Rivanna Water and Sewer Authority

Board of Directors Meeting

November 13, 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: **November 13, 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 September 25, 2018*

3. ***RECOGNITION***

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

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

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

7. ***CONSENT AGENDA***
   a. *Staff Report on Ongoing Projects*

   b. *Staff Report on Operations*

   c. *Approval of Additional Employee Holidays*

   d. *Approval of Board Meeting Schedule for Calendar 2019*

   e. *Approval of Engineering Services, and Update on Award of Construction Contract – SFRR To RMR 36-Inch Raw Water Main; Phase 1 Birdwood Golf Course*

8. ***OTHER BUSINESS***

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

   a. *Presentation: Quarterly Strategic Plan Update; Katie McIlwee, Executive Coordinator and Communications Manager*

(RECESS TO COMPLETE THE RSWA MEETING; MOTION REQUIRED)

b. *Presentation: Wet Weather Operations at Moores Creek AWWRF – David Tungate, Director of Operations and Tim Castillo, Wastewater Manager*

9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA

10. CLOSED MEETING

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
October 23, 2018

A regular meeting of the Rivanna Water & Sewer Authority (RWSA) Board of Directors was held on Tuesday, October 23, 2018 at 2:15 p.m. in the 2nd floor conference room, Administration Building, 695 Moores Creek Lane, Charlottesville, Virginia.

Board Members Present: Mike Gaffney, Lauren Hildebrand, Jeff Richardson, Liz Palmer, Gary O'Connell, Mike Murphy, and Kathy Galvin.

Board Members Absent: None.

Staff Present: Bill Mawyer, Katie McIlwee, Lonnie Wood, Jennifer Whitaker, Tom Freeman, Andrea Terry, Liz Coleman, Dave Tungate, Victoria Fort, Scott Schiller, Michelle Simpson, and Tim Castillo.

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

1. CALL TO ORDER

Mr. Gaffney called the regular meeting of the Board of Directors of the Rivanna Water and Sewer Authority at 2:55 p.m.

2. MINUTES OF PREVIOUS BOARD MEETINGS

a. Minutes of Regular Board Meeting on September 25, 2018

There were no changes to the minutes presented.

Dr. Palmer moved to approve the RWSA Board meeting minutes of September 25, 2018. Ms. Galvin seconded the motion, which passed 7-0.

3. RECOGNITION

There were no recognitions presented.

4. EXECUTIVE DIRECTOR'S REPORT

Mr. Mawyer stated that he had noted for the Board how well staff had performed during Hurricane Michael, which brought more than three inches of rain to Scottsville -- but there were no sewer overflows or water treatment disruptions. He stated that David Tungate and Tim Castillo would provide a presentation in November on how massive quantities of water were moved through a plant without overflow, noting that this storm brought more than 55MGD in instantaneous flow coming into the plant. Mr. Mawyer explained that they basically bypass normal operating procedures and store it in the ponds, then bring it back and treat it after the flows subside.

Mr. Mawyer reported that this was National Lead Poisoning Prevention Week, and people can be exposed to lead through the water they drink -- with this community having excellent drinking water, falling far below the action level for lead. He stated that RWSA was in the process of completing a corrosion inhibitor study, with corrosion chemicals preventing lead from leaching into the water, and he noted that Rivanna staff would be discussing more with the Board about the lead prevention program in the coming months.

Mr. Mawyer stated that they continue to celebrate their granular activated carbon system and how well it produced quality water for the whole community, with continued good results. He stated they had a "taste and odor panel" comprised of City, ACSA, and Rivanna staff members who came over and drank the treated water to detect any issues. He stated that the panel had commented on the good quality of the water and the consistency over the past several months. Mr. Mawyer noted that GAC was a resource that would reach the end of its useful life, and Rivanna's consultant had studied it and determined that the GAC material at South Rivanna and Crozet was closing in on the end of its service life. He stated that this meant that they would replace the GAC at both facilities by the end of calendar year 2018, at a cost of approximately $500K.

Ms. Galvin asked if it was somewhat related to the turbidity of the water.

Mr. Mawyer confirmed that it was, stating that the sediment levels in the water determined how much organic material was absorbed by the carbon. He commented that this was not unexpected, and estimates when he arrived two years ago were about $1 million per year to replace the GAC material. He added that there were also theories that you could never replace the GAC material by letting bugs grow in to treat the organic material, but this was not an appealing solution, as is done with wastewater.

Dr. Palmer asked if, when the new sediment removal system was installed at South Fork to transfer the water from South Fork to Ragged Mountain, they would run the water normally treated directly at South Fork through that sediment removal system -- as it would reduce the amount of carbon needed.

Mr. Mawyer responded that it would go back into a natural reservoir.

Ms. Whitaker explained that it would be part of the final design considerations and there would be several options. She stated that one was to pretreat everything and use it as part of the treatment train at South Fork, sending the settled water to Ragged Mountain. She stated that

another alternative was to build a smaller footprint facility and allow South Fork to continue to treat what it has, then split at the raw water intake -- going in two directions that allow the smaller facility to pretreat Ragged Mountain. She stated that they budgeted to handle the more expensive of those options, but as they get into design, the goal will be to design for the optimum.

Mr. O'Connell asked if they could evaluate the GAC cost and replacement as part of that.

Ms. Whitaker responded that they could, but the primary concern was originally sediment removal as they went to Ragged Mountain and that now includes phosphorous removal so that they don't create algae issues at Ragged Mountain. She stated that she does not have good information on how that then impacts the GAC treatment, which was not on their radar at the time and would need to be considered.

Dr. Palmer asked when this was in the CIP.

Ms. Whitaker replied that she did not know.

Mr. Mawyer clarified that from the two options the Board had considered, the earliest start date would be 2027 and the latest would be 2035.

Mr. O'Connell asked Mr. Mawyer to include something in the November RWSA Board packets about financial implications of GAC replacement and how that fit into the budget.

Mr. Mawyer responded that they had about $450K in the budget from a prior year and this year for GAC replacement, so that would cover most of the cost but there may be a smaller amount needed from savings or reserves. He clarified that there had been $250K budgeted two years ago and some money in the current year, totaling about $450K, but he would provide actual numbers.

Mr. O'Connell stated that the budget process could push the item up.

Mr. Mawyer stated that now that they had historical information on how GAC would perform, they would have a budget item for material replacement every year.

Mr. Mawyer stated that staff had told the Board in September that they were in the process of taking over the Red Hill water system, and he and Mr. O'Connell were meeting later in the day at Red Hill Elementary to discuss the transfer with customers of that system. He stated that Mr. Henry had suggested meeting with County staff about using the Rivanna lab for lake water analysis, and Andrea Terry had been able to work with Mr. Tungate and their lab to provide nutrient analysis of the water samples -- but could not do algae counts because those were contracted out.

Mr. Mawyer reported that Ms. Whitaker had been invited to participate in a lake/dam emergency tabletop exercise, and she would report on that later in the meeting.

He noted that the Board's next meetings would be November 13 and December 18, which were both earlier in the month to accommodate the holidays.

5. ITEMS FROM THE PUBLIC

There were no items from the public.

6. RESPONSES TO PUBLIC COMMENTS

There were no 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 Engineering Services - Beaver Creek Reservoir Dam Improvements – Schnabel Engineering

e. Approval of Engineering Services – Observatory Water Treatment Plant - Expansion And Rehabilitation Project – Short, Elliot, Hendrickson Engineers

f. Approval of Engineering Services – South Rivanna Water Treatment Plant - Expansion And Rehabilitation Project – Short, Elliot, Hendrickson Engineers

g. Approval of Engineering Services – Ragged Mountain Reservoir To Observatory Water Treatment Plant Raw Water Line - Michael Baker International

h. Approval of Term Contract for Environmental Engineering Services - ECS Mid-Atlantic, LLC

Dr. Palmer moved to approve the Consent Agenda as presented. Mr. O'Connell seconded the motion, which passed 7-0.

Mr. O'Connell noted that the RWSA had $75 million in projects they were preparing to design, including a lot of big projects that affected ACSA rates, such as 100% of the Crozet project.

8. OTHER BUSINESS

a. Presentation: Birdwood Raw Water Line Update - Bill Mawyer, Executive Director
- *i. Recommendation for Acquisition of Raw Water Line Easements*
- *ii. Recommendation for Authorization to Award Construction Contract*

Mr. Mawyer reported that the RWSA Board had authorized staff in August to move forward with the Birdwood Raw Water Line, and staff including Ms. Whitaker, Ms. Simpson, Mr. Schiller, and Mr. Krueger had been very busy working on easement documents so they had legal right to access the property and have a pipeline, as well as construction documents to procure the work. He stated that the goal was to have this information ready for the Board to approve at this meeting, as UVA had already begun its work and Rivanna needed to keep pace.

Mr. Mawyer stated that there was approximately 1.2 miles of 36-inch waterline to be installed, which was part of the raw waterline from the South Rivanna to Ragged Mountain reservoirs. He stated they had advertised construction bids in September and were hoping to award on October 23, which was not quite possible but they hoped to still begin construction in early December with completion by October of 2019. Mr. Mawyer stated that the budget presented in August was $7 million, but staff believes there is now a better figure.

Mr. Mawyer presented a map showing Route 250 and the line depicting the pipeline location, which would come under Rt. 250 with a 40-foot permanent easement, as well as a 10 feet on each side totaling a 20-foot temporary easement while the project was being constructed. He stated that this was the only permanent access easement to the pipeline, and at the other end of Canterbury Road they would have access by a temporary easement across the UVA Foundation property to provide a second access. He noted the location of storage areas there and near Rt. 250 to be used during construction. Mr. Mawyer stated that they had been negotiating with the Foundation about two permanent easements and a temporary easement, as well as access at Rt. 250 and at Canterbury Road.

Dr. Palmer asked if Rivanna had reached out to the Bellair Homeowners Association, noting that they were a very active group.

Mr. Mawyer responded that they haven't yet, but as soon as they have a construction contractor and firm plans, RWSA would schedule a meeting.

Dr. Palmer stated that she planned to attend that meeting and asked that staff provide as much advance notice as possible.

Mr. Mawyer presented a sketch showing the pipeline and the permanent and temporary easements, showing that they were purchasing 60 feet of right of way from the Foundation, down the length of the golf course adjacent to Bellair. He stated that in negotiations with the Foundation, they planned to acquire 6.03 acres of permanent easements on two parcels, 2.83 acres of temporary easements, at a cost of $240,200.

Mr. Mawyer reported that the project budget was $7 million, and Rivanna had received bids the previous week ranging from $2.6-$4.1 million, but unfortunately the applicants did not properly complete the bid forms, so all the bids had to be rejected. He stated that they re-advertised for bids and would reopen for bids on October 31, so it was hoped the cost range would remain the same, with a projected cost of $4-4.5 million. He noted that the coordination with UVAF and Virginia Power was also beneficial.

Mr. Mawyer stated that RWSA shared the risk of underground rock with the bidders, who provided a unit price and would be paid for every cubic yard removed, and that was rolled into the total base bid.

He noted that the reason for the bid returns was that as required in the request for bids, mobilization could not exceed more than 3% of the bid, and they had all miscalculated.

Mr. Mawyer stated that the Board was being asked at this time to authorize execution of the easement and compensation agreement totaling $240,200 with UVAF, as well as to authorize Mr. Mawyer to execute minor modifications to this in the event they had to move a few feet in any direction.

Ms. Galvin moved to authorize execution of the easement and compensation agreement totaling $240,200 with UVAF, as well as to authorize Mr. Mawyer to execute minor modifications to them. Mr. O'Connell seconded the motion, which passed 7-0.

Mr. Mawyer reported that the construction contract was a bit unorthodox, but staff was asking the Board to authorize RWSA staff to award the construction contract from bids received the following week, providing they were within the project budget, so they could move forward immediately -- with the typical clause of executing change orders not to exceed 10% of the contract price. He stated that this would help them keep pace with the Foundation and its work, and the award process could be expedited so that things were proceeding before Thanksgiving.

Dr. Palmer moved to authorize RWSA staff to award the construction contract, providing it was within the project budget of $7 million or less, with the typical clause of executing change orders not to exceed 10% of the contract price.

Mr. Murphy commented that the $7 million estimate was derived from information available up to August, but it seemed like there was more information now and he wondered why they couldn't be at $5 million, inclusive of the highest bid estimated plus 10%.

Dr. Palmer responded that they just did not know, because the bids came in and were incorrectly done.

Mr. Mawyer added that they were hopeful they would be in that same range, but before they got those bids they were prepared with a $7 million budget and an engineer's estimate of $5.3 million. He stated that they could not fully identify why they were lower, but it was hoped they would remain low -- and if the bid had been at $5 million and was correct, it would have remained on budget.

Dr. Palmer stated that if a bid came in at $5.5 million, it would nullify that bid.

Mr. Murphy asked if there was a material change in the bids as a result of what the contractors missed.

Mr. Mawyer responded that they did not know and had heard there was pipe put on reserve and may not be maintained at the bid price -- and in the past, prices had risen when they were rebid.

Ms. Hildebrand asked if there was a risk of pushing the bids up if they approved something close to budget.

Mr. Mawyer responded that the budget was known in the first round of bidding.

Mr. O'Connell suggested that they authorize $5 million -- and if it came in higher, they had a meeting on November 13 and could discuss it then, which would avoid the possibility of pushing the bids up.

Mr. Gaffney added that they could always hold a special meeting.

Ms. Galvin commented that she understood this logic.

Mr. Krueger pointed out that the bidders had the $7 million in the first round of bidding, and that was not being changed, so in some sense the engineer's estimate was $7 million -- and the only reason Mr. Mawyer mentioned a smaller project is because they received the bids. He emphasized that there was nothing in the engineer's estimate to say it was wrong, and from a competitive standpoint, there will still be competition among bidders.

Ms. Galvin noted that the budget was approved by both, and she was hearing from Mr. Mawyer and Mr. Krueger that it would be easier to proceed as proposed.

Mr. Krueger mentioned that Mr. Mawyer could always come back to the Board if he so chose, and he was not being required to sign if it was less than $7 million -- he was only being authorized to do so.

Mr. O'Connell stated that in terms of a schedule, bids would be opened on October 31, then reviewed and a low bidder determined to get to the point of signing -- which did not offer much time before the next Board meeting.

Mr. Mawyer responded that they typically used a 10-day waiting period, and if this Board awarded it on November 13, they would wait 10 days before issuing the award letter. He stated that while it was only two or three weeks, it would avoid the holiday period.

Dr. Palmer stated she did not see a reason to change this, as it was in the CIP and had been publicized at $7 million.

Ms. Galvin noted that they were basing the lower budget on bids that were provided in error, which caused concerns for her.

Mr. O'Connell clarified that the contractors had just filled the bid form out incorrectly.

Mr. Gaffney stated that hopefully they would be bidding close enough to what they had done before, if they wanted the job.

Mr. O'Connell stated that they did not know what the contractors would do behind the scenes, and it would be challenging to get going by November 13.

Dr. Palmer stated it was the 10-day waiting period and Thanksgiving that were at issue, and she would rather get it going -- especially in light of complaints from Bellair constituents. She added that she was getting a constant flow of complaints about Birdwood construction, and it looked like a moonscape with all the clearing, so she would prefer that they get going.

Mr. Krueger noted that the compensation agreement approved also had milestones for completion of two phases of the project that directly affected Birdwood's fairways and greens, and there was a good amount of time to meet those benchmarks of a date certain in 2019. He stated that in the event they did not meet them, they had to shut down and start over later on, which Birdwood wanted so they could get their grass seed planted and reopen in the spring.

Ms. Galvin called for the question.

Mr. Murphy offered a friendly amendment that the Executive Director be required to notify the Board of any executed contract exceeding $4 million in construction costs.

Mr. Mawyer stated that would be fine with him.

Dr. Palmer accepted the amendment to the motion. Ms. Galvin seconded the motion. The motion as amended was approved by a 7-0 vote.

b. Presentation: Rivanna's Dam Safety Program - Jennifer Whitaker, Director of Engineering and Maintenance and Victoria Fort, Senior Civil Engineer

Ms. Whitaker stated that Ms. Fort would be co-presenting on the dam safety overview, which had been a program with Rivanna for some time and was a pivotal piece of what RWSA did as an organization. She stated that Rivanna had grown into a regional resource for other dam owners, and she had recently learned there were only about 300 regulated dam structures in Albemarle County.

Ms. Fort reported that dam safety was important in avoiding catastrophic failure of dams, which had resulted in loss of life over the years, as well as massive damage to properties. She stated that they could also learn a lot from non-failure dam emergencies, and she would highlight several of those.

