

WATER RESOURCES BOARD

Tuesday, June 23, 2020
Operations & Maintenance Facility
1725 South Church Street
3:30 PM

A G E N D A

1. Consent Agenda:
 - A. Consider renewal of Memorandum of Understanding with MTSU 2
 - B. Consider ADS Professional Services Contract Year 1 extension 8
 - C. Consider revision to CUD/MWRD boundary 12
 - D. Consider Tiger Hill, Mill St., Halls Hill Water Tanks Change Control Form 1 14
2. Consider minutes from the May 26, 2020 meeting..... 29
3. Consider sole source Rotork tank actuator modifications purchase 37
4. Consider SSR Task Order 09-47-001.2, Amendment No. 7 for bioassessment monitoring of the West Fork Stones River and stratification study of J. Percy Priest reservoir..... 41
5. Consider SSR Task Order 18-41-009.0 Amendment No. 1 for Overall Creek pump station upgrade additions 63
6. Dashboard
7. Financials
8. Other business
9. Adjourn



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Memorandum

Date: June 5, 2020
To: Water Resources Board
From: Robert Haley, III
Subject: Memorandum of Understanding with MTSU for stormwater education services
Amendment to renew MOU for 2020-21

BACKGROUND

Public education and participation are a core requirement of the State-issued stormwater discharge permit under which the City of Murfreesboro operates. The City's annual report to TDEC includes a record of the outreach and education done during the year; and last year's auditors examined the City's records of outreach and education.

In 2011, the City and MTSU entered into a memorandum of understanding (MOU) for MTSU to do education projects for us related to stormwater and surface water quality. We have continued with that MOU by annual renewals since then. The MOU sets a base amount of \$45,000 and allows up to \$60,000 in payments by the City to MTSU.

Each year MTSU and the City plan for a set of projects and events that MTSU will work. These include education and outreach targeted to selected businesses or properties (for example, adjacent a stream); activities (TV spots, stream clean-up events, tree-planting, and follow-up education, etc.); classroom teaching; and setting up and staffing outreach events (Earth Day, school field days, etc.). Projects vary from year to year.

RECOMMENDATION

Staff would like to renew the MOU without changes. We recommend that the Water Resources Board recommend to City Council renewal of the MOU.

FISCAL IMPACT

\$50,000 has been included in the 2020-21 fiscal year budget for the MTSU education services and would be paid out of stormwater funds, account no. 20951.001.

ATTACHMENTS

- Copy of MOU renewal amendment and copy of original MOU from 2011.

**Eighth Amendment to Memorandum of Understanding
between
the City of Murfreesboro, Tennessee
and
Middle Tennessee State University**

This Amendment to the Memorandum of Understanding (MOU), MTSU Contract Number C13-0272 between the City of Murfreesboro, Tennessee and Middle Tennessee State University shall be effective July 1, 2020 through June 30, 2021.

The Amendment serves to renew the Memorandum of Understanding for the term stated above; all other terms and conditions of the MOU remain unchanged and are hereby ratified and affirmed.

City of Murfreesboro

Middle Tennessee State University

By: _____
Shane McFarland, Mayor

By: _____
Alan Thomas
Vice President,
Business and Finance

Date: _____

Date: _____

Approved as to form:

Adam Tucker
City Attorney

May, 2020

Memorandum of Understanding

WHEREAS, Middle Tennessee State University ("MTSU") and the City of Murfreesboro, Tennessee ("City") have entered into a Memorandum of Agreement to be co-permittees for the NPDES General Permit for Phase II MS4's; and

WHEREAS, said Memorandum of Agreement provides that MTSU will offer the support of its resources in managing the six minimum measures under the NPDES General Permit, including but not limited to, Public Education and Participation and Pollution Prevention and Good Housekeeping for Municipal Operations; and

WHEREAS, MTSU and the City also entered a Memorandum of Understanding with an effective date of February 1, 2011, and now would like to replace that Memorandum of Understanding with a new Memorandum of Understanding ("MOU") to provide specificity as to said means and forms of support.

NOW THEREFORE MTSU AND THE CITY HEREBY ENTER INTO THIS MOU AND AGREE AS FOLLOWS:

1. MTSU will provide annual assistance with Public Education and Participation Outreach projects during consecutive years of this MOU as described below; all references to "BMP" and a number refer to a "Best Management Practice" and the related number as shown on the City's Notice of Intent for a NPDES Permit filed by letter dated December 29, 2010, and subsequent mailing May 27, 2011. Notice of Coverage was received July 11, 2011.
2. The City will maintain a list of projects based on education-related needs of the City's storm water and surface-water quality program and shall associate a value in dollars for each project. A list will be made available to MTSU Facilities Management at least 90 days prior to start of the fiscal year. The project list will serve as the menu of services and values for which the City will pay MTSU over the course of the year. In general, the types of services are those listed in item 3.
3. Public education, participation and outreach involves activities, such as:
 - *Cooperating with other community and water-quality advocacy groups*
 - *Public service announcements*
 - *Community radio campaign*
 - *Local radio airplay*
 - *Local TV/video spots*
 - *Developing content for print, radio, TV, and internet*

- *Various NPDES permit assistance, such as:*
 - *Pollutant source tracking*
 - *Public Involvement and Education (PIE) plan* also (BMP1G) assist and provide support and resources as directed.
 - *Permit documentation and tracking-* assist City and MTSU campus staff with related documentation and tracking as requested by utilizing CBI software or other procedures determined for best tracking capabilities and use.
 - *Permit Effectiveness-* Share options and guidance for measuring effectiveness of campaigns and education such as change in thinking (perceptions, behaviors) and options for tracking mechanisms for measurable success as available.
 - *Annual Targeted Sub-Watershed projects* – assist as directed for City (ex. Promote community awareness, assist with annual events and publicize to solicit participation, help create a sense of personal pride/ ownership).
- *Hot Spot Outreach and Education* – Work with the City to identify possible development of project targeted materials/resources.
- *Watershed-specific educational events* -(BMP1C) assist and offer support and help document as directed or applicable including but not limited to:
 - *Annual Tree Day and/or other planting events*
 - *Annual Boat Day*
 - *Annual Stones Throw Away*
 - *Annual Earth Day events*
 - *Annual Organization/Business Fairs (Master Gardeners, etc)*
 - *Annual Pharmaceutical/ Drug Take-Back events*

The specific assistance and services to be provided by MTSU may vary from year to year by further agreement between MTSU and the City.

