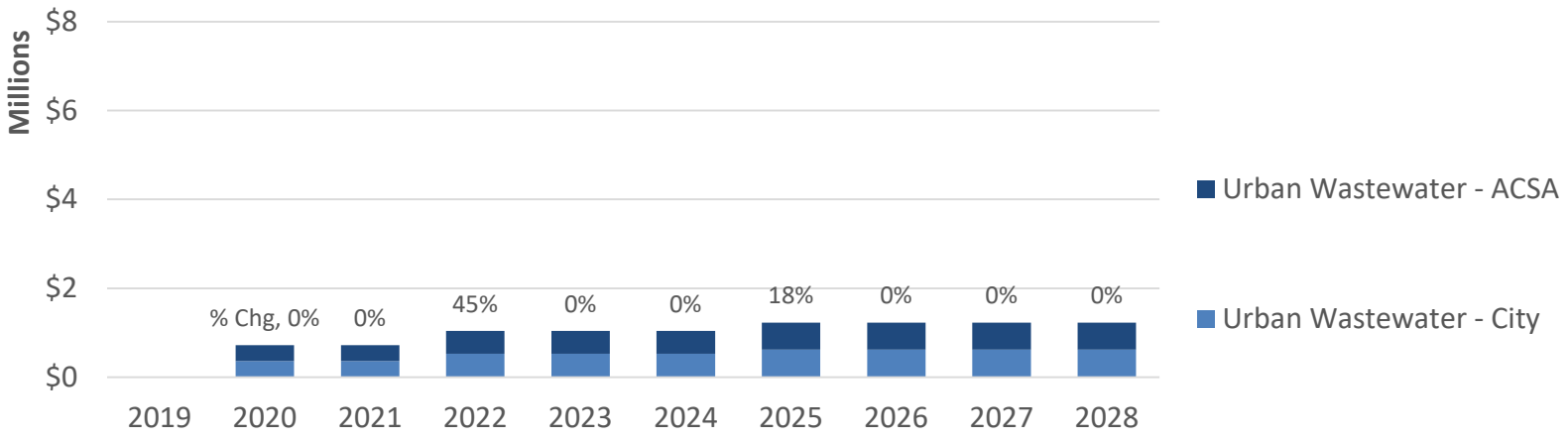
New Debt Payments



Water



Wastewater



Assuming issuance cost of 