Ms. Fort reported that the first of those was in February 2017 with the Oreville Dam incident in Northern California. She explained that the dam was constructed in 1968 and was a 770-foot embankment dam -- 10 times the height of the Sugar Hollow Dam -- and was an embankment dam with a concrete main spillway and an earthen emergency spillway. Ms. Fort stated that there had been heavy rains in the winter of early 2017, which caused the lake level to rise quickly, so

they opened the gates to the main spillway to allow some of the water to release from the lake. She stated they found fairly quickly that a large crater had formed in the spillway, so they shut off flow to assess the damage but had to continue to release water from the lake to prevent the earthen spillway from activating.

Ms. Fort stated that ultimately they were not able to release enough water, the earthen spillway over-topped and started undercutting quickly, and there was concern that the entire spillway would fail and release a massive floodway into the river basin. She stated that local officials decided to evacuate the Feather River Basin, with 188,000 residents evacuated -- many of whom ended up stuck on the bridge over the Feather River downstream because evacuation routes routed over the river. She noted that the waters eventually receded and the spillway did not fail, but they were currently undergoing repairs at a cost of over $1 billion.

Ms. Fort stated that what went well was that everyone recognized the failure early, took steps to try to mitigate, the dam ultimately did not fail, and local officials responded quickly to evacuate the area. She stated that what did not go well was the evacuation route, as they ended up with vehicles stuck over the Feather River on a bridge. She stated there were also some structural issues with the spillway itself that led to the crater and the subsequent damage, which may have been able to be recognized in regular inspections.

Ms. Fort reported that there was also an incident with the College Lake Dam in Lynchburg, Virginia, which had been overtopped by heavy rains in August 2018 from the upstream basin. She stated that the dam was built in 1934 by VDOT and was 35 feet high, closer in scale to the Totier and Licking Hole Creek dams. She stated that the dam had overtopped and the water caused damage to the road and the dam itself -- with concerns that the dam would fail as the waters continued. She noted that they eventually opened a gate in the dam to release water and drain the lake, but in the meantime evacuated 124 homes downstream. Ms. Fort stated that they would likely abandon the dam built for flood storage and sediment control because the cost of repairs would be too high for the owners to bear.

Ms. Fort stated that positive aspects were that they made the decision to evacuate in a very timely manner, and protected the downstream university and residents. She stated that the negative aspects were that the dam was undersized for these types of flood events and was in need of an upgrade that was not being pursued as quickly as needed.

Dr. Palmer asked what they would do to serve the purpose if they were not replacing or repairing the dam.

Ms. Fort responded that her understanding was that it would be converted to wetlands.

Ms. Whitaker reported that per the state of Virginia, a regulated dam must be greater than 6 feet tall or greater than 25 feet tall and impounding more than 50 acre feet, or over 15 acre feet for a shorter dam. She stated there were agricultural small dam exceptions, so taking the 300 regulated structures in Albemarle County and doubling or tripling those for ag-exempted dams would mean upwards of several hundred additional dams that fell within that exemption. She added that the South Fork Rivanna Dam was an energy-related dam and thus was a federal dam.

Ms. Whitaker stated that dams were designed with a high level of conservatism, but current meteorological data may show that is not high enough. She stated that dam safety events were low-probability events but had a potential for high impact. She stated that in Charlottesville, there was the South Fork Rivanna Dam, Sugar Hollow, and Ragged Mountain dams -- and Ragged Mountain and South Fork both had high urban populations downstream, meaning a high impact to homes, transportation, and community functionality. She added that the dam safety program and upkeep on high-hazard dams was important given the close proximity of the community.

Ms. Whitaker reported that things that could cause dam emergencies included a rainfall event, which had been the case in 2018; material failure such as in the Oreville example; vandalism or terrorism; and accidents and public safety issues. She mentioned that there were a few low-head dams in Albemarle County, which brought safety concerns related to the structures and the hydraulics adjacent to them.

Ms. Whitaker reported that there were three hazard classifications, including high-hazard dam, which was related to what was downstream and was not related to deficiencies or vulnerability. She stated that high-hazard dams had the potential for loss of life or high economic impact. She stated that significant hazard dams had a possible loss of life and probable destruction of property; low-hazard dams had no loss of life and minimal economic or environmental loss, such as Totier Creek because there are no structures downstream and only three properties between it and the James River, as well as no potential economic functional loss.

Ms. Whitaker stated that they have discussed probable maximum precipitation, which is the theoretical greatest amount of precipitation for a given area and given period of time, based on fairly complex computer models -- including one completed in 2015-16 for Virginia -- preceded by models that used hydrologic data from the 1980s. She stated that given precipitation patterns, there would likely be more frequent updates in the future.

Ms. Whitaker presented probable maximum precipitation (PMP) data from the Beaver Creek watershed evaluation, with that being a relatively small watershed. She stated that the South Fork Rivanna River watershed had 259 square miles, so those numbers would drop because you could not have a very intense storm over an area that large. She stated that a 2-year storm had just under four inches of rain; a 100-year storm had 9 inches of rain; and a PMP event was 34 inches of rain in a 24-hour period. Ms. Whitaker noted that the May 30-31, 2018 storm event had 9 inches of rain in a very short timeframe. She stated that while PMP was a maximum, there were several events in Virginia that have approached that level -- Hurricane Camille and the 1995 Madison County rain event, both of which were at 80% of PMP. Ms. Whitaker mentioned that those two events were among the largest rain events in the entire country.

Dr. Palmer asked what percentage the 1995 event was for Sugar Hollow, as it was impacted the same as Madison County.

Ms. Whitaker responded that it was 86%, and it was one of the storms that governed the Virginia study for the region.

Ms. Whitaker noted that there were high-hazard facilities that included South Fork, Sugar Hollow, Beaver Creek, Ragged Mountain; low-hazard was Totier Creek and Lickinghole; and there were other facilities such as North Fork, Mechums River, a small dam at the Ivy MUC, and a small dam at Buck Mountain Creek that were monitored. She stated there was also Lake Albemarle, state-regulated dams, private dams, County-run dams, Dominion Power dams, etc. that needed to be monitored -- and this was a big issue in the County, given its topography.

Ms. Whitaker stated that South Fork was federally regulated with FERC, but Rivanna hoped it would revert back to state regulation in the near future; Ragged Mountain was earthen and state-regulated; Sugar Hollow was concrete with a rubber bladder, which would be replaced along with the bladder air system in the next CIP. She stated that Beaver Creek Dam was fairly significant and would need upgrades, and given the road on the crest of the dam, it fell into high-hazard. She stated that Totier Creek and Lickinghole were relatively small, low-hazard dams and were just over 30 feet tall.

Mr. O'Connell asked how Rivanna was responsible for Lickinghole.

Ms. Whitaker responded that she researched it and found that it came out of the anti-eutrophication watershed ordinance work in the 1980s, at which time there was interest in trying to do sediment forebays on the South Fork Rivanna River to prevent nutrients moving downstream. She stated that Rivanna was a dam-owning agency and a regional cooperation agency in the water supply with jurisdiction in the river, and the project was handed over for operation. Ms. Whitaker noted that it served as a sediment basin for the Crozet service area and prevented sediment from coming into South Fork.

Dr. Palmer recalled that it went along with putting the Crozet Interceptor in to save the South Fork from eutrophication, as there was a lot of algae growth in the South Fork in the 1970s.

Ms. Whitaker added that there were nutrients coming from the interceptor to the wastewater plant in Crozet that was discharging, as well as sediment that carried phosphorous typically, so the idea was to address it in several different ways and try to improve the health of the South Fork.

Ms. Fort stated that there was a number of elements that went into emergency response planning (EAP) for dams, and they have created the Owners Dam Safety Plan, which included internal dam safety policies, internal procedures and training, safe dam design and quality construction, dam maintenance and monitoring -- including inspection and instrumentation, emergency action plans for high-hazard dams as a federal and state requirement, and annual review of and training on emergency action plans, including functional exercises. She stated there was also public notification protocol regarding present hazards, including sigs and buoys of "dam ahead," with a goal of increasing that signage and possible alarm systems to alert for rising floodwaters.

Ms. Fort stated that EAPs included several sections, including a notification chart for each type of emergency for each dam, which went through a call-down list and actions to take; emergency detection evaluation and classification; responsibilities both internally and externally within

Rivanna in the event of an emergency; preparedness steps to be ready for an emergency; and inundation maps.

Ms. Fort reported that there were three failure scenarios: a dam has failed or is about to fail; there is a potential situation developing, such as a new seep getting bigger; and a non-failure emergency such as a high-rain event that may increase the level of monitoring. She stated that each scenario had a notification chart for each dam under each EAP, and she presented an example of each along with a description of each failure scenario it accompanies. Ms. Fort also presented a call-down list, which included police, fire, RWSA Board members, emergency management, the National Weather Service, dam safety officials, VDOT, and alternative contacts.

Dr. Palmer noted that she was not on the list.

Ms. Whitaker responded that they were in the process of updating it and would add her, noting that it may not include elected officials.

Ms. Fort clarified that it was County and City executives.

Mr. O'Connell asked what officials would be expected to do.

Ms. Fort stated that in terms of responsibilities, Rivanna would verify and assess what the emergency condition was and how it was progressing; notify emergency management agencies of the event and how RWSA felt it should be classified; undertake corrective action at the facility as much as possible, such as putting down stone or rip-rap; issuing condition status reports to local officials and emergency management personnel; and declare an emergency at the facility. She stated that Charlottesville, UVA, Albemarle, and other emergency management staff were responsible for receiving Rivanna's condition status reports and notifying the public -- and if an evacuation needed to happen, the localities and UVA would be the ones coordinating it. She mentioned that Fluvanna was also receiving the reports since they were in the inundation areas, and were thus responsible for notifying the public in connecting the evacuations.

Mr. Murphy stated that he assumed they would convene the regional Emergency Operations Center (EOC), and Alison Farole would convene the group and work through that -- but he wasn't sure how that would work with Fluvanna.

Ms. Fort confirmed this, adding that in the event of an emergency, Fluvanna would also be notified.

Ms. Whitaker clarified that Ms. Farole has called Fluvanna's representatives in the past related to some of the South Fork Dam emergency items, and they had been asked to attend EOC events.

Mr. O'Connell pointed out that in the event of a major weather event, everyone would be involved anyway.

Ms. Fort stated that EAPs would likely be activated for multiple facilities, and the longer text in those plans expounded on the detail as to which staff members were present at the EOC, who was coordinating with whom, and the protocol for contacting local officials.

Ms. Fort stated that she would also review inundation mapping, as they had a set of maps for every facility included in the copy of the EAP, and she pointed out various sections of the Ragged Mountain Dam EAP. She stated that they evaluated various road crossings and the distance from the dam, the arrival of the flood wave, and a sunny day breach -- which was one that occurred in the middle of a day, not related to a flood; or a Probably Maximum Flood (PMF) breach, a flood resulting from PMP. She noted that it also showed where inundated road beds and structures were, which were also detailed in the EAP for crossings.

Mr. Murphy asked about authority for an evacuation because in terms of local government it was just a suggestion, as the Governor was the only one authorized to require mandatory evacuation.

Ms. Whitaker explained that from a dam safety perspective, Rivanna had to notify all the local emergency management agencies -- and it was incumbent on the local EOC and municipalities to issue evacuation orders.

Mr. Murphy stated that he had only done a preliminary look with the City Attorney, along with research pertaining to the recent Lynchburg incidents, and he understood that it was not in the power of a local administrator and must be coordinated with the state.

Ms. Whitaker responded that during Hurricane Isabel, the EOC issued evacuation orders for Reservoir Road and Sugar Hollow -- but she was not certain if they were enforceable by law. She stated that emergency management went door to door to encourage evacuation, but she was not aware of their legal authority.

Mr. O'Connell noted that County Police went door to door with Sugar Hollow in 1995, but he was not sure if people resisted or refused.

Dr. Palmer stated that the Fire Department had come by and advised her to leave, but it was not an order -- and she had not left because they were at a higher elevation.

Ms. Fort reviewed the dam safety program elements, noting that they took care of all the permitting and regulatory compliance for FERC and DCR for regulatory dams; developed and annually updated all EAPs; performed annual training internally and regionally, including exercises annually; addressed vegetation control at all facilities, including grass maintenance; performed repairs and upgrades needed to instrumentation for the dam and ancillary facilities; dealt with public safety, signage, access, and recreational components; performed studies and reports for the facilities for emergency procedures and design purposes; conducted annual and monthly inspections; and monitored facilities, including use of staff.

Mr. Mawyer commented that it takes a lot of the Rivanna team's effort to manage the 5+ dams under its purview.

c. Presentation: Recommendation for Disposition of FY 2017-2018 Rate Center Results – Lonnie Wood, Director of Finance and Administration

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Mr. Wood reported that the bond issue would price the following week, with November 6 as a target date for execution.

Mr. Wood explained that at the end of each year, after the auditors completed their work, Rivanna went through a process of evaluating operating cash balances and comparing them and reconciling them with year-end results. He stated the authority had six separate rate centers, each with its own budget, rates, and revenue stream. He stated that they would not want to have rate center surplus one year to pay for another's deficit.

Mr. Wood stated that they had looked at their cash balances and came up with a 60-day cash target for operating, with $4.1 million currently in that account and target cash of $5.4 million, making them short by about $1.29 million -- which was close to what year-end results were, due to a wastewater deficit as discussed in April. He stated that most of this was due to a low-flow year, with a dry year at the end of 2017, and they were hard to predict, that caused about $600K of the deficit itself and revenues lower than anticipated. He stated that they also had some metering issues in July and August that caused about $100K of the deficit, and had some pipeline and streambank restorations that were over budget by $122K. Mr. Wood stated they had some odor control issues with the Crozet Interceptor that were fixed with the contractor, and the utility budget was going over because of the new pump station.

Mr. Wood presented a memo that detailed transfers in and out of the operating account to make it whole, and the recommendation was to transfer those funds according to that. He stated the other attachment was provided to give an idea of where reserves were currently, and the year-end results were about $29.9 million -- with $28.6 million remaining after this transfer. He stated that while this seemed like a lot in reserves, however with $160 million in debt, the liquidity position helped balance some of that out. He noted that there was a recent Moody's review that showed Rivanna having a significant/above-normal amount of debt, but the liquidity position balanced that out and helped maintain the Authority's AA2 rating.

Mr. Mawyer commented that they had an excess of funds in 2014.

Mr. Gaffney noted that there had been a lot of rain in the current year.

Mr. Wood responded that this would help make up some of that difference.

Mr. Murphy asked what the total number was for wastewater.

Mr. Wood clarified that it was about $15 million, or half of the total, and he mentioned that wastewater could fluctuate 40% from one year to the next based on rain.

Dr. Palmer stated that it was better than it used to be when they had capital debt built into the rates.

Mr. Wood stated it would be double that if flows were still tied to debt service rates.

Mr. Murphy stated that he was trying to establish how closely the $1.3 million tracked the 9.3%.

Mr. O'Connell noted that with a $15-million budget, 10% would be $1.5 million.

Mr. Wood mentioned that it was on the website for the June RWSA financial results, but he could also send it directly.

Mr. Gaffney noted that they were 20% over for this year.

Mr. Wood stated that would get even better if the upcoming spring was wet.

Dr. Palmer moved to approve transfer of funds according to the memo. Ms. Hildebrand seconded the motion, which passed 6-0. Ms. Galvin had left the meeting and was not present for the vote.

9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA

Dr. Palmer stated she had asked in September who attended project coordination meetings, such as those with VDOT and the power companies, and she asked Mr. Mawyer to send the list.

Mr. O'Connell noted that there would be a new meeting set up with VDOT in March to look at County water and sewer projects to coordinate them with paving projects.

10. CLOSED MEETING

There was no closed meeting held.

11. ***ADJOURNMENT***

Dr. Palmer moved to adjourn the meeting. Ms. Hildebrand seconded the motion, which passed 6-0. Ms. Galvin had left the meeting and was not present for the vote.

The RWSA Board adjourned the meeting at 4:10 p.m.

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MEMORANDUM

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

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

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

SUBJECT: **RECOMMENDATION FOR DISPOSITION OF FY 2017-2018 RATE CENTER RESULTS**

DATE: **OCTOBER 23, 2018**

The Authority ended the previous fiscal year with a cumulative net loss/deficit of roughly $1,295,600. The Urban Wastewater rate center was the most significant contributor to the deficit this year due to unbudgeted expenses for the clarifier repairs and chemicals for temporary odor control at the Moores Creek Plant. The amount of the deficit for Urban Wastewater was $1,313,500. *(Notes about the Urban Wastewater deficit that were discussed with the Board at the April meeting are attached at the end of this memo.)* Urban Water ended the year nearly even with a surplus of $1,800. Of the other rate centers, Crozet Water had a deficit and the two Scottsville Rate Centers and Glenmore Wastewater had surpluses.