4. MTSU will provide assistance with Pollution Prevention and Good Housekeeping for Municipal Operations by continuing to develop concept of online stormwater education and training classes. Support and assist as directed with potential benefits to the following permit sections BMP2C, 2E, 5A, 5B, 5C as it relates to Good Housekeeping.
5. The term of the MOU shall be one year. The MOU may be renewed for additional annual terms for up to ten years, at which time the parties may agree to continue the MOU. Either party may terminate the MOU upon ninety (90) days prior written notice.
6. MTSU shall invoice the City \$11,250 per quarter for a total fixed payment of \$45,000 in the first year of this MOU. The City may request and pay for services on a supplemental project list provided by the City for each fiscal year, up to a maximum of \$15,000 per year.

Invoices will be emailed to:

Debi Noyce, Accounts Payable Specialist
Murfreesboro Water and Sewer Department
dnoyce@murfreesborotn.gov

Payments will be sent to: MTSU
 Facilities Services Box 32
 1301 East Main St
 Murfreesboro, TN 37132

7. The City warrants that no fee or compensation has been paid directly or indirectly to an employee or official of the State as wages, compensation, or gifts in exchange for acting as an officer, agent, employee, subcontractor, contractor to the City in connection with any work contemplated or performed relative to this agreement. Notwithstanding anything to the contrary in the foregoing, nothing in this paragraph shall be construed to prevent MTSU from paying any of its employees working in conjunction with this MOU from funds received from the City.
8. It is the policy of the City and MTSU not to discriminate on the basis of age, race, sex, color, national origin, disability or veteran status in its hiring and employment practices, or in admission to, access to, or operation of its programs, services, and activities. With regard to all aspects of this MOU, the parties certify that they will comply with this policy.
9. The parties shall comply with the applicable federal and Tennessee laws and regulations in the performance of this MOU.
10. Effective July 1, 2012, this MOU shall replace in its entirety the Memorandum of Understanding with an effective date of February 1, 2011, which shall then be of no further force or effect. This MOU is not intended, and shall not be construed, to modify any of the terms and conditions of the Memorandum of Agreement between the parties or their NPDES General Permit.

City of Murfreesboro

Middle Tennessee State University

By: Tommy Bragg, Mayor

By: [Signature]

Title: MAYOR

Title: John W. Cothran
Senior Vice President

Date: 9-12-12

Date: 9/5/12

Approved as to form:

Attest:

[Signature]
City Attorney
Susan Emery McGannon



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MEMORANDUM

DATE: June 9, 2020

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: Professional Services Contract – Year 2 Extension
Engineering Analysis of Permanent and
Temporary Flow Monitoring Data
To Include Field Inspections

Background

Currently the Department is contracted with ADS, LLC to operate and maintain the Department's nineteen (19) permanent sewer flow monitors and seven (7) rain gauges, to analyze data recorded from these monitors and to report on this data annually. These annual reports, report wet and dry weather capacities and rain dependent inflow and infiltration (RDII) for 18 flow monitor areas. They also are contracted to perform temporary flow monitoring, analyze the temporary data recorded and report findings as well as perform field investigations.

The current Professional Services Contract is nearing the end of its first year which is June 30, 2020. There is an option to extend for two additional one-year periods, with pricing for Years 2 & 3 being established on the consumer pricing index (CPI) for the southern region. The proposed extension adjusts pricing 1.4%. Staff desires to continue to contract their professional service as we have in various forms over the last 27 years.

The contract amendment for the extension to subject to Legal review and approval.

Recommendation

Staff recommends accepting the renewal of the ADS contract for a one-year period.

Fiscal Impact

The use of the quantities/units listed in the contract will be within the estimated budget amount for 2020-2021 of \$300,000. The Long-Term Monitoring and Temporary Flow Monitoring quantities/units are completely used; however, the field inspections change from year to year, so this portion of the total is used within the budgeted amount.

May 26, 2020

Ms. Valerie Smith, PE
 Murfreesboro Water Resources Department
 220 NW Broad Street
 P.O. Box 1477
 Murfreesboro, Tennessee 37133-1477

RE: Contract Renewal for year 2020-2021

Dear Valerie,

Pursuant to our contract dated July 1, 2019, ADS, agrees to a contract extension for an additional one-year term as provided in Article 3.1 of the original contract at the prices listed below adjusted for CPI-U of 1.4%.

Long Term Flow Monitoring

Item	Description	# of Units	2020-2021 YEAR 2 Unit Price	2020-2021 YEAR 2 Total Price
1	Turnkey Operations, Parts, Maintenance, Data Collection, Data Analysis, Monthly Data Delivery and Monthly Meetings for 19 meters.	228	\$843.74	\$192,372.72
2	Turnkey Operations, Parts, Maintenance, Data Collection, Data Analysis, Monthly Data Delivery and Monthly Meetings for 7 Rain Gauges.	84	\$290.85	\$24,431.40
3	Wet Weather and Capacity Performance Summary Report	1	included	
4	FlowView PRISM Set-up for additional sites added to network	26	\$ 269.55	\$7,008.30
5	FlowView PRISM Monthly Service per site per month	312	\$43.13	\$13,456.56
6	ECHO Service, Wireless & FlowView PRISM monthly charge	12	\$104.64	\$1,255.60
TOTAL				\$238,524.66

*Monthly service items will be billed at the beginning of the month for which services are to be provided.