5.0% and interest rate of 5.5% for 30 years

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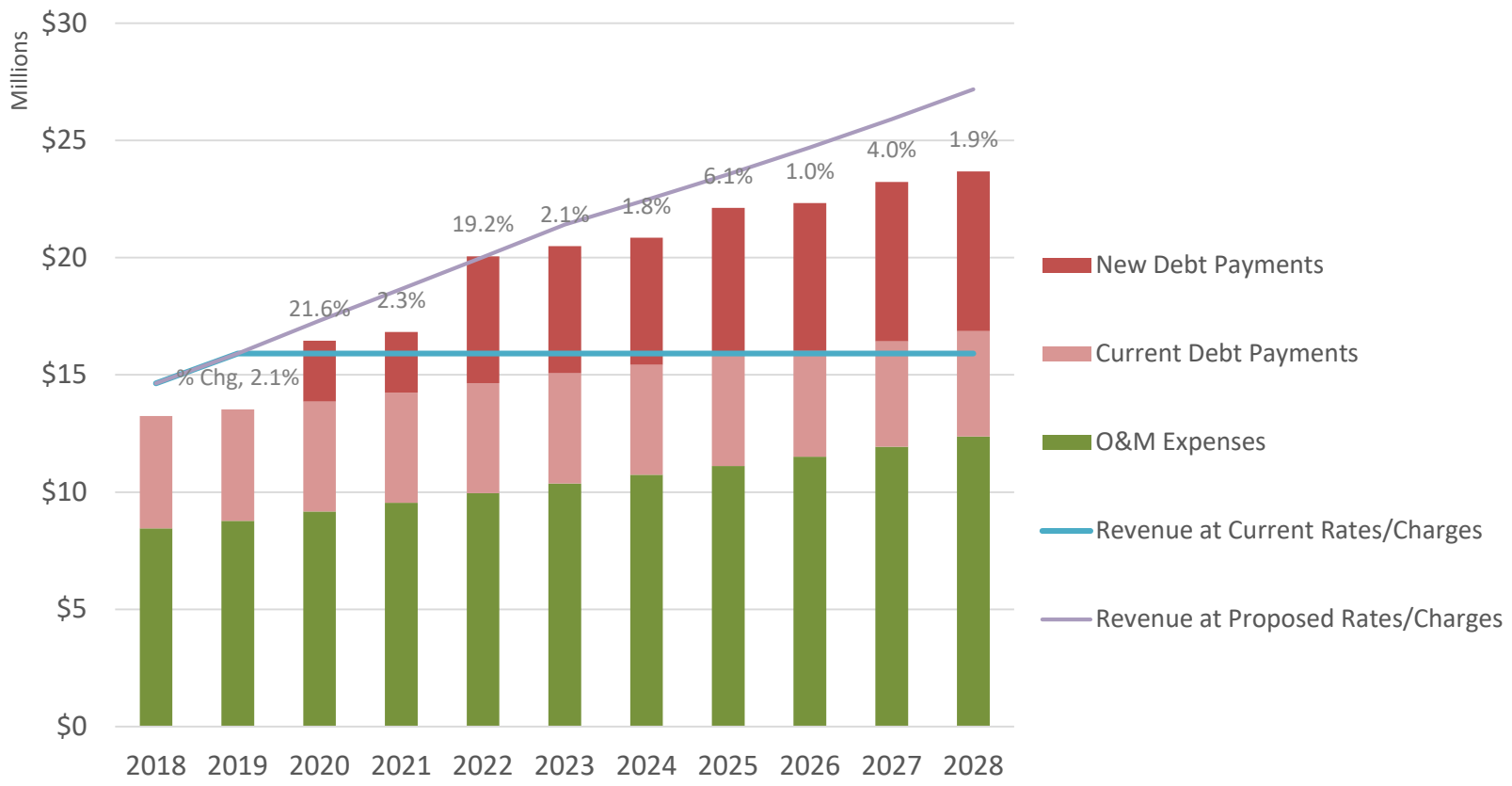
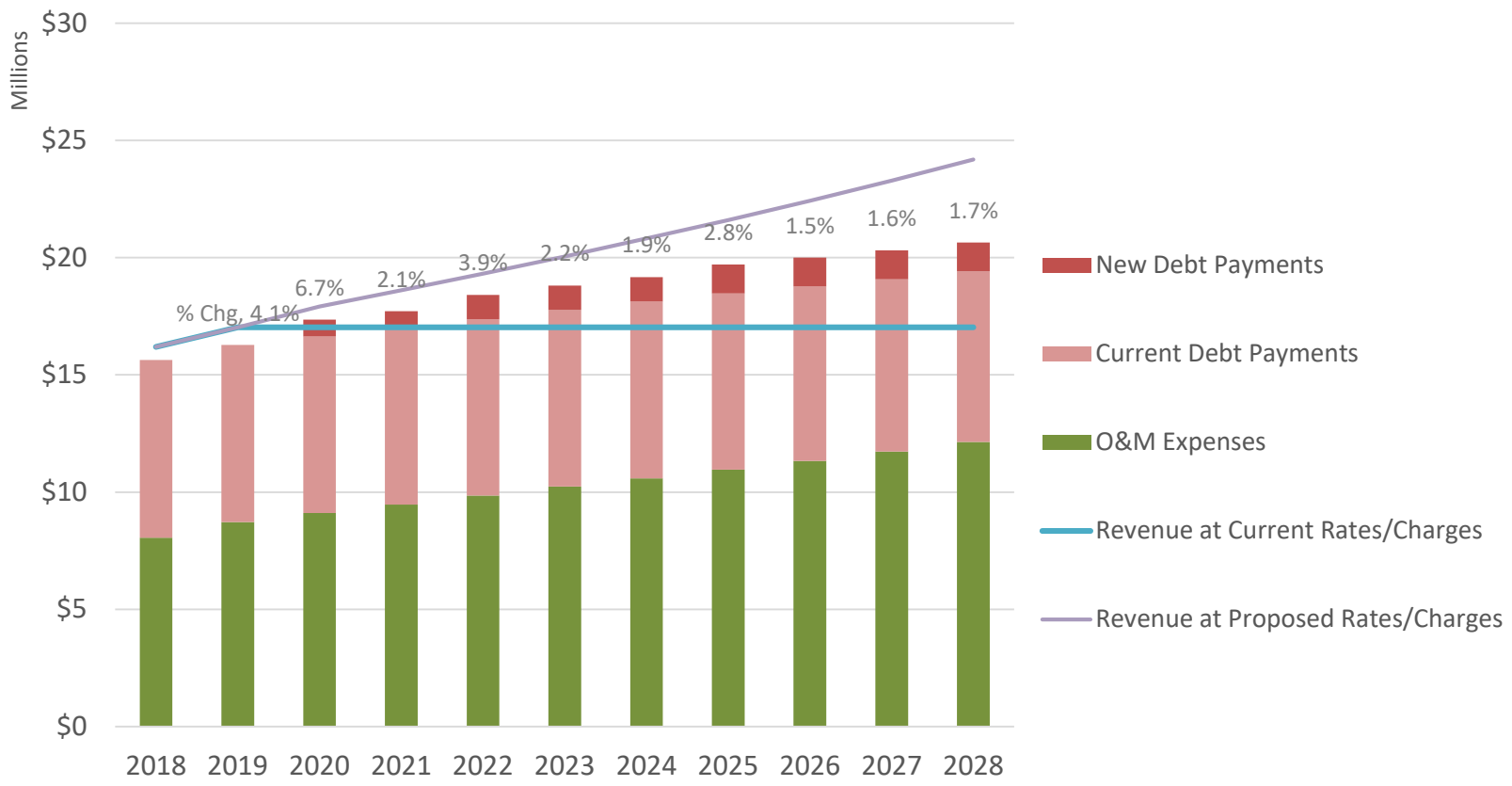
Revenue Requirements vs. Revenue - Water