Background: After the completion of the audit, staff performs an analysis of the year ending financial results and the effect on the operating cash liquidity position. This is also done to ensure that rate center results are kept separate from each other. In some years similar to FY 2018, one rate center may have a deficit and others may have a surplus, therefore, we do not want one rate center's surplus funding another rate center's deficit.

There is only one operating cash account where all transactions originate during the year for all capital and operating activities including inflow from revenues and bond proceeds, and outflow for expenses and debt payments. Capital transactions are reconciled and separated at the end of each month, (i.e., no capital funds are in the operations account at the end of each month or at year end). However, all of the rate centers' operating results are comingled until this process of determining the results for the year and making transfers (to or from) the respective rate center reserves to ensure proper segregation.

The operations account has a target working cash balance of 60 days of cash and cash equivalents on hand to meet daily and monthly cash flow needs, which currently is $5,470,300 (based on the FY 2019 budget). This is an increase of $372,800 from the prior year, because the FY 2019 budget was increased compared to the FY 2018 budget. At year end, this target is compared to actual cash basis results for the fiscal year, and the variance, if any, is brought before the Board for action, which is consistent with the Authority's financial policy.

At year end, operating cash and cash equivalents were as follows:

Cash on hand	$2,808,100
Cash equivalents	$1,366,600
Total	$4,174,700
60 Day Cash Target	$5,470,300
Deficit Operational Cash	($1,295,600)

Cash equivalents are the invoiced amounts mostly due from the City and ACSA net of our accounts payable due at year end, but paid in the next year, which is a very conservative measure of working cash. *(Many entities only use actual cash on hand to measure their requirement of working cash/capital.)*

The target amount is underfunded by $1,295,600 which agrees to the cash basis result on the monthly budget vs. actual reports to the Board for June 2018. Therefore, the following transfers to the discretionary reserves are recommended for FY 2018 to bring the operations account back to the target balance and properly keep the six rate center reserves separated. FY 2017 to FY 2014 transfers are included for comparison:

Transfers to (from) reserves based on ending results for each rate center:

	FY2018	FY2017	FY2016	FY2015	FY2014
Urban Water	**$ 1,800**	$ 113,700	$ 55,983	$ 279,390	$ 298,310
Urban Wastewater	**(1,313,500)**	(673,900)	355,437	4,070	1,264,670
Crozet Water	**(58,500)**	(18,600)	17,618	7,630	(37,070)
Scottsville Water	**30,100**	30,200	11,382	8,580	28,880
Glenmore Wastewater	**26,800**	(5,300)	(1,896)	(21,380)	1,920
Scottsville Wastewater	**17,700**	7,900	(6,263)	(20,900)	(6,210)
	$ (1,295,600)	$ (546,000)	$ 432,261	$ 257,390	$ 1,550,500

To summarize the year-end process, one of the Authority's financial policies is to keep the operations account, defined here as cash and cash equivalents, financially sound with 60 days of cash for normal operating cash flow needs. That goal will continue to be met, and the reserves will continue to provide for the yearly variances in budget versus actual results. The previous years' results are shown for comparison to show how reserves are used and accumulated to maintain a sound operating account. As any given year progresses, the operations account temporarily funds rate center deficits and accumulates surpluses, and a reconciliation of the results to allocate the respective surpluses and deficits is performed annually after the year-end audit is complete. The Board has taken similar action for the previous 13 years. Attached is a summary of the ending reserves for Fiscal Year 2018.

Board Action Requested:

Board action is requested to transfer funds to/(from) the respective reserves for FY 2018 ending results to or from the operations account as follows:

Urban Water	$ 1,800	Urban Wastewater	$(1,313,500)

Crozet Water	$ (58,500)	Glenmore Wastewater	$ 26,800
Scottsville Water	$ 30,100	Scottsville Wastewater	$ 17,700

Attachment

Rivanna Water and Sewer Authority
Statement of Reserve Balances
June 2018 Reserves

	June FY 2018 Ending Balance	FROM (TO) OPERATIONS ACCOUNT FY 2018 ending results reserve adjustment proposed Board action needed **	Adjusted FY 2018 Ending Balance
Urban Water			
Discretionary Reserve	$ 11,963,306	$ 1,800	$ 11,965,106
Rate Stabilization Fund	1,000,000		1,000,000
Watershed Management Fund	194,393		194,393
Subtotal	$ 13,157,699		$ 13,159,499
Urban Wastewater			
Discretionary Reserve	$ 9,387,424	(1,313,500)	$ 8,073,924
Rate Stabilization Fund	1,000,000		1,000,000
Subtotal	$ 10,387,424		$ 9,073,924
Crozet Water			
Discretionary Reserve	$ 789,028	(58,500)	$ 730,528
Scottsville Water			
Discretionary Reserve	$ 255,983	30,100	$ 286,083
Glenmore Wastewater			
Discretionary Reserve	$ 78,985	26,800	$ 105,785
Scottsville Wastewater			
Discretionary Reserve	$ 87,240	17,700	$ 104,940
Capital Fund			
Specific Capital Projects	$ 4,199,908		$ 4,199,908
Vehicle Replacement Fund	$ 961,084		$ 961,084
Subtotal Discretionary Reserves	$ 29,917,351	$ (1,295,600)	$ 28,621,751
Indenture Restricted Minimum	$ 500,000		$ 500,000
Total Reserves *	**$ 30,417,351**		**$ 29,121,751**

*** - Agrees to investment balances - audited.**

**** - Proposed Board action**

Rivanna Water & Sewer Authority
Urban Wastewater Deficit Analysis:

Deficit as of April 30, 2018	*$ 918,295*	
Flows are under budget by 9.3%	$ 520,137	Dry summer and fall of 2017 flows are 266,600,000 gallons below budgeted amounts
Metering errors in July and August	$ 100,000	Recycle meter was over reporting causing billed flow to be under reported
Utility Budget overrun	$ 45,000	Budgeted $750,000 (12 months) vs actual of 794,963 (10 months) New PS, new odor control systems, rate schedule may be in error
Odor control overrun - Crozet Interceptor	$ 116,500	Budgeted $207,000 (annual) vs actual of $323,500 (10 months)
Pipeline - line items overruns	$ 122,142	Several stream bank restorations: Aug: $20,660 Moores Creek Interceptor repair at 5th St. Oct: $116,409 Stream Bank Restoration & repair-Rivanna Int. Dec: $45,266 to Morey Creek Aerial Crossing
Total items identified	**$ 903,779**	

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MEMORANDUM

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

FROM: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **EXECUTIVE DIRECTOR'S REPORT**

DATE: **NOVEMBER 13, 2018**

Observatory Water Treatment Plant Lease

SP GOAL: Infrastructure and Master Planning

A lease for the Observatory Water Treatment Plant, a second lease for the Alderman Road Water Pumping Station, and an easement for raw and finished water piping and a storage tank , all with associated plats, have been drafted and forwarded to UVA Facilities Management for final consideration. We will meet with UVA on November 27 to review the documents and establish a schedule for signatures.

Birdwood Water Line

SP GOAL: Infrastructure and Master Planning

A construction contract has been awarded to E. C. Pace, Inc. for $2,593,726 to complete approximately 6200 LF of 36" raw water line along the eastern border of the Birdwood property. Construction will begin after Thanksgiving. Staff will attend a Bellair Neighborhood Association Meeting on November 15 to provide information to the residents about the project.

The Army Corps of Engineers has been notified that we are starting construction on this raw water line, as required by our permit.

Community Outreach

SP GOAL: Communication and Collaboration

Tim Castillo, Wastewater Department Manager, provided a tour of the Moores Creek Advanced Resources Recovery Facility for an Environmental Biology Class from PVCC. Tim also provided a tour to a sophomore student from the Renaissance School who is working on a yearlong biology project on Moores Creek. The student was interested in how Rivanna protects the ecosystem of Moores Creek.

Matt Bussell, Water Department Manager, provided a tour of the South Rivanna Water Treatment Plant to a group of students from the Tandem Friends School. Matt also provided a tour of the South Rivanna Water Treatment Plant to a group of educators from the Thomas Jefferson Soil and Water Conservation District.

Jennifer Whitaker, Director of Engineering and Maintenance, has been asked by Albemarle County to be a resource for the Town of Scottsville, as they review and update their Emergency Action Plan processes and procedures.

RWSA and ACSA staff met with Albemarle Board of Supervisors Member, Ned Gallaway and ACSA Board Member, Kim Swanson, to review our Operating and CIP budgeting processes and rates.

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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: **NOVEMBER 13, 2018**

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

Under Construction

1. Birdwood Raw Water Main
2. Crozet Water Treatment Plant Expansion
3. Crozet Interceptor Pump Stations Bypass & Isolation Valves
4. Wholesale Water Master Metering
5. Sugar Hollow Reservoir to Ragged Mountain Reservoir Transfer Flow Meter
6. Crozet Finished Water Pump Station
7. Interceptor Sewer & Manhole Repair
8. Urgent and Emergency Repairs
9. Piney Mountain Tank Rehabilitation (on hold until April 2019)

Design and Bidding

10. Observatory Water Treatment Plant Expansion
11. South Rivanna Water Treatment Plant Improvements
12. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line and Raw Water Pump Station
13. Crozet Flow Equalization Tank
14. Beaver Creek Dam Alterations
15. Beaver Creek Raw Water Pump Station and Hypolimnetic Oxygenation System
16. Crozet Interceptor Pump Station Rebuilds
17. Buck's Elbow & Crozet Waterball Tank Painting
18. Valve Repair – Replacement (Phase 2)

19. MCAWRRF Digester Sludge Storage Improvements
20. MCAWRRF Aluminum Slide Gate Replacements
21. Glenmore Secondary Clarifier Coating
22. Sugar Hollow Dam – Rubber Crest Gate Replacement and Intake Tower Repairs
23. Scottsville WTP – Finished Water Metering Improvements
24. Avon to Pantops Water Main (on hold until completion of the Urban Water Master Plan)

Planning and Studies

25. South Fork Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way
26. Urban Water Demand and Safe Yield Study
27. Urban Finished Water Infrastructure Master Plan
28. South Rivanna River Crossing and North Rivanna Transmission Main
29. Route 29 Pump Station
30. South Rivanna Hydropower Plant Decommissioning
31. Security Enhancements
32. Upper Schenks Branch Interceptor, Phase II
33. Engineering and Administration Building
34. Asset Management Plan

O&M Related Projects

35. NRWTP Raw Metering Improvements
36. NRWTP Sludge Lagoon Study and Needs Assessment
37. NRWTP High Service Pump Replacement
38. MCAWRRF Cogeneration System Analysis
39. SRWTP Future Site Development Analysis

1. Birdwood Raw Water Main

Design Engineer:	Michael Baker International
Construction Contractor:	E.C. Pace
Construction Start:	November 2018
Percent Complete:	0%
Base Construction Contract + Change Orders to Date = Current Value:	$2,593,726
Expected Completion:	October 2019
Total Capital Project Budget:	$4,000,000

Current Status:

A construction contract has been awarded. Construction will begin after Thanksgiving.

History:

RWSA and the UVA Foundation wish to expedite construction of the portion of the 36-inch

raw water main through the Birdwood property. This would enable pipeline work to proceed just ahead of the planned golf course reconstruction project to prevent subsequent disruption to the property and adjacent neighbors, as well as increased water line construction costs. The golf course reconstruction project is planned to be underway in November 2018. This work includes installation of approximately 6,100 linear feet of 36-inch raw water main along the eastern property boundary of the golf course.

2. Crozet Water Treatment Plant Expansion

Design Engineer:	Short Elliot Hendrickson (SEH)
Construction Contractor:	Orders Construction Co.
Construction Start:	November 2018
Percent Completion:	0%
Base Construction Contract + Change Order to Date = Current Value:	$7,170,000
Expected Completion Date:	December 2020
Total Project Budget:	$8,500,000

Current Status:

A Notice of Award has been issued and the contractor is in the process of securing bonds and insurance. A preconstruction meeting has been scheduled for November 15, 2018 and a Notice to Proceed is expected to be issued later this month.

History:

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 regard to the 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 100% (from 1 to 2 mgd).

SEH completed a Preliminary Engineering Report (PER) for this project and some preliminary watershed data collection. In addition, raw water jar testing was performed to finalize the type of treatment parameters necessary for the upgrade work, and the testing results were incorporated into the PER. A new Work Authorization with SEH was executed to perform preliminary and final design documents, as well as construction administration services.

3. Crozet Interceptor Pump Stations Bypass and Isolation Valves

Design Engineer:	Johnson, Mirmiran & Thompson (JMT)
Construction Contractor:	Anderson Construction
Construction Start:	September 2018
Percent Completion:	5%
Base Construction Contract + Change Order to Date = Current Value:	$361,820
Expected Completion Date:	December 2018
Total Capital Project Budget:	$720,000

Current Status:

The contractor anticipates mobilizing in mid-November once materials have been delivered on site.

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. Contract Documents were advertised for bidding and bids were opened on July 10, 2018. A Notice of Award was provided to Anderson Construction on August 6, 2018.

4. Wholesale Water Master Metering

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	Linco, Inc.
Construction Start:	January 2016
Percent Complete:	97%
Base Construction Contract + Change Orders to Date = Current Value:	$2,228,254 - $284,104.24 = $1,944,149.76
Expected Completion Date:	February 2019
Total Capital Project Budget:	$3,200,000

Current Status:

Three water treatment plant flow meters, and all 25 distribution system flow meters have been installed. Of those 25 meters, 20 are currently functional and 5 are experiencing reporting errors. Meter troubleshooting is ongoing with the bidirectional meters. Our consultant, meter representatives and staff have found a practical solution for the negative readings at the bidirectional sites, and expect to have additional meter programming software and hardware available to complete operational start-up by February 2019.

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.

In May 2018, a final version of the *Wholesale Metering Administration and Implementation Policy* was completed and forwarded to the ACSA and the City. RWSA terminated the construction contract with Linco, Inc. on April 2, 2018 and is coordinating the remaining work in-house.

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

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	G.L. Howard
Construction Start:	October 2018
Percent Complete	5%
Base Construction Contract + Change Orders to Date = Current Value:	$354,905
Expected Completion:	February 2019
Total Capital Project Budget:	$383,241

<u>Current Status</u>:

RWSA staff has been collaborating with and assisting the demolition subcontractor with fulfilling all applicable Albemarle County requirements to allow the issuance of the Demolition Permit for the Gatekeeper's House. The asbestos removal subcontractor will be mobilizing prior to or just after the issuance of the Demolition Permit, and Substantial Completion is estimated for late January 2019. This project requires the Sugar Hollow to Ragged Mountain Reservoir transfer line to be out of service.

<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 four existing small utility structures and sheds 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. As a result, there will be some special abatement work required. Several long lead items were purchased by the contractor as a result of the initial Work Authorization. A subsequent Work Authorization covering the purchase of all remaining materials, construction and demolition was issued to the contractor on September 28, 2018. The Notice to Proceed (NTP) was issued to the contractor on October 1, 2018.

6. Crozet Finished Water Pump Station

Design Engineer:	Short Elliot Hendrickson (SEH)
Construction Contractor:	Anderson Construction, Inc.
Construction Start:	May 2017
Percent Complete:	95%
Base Construction Contract + Change Orders to Date = Current Value:	$1,949,386
Expected Completion Date:	December 2018
Total Capital Project Budget:	$2,600,000

Current Status:

Start-up and testing of equipment continues. Operations and Maintenance Manuals have been distributed and training has been completed. The new pump station will be put into service at the conclusion of the demonstration period. Due to a malfunction of one of two pumps, the 30-day demonstration period will be re-started this month once the repairs are complete. A number of punch list items have already been completed and following completion of the demonstration period, the existing pump station will be demolished.

History:

As part of the FY 2016 CIP, the Crozet Water Treatment Plant was studied to expand the treatment capacity to secure future demand needs of the Crozet community. Prior to any plant expansion, it was determined that the finished water pumping facilities were in need of replacement. The existing pump station was 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 was 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.

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.

7. Interceptor Sewer and Manhole Repair

Design Engineer:	Frazier Engineering
Construction Contractor:	IPR Northeast
Construction Start:	November 2017
Percent Complete:	10%
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:

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 begun and completion is expected by December 2018 as some additional cleaning of interceptor sections will be required to complete the investigation in easement areas with difficult access conditions. Initial results from the investigation have been provided to Frazier Engineering for review. A condition assessment report for a portion of the Morey Creek Interceptor has been completed with rehabilitation work to follow. 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.

8. 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
2018-06	South Rivanna Dam Apron and River Bank Repairs	$200,000

- 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. Coordination with the property owner is underway and this repair will be scheduled sequentially with the Rivanna Interceptor manhole repair this fall/winter.

- 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 fall/winter.