**FlowView PRISM Set-up fee is a one-time event at the initial set up. Monthly service fee starts immediately upon setup.

Temporary Flow Monitoring

TFM	# of Monitors	# of Days	YEAR 2 Rate	2020-2021 YEAR 2 Total Price
Equipment Rental, Service including parts, Meter Installation, Calibration, Collect, Analysis, Removal, for 1 st 30 days	6	30	\$145.55	\$26,199.00
Collect, Confirmation, Analysis for days>30*	6	30	\$75.47	\$13,584.60
TOTAL				\$39,783.60

*Temporary Flow monitoring extensions assumes extensions in increments of 1 month (30 days)

Field Inspections (SSES)

SSES	Number	Units	YEAR 2 Rate	2020-2021 YEAR 2 Total Price
Flow Isolation Readings	50	each	\$252.29	\$12,614.50
Wet Weather Inspection	40	Hrs.	\$271.70	\$10,868.00
Manhole Inspection with Data Entry	400	each	\$107.82	\$43,128.00
Smoke Testing w/ Data Entry	100,000	Lf.	\$0.455	\$45,500.00
Dye	25	each	\$404.31	\$10,107.75
PM Consultation	10	Hrs.	\$155.25	\$1,552.50
Field Crew Rate	4	Hrs.	\$226.42	\$905.68
TOTAL				\$124,676.43

For MWRD:

For ADS LLC:

Signature

Signature

Printed Name/Title

Printed Name/Title

Date

Date

As always, we look forward to our continuing partnership with the City of Murfreesboro Water and Sewer Board. If you have any questions, please contact me on my cellular (256) 508-1628

Best Regards,

A handwritten signature in black ink, appearing to read 'L. Mijares', with a stylized flourish at the end.

Luis Mijares
Senior Business Development Manager

cc: S. Hembree
Attachments



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MEMORANDUM

DATE: June 11, 2020
TO: Water Resources Board
FROM: Valerie H. Smith
SUBJECT: Consolidated Utility District (CUD)
Boundary Revision – Wilkinson Pike
Stones River National Battlefield
Amendment #6

Background

For this Amendment #6 of the CUD/MWRD Boundary, staff proposes to swap a small area, within the Stones River National Battlefield along Wilkinson Pike, with Consolidated Utility District (CUD) as shown. It is unclear why this area was not included with a previous land swap since MWRD serves the surrounding area. CUD agrees with this swap and requested to bring this to the Board to “clean up” the boundary.

Amendment document #6 will be prepared by our Legal Department to be executed by both parties.

Recommendation

It is recommended that City Council approve the revision to the CUD/MWRD boundary and the Mayor executing an amendment to the Water Service Boundary.

Fiscal Impact

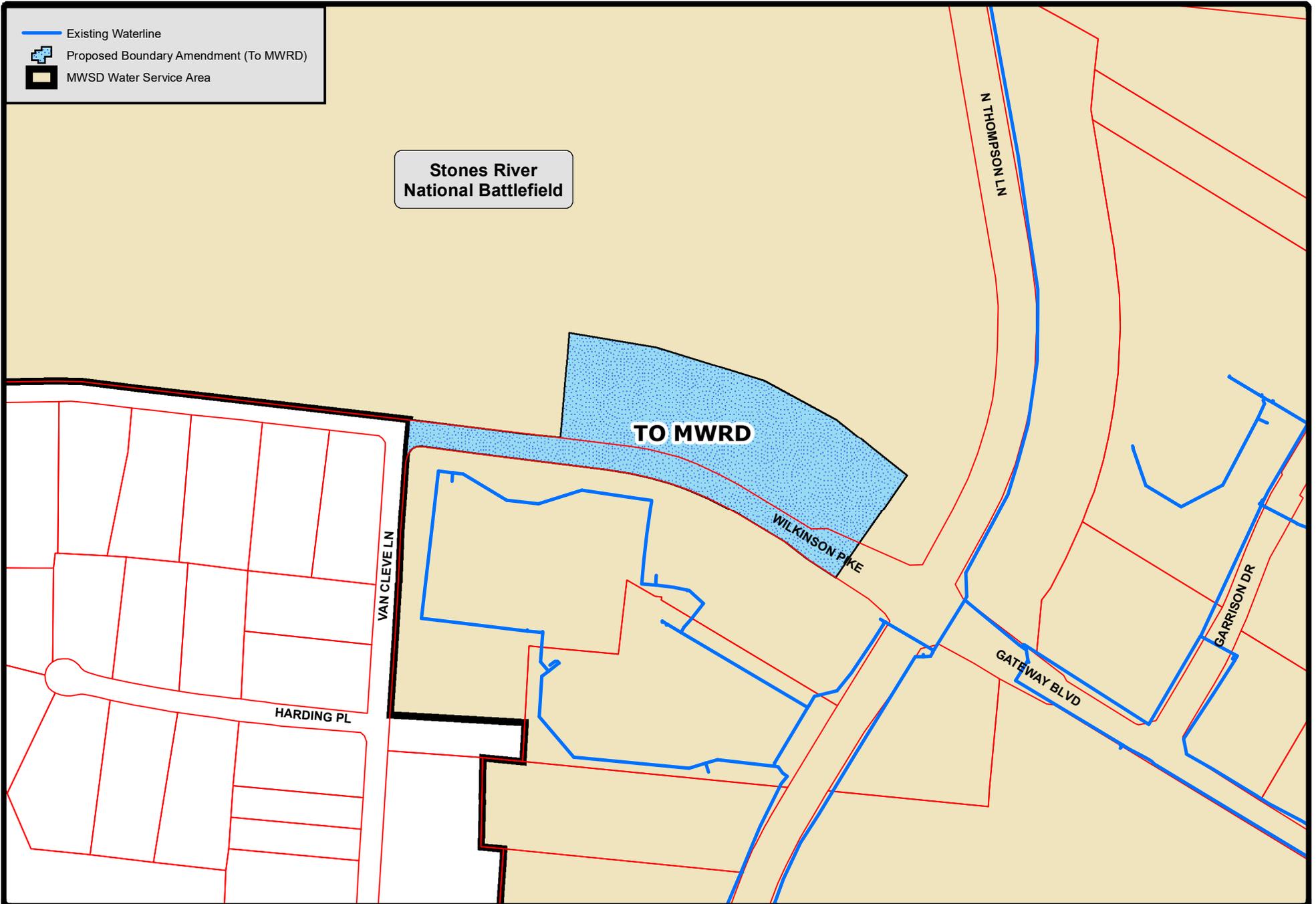
CUD and MWRD continue to swap properties where necessary.