Revenue at Proposed Rates/Charges calculated so that debt service coverage of 1.25 is achieved by no later than FY 2028

Revenue Requirements vs. Revenue - Wastewater



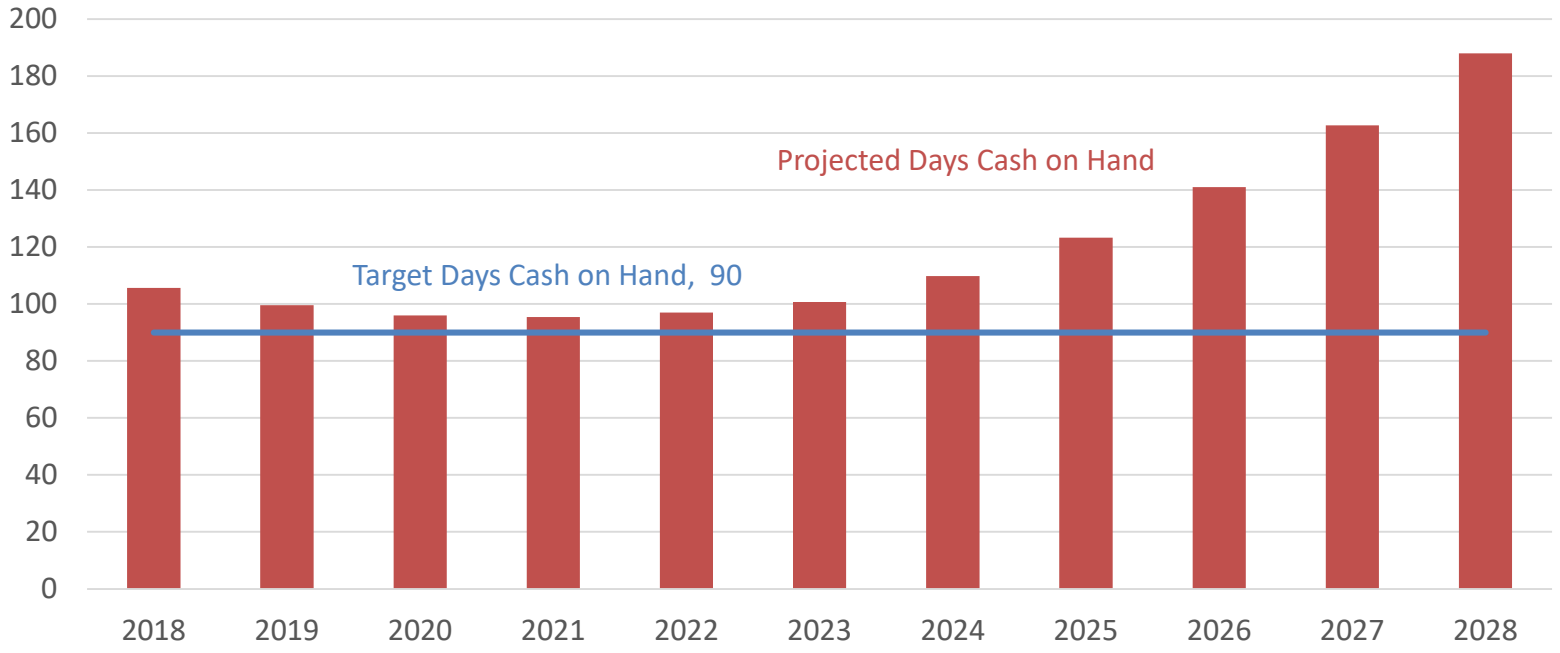
Revenue at Proposed Rates/Charges calculated so that debt service coverage of 1.25 is achieved by no later than FY 2028

O&M Reserve – Combined Water/Wastewater

- Number of days of operating cash on hand:

$$Days\ Cash\ on\ Hand\ = \frac{Cash}{O\&M}\ x\ 365$$

- Reflects a measure of financial liquidity
- The number of days the system could continue to operate if revenues stopped
- A higher number helps achieve a stronger credit rating
- Target has been set at 90 days of O&M and RWSA goal is 60 days of total budget