- South Rivanna Dam Apron and River Bank Repairs

  Intense rainfall between May 30-31 resulted in extensive flooding throughout Charlottesville and parts of Albemarle County, with flows over the South Fork Rivanna Dam reaching more than 7 feet over the spillway crest at its peak. Staff has inspected the dam and abutments to determine the extent of damage resulting from the extreme flooding. Although there is no discernible damage to the dam itself, staff found erosion damage to the north downstream river bank and substantial displacement of large stone downstream of the dam to form a rock dam and pool below the north apron. Additionally, some damage to concrete structures on both aprons was noted, including possible creation of voids beneath the concrete and loss of concrete joint filler. Repairs to the river bank and removal of the rock dam will take place in late 2018 under RWSA's on-call construction contract. Repairs to the north and south concrete aprons will be designed by Schnabel Engineering and those services will be procured separately from the on-call contract.

9. Piney Mountain Tank Rehabilitation (on hold until April 2019)

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 has been postponed until spring 2019. Utility Service Co., Inc will remain the general contractor for this project.

History:

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.

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.

10. Observatory Water Treatment Plant Expansion

Design Engineer:	Short Elliot Hendrickson, Inc. (SEH)
Project Start:	October 2017
Project Status:	Preliminary Engineering Report
Construction Start:	October 2019
Completion:	2023
Total Capital Project Budget:	$18,630,000

Current Status:

A project kickoff meeting with staff has been scheduled for November 14, 2018. 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 PER

has been finalized, as well as a Work Authorization with the design engineer for design, bidding and construction administration services.

11. South Rivanna Water Treatment Plant Improvements

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	October 2017
Project Status:	Preliminary Engineering Report
Construction Start:	October 2019
Completion:	December 2022
Total Capital Project Budget:	$15,000,000

Current Status:

A project kickoff meeting with staff has been scheduled for November 13, 2018. 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. The PER has been finalized, as well as a Work Authorization with the design engineer for design, bidding and construction administration services.

12. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line and Raw Water Pump Station

Design Engineer:	Michael Baker International (Baker)
Project Start:	August 2018
Project Status:	Work Authorization in Progress
Construction Start:	2022
Completion:	2025
Total Capital Project:	$18,000,000

Current Status:

A Work Authorization is being executed with Michael Baker International for the raw water line routing study, preliminary design, plat creation and the easement acquisition process for this portion of the project. A site evaluation study to recommend a location for the raw water pump station is currently being conducted under the South Rivanna River to Ragged Mountain Reservoir Water Line Right-of-Way Work Authorization with Baker.

History:

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 may eventually have the capacity to treat 10 million gallons per day (mgd). The new pipeline is expected to be constructed of 36-inch ductile iron and will approximately 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.

The RMR to Observatory WTP raw water pump station is planned to replace the existing Stadium Road and Royal pump stations, which have exceeded their design lives or will require significant upgrades with the Observatory WTP expansion. The pump station will pump up to 10 million gallons per day (mgd) of raw water 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 mgd of raw water from RMR back to the SRR WTP.

13. Crozet Flow Equalization Tank

Design Engineer:	Schnabel Engineering
Project Start:	October 2016
Project Status:	25% Design Complete
Construction Start:	2019
Completion:	2020
Total Capital Project Budget:	$3,300,000

Current Status:

A geotechnical analysis and report, field survey work, and existing pump station evaluation have all be completed as part of the design process. Design documents will be completed by February 2019.

History:

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.

Greeley and Hansen completed a siting study to determine the location for the flow equalization tank based on the results of the comprehensive model update. The results of the siting study were reviewed with ACSA and a final tank location was determined.

A work authorization with Schnabel Engineering was finalized and a Project Kick-off Meeting was held on July 12, 2018. A data collection period has begun which includes a wetlands investigation of the project site and a topographic survey of the site has also been completed. An inspection of the existing Pump Station No. 4 is scheduled for September 20, 2018 where information on the control and electrical systems will be gathered.

14. Beaver Creek Dam Alterations

Design Engineer:	Schnabel Engineering
Project Start:	February 2018
Project Status:	Work Authorization Under Negotiation
Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	$18,600,000

Current Status:

A Preliminary Engineering Report has been completed for the selected design alternative. Schnabel Engineering is beginning final design of the dam improvements this month. Staff anticipates the project will bid in fall of 2020 with construction to begin in 2021.

History:

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. Work for this project will be coordinated with the new relocated raw water pump station and intake and a reservoir oxygenation system project.

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 design work for this project is being completed under Schnabel's term contract.

Following the completion of an updated alternatives analysis by Schnabel Engineering, staff met with members of Albemarle County and ACSA staff to discuss the preferred alternative. It was determined that staff would proceed with design of a labyrinth spillway and chute through the existing dam with a bridge to allow Browns Gap Turnpike to cross over the new spillway.

15. <u>Beaver Creek Raw Water Pump Station, Intake and Hypolimnetic Oxygenation System</u>

Design Engineer:	Hazen & Sawyer
Project Start:	August 2018
Project Status:	Work Authorization Under Negotiation
Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	$5,100,000

<u>Current Status</u>:

Staff is negotiating a Work Authorization (scope and fee) with Hazen and Sawyer for site selection work for the new Raw Water Pump Station and permitting for the Pump Station, Intake, and Beaver Creek Dam Upgrades. This work is expected to begin in November 2018.

<u>History</u>:

The Drinking Water Infrastructure Plan for the Crozet water service area, developed by Hazen and Sawyer, recommends installation of a new Raw Water Pump Station and Intake at the Beaver Creek Dam in order to meet new minimum instream flow requirements and provide adequate raw water pumping capacity to serve the growing Crozet community for the next 50 years. The pump station will be moved out of its existing location at the toe of the dam to a new location, to be determined during design. The new intake structure will include enhanced controls to allow for access to the best quality water at any given time.

Following a Reservoir Water Quality and Management Study by DiNatale Water Consultants, several recommendations were made to improve water quality in the Beaver Creek Reservoir, including installation of a new outlet structure and installation of a hypolimnetic oxygenation system. The oxygenation system will reduce reliance on algaecide treatments by increasing dissolved oxygen in the reservoir. This system will be designed as part of the new raw water pump station and intake by Hazen and Sawyer, with assistance from DiNatale in preparing the system specifications.

16. Crozet Interceptor Pump Station Rebuilds

Design Engineer:	TBD
Project Start:	July 2018
Project Status:	25% Design Complete
Construction Start:	2019
Completion:	2023
Total Capital Project Budget:	$525,000

Current Status:

Staff is reviewing the overall scope of work for the project and will be coordinating with the Maintenance Department regarding schedule and preferred equipment and materials. Work will be performed via quote packages and the need for consultant assistance is being determined.

History:

The Crozet Interceptor Pump Stations were constructed in the 1980's and many of the components are still original. The project will include the replacement of pumps and valves at Pump Station No. 2 in order to improve pumping capabilities at this location and provide spare parts for the pumps at Pump Station No. 1. This work will also include roof replacements at all four pump stations, siding replacement for the wet well enclosure at Pump Station No. 3, and installation of a new water well at Pump Station No. 3. Components of this project will be coordinated and timed to properly coincide with the Crozet Flow Equalization Tank project.

17. Bucks Elbow Tank and Crozet Waterball Tank Painting

Design Engineer:	TBD
Project Start:	Summer 2019
Project Status:	Work Authorization Under Negotiation
Construction Start:	Spring 2021
Completion:	Summer 2021
Total Capital Project Budget:	$1,200,000

Current Status:

Following selection of a consultant to complete the work, staff will begin negotiation of the first work authorization for design services for this project. Construction for this project is scheduled to begin in Spring 2021, following completion of the CZWTP Expansion in October 2020.

History:

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. Construction of the tank improvements are expected to begin in spring of 2021.

18. Valve Repair – Replacement (Phase 2)

Design Engineer:	N/A
Project Start:	July 2018
Project Status:	Bidding
Construction Start:	Spring 2019
Completion:	Summer 2019
Total Capital Project Budget:	$500,000

Current Status:
RWSA staff has finalized the project's scope, and using feedback from each stakeholder (RWSA, ACSA and VDOT), all design and bid documents have been finalized and assembled. A Request for Bids (RFB) will be issued on November 6, 2018. Staff anticipates making a bid award recommendation at the January 2019 Board Meeting, with construction starting in Spring of 2019.

History:
Isolation valves are critical for normal operation of the water distribution system and timely emergency response to water main breaks. Staff continuously reviews results from an ongoing Valve Exercising and Condition Assessment Program. This project will replace the highest-priority valves that are identified during the condition assessment as not operable and not repairable. In addition, valves that are identified in the condition assessment as being inoperable and repairable will be repaired as a part of the project. Phase 1 of the Valve Repair-Replacement Project replaced several inoperable and unrepairable valves in the North Rivanna Finished Water System. Phase 2 will continue replacing inoperable and unrepairable valves in the North Rivanna Finished Water System, but it will also replace (and potentially repair) valves on the South Rivanna, Crozet, Pantops, and Southern Loop Finished Water Systems. Once all specified valves have been repaired/replaced in Phase 2, the focus will shift to replacing older isolation valves in subsequent phases. Numerous valves in the North Rivanna and South Rivanna Finished Water Systems are 50+ years old and replacing these valves will enhance the resiliency and reliability of the two systems.

19. MCAWRRF Digester Sludge Storage Improvements

Design Engineer:	TBD
Project Start:	Fall 2018
Project Status:	Preliminary Design
Construction Start:	Spring 2019
Completion:	Fall 2019
Total Capital Project Budget:	$265,000

Current Status:

Preparation of construction documents will begin this Fall. Implementation of this work will commence after Digester No. 2 and No. 3 are both coated and back in service.

History:

With the second centrifuge installation, 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 (Digester No. 1) 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.

20. MCAWRRF Aluminum Slide Gate Replacements

Design Engineer:	Hazen and Sawyer
Project Start:	November 2018
Project Status:	Preliminary Design
Construction Start:	March 2019
Completion:	July 2019
Total Capital Project Budget:	$470,000

Current Status:

Engineering staff has negotiated a scope of work with Hazen and Sawyer for project design support. A project kick-off meeting is anticipated in November.

History:

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 influent 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.

21. Glenmore Secondary Clarifier Coating

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	Fall 2018
Project Status:	Preliminary Design
Construction Start:	2019
Completion:	2019
Total Capital Project Budget:	$50,000

Current Status:

Engineering staff is developing specifications to provide Lyttle Utilities with a change order to their MCAWRRF Digester Coating project for blasting and coating both clarifiers.

History:

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 abrasion 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.

22. Sugar Hollow Dam – Rubber Crest Gate Replacement and Intake Tower Repairs

Design Engineer:	Schnabel Engineering
Project Start:	December 2018
Project Status:	Work Authorization Under Negotiation
Construction Start:	2019
Completion:	2021
Total Capital Project Budget:	$940,000

Current Status:

Design will begin in the winter of 2018 with construction to begin in 2019.

History:

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.

23. Scottsville WTP – Finished Water Metering Improvements

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	September 2018
Project Status:	Preliminary Design
Construction Start:	February 2019
Completion:	May 2019
Total Capital Project Budget:	$145,000

Current Status:

SEH has begun preliminary design work and final design documents are anticipated to be complete in November 2018.

History:

The Scottsville WTP is permitted to provide up to 0.25 MGD of potable drinking water to RWSA customers in the Scottsville service area. After water has been treated in the plant it is collected in an existing clearwell, which was constructed with the original facility. From the clearwell, the water is pumped into the distribution system by one of the two high service pumps. The flow from these pumps is not metered. In order to keep a record of the total flow entering the Scottsville system, plant operators must periodically conduct draw-down tests to verify the pumping rate of each of the two pumps. The total flow is then calculated based on the run time of each pump. This method of measuring flow is not accurate, as the pumping rate will vary based on the clearwell level and the hydraulic grade line of the distribution system. In addition, the Virginia Department of Health has indicated that the flow should be metered during recent conversations related to the disinfection profile calculation throughout the plant. The purpose of this project is to install a finished water meter at the plant.

24. Avon to Pantops Water Main (on hold until completion of the Urban Water Master Plan)

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

Current Status:

Route alignment determination, hydraulic modeling, and preliminary design were underway. Due to the complicated nature of our finished water systems, it was decided at the August 2018 Board meeting that a more comprehensive approach is warranted and we should complete the Finished Water Master Plan prior to moving forward with final design and construction of the Avon to Pantops Water Main. This project is on hold.

History:

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

25. 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:	Preliminary Engineering Report

Completion:	2021
Total Capital Project Budget:	$2,295,000

Current Status:

The PER will be completed by December 2018. Easement acquisition negotiations will begin by May 2019.

History:

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.

Baker is now completing the routing study. Preliminary design, plat creation and the acquisition of easements will take place as soon as the final route determination has been made. Property owners have been contacted to request permission to access properties for topographical surveying which will take place following completion of the PER. A recommendation for a tentative final alignment was presented at a community information meeting in June 2018.

26. Urban Water Demand and Safe Yield Study

Design Engineer:	Hazen and Sawyer
Project Start:	November 2018
Project Status:	0% complete
Completion:	August 2019
Total Capital Project Budget:	$154,000

Current Status:

A work authorization with Hazen and Sawyer has been executed and a project kick-off meeting is anticipated this month.

History:

The City of Charlottesville, Albemarle County Service Authority, and RWSA entered into the Ragged Mountain Dam Project Agreement in 2012. This Agreement included 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. 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.

27. Urban Finished Water Infrastructure Master Plan

Design Engineer:	Michael Baker International (Baker)
Project Start:	November 2018
Project Status:	0% complete
Completion:	January 2020
Total Capital Project Budget:	$253,000

Current Status:

A project kick-off meeting is anticipated this month.

History:

As identified in the 2017 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. Many previously identified projects in the urban finished water treatment and distribution system are under in preliminary engineering, design or construction. As such, staff have identified a need to develop a current and ongoing finished water master plan.

28. South Rivanna River Crossing and North Rivanna Transmission Main

Design Engineer:	Michael Baker International (Baker)
Project Start:	July 2020
Project Status:	Planning
Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	$5,340,000

Current Status:

An update to the Airport Zone Study Report was completed in summer of 2018, confirming the need for and timing of the river crossing and transmission main. Design of the project will begin in summer 2020.

History:

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. 20 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.

29. Route 29 Pump Station

Design Engineer:	Michael Baker International (Baker)
Project Start:	July 2019
Project Status:	Planning
Construction Start:	2021
Completion:	2022
Total Capital Project Budget:	$2,300,000

Current Status:

Design of the pump station will begin in the summer of 2019.

History:

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 update was completed in June of 2018 to reflect the changes in the system and demands since 2007. This project, along with the South Rivanna River Crossing and North Rivanna Transmission Main project 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 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.

30. 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. As part of the application, a draft decommissioning plan has been developed and is being reviewed by RWSA. Due to a recent significant wet weather event, returning the 72-inch diameter penstock to a reservoir drain is being considered. Modifications to the decommissioning plan may be necessary as a result.

History:

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. 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.

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.

31. Security Enhancements

Design Engineer:	TBD
Project Start:	July 2018
Project Status:	Planning
Construction Start:	2019
Completion:	2021
Total Capital Project Budget:	$2,400,000

Current Status:

RWSA Engineering and Operations staff met to consider the recommendations of the final 2018 Risk Assessment Report (RA), narrow the scope of the project and discuss methods for applying the considered improvements. RWSA Engineering staff has begun addressing priority items discussed during the meeting and determining which portions of the project will require additional input from various RWSA departments. Staff from other utilities, such as ACSA and the City, will be contacted to determine how access control and other security measures are integrated into their facilities. As the project's scope of work is refined, a consultant will be selected to provide project assistance where needed.

History:

As required by the Federal Bioterrorism Act of 2002, water utilities must conduct Vulnerability Assessments and have Emergency Response Plans. RWSA recently completed an updated Risk Assessment of its water system in collaboration with the Albemarle County Service Authority (ACSA), City of Charlottesville (City), and University of Virginia (UVA). A number of security improvements that could be applied to both the water and wastewater systems were identified. 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.

32. Upper Schenks Branch Interceptor, Phase II

Design Engineer:	Frazier Engineering, P.A.
Project Start:	TBD
Project Status:	Planning
Construction Start:	TBD
Completion:	TBD
Total Capital Project Budget:	$4,485,000

Current Status:

Discussions are underway to determine an alignment for the replacement sewer line, generally located between the McIntire Recycling Center and Preston Avenue along McIntire Road.