Attachments

GIS Exhibit of the Proposed Boundary Revision

-  Existing Waterline
-  Proposed Boundary Amendment (To MWRD)
-  MWRD Water Service Area

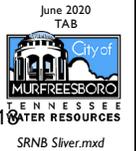
Stones River National Battlefield



MURFREESBORO WATER RESOURCES DEPARTMENT

Proposed MWRD Water Service Boundary Amendment #6 (Stones River Nat'l Battlefield)

SCALE : 1" = 300'





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MEMORANDUM

DATE: June 9, 2020
TO: Water Resources Board
FROM: Alan Cranford
SUBJECT: Tiger Hill, Mill Street and Halls Hill Water Tanks Change Control Form No. 1
Stones River Water Treatment Plant

Background

Currens Construction Services, LLC is the general contractor for the repair and recoating of the Tiger Hill, Mill Street and Halls Hill water storage tanks. Crom Corporation is a sub-contractor for Currens Construction Services, LLC on the Halls Hill water tank. Crom Corporation was the original contractor building the Halls Hill water tank.

Change Control Form (CCF) No. 1 is for necessary changes to the scope of work to complete the project. These changes will come from the contingency amount in the contract. The approved changes are for items at the Mill Street, Halls Hill and Tiger Hill water tanks.

Changes at the Mill Street water tank include:

- Replace bowl siphon pipe - \$1,960
- Install new inner bottom drain valve - \$3,930
- Close vent opening at roof to access tube interface - \$2,350
- Add 3" clean-out drain with plug - \$0
- Revised logo change with additional color - \$0
- Total Cost - \$8,240

Changes at the Halls Hill water tank include:

- 1,678 linear feet of exterior crack repair - \$1,745
- Coating of the electrical room door - \$0
- Total Cost - \$1,745

Changes to Mill Street and Tiger Hill water tank fall protection - \$0

SSR and Staff have reviewed the cost associated with CCF No. 1 and concur that all charges are fair.

Fiscal Impact

The cost for Change Control Form No. 1 is \$9,985. The contract has a contingency of \$175,000 for this project. The remaining contingency amount after Change Control Form No. 1 is \$165,015.

Recommendations

The approval for this change is within the authority of the Director and is for informational purposes only.

Attachments

SSR, Inc. - Tiger Hill, Mill Street and Halls Hill Water Tanks Change Control Form No. 1



CHANGE CONTROL FORM NO. 01

Date Issued:	June 8, 2020	Project:	Tiger Hill, Mill Street, and Halls Hill Water Tanks
Project No.:	18-41-021.0 (SSR)	Contractor:	Currens Construction Services, LLC.
This Document is a: <input type="checkbox"/> Request for Proposal <input type="checkbox"/> Field Order <input checked="" type="checkbox"/> Work Change Directive <input type="checkbox"/> Contractor Change Request			

Description of Change (*attach necessary supporting documentation*):

The \$9,985.00 cost of the following items will be taken out of the \$175,000.00 contingency for this project. The remaining contingency amount will be \$165,015.00.

Mill Street

- Replace bowl siphon pipe – **\$1,960.00**
 - Remove and replace failed steel siphon pipe with new PVC line. Repair to include extending the pipe and installing new pipe supports.
 - Please refer to the attached See Mid-South Tank Drain Recommendations and Currens Construction Mill Street Drain Solutions.
- Install New Inner Bottom Drain Valve – **\$3,930.00**
 - Replace and move siphon drain valve to location near low point in the bowl so that it can be accessed by interior dry ladder.
 - Please refer to the attached See Mid-South Tank Drain Recommendations and Currens Construction Mill Street Drain Solutions.
- Close Vent Opening at Roof to Access Tube Interface – **\$2,350.00**
 - Cover vent openings with steel plate.
 - Please refer to the attached See Mid-South Tank Drain Recommendations and Currens Construction Mill Street Drain Solutions.
- 3" Clean-out drain with plug: **NO CHARGE**
 - This drain plug will be installed near the low point of the tank directly above the overhead door to help aid in the removal of sand from abrasive blasting.
 - Please refer to the attached Submittal No. 14.1 – Mill Street Sand Drain & Plug_SSR Reviewed
- Logo – **NO CHARGE**
 - Revised logo and addition of extra color to logo

Halls Hill

- 1678 LF of Exterior Crack Repair – **\$1,745.00**
 - CROM provided a cost for linear foot to make crack repairs if necessary, on the tank's exterior. Originally, only 515 LF were identified, however, after pressure washing at 5,000 psi, the total repair needed jumped to 1,678 LF. Based on the \$15/LF cost noted on CROM's original total, this brings the repair cost of this time to \$25,170. A portion of this repair cost will be covered with money left over from unperformed items in CROM's original proposal. These items include the following:
 - \$4,000 credit for Strip Coating of Cracks – CROM opted to grind out all cracks found on the tank in lieu of stripe coating them to ensure quality of the repair. No work for this line item will be performed and the full \$4,000 will be given back as a credit.
 - \$19,425 credit for Exterior Concrete Repairs – CROM has 800 SF of repair for this line item in their proposal, however, only 625 SF of repairs were performed. This unperformed work has a value of \$19,425 based on 175 SF at \$111/SF. The \$19,425 will be given as a credit back to MWRD for work not performed.
 - Please refer to the attached Halls Hill Exterior Crack Repair Quantities.
- Coating of the electrical room door - **NO CHARGE**
 - Currens will paint the electrical room door ordered by MWRD

Misc.