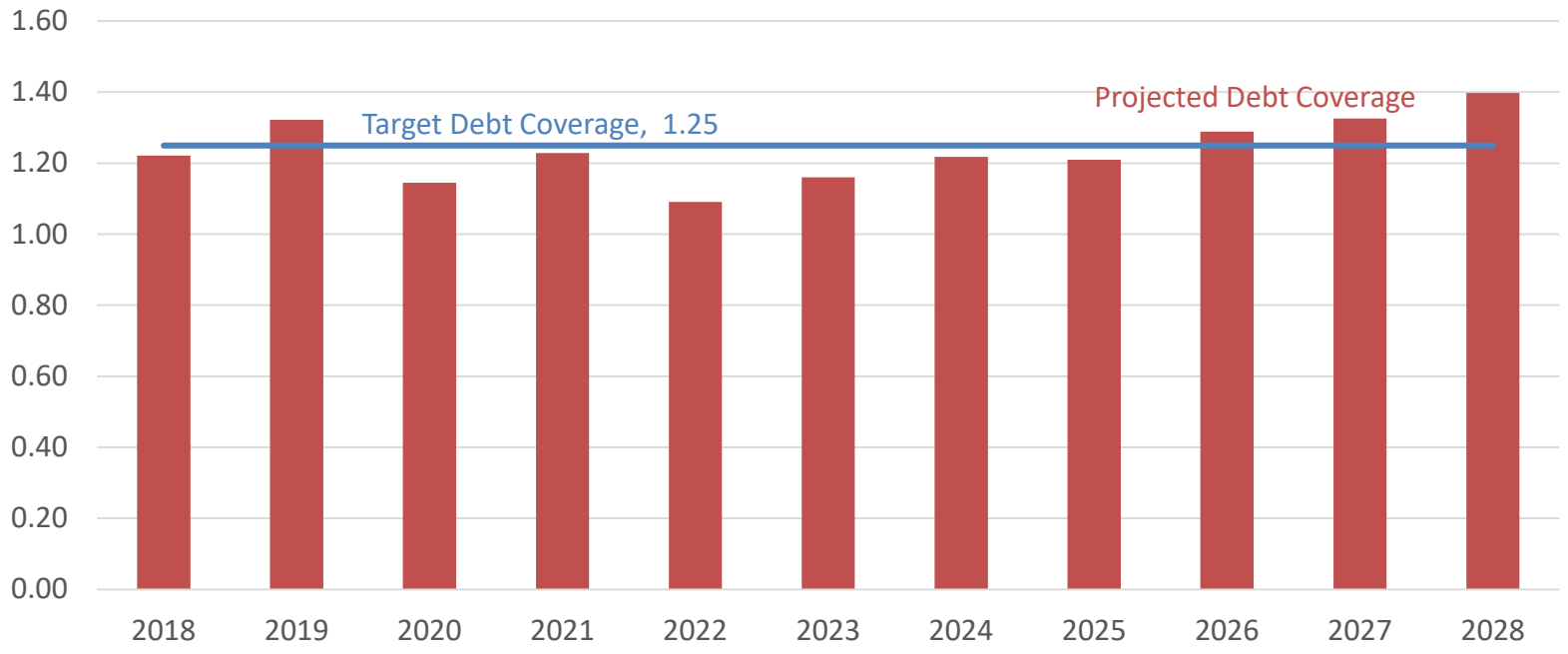


Debt Coverage – Combined Water/Wastewater

- Ratio of cash available to meet annual interest and principal debt payments:

$$Debt\ Service\ Coverage = \frac{Revenue\ - O\&M}{Debt\ Service}$$

- Reflects the adequacy of utility revenues to meet costs
- May be required for debt covenant agreements
- A higher ratio helps achieve a stronger credit rating
- Target has been set at 1.25 and RWSA goal is 1.50



Projected Rates and Charges

	Current	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
City of Charlottesville											
Urban Water											
Operating Rate (per 1,000 gallons)	$1.97	$2.07	$2.17	$2.28	$2.40	$2.52	$2.64	$2.77	$2.91	$3.06	$3.21
Debt Service Charge (per month)	$160,039	$181,008	$204,789	$227,164	$249,539	$271,914	$285,510	$299,785	$314,774	$330,513	$347,039
Urban Wastewater											
Operating Rate (per 1,000 gallons)	$1.95	$2.15	$2.25	$2.37	$2.48	$2.61	$2.74	$2.88	$3.02	$3.17	$3.33
Debt Service Charge (per month)	$392,841	$408,260	$429,341	$441,801	$454,261	$466,721	$480,723	$495,144	$509,999	$525,299	$541,058
Albemarle County Service Authority											
Urban Water											
Operating Rate (per 1,000 gallons)	$1.97	$2.07	$2.17	$2.28	$2.40	$2.52	$2.64	$2.77	$2.91	$3.06	$3.21
Debt Service Charge (per month)	$285,439	$307,598	$341,357	$369,357	$397,357	$425,357	$446,625	$468,956	$492,404	$517,024	$542,876
Urban Wastewater											
Operating Rate (per 1,000 gallons)	$1.95	$2.15	$2.25	$2.37	$2.48	$2.61	$2.74	$2.88	$3.02	$3.17	$3.33
Debt Service Charge (per month)	$222,550	$246,308	$266,358	$276,698	$287,038	$297,378	$306,300	$315,489	$324,953	$334,702	$344,743

Municipal & Financial Services Group

Projected Annual Revenue (in millions)