History:

The Schenks Branch Sanitary Sewer interceptor is a pipeline operated by RWSA that serves the City of Charlottesville. The 21-inch sewer line was originally constructed by the City in the 1950s. Evaluations from the flow metering and modeling from the Comprehensive Sanitary Sewer Interceptor Study, and negotiations with the ACSA and City, resulted in an inflow and infiltration reduction plan from which it was concluded that increased capacity of the Schenks Branch Interceptor was needed for wet weather peak flow. Due to several road construction projects and the construction of the Meadow Creek Interceptor project along the sewer alignment, Schenks Branch was to be constructed in multiple phases. The completed sections, collectively known as the Lower Schenks Branch Interceptor, include the Tie-in to Meadow Creek, the section along McIntire Road Ext, and the section though the Route 250 Interchange.

The remaining sections, which are considered the Upper Schenks Branch Interceptor, were split into 2 phases. The first phase has been completed and is located within City-owned Schenks Greenway adjacent to McIntire Road and the second phase is to be located on County property (baseball field and County Office Building) adjacent to McIntire Road or within McIntire Road. Both phases are included in a DEQ Consent Order. As a result of discussions between RWSA and DEQ, DEQ approved a milestone schedule for completing the Phase 1 section by March 31, 2017 and set in “abeyance” a schedule for completing work on Phase 2 as a result of complications associated with the execution of the necessary easements. Phase 2, preliminary construction drawings and specifications have been developed. No new

agreements concerning right-of-way have been reported to RWSA regarding Phase 2. No bidding or construction can take place until one of the following two options occur: (1) County grants RWSA a suitable easement on County property; or (2) City grants RWSA permission and a street cut permit to install the sewer directly under McIntire Road.

33. Engineering and Administration Building

Design Engineer:	Dewberry
Project Start:	April 2018
Project Status:	Space Needs Analysis
Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	$3,000,000

Current Status:

An assessment of space needs for the departments housed within the existing Administration Building and Engineering Building has been completed and layouts for an expanded Administration Building have been developed along with a draft final report. The report and layouts are being reviewed by a committee at RWSA to provide any additional comments before the documents are finalized.

History:

RWSA currently has its administrative headquarters in two buildings on the grounds of the MCAWRRF. 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 expansion. There is currently a need to house additional staff; increase office and meeting space; plan for the replacement of the trailers; bring IT server workrooms to modern standards; and provide classroom space for education outreach. Staff has procured a consultant to perform a space needs analysis and provide recommendations on how to address future building needs.

34. Asset Management Plan

Design Engineer:	GHD, Inc.
Project Start:	July 2018
Project Status:	5% Complete (Phase 1)
Completion:	2020
Total Capital Project Budget:	$500,000

Current Status:

A work authorization and Agreement has been finalized with GHD to perform the first phase of the process which includes the development of an asset management framework and implementation roadmap. An internal Asset Management Project Team meeting was held on September 18, 20187 and a kick-off meeting with GHD was held on October 12, 2018. Asset

Management awareness training is scheduled for November 7, 2018 and the Asset Management Program Development Workshop has been scheduled for November 8, 2018.

History:

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. 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 has been 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.

O&M Related Projects

Staff is currently working on several O&M related projects within the water and wastewater systems as listed below:

#	Project Description	Total Approx. Value
35	NRWTP Raw Water Metering Improvements	$135,000
36	NRWTP Sludge Lagoon Study and WTP Needs Assessment	$60,100
37	NRWTP High Service Pump Replacement	$200,000
38	MCAWRRF Cogeneration System Analysis	$48,300
39	SRWTP Future Site Development Analysis	$15,000

- NRWTP Raw Water Metering Improvements

  The NRWTP is permitted to provide up to 2.0 MGD of potable drinking water to RWSA customers located in the Urban service area. After water is pumped from the raw water pump station on the North Fork Rivanna River, the raw water flow is metered by an orifice plate, or insert style meter, prior to entering the rap mix chamber. The meter is located behind the existing powdered activated carbon feed system and is difficult to access. In addition, RWSA recognizes that the accuracy of this style of meter is reduced by laying length conditions in comparison to modern magnetic flow meters which have been installed at other locations. RWSA is working with SEH to develop contract documents to have a magnetic flow meter installed on the raw water line in an exterior below grade vault. Bidding is expected in January 2019 and construction to be completed by June 2019.

- NRWTP Sludge Lagoon Study and WTP Needs Assessment

  The two lagoons or settling ponds at the plant are earthen basins designed to capture and hold residuals generated through the treatment process as well as periodic draining and washdown

of the sedimentation and flocculation basins. The basins were designed to allow all the residuals and solids to settle out and then the clarified water to be decanted and conveyed to the river. The operational use of these lagoons is not as originally intended, and the Virginia Department of Environmental Quality has concerns regarding their condition. A study is being performed to determine how they can be improved, and other locations on site that may be less prone to flood waters. Under this project, a needs assessment at the plant will be also be performed and updated.

- NRWTP High Service Pump Replacement

  The two existing high service pumps at the NRWTP were installed when the plant was originally constructed in 1974 and as a result have reached the end of their serviceable lives. Due to excessive maintenance needs and concerns regarding their reliability, RWSA is working with SEH to develop quote packages for the procurement of the pumps and then installation. Quotes have been received for the procurement of the pumps and a subsequent quote for installation is upcoming with work anticipated to begin in January 2019.

- MCAWRRF Cogeneration System Analysis

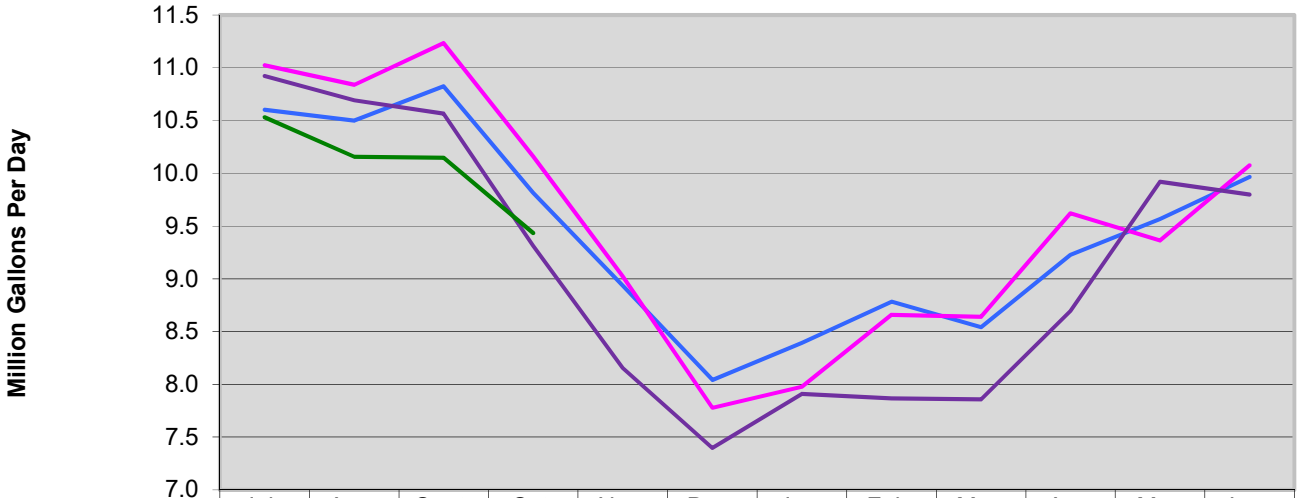
  The MCAWRRF currently utilizes a cogeneration facility which accepts digester gas and uses it to create electricity and heat. The facility was put into operation in 2011. The generator supplies power back to the plant electrical distribution system providing energy usage savings through offsetting usage through the electric utility. Unfortunately, there have been a number of issues associated with operation of the generator including, expensive and proprietary maintenance services and temperature issues. With a significant and expensive scheduled maintenance event forthcoming, RWSA wanted to conduct a study to determine if these issues could be resolved or if there was a more efficient way to utilize the digester gas. This study will evaluate options for improvements to the existing system or new systems that could be implemented along with estimated costs and returns on investment. The study is expected to be complete by February 2019.

- SRWTP Future Site Development Analysis

  As future water demands increase, facility expansions and additions at the SRWTP site are proposed to continue. At some point in the future RWSA has plans to increase the capacity at the SRWTP to 16 MGD along with preliminary plans for a 41 MGD raw water pump station and a 25 MGD pretreatment facility associated with the future transfer of raw water from the South Rivanna Reservoir to the Ragged Mountain Reservoir. With property development activity increasing near the plant, the intent of this analysis is to confirm what approximate space would be needed to meet the plant's future needs in order to better determine future property requirements. The analysis is expected to be complete by December 2018.

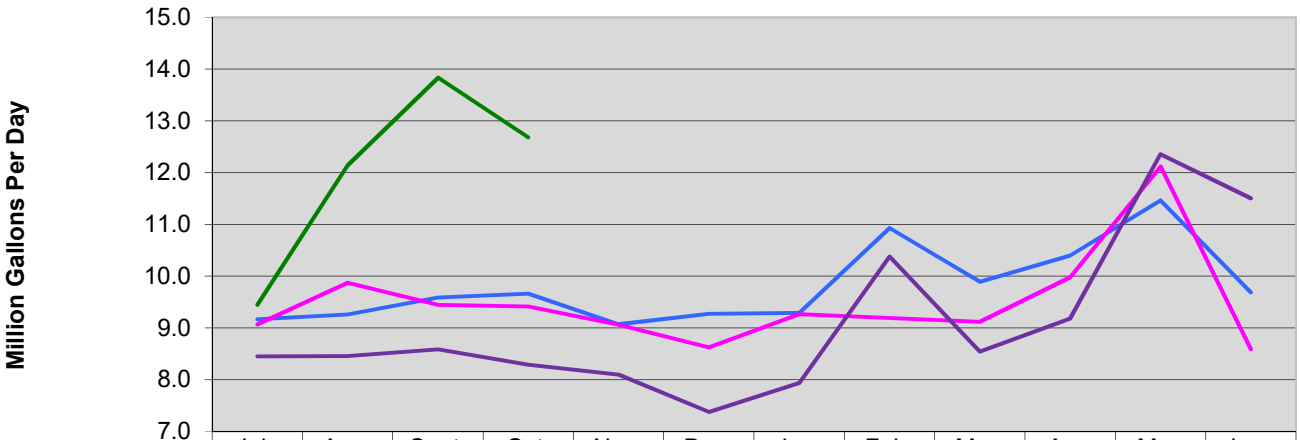
Rivanna Water and Sewer Authority
Flow Graphs

Urban Water Flows



	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
5 YR AVG.	10.60	10.50	10.83	9.82	8.94	8.04	8.39	8.78	8.54	9.23	9.57	9.97
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	9.80
FY 2019	10.53	10.16	10.15	9.43								

Urban Wastewater Flows



	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
5 YR AVG	9.17	9.26	9.59	9.66	9.07	9.27	9.29	10.93	9.89	10.39	11.47	9.68
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	11.50
FY 2019	9.45	12.14	13.83	12.68								

RIVANNA WATER & SEWER AUTHORITY
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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 OCTOBER 2018**

DATE: **NOVEMBER 13, 2018**

WATER OPERATIONS:

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

Water Treatment Plant	***Average Daily Production (MGD)***	***Total Monthly Production (MG)***	***Maximum Daily Production in the Month (MGD)***
Observatory	1.69	52.44	2.26 (10/02/18)
South Rivanna	7.37	228.41	8.89 (10/05/18)
North Rivanna	0.37	11.58	0.488 (10/09/18)
Urban Total	9.43	292.43	10.94 (10/05/18)
Crozet	0.566	17.55	0.760 (10/07/18)
Scottsville	0.046	1.44	0.086 (10/14/18)
RWSA Total	10.04	311.42	---

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

Status of Reservoirs (as of November 8, 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%)

WASTEWATER OPERATIONS:

All RWSA Water Resource Recovery Facilities (WRRFs) were in regulatory compliance with their effluent limitations during the month of October 2018. Performance of the WRRFs in October 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	11.5	0.5	10	0.6	22	0.07	2.0
Glenmore	0.124	2.0	15	2.4	30	0.15	NL
Scottsville	0.085	0.8	25	1.5	30	0.14	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 September 2018:

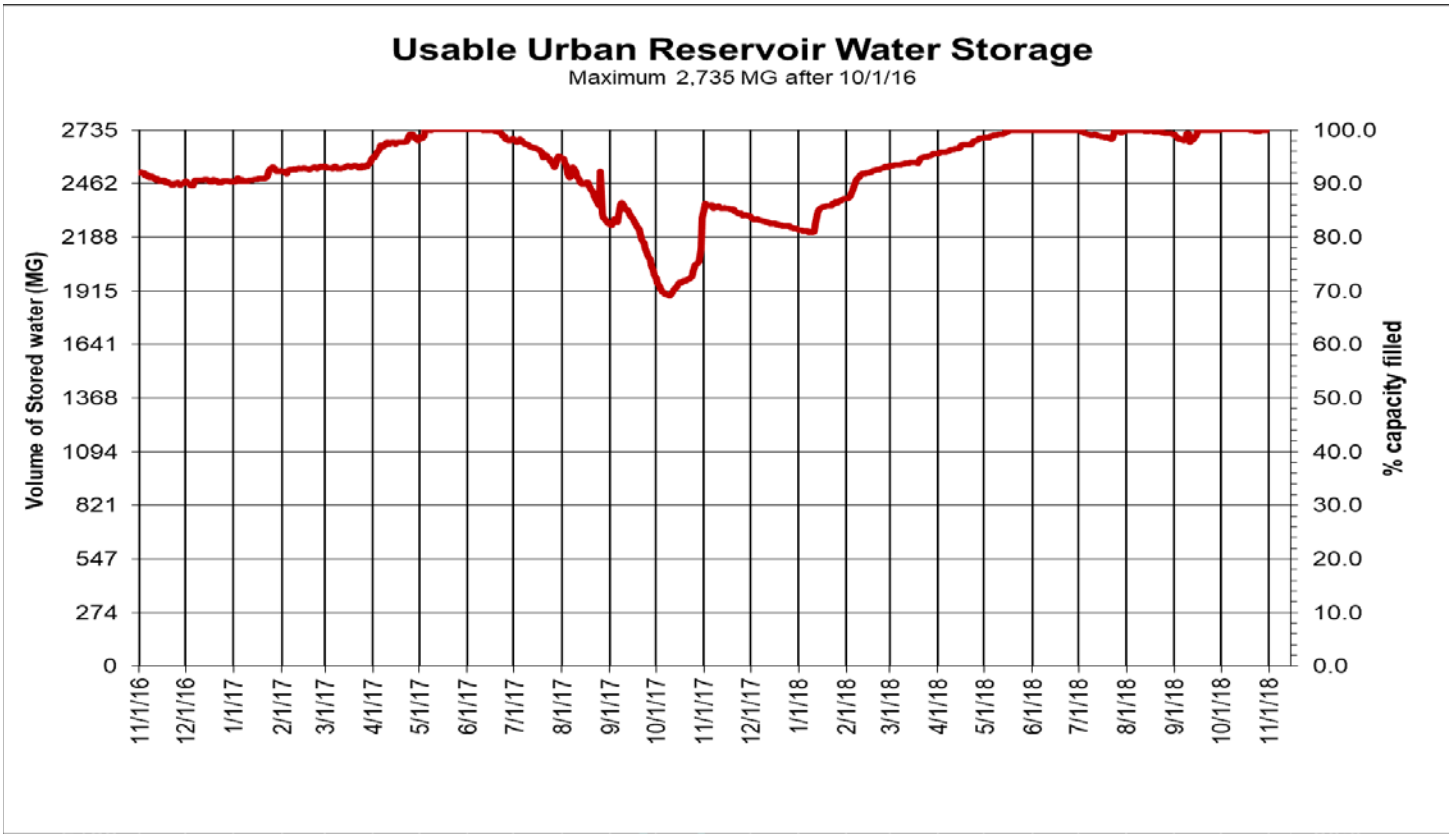
State Annual Allocation (lb./yr.)		*Average Monthly Allocation (lb./mo.)**	*Moores Creek Discharge (lb./mo.)*	*Performance as % of Average Allocation**
Nitrogen	282,994	23,583	7743	33%
Phosphorous	18,525	1,544	587	38%