- Fall Protection System Designed and Installed by Currens Construction: **NO CHARGE**
 - Tri-Tech Fall Protection submitted their preliminary design drawings for the fall protection systems at the Mill Street and Tiger Hill Tanks. During the submittal review phase, there were multiple concerns with the proposed system identified by both the Contractor and Engineer. It was determined the best way to move forward with adding fall protection to the two (2) tanks would be to end the contract with Tri-Tech Fall Protection and have Currens Construction design and install their preferred fall protection system.

CHANGE CONTROL FORM NO. 01

- o Currens Construction then proposed to provide and install their stamped engineered system for the lump sum bid price provided by Tri-Tech Fall Protection. Currens Construction's proposed fall protection system uses welded on anchor points placed at areas of importance such as ladder hatches, roof vents, or misc. equipment across the tanks. Currens Construction proposes to add seven (7) anchor points to the Mill Street Tank and nine (9) anchor points to the Tiger Hill Tank for a total of sixteen (16) new anchors.
- o Please refer to the attached Currens Construction Submittal No. 15-1 – Mill Street Roof Anchor Points SSR Reviewed and Currens Fall Protection Pricing.
 - It should be noted that Currens Construction has only submitted the anchor point design drawings for the Mill Street Tank as of the issue date of this Change Control Form. Currens will submit the anchor point design drawings for Tiger Hill once they have mobilized to the site following completion of the Mill Street Tank.

Contractor
 Engineer
 Owner
 Resident Project Representative

Drawing(s) Reference: N/A
 Spec. Reference: N/A

RFI Reference: N/A
 Date of RFI: N/A

- Attachments:**
- Mid-South Tank Drain Recommendations
 - Currens Construction Mill Street Drain Solutions
 - Currens Construction Submittal No. 14.1 – Mill Street Sand Drain and Plug_SSR Reviewed
 - Halls Hill Exterior Crack Repair Quantities.
 - Currens Construction Submittal No. 15-1 – Mill Street Roof Anchor Points_SSR Reviewed
 - Currens Construction Fall Protection Pricing

REQUEST FOR PROPOSAL/CHANGE REQUEST

We propose to perform the Work or make the Claim described above for the following change in Contract Cost and Contract Times:

- No Change in Contract Amount is Required
 A Change in Contract Amount is Required:
 No Change in Contract Time is Required
 A Change in Contract Time is Required:

WORK CHANGE DIRECTIVE

You are directed to proceed to make the changes to the Work described in this Work Change Directive. Any change in Contract Price or Contract Time will be determined in accordance with the General Conditions.

FIELD ORDER

This Field Order issued in accordance with the General Conditions for minor changes in the Work without changes in the Contract Price or Contract Time. If you consider that a change in Contract Price or Contract Times is required, notify the Engineer immediately and before proceeding with the proposed Work.

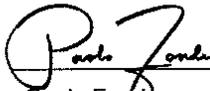
AUTHORIZING SIGNATURES

ENGINEER:

CONTRACTOR:

OWNER:

RESIDENT PROJECT REPRESENTATIVE:



 Paolo Forde



 Terry Currens

 Darren Gore

 N/A

(print name)

(print name)

(print name)

(print name)

Date: June 8, 2020

Date: 6/8/20

Date: _____

Date: _____



Photo shows the upper section of the access tube. This area was designed to be a vent when the tank was constructed. A rubber gasket which has severely rotted is in place now. This area should be sealed by welding a plate along the circumference.



Photo shows the malfunctioning steel siphon pipe. This pipe should be replaced with a new 3" schedule 80 PVC siphon pipe.



Photo shows another view of the malfunctioning steel siphon pipe. Heavy corrosion along the pipe interior has caused it to become clogged. A new PVC siphon pipe will not corrode.



Photo shows the siphon pipe discharges into the inlet/outlet pipe in the center section of the floor.