	Current	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
City of Charlottesville											
Urban Water	**$5.43**	**$5.76**	**$6.22**	**$6.68**	**$7.15**	**$7.62**	**$8.01**	**$8.41**	**$8.83**	**$9.27**	**$9.73**
$ Change		$0.33	$0.46	$0.46	$0.47	$0.48	$0.38	$0.40	$0.42	$0.44	$0.46
% Change		6.0%	8.1%	7.3%	7.0%	6.7%	5.0%	5.0%	5.0%	5.0%	5.0%
Urban Wastewater	**$8.26**	**$8.61**	**$9.05**	**$9.39**	**$9.75**	**$10.11**	**$10.51**	**$10.92**	**$11.34**	**$11.79**	**$12.25**
$ Change		$0.36	$0.44	$0.34	$0.35	$0.36	$0.39	$0.41	$0.43	$0.44	$0.46
% Change		4.3%	5.1%	3.8%	3.8%	3.7%	3.9%	3.9%	3.9%	3.9%	3.9%
City - All Systems	**$13.69**	**$14.37**	**$15.27**	**$16.07**	**$16.90**	**$17.74**	**$18.51**	**$19.32**	**$20.17**	**$21.05**	**$21.98**
$ Change		$0.68	$0.90	$0.80	$0.82	$0.84	$0.77	$0.81	$0.85	$0.89	$0.93
% Change		5.0%	6.3%	5.2%	5.1%	5.0%	4.4%	4.4%	4.4%	4.4%	4.4%
Albemarle County Service Authority											
Urban Water	**$6.67**	**$7.14**	**$7.72**	**$8.23**	**$8.76**	**$9.29**	**$9.76**	**$10.25**	**$10.76**	**$11.30**	**$11.86**
$ Change		$0.47	$0.58	$0.52	$0.53	$0.54	$0.46	$0.49	$0.51	$0.54	$0.56
% Change		7.0%	8.1%	6.7%	6.4%	6.1%	5.0%	5.0%	5.0%	5.0%	5.0%
Urban Wastewater	**$5.81**	**$6.52**	**$6.94**	**$7.25**	**$7.57**	**$7.90**	**$8.23**	**$8.56**	**$8.92**	**$9.28**	**$9.67**
$ Change		$0.71	$0.42	$0.31	$0.32	$0.33	$0.32	$0.34	$0.35	$0.37	$0.38
% Change		12.2%	6.4%	4.5%	4.4%	4.4%	4.1%	4.1%	4.1%	4.1%	4.1%
Non-Urban Water and Wastewater	**$2.80**	**$3.21**	**$3.61**	**$4.01**	**$4.42**	**$4.84**	**$5.08**	**$5.33**	**$5.59**	**$5.87**	**$6.16**
$ Change		$0.41	$0.40	$0.40	$0.41	$0.42	$0.24	$0.25	$0.26	$0.28	$0.29
% Change		14.8%	12.4%	11.2%	10.2%	9.4%	4.9%	4.9%	4.9%	4.9%	4.9%
ACSA - All Systems	**$15.28**	**$16.87**	**$18.26**	**$19.50**	**$20.75**	**$22.03**	**$23.06**	**$24.14**	**$25.27**	**$26.45**	**$27.69**
$ Change		$1.59	$1.40	$1.23	$1.26	$1.28	$1.03	$1.08	$1.13	$1.18	$1.24
% Change		10.4%	8.3%	6.7%	6.4%	6.2%	4.7%	4.7%	4.7%	4.7%	4.7%

Municipal & Financial Services Group

Conclusions and Recommendations

- The Authority needs to increase water and wastewater rates and charges over the planning period (FY 2019 to FY 2028) to keep revenues in line with expenses, to fund the required operating and capital costs identified and to meet target operating cash balance and debt service coverage.

- Adopt the recommended water and wastewater rates and charges for the first five years of the planning period (FY 2019 to FY 2023).

- Review rates and charges on an annual basis and revise as needed. Consider a full cost of service study for all rates and charges every five years.

Discussion / Questions?