*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


Usable Urban Reservoir Water Storage
Maximum 2,735 MG after 10/1/16
Volume of Stored water (MG)
% capacity filled
2735
2462
2188
1915
1641
1368
1094
821
547
274
0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
11/1/16
12/1/16
1/1/17
2/1/17
3/1/17
4/1/17
5/1/17
6/1/17
7/1/17
8/1/17
9/1/17
10/1/17
11/1/17
12/1/17
1/1/18
2/1/18
3/1/18
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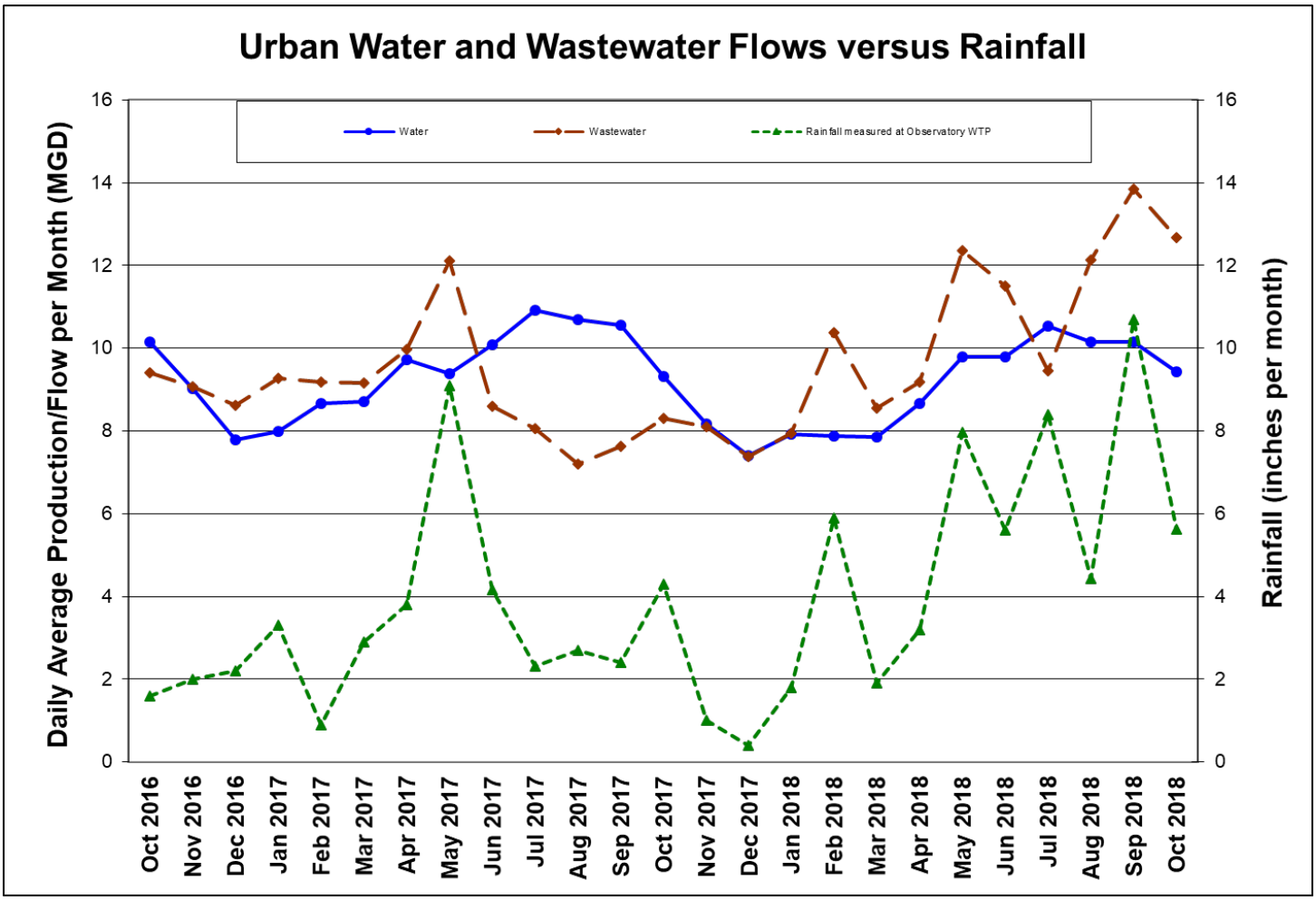
9/1/18
10/1/18
11/1/18


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)
16
14
12
10
8
6
4
2
0
Oct 2016
Nov 2016
Dec 2016
Jan 2017
Feb 2017
Mar 2017
Apr 2017
May 2017
Jun 2017
Jul 2017
Aug 2017
Sep 2017
Oct 2017
Nov 2017
Dec 2017
Jan 2018
Feb 2018
Mar 2018
Apr 2018
May 2018
Jun 2018
Jul 2018
Aug 2018
Sep 2018
Oct 2018

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MEMORANDUM

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

FROM: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **APPROVAL OF ADDITIONAL EMPLOYEE HOLIDAYS**

DATE: **NOVEMBER 13, 2018**

A ½ day holiday starting at noon is requested for Wednesday, November 21, 2018, the day before Thanksgiving. A full day holiday is requested for Monday, December 31, 2018, the day before the New Years Day holiday. These additional holidays have been granted by the Governor for State employees, as well as by Albemarle County, the Albemarle County Service Authority and the City (Administrative days) for their employees.

Board Action Requested:

It is respectfully requested that the Board of Directors authorize a ½ day holiday (4 hours) on November 21, 2018 and a full day holiday (8 hours) on December 31, 2018.

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MEMORANDUM

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

FROM: **BILL MAWYER, EXECUTIVE DIRECTOR**

SUBJECT: **APPROVAL OF BOARD MEETING SCHEDULE FOR CALENDAR 2019**

DATE: **NOVEMBER 13, 2018**

This memo is to propose a schedule for Board meetings during calendar year 2019.

Since 2009, the Board has met on the fourth Tuesday of the month at 2:15 p.m. (or upon conclusion of the RSWA Meeting when it is also held), except traditionally the November and December meetings have been advanced to the third Tuesday to avoid conflicts with the Thanksgiving and Christmas holidays.

Board Action Requested

Staff respectfully recommends adoption of the attached Board Meeting Schedule for Calendar Year 2019.

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Board Meeting Schedule

Listed below are the approved RWSA Board of Directors meeting dates for calendar year 2019:

Tuesday, January 22, 2019

Tuesday, February 26, 2019

Tuesday, March 26, 2019

Tuesday, April 23, 2019

Tuesday, May 28, 2019

Tuesday, June 25, 2019

Tuesday, July 23, 2019

Tuesday, August 27, 2019

Tuesday, September 24, 2019

Tuesday, October 22, 2019

Tuesday, November 19, 2019*

Tuesday, December 17, 2019*

* The November and December meetings are moved to the third Tuesday of the month, respectively, to avoid conflicts with the weeks of Thanksgiving and Christmas.

RWSA meetings will start following the RWSA Board Meetings but not earlier than 2:15 p.m. RWSA meetings will be held in the large conference room of the Moores Creek Wastewater Treatment Plant Administration Building, 695 Moores Creek Lane, Charlottesville, VA.

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MEMORANDUM

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

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

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

SUBJECT: **APPROVAL OF ENGINEERING SERVICES, AND UPDATE ON AWARD OF CONSTRUCTION CONTRACT – SRFF TO RMR 36-INCH RAW WATER MAIN; PHASE 1 BIRDWOOD GOLF COURSE**

DATE: **NOVEMBER 13, 2018**

As outlined in our Board report last month, our staff has been coordinating with the UVA Foundation to plan an expedited project to construct approximately 6,100 LF of 36-inch raw water main along the eastern boundary of the Birdwood golf course property in conjunction with the planned golf course reconstruction project which has just begun. This approach will reduce our project costs, as well as to avoid repeated disruptions to the property, golf course operations, and the adjacent neighbors.

RWSA originally opened bids for this project on October 11, 2018. Four competitive bids were received, however, it was determined that all of the bids were nonresponsive to the bid requirements, and therefore, all of the bids were rejected. The bid documents were clarified, and a new Invitation for Bids was issued on October 19, 2018. Construction bids for RFB No. 348 were opened on November 1, 2018 and two bids were received ranging from $2,571,264 to $2,684,048. The apparent low bidder was E.C. Pace Company, Inc. of Roanoke, VA with a total bid of $2,571,264.

Our design engineer, Michael Baker International (Baker), has reviewed the bid documents submitted by E.C. Pace Company, Inc. and verified that the bid and attached documents are both responsive and responsible. Baker recommended awarding a construction contract for $2,571,264 to E.C. Pace Company, Inc. With the advanced authorization from the Board last month, the Executive Director has awarded this project to E.C. Pace Company, Inc. of Roanoke, VA with a total bid of $2,571,264 and an additional 10% contingency available for change orders if necessary.

Professional engineering support services from Baker will also be required during the year of Birdwood construction by providing construction administration and limited field services to support the construction observation work by RWSA's staff. Engineering support will be provided in areas such as the review of shop drawings, interpretation of plans and specifications, preparation

of change orders and contract document administration, attendance of meetings, and preparation of record drawings.

Noteworthy is that the construction bids came in significantly under the Engineer's probable estimate of cost. Including all construction costs, geotechnical investigations and testing, engineering design, bidding, and construction management costs, legal, administration, permitting, and contingency costs, the total CIP project budget will be reduced from $7M to $4M.

Board Action Requested:

Staff respectfully requests that the Executive Director be authorized to execute Work Authorizations with Michael Baker International for Construction Administration Services for a total fee not to exceed an amount of $175,300 to be funded out of the CIP budget for SFRR to RMR 36-inch Raw Water Main; Phase 1 – Birdwood Golf Course. Staff also requests authorization for a 10% contingency for these professional services, to be used at the discretion of the Executive Director only if necessary for completion of the project.

STRATEGIC PLAN QUARTERLY UPDATE

4th Quarter – 2018

Report to the Board of Directors

November 13, 2018

RIVANNA

WATER AND SEWER AUTHORITY

& SOLID WASTE AUTHORITY

Goal Team Composition

Goal	Champion
Communications	Katie McIlwee
Environmental Stewardship	Andrea Terry
Solid Waste Services	Phil McKalips
Workforce Development	Betsy Nemeth / Lonnie Wood
Infrastructure	Scott Schiller
Operational Optimization	Tim Castillo / David Tungate

By the Numbers

Overall plan completion: 52%

Status: **GREEN**

Workforce Development Tactics

Strategies:

A. Develop a comprehensive staffing, classification, & compensation plan
B. Conduct a training needs assessment & enhance the training program

Recent Activity:

A. Presented Staffing Master Plan to Boards in August
B. Leadership training for Class 1 & 2 Operators
C. Working with PVCC on Manager Training

Next Steps:

A. Continue review of Staffing Master Plan and beginning budget process for new positions
B. Assemble a plan to conduct a Training Needs Assessment
C. Design a Development Plan Program and forms

PROGRESS STATUS

TACTIC COMPLETION

RIVANNA WATER & SEWER AUTHORITY

Status: YELLOW

Operational Optimization Tactics

Strategies:

A. Continually evaluate, prioritize, & improve key business & operational processes
B. Protect our workforce & the public through continually growing a culture of safety

Recent Activity:

A. Completion of needs analysis for inventory of existing training material & cataloging for wastewater department
B. CIP projects; moving forward with South Rivanna, Observatory & Crozet WTP upgrades

Next Steps:

A. Complete corrosion inhibitor study & implement recommendations
B. Complete sealing of digester #3

PROGRESS STATUS

TACTIC COMPLETION

RIVANNA WATER & SEWER AUTHORITY

Status: **GREEN**

Communication & Collaboration Tactics

Strategies:

A. Create & maintain internal communication platforms
B. Create & implement a comprehensive public outreach plan

Recent Activity:

A. Completed inventories, updates, and maintenance of internal and external contact lists
B. Completed inventory of current public outreach activities

Next Steps:

A. Analyze web statistics to enhance usability of the Rivanna website
B. Complete Employee Portal
C. Continue to collaborate with other Goal Teams (Solid Waste Services / Environmental Stewardship) to support completion of their tactics

PROGRESS STATUS

TACTIC COMPLETION

Status: **RED**

Environmental Stewardship Tactics

Strategies:

A. Increase internal environmental engagement
B. Designate resources to support environmental outreach & green initiatives

Recent Activity:

A. Will include "Environmental Stewardship Tips" in the bi-monthly employee newsletter
B. Continue to attend meetings with external environmental partners

Next Steps:

A. Continue coordination with the Communication & Collaboration team to disseminate information on on-going environmental activities
B. Identify and plan for activities to engage employees in projects
C. Develop a budget for green initiatives and activities

PROGRESS STATUS

TACTIC COMPLETION

Status: **RED**

Solid Waste Services Tactics

Strategies:

A. Determine community needs & preferred service levels
B. Enhance partnerships with local governments & the University of Virginia

Recent Activity:

A. Began outreach and partnership opportunities
B. Implementing increased composting opportunities

Next Steps:

A. Coordinate with UVA to develop composting partnership at Ivy MUC
B. Complete of Ivy Master Plan

PROGRESS STATUS

TACTIC COMPLETION

RIVANNA WATER & SEWER AUTHORITY

Status: **GREEN**

Infrastructure & Master Planning Tactics

Strategies:

A. Implement an Authority-wide asset management program
B. Develop & maintain long-term master plans for all critical asset classes

Recent Activity:

A. Working with GIS Coordinator to organize current asset information
B. Complete Asset Management kick-off meeting with contractor and staff; training and workshops scheduled

Next Steps:

A. Conduct Asset Management Plan Awareness Training and Program Development Workshops
B. Meet with Goal Team to refine gap analysis based on inventory of existing Master Plans & other critical assets
C. Identify additional Master Planning requirements

PROGRESS STATUS

TACTIC COMPLETION

QUESTIONS?

Strategies

1. Workforce Development

A. Develop a comprehensive staffing, classification, & compensation plan

B. Conduct a training needs assessment & enhance the training program

2. Operational Optimization

A. Continually evaluate, prioritize, & improve key business & operational processes

B. Protect our workforce & the public through continually growing a culture of safety

3. Communication & Collaboration

A. Create & maintain internal communication platforms

B. Create & implement a comprehensive public outreach plan

4. Environmental Stewardship

A. Increase internal environmental engagement

B. Designate resources to support environmental outreach & green initiatives

5. Solid Waste Services

A. Determine community needs & preferred service levels

B. Enhance partnerships with local governments & the University of Virginia

6. Infrastructure & Master Planning

A. Implement an Authority-wide asset management program

B. Develop & maintain long-term master plans for all critical asset classes

Workforce Development Tactics

Develop a comprehensive staffing, classification, & compensation plan

- Implement approved pay grade schedule - July 1
- Develop Master Staffing Plan
- Review staffing plans with BOD, gain approval (CONCEPTUALLY) of plan, formal approval will occur in budget approval for next fiscal year's new positions
- Continued annual review of staffing needs at an executive level

Conduct a training needs assessment & enhance the training program

- 12 month training calendar
- PVCC Leadership Training
- Employee Development Plans
- New Employee Training - scheduling, comm., trainers, ON-BOARDING specific to positions
- Training communication and scheduling

Operational Optimization Tactics

Continually evaluate, prioritize, & improve key business & operational processes

- Inventory and prioritize critical business and operational processes
- Identify key performance indicators for each department
- Research appropriate benchmarks/best practices
- Select one key business or operational process to improve as a pilot
- Create training to support efficiency and effectiveness improvements

Protect our workforce & the public through continually growing a culture of safety

- Identify and prioritize 10 safety concerns in each department regarding design engineering, operations, and preventative maintenance
- Research successful public-sector safety programs, including health and safety audits for project design
- Develop and communicate guidance for safety incident reporting, near misses, and suggestions
- Monitor and evaluate the outcomes from the vulnerability assessment
- Develop recommendations to improve cyber security

Communication & Collaboration Tactics

Create & maintain internal communication platforms

- Inventory current internal communications efforts and ensure all employees have equal access to internal communications
- Collaborate with Employee Council
- Create internal communication "trees" for specific types of information (e.g. safety, emergency information, on-boarding/off-boarding, etc.)
- Research and develop a digital communications protocol"
- Review SOPs for job duties
- Standardize records management protocols

Create & implement a comprehensive public outreach plan

- Inventory current public outreach activities
- Research communication planning best practices
- Develop communication service level agreements with ACSA and the City of Charlottesville
- Create communication contact lists (names, roles, responsibilities) for City of Charlottesville, Albemarle County, ACSA, and UVA
- Evaluate social media outreach options, including Facebook
- Partner with local schools and civic groups for facility tours and environmental education

Environmental Stewardship Tactics

Increase internal environmental engagement

- Inventory green initiatives
- Partner with Community/env'l groups
- Research other Organizations on green initiatives
- Identify Environmental Engagement goals
- Develop communication tools
- Create Green Road shows

Designate resources to support environmental outreach & green initiatives

- Create a standing Employee Environmental Committee (structure)
- Create a staffing plan (existing and potential new position) Coordinate with Workforce Development
- Develop an annual budget for green initiatives and activities

Solid Waste Services Tactics

Determine community needs & preferred service levels

- Research Existing Solid Waste and Recycling Practices/Data
- Communicate Data and Existing Services to Public
- Design Outreach
- Conduct Outreach
- Analyze Outreach Data
- Report on Outreach Results to Exec. Dir. & Board