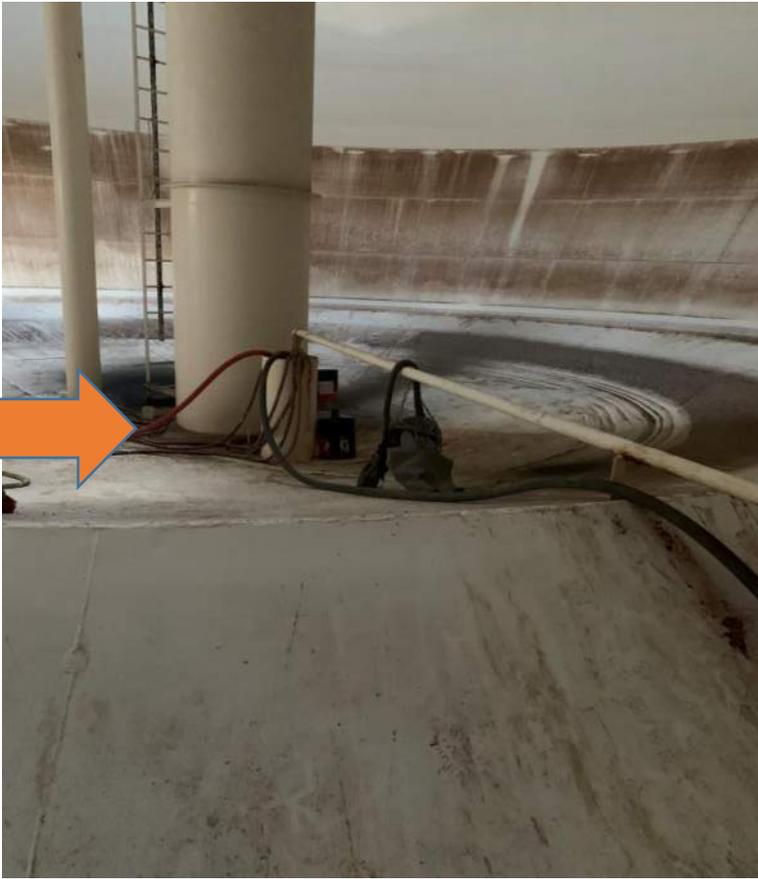
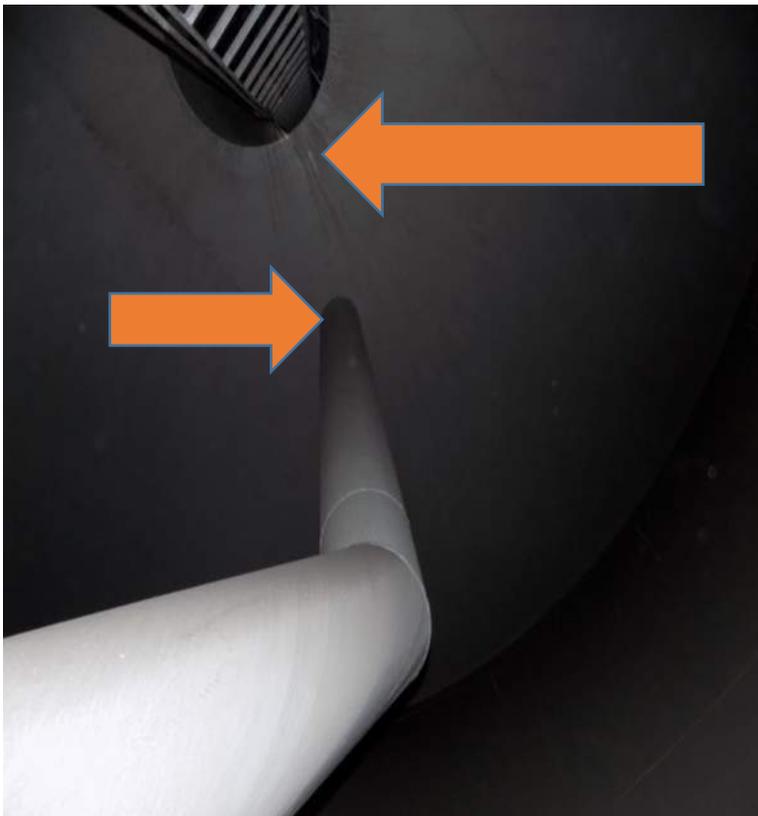


Photo shows the center section of the floor. A 3” drain valve should be placed at the base of the access tube to allow the center floor area to drain.



The drain valve can be connected to the overflow pipe underneath the tank floor in the catwalk area. A climber can open the valve safely from this area and allow the center floor to drain prior to entering the wet area.



Terry Currens, Owner
P.O. Box 492
1025 Danville Road
Harrodsburg, KY 40330
www.currensconstruction.com
terry@currensconstruction.com

May 8, 2020

Murfreesboro, Tennessee
Mill Street Tank
Mill Street Drain Solution

Good Afternoon:

Currens Construction Services, LLC (CCS) is providing the following proposal for the repair recommendations made by Mid-South Tank Consultants on May 5, 2020.

Item 1: Replace Bowl Siphon Pipe

- Remove failed steel siphon pipe
- Install new PVC siphon pipe system
 - Pipe and fittings to be sch 80 PVC with socket connections
 - Provide 1" vacuum breaker
 - Pipe supports to be carbon steel with stainless steel u-bolts and nuts
 - Pipe to extend down existing inlet pipe
- **Lump Sum Price Item 1: \$1,960.00**

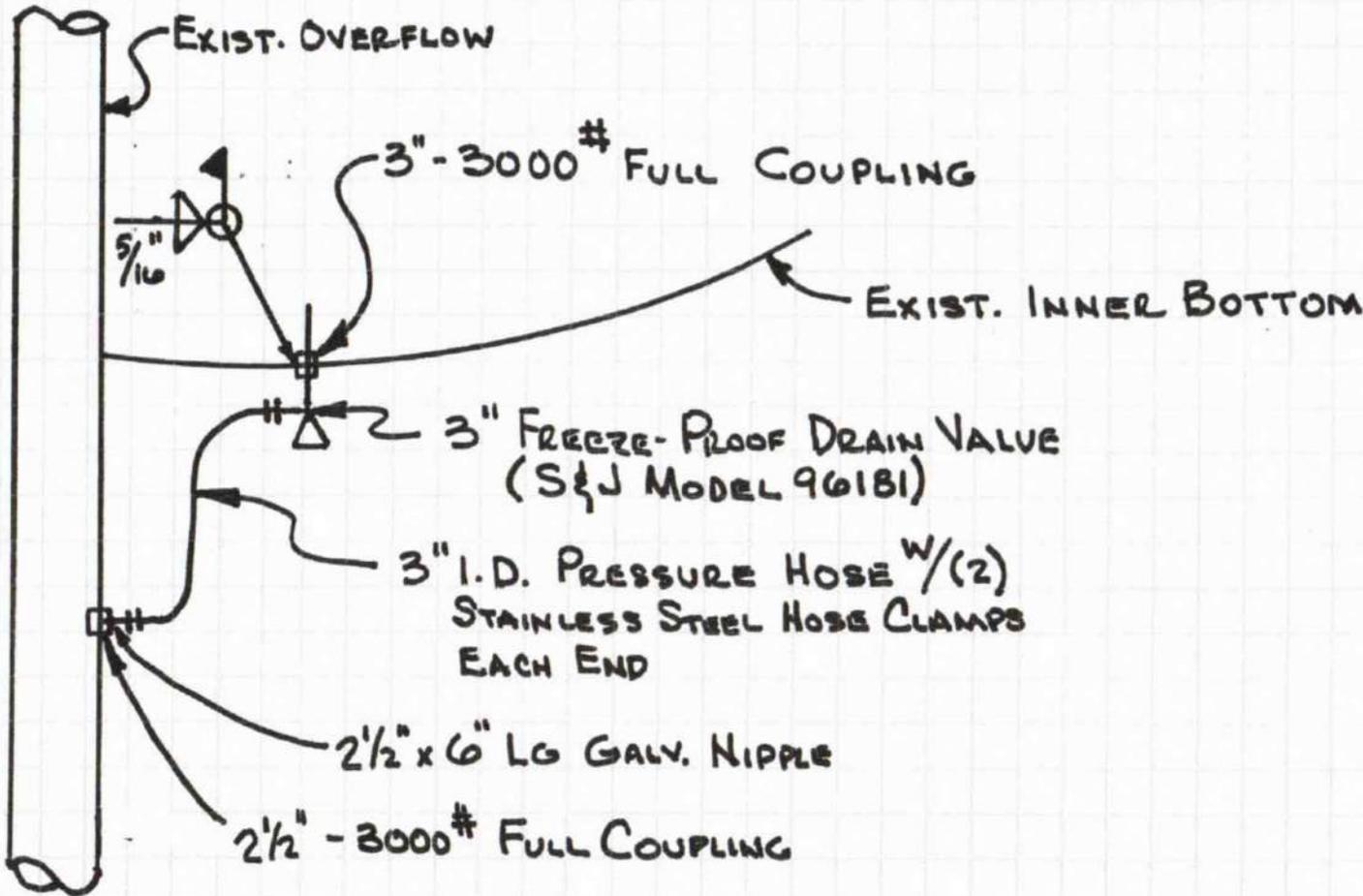
Item 2: Install New Inner Bottom Drain Valve