Enhance partnerships with local governments & the University of Virginia

- List Potential Partnership Organizations (POs)
- Identify Points of Contact for each PO
- Craft Message (what we are, resources we have, what we do)
- Contact Pos; discuss our resources, operations, needs; define their resources, needs, operations
- Evaluation Process (turn #4 into possible Programs and evaluate)
- Present possible Programs to Exec. Dir. and Board for action (and, if needed, funding)
- Implement

Infrastructure & Master Planning Tactics

Implement an Authority-wide asset management program

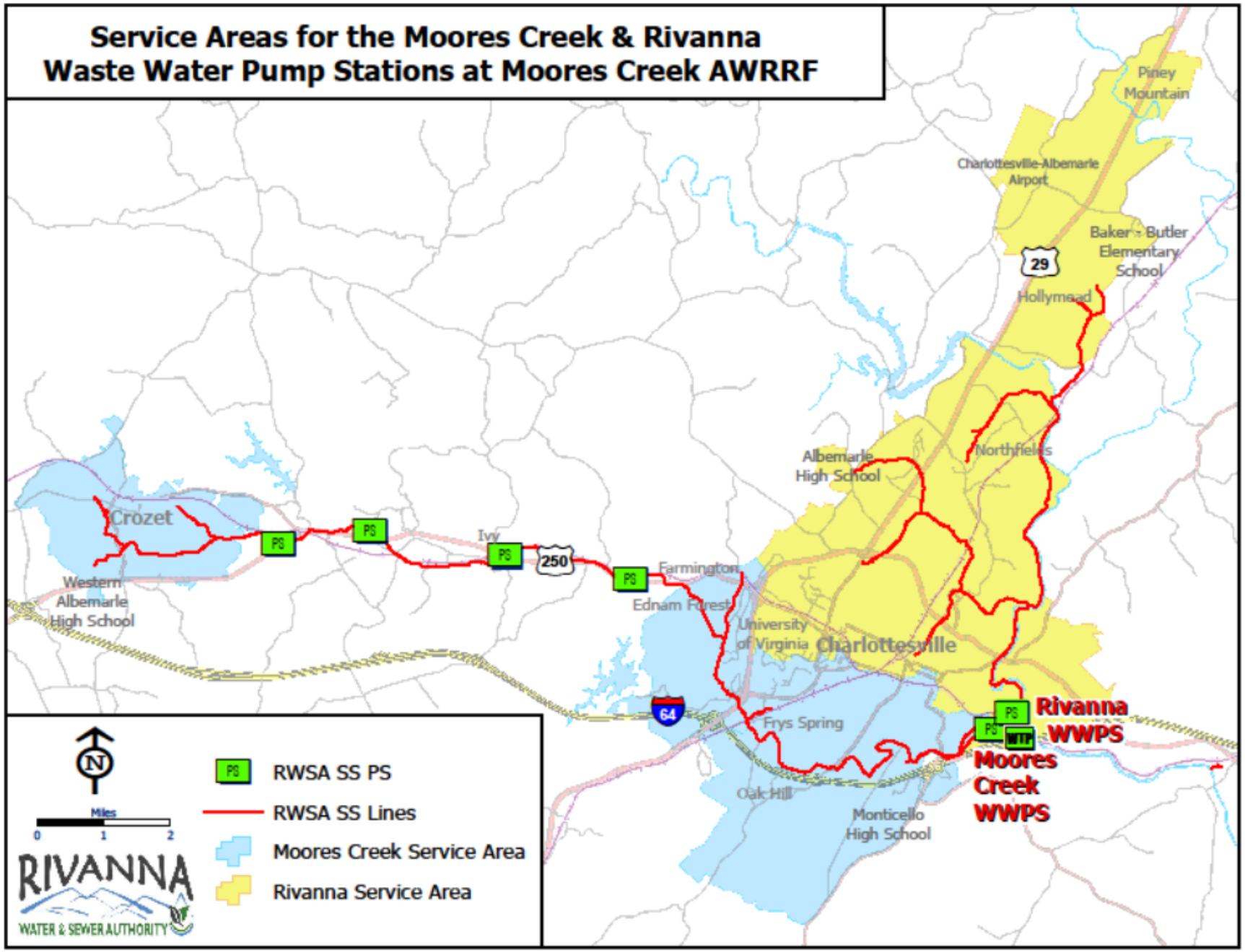
- Develop an RFP for an Asset Management Plan
- Create an Asset Management Committee and Prepare for AM
- Identify and Meet Short Term Software Needs
- Procure Consultant Assistance (Phase 1 - Strategic Plan)
- Organize Current Asset Information
- Develop an Asset Management Strategic Plan

Develop & maintain long-term master plans for all critical asset classes

- Inventory all existing master plans
- Identify existing master plan obligations
- Conduct gap analysis to get to comprehensive master plans
- Classify all critical asset classes, functions, and departments that require master planning (in conjunction with Strategy 1, Tactic 5)
- Assign champions to asset class master plans
- Create a process to ensure that master plan-prioritized recommendations are linked to capital improvement program

Wet Weather Operations at Moores Creek AWWRF

Presented by:
Tim Castillo, Wastewater Manager
Dave Tungate, Director of Operations
RWSA Board of Directors Meeting
November 13, 2018


Service Areas for the Moores Creek & Rivanna Waste Water Pump Stations at Moores Creek AWRRF
Piney Mountain
Charlottesville-Albemarle Airport
Baker - Butler Elementary School
29
Hollymead
Albemarle High School
Northfields
Crozet
Western Albemarle High School
Ivy
250
Farmington
Ednam Forest
University of Virginia
Charlottesville
64
Frys Spring
Oak Hill
Monticello High School
Rivanna WWPS
Moores Creek WWPS
PS
WTP
N
Miles
0 1 2
RWSA SS PS
RWSA SS Lines
Moores Creek Service Area
Rivanna Service Area
RIVANNA
WATER & SEWER AUTHORITY

Moores Creek Pump Station

Rivanna Pump Station

Band Screens and dumpster

Band Screens

Grit Removal System

Primary Treatment

Primary odor control

Biological Treatment

Secondary Clarifiers

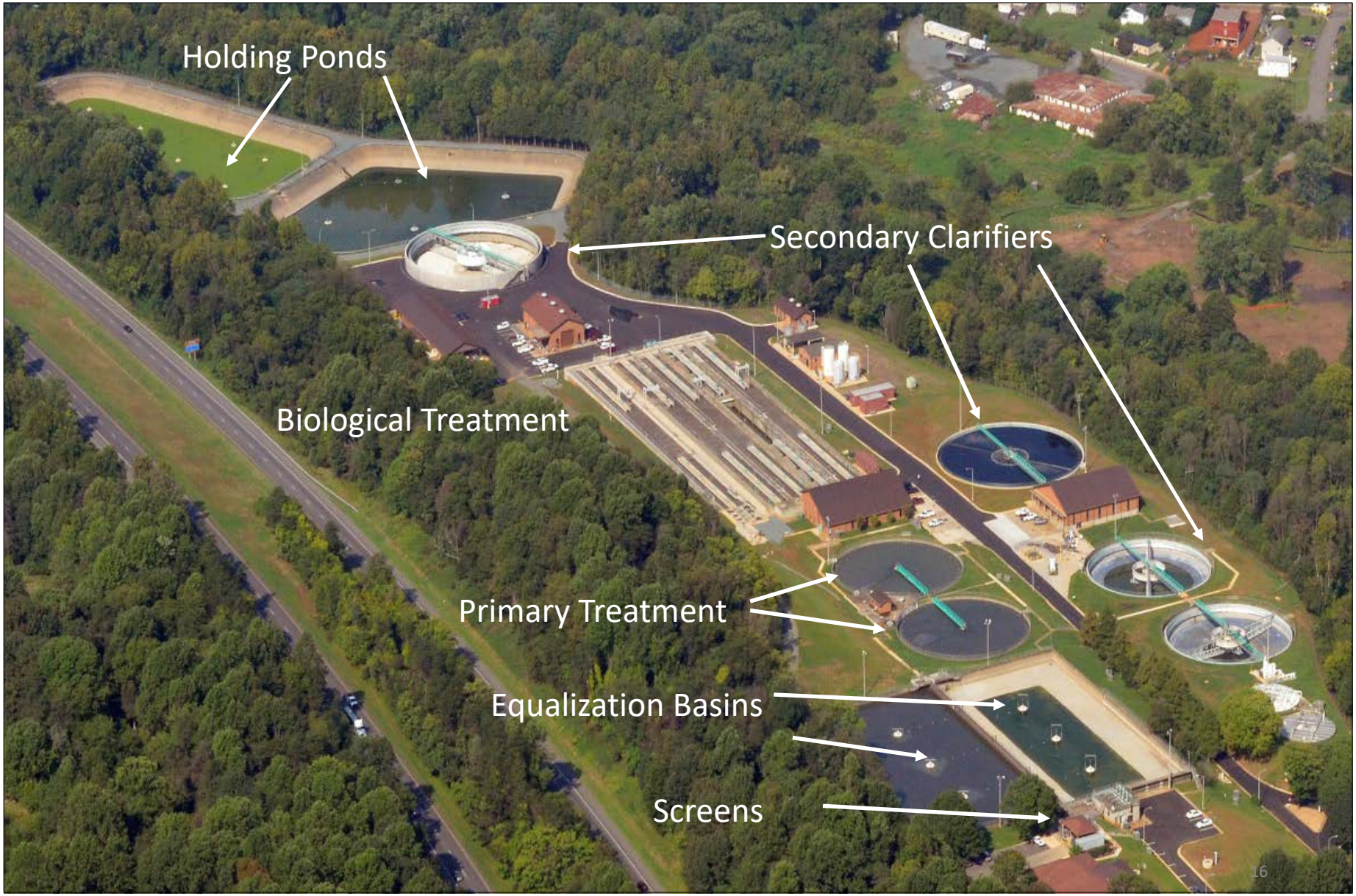
Sand Filters

Ultraviolet Disinfection

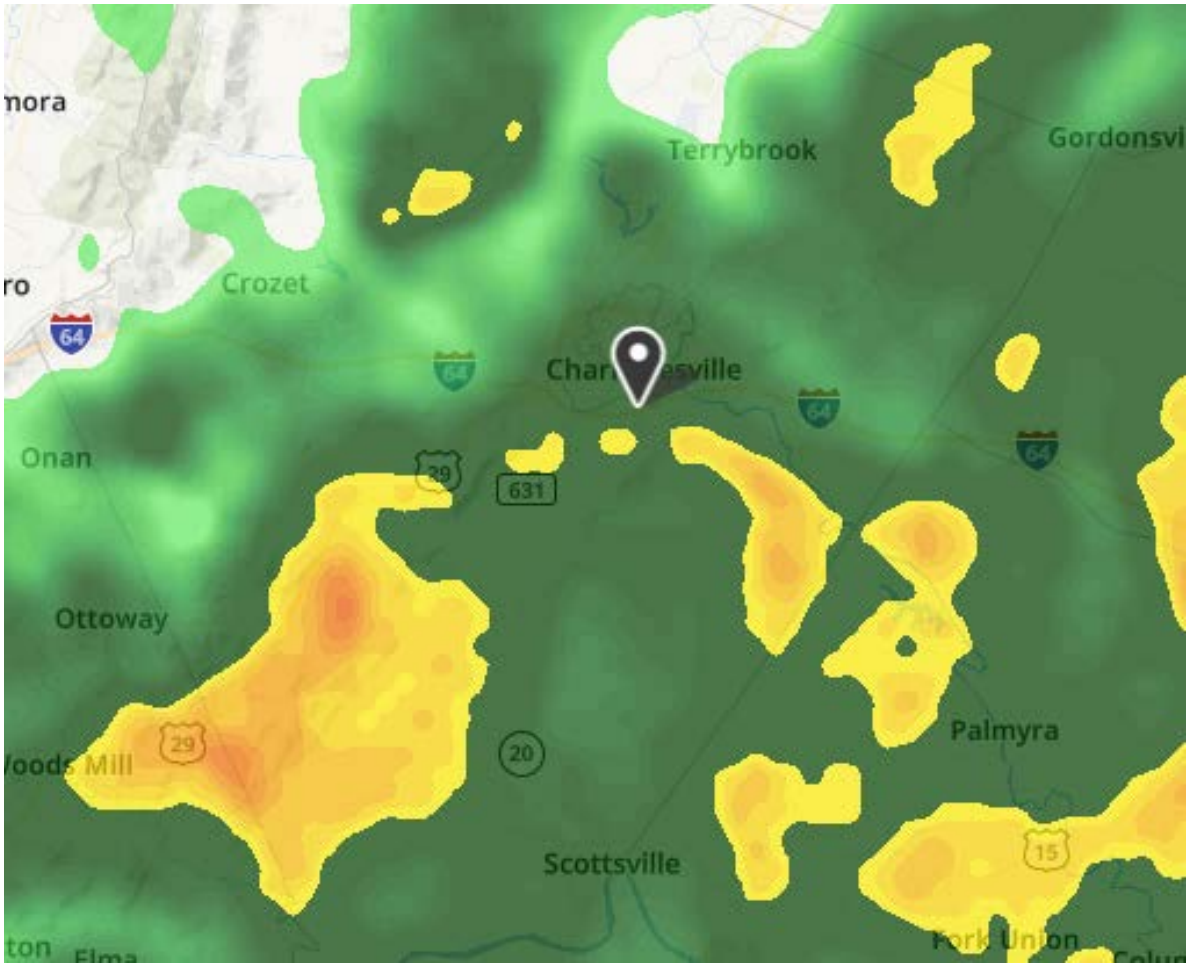
Discharge to Moores Creek

Dewatered solids

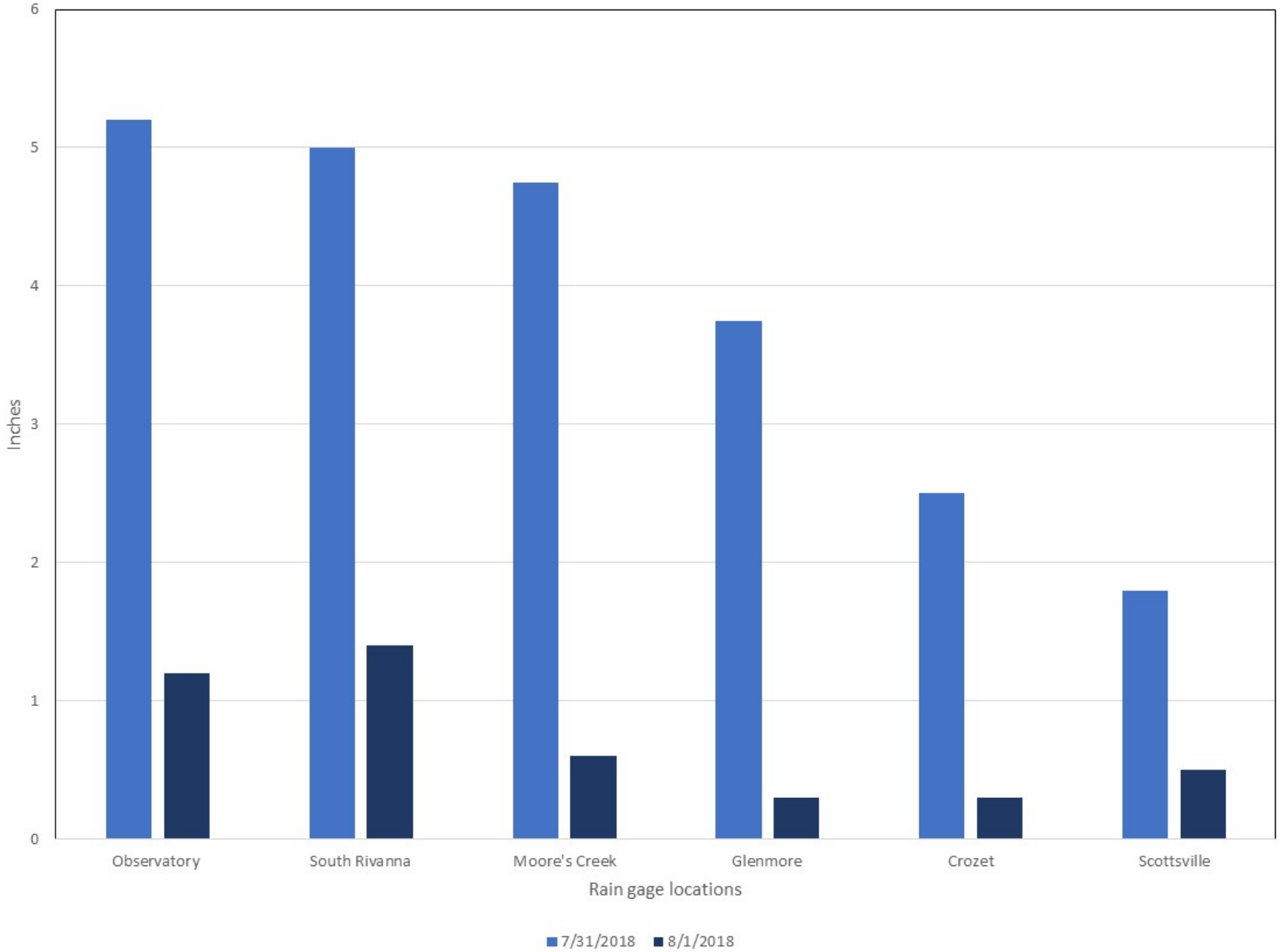
Moores Creek AWRRF



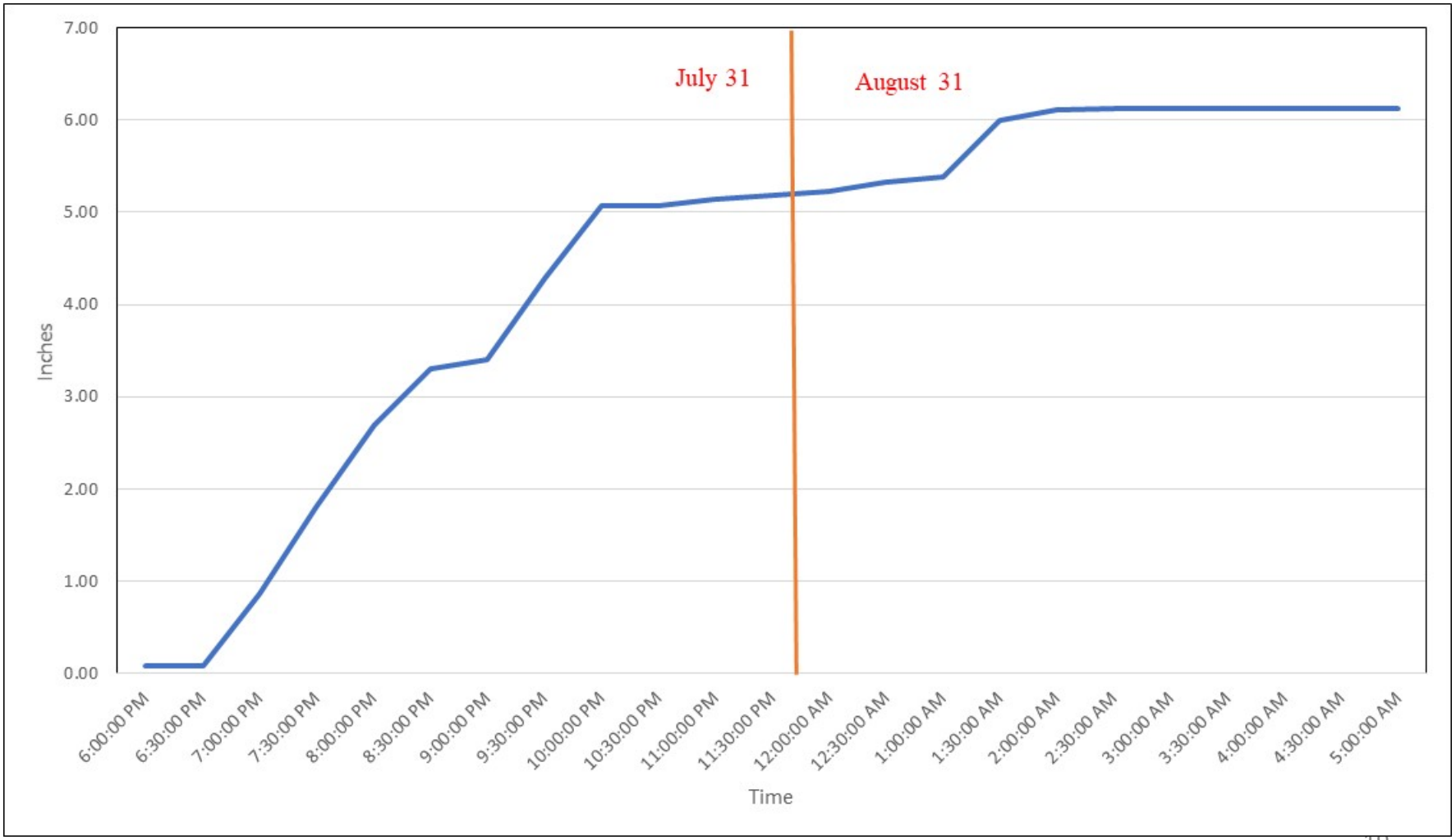
July 31


Terrybrook
Crozet
64
Onan
29
631
Ottoway
Palmyra
20
Scottsville
15

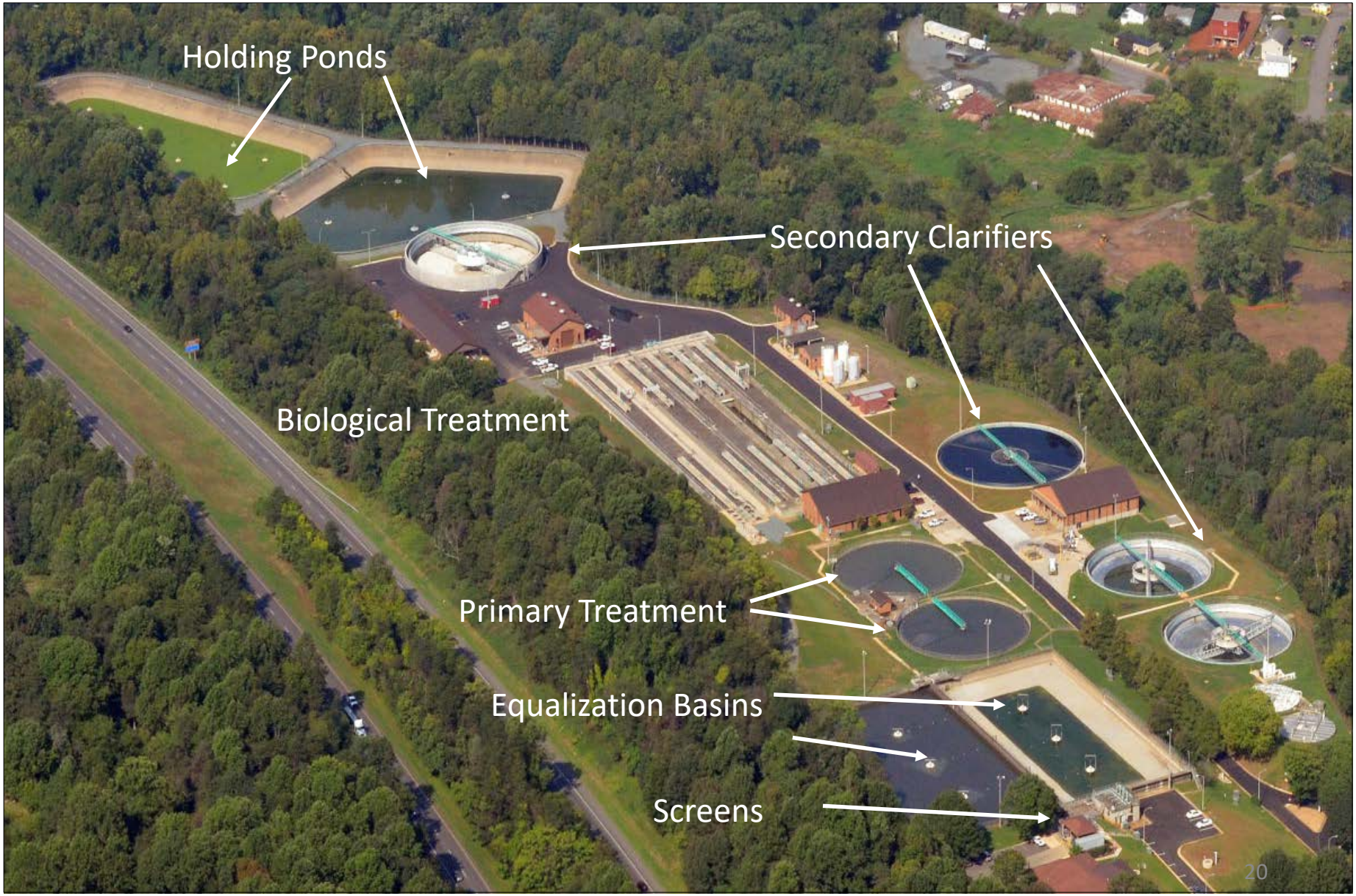
Rainfall distribution RWSA facilities



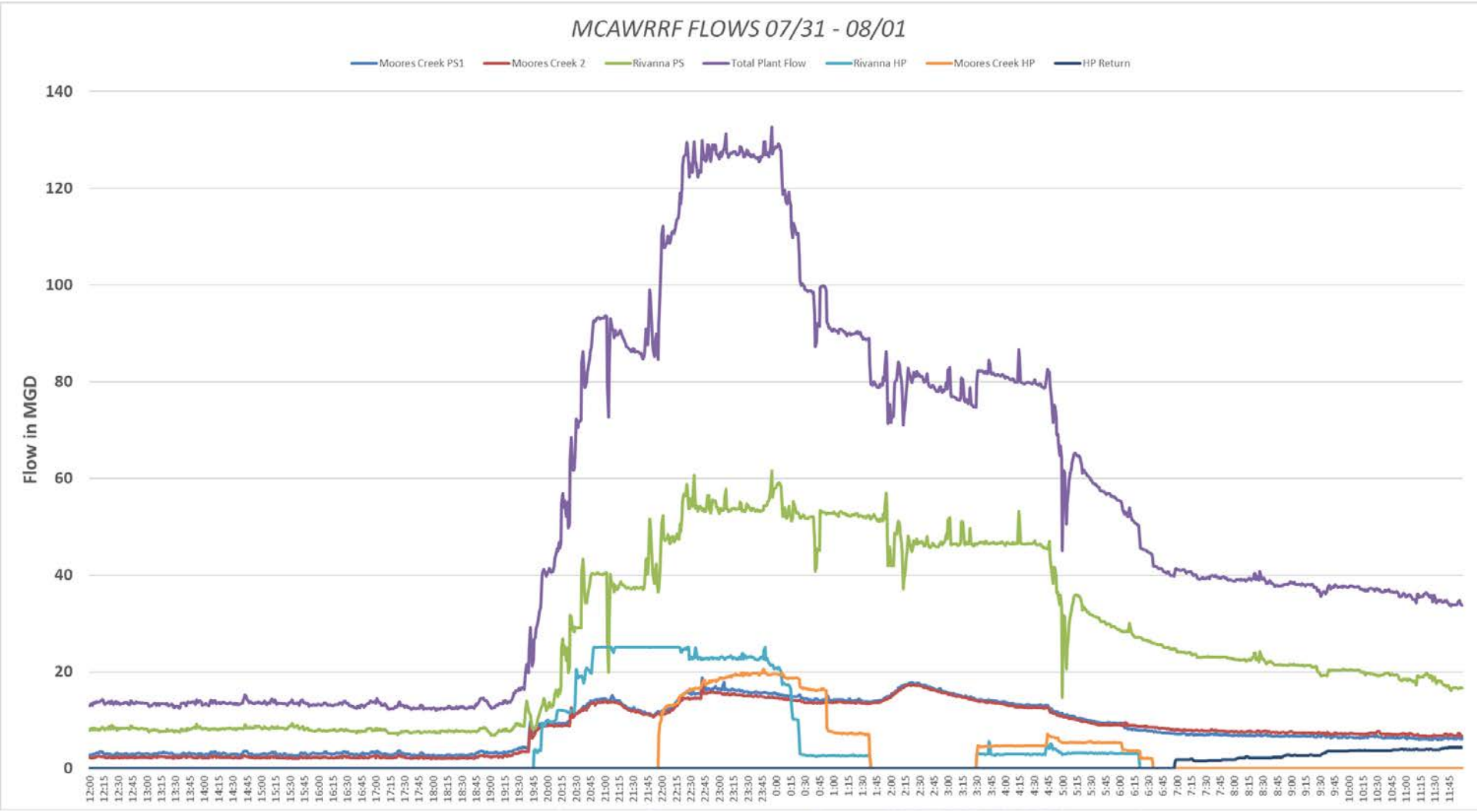
Observatory WTP rainfall on July 31 and August 1 2018



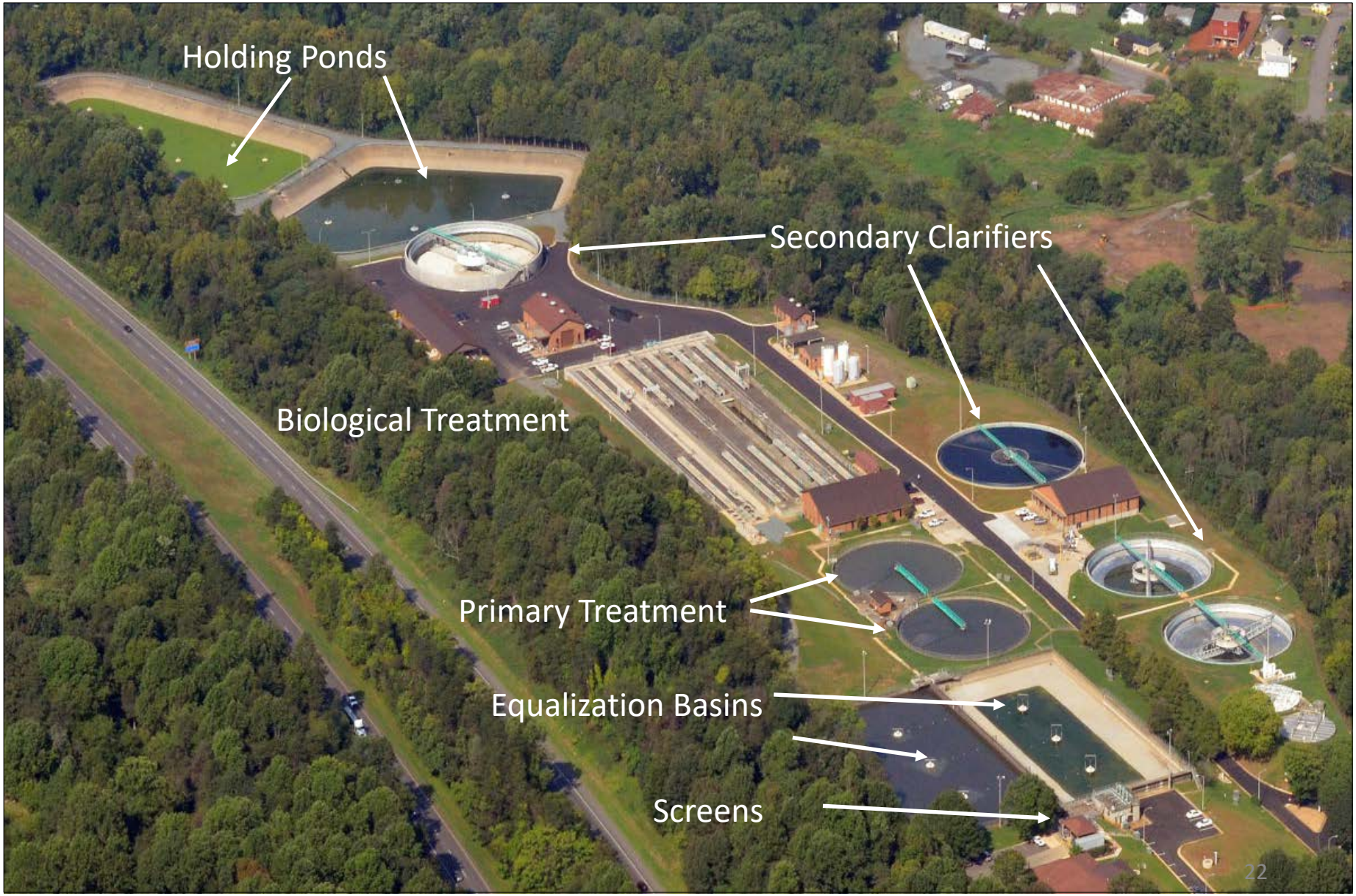
Moores Creek AWRRF



July 31, 2018


MCAWRRF FLOWS 07/31 - 08/01
Moores Creek PS1
Moores Creek 2
Rivanna PS
Total Plant Flow
Rivanna HP
Moores Creek HP
HP Return
Flow in MGD
140
120
100
80
60
40
20
0

Moores Creek AWRRF



Questions ?

RIVANNA

WATER & SEWER AUTHORITY