- See Sketch – Inner Bottom Drain Valve
- See Catalog Cut – Shand&Jurs 96181 Drain Valve
- Drain valve system to be installed near low point of inner bottom at location accessible for operation from existing ladder
- **Lump Sum Price Item 2: \$3,930.00**

Item 3: Close Vent Opening at Roof to Access Tube Interface

- Install ¼" cover plate over vent opening(s) in vertical annular ring around access tube above roof
- Cover plate to extend 1 1/2" minimum beyond opening edges
- Cover plate to annular ring welds to continuous 3/16" fillet welds
- **Lump Sum Price Item 3: \$2,350.00**

Attachments (2)



INNER BOTTOM DRAIN VALVE

MURFREESBORO - TN
MILL STREET TANK
DGC 5-7-2020

CERTIFICATE OF PROGRESSIVE COMPLETION

Project No: 2020-R-004 .01	Location: Murfreesboro, TN
Owner: City of Murfreesboro	Tank Info: 123'-0" I.D x 34'-0" S.W.D

Superintendent: Leo Ramirez	Project Manager: Jason Bossier
------------------------------------	---------------------------------------

Work Description:
 3.0-MG Halls Hill Reservoir
 123'-0" I.D x 34'-0" S.W.D.
 Original CROM Job No. 1980-M-030

Exterior Crack Repair for Cracks Wider than 1/64"
 (1) Route cracks larger than 1/64" to create a 1/4" V-shaped groove
 (2) Pressure wash using 5000 psi to remove loose coatings, dirt, oil, grease, and other contaminants from the substrate.
 (3) Application of Tnemec Series 215 Surfacing Epoxy to routed cracks
 (4) Application of a stripe coat of Tnemec Series 156 Enviro-Crete over cracks repaired with Tnemec Series 215

1678 LF of Crack Repair

1678 LF * \$15.00/LF = \$25,170.00

Date Started: 3/30/2020	Date Complete:
--------------------------------	-----------------------

The signing of this document indicates that CCR has notified an on-site representative of the owner/general contractor that we have completed the above referenced scope of work. Any items found to be unacceptable after this date should be made in writing to the CCR project manager listed above.

Owner / General Contractor	CROM Coatings and Restorations, a Division of Crom, LLC
Print:	Print:
Sign:	Sign:
Date:	Date:

Comments:
 What could the CCR have done to make the project run more efficiently?

Other Comments:



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12



Figure 13



Figure 14



Figure 15



Figure 16



Figure 17



Figure 18

MINUTES
MURFREESBORO WATER RESOURCES BOARD
May 26, 2020

The Murfreesboro Water Resources Board met on Tuesday, May 26, 2020 via Zoom consistent with the Governor's Executive Order. It has been determined that holding the meeting electronically is necessary to protect the public health, safety, and welfare in light of the COVID-19 pandemic. Present at the meeting were Board members: Mr. John Sant Amour, Mr. Ron Crabtree, Dr. Al Carter, Mr. Brian Kidd, Ms. Sandra Trail, Ms. Kathy Nobles, Mr. Kirt Wade, and Ms. Madelyn Scales-Harris. Also present were Darren Gore, Valerie Smith, Doug Swann, Michele Pinkston, Roman Hankins, Sharon Seibert, Donald Hughes, Jimmy Stacey, Matt Powers, Alan Cranford, Joe Russell, John Strickland, Randy McCullough, Brent Fowler, Jay Bradley, Linda Sullivan, Mike Bernard, Tazio Qubeck, Emily Kelly, Ronnie Martin, and Travis Wilson along with other members of the public.

The Consent Agenda was presented for the following considerations:

A. Consider JB&S Task Order 20-03, Air Compressor Replacement at SRWTP –

Staff submitted Task Order 20-03 for the Water/Wastewater Mechanical/Electrical Services Contract to remove, pour a new pad, purchase and replace the two air compressors for the lime and soda ash system.

The Task Order pricing includes demolishing two existing air compressors, furnish and install two new Gardner Denver air compressors, test run, labor, filters, and miscellaneous materials.

The cost for the project is \$21,868.72. The project is budgeted in the capital budget at \$20,000. Staff requests to take the additional \$1,868.72 from another item in the capital budget that was underbudget.

Staff recommended the Board recommend to the City Council approving JBS Task Order 20-03 in accordance with the JBS estimate.

B. Consider custodial services contract renewal –

Murfreesboro Water Resources Department received bids to provide custodial services to Operations Maintenance (1725 S. Church St.), Administrative Offices (300 NW Broad St.), and Engineering (220 NW Broad St.). The contract was awarded to Culp's Cleaning Service effective July 1, 2017 and we are satisfied with their quality of work and timely service.

Staff recommended extending the contract term for the final two-year period as allowed by the contract.

The Department budgeted \$48,100 for the first year which included an initial deep cleaning fee. All terms and conditions of the contract remain the same and staff anticipates year four and five costs to be \$46,000.

C. Consider Barton Lawn Care Contract Change Order 1 –

Operations and Maintenance received bids for the Lawn Care Service for MWRD's Operations and Maintenance Division and the contract was awarded to Barton Lawn Care. Staff is requesting approval to add a Change Order #1 to the existing contract to include grass cutting for the following new pump stations.

3699 Caroline Farms
1031 Black Oak Dr.
5353 Bridgemore Blvd.
5208 Pointer Place

Staff recommended the Board approve the additional sites for lawn care services. Barton Lawn Care agreed to cut each pump station for \$30. Staff estimates cutting the pump stations 18 times per year. The yearly additional cost will be \$2,160.

D. Consider abandonment of water easement at A+ Storage –

The developer of A+ Storage is requesting the abandonment of an existing water easement. This easement was recorded by plat and was intended for a proposed fire hydrant to serve the property. The developer will dedicate a new water easement during the construction of the project at the proper location of the fire hydrant.

Staff recommended that the Board recommend to the Planning Commission and City Council approval of abandoning this existing water easement.

E. Consider 2018/2019 Sanitary Sewer Rehab Project Change Order #3 –

At the December 6, 2018 Board meeting the Board approved the Engineering, Construction Administration & Resident Inspection necessary for this next sanitary sewer rehabilitation project with S&ME. Bids were received July 11, 2019 and the project was award to SBW Constructors in the amount of \$3,842,301. At the January 28, 2020 meeting, Change Order #1 was approved in the amount of \$150,812 to be added to the project along with an additional 73 days for the construction. At the March 2020 meeting, Change Order #2 was approved in the amount of \$79,645 along with an additional 44 days for the construction.

Staff requested S&ME to prepare Change Order #3 to balance the contract for the quantities not used and the additional work necessary to complete the sewer relocation at Northfield Blvd which was approved with Change Order #2. There is no additional time adding to the contract with this change order.

Staff recommended that the Board recommend to the City Council approval of Change Order #3 for a decrease in the amount of \$64.55 to the contract.

Funding for the Engineering, Construction Administration, Inspection and Construction was approved from a combination of 2018/2019 and 2019/2020 Budget & Working Capital Reserves. The total contract amount with this change order will be \$4,072,693.

Funding Source	Budgeted Amount	Engineering Expenditures	Construction Expenditures	Remaining
Rate Funded Operating Budget 2018-19	\$1,000,000	\$ (432,000)	\$0	\$568,000
Working Reserves 2018-19	\$1,500,000		\$0	\$1,500,000
Rate Funded Operating Budget 2019-20	\$1,000,000	\$0	\$ (3,842,301)	\$1,000,000
Working Reserves 2019-20	\$1,000,000	\$0		\$ (2,842,301)
Change Order #1			\$ (150,812)	\$ (150,812)
Change Order #2			\$ (79,645)	\$ (79,645)
Change Order #3			\$64.55	\$64.55
Total	\$4,500,000	\$ (432,000)	\$ (4,072,693)	\$ (4,693)

F. Consider Water/Wastewater Electrical/Mechanical Services Contract Extension –

Staff accepted bids on February 21, 2018 for one base-bid task order (18-01) along with supplemental unit prices for outside labor and equipment services. The bid was awarded to John Bouchard and Sons Co. (JB&S), and the agreement was executed on May 17, 2018. The agreement allowed for the provision of extending the supplemental unit prices an additional three, 12-month terms. Staff is requesting approval from the Board to extend the agreement with JB&S an additional twelve months to May 17, 2021.

Task order 18-01 was the basis for awarding the bid. Task Orders 18-02 through 20-03 are task orders using the supplemental unit pricing provided by JB&S over the last two years. Staff has been satisfied with JB&S. They have been able to complete work MWRD maintenance staff could not due to lack of resources.

Staff recommended the Board recommend to the City Council to extend the agreement with John Bouchard & Sons Co. for an additional 12-month period from May 17, 2020 to May 17, 2021.

A lot of the costs associated with John Bouchard's help can be classified as reactive maintenance due to unforeseen repairs and equipment breakdowns and will likely be requested as funded from working capital reserves. However, the Department's 5-yr capital improvements plan, does account for \$1.5M in rate funded vehicle and equipment replacement that may fund a portion of the costs associated with JB&S services.

A motion was made by Brian Kidd to accept the Consent Agenda as presented and it was seconded by Dr. Carter. The Board voted unanimously to approve.

The April 28, 2020 Board Minutes were unanimously accepted as presented.

The Board considered O&M sewer inspection and asset management software purchase.

Operations and Maintenance purchased Cobra Technologies Asset DMS Software in 2003 to collect, report, and analyze sewer pipeline inspection data. The hardware and software met the department's

needs for many years. Difficulties started to develop when Trio Vision purchased Cobra Technologies in 2016. The company suffered many changes including turnover of management, technical support, and sales staff personnel. The software is experiencing detrimental errors daily resulting in loss productivity. Trio Vision is not providing adequate technical support to address these issues and O&M was compelled to search for another solution.

O&M evaluated two of the market leaders, WinCan and ITPipes. Staff is recommending the purchase of WinCan. With WinCan’s 15-year track record and the market’s largest installed base, it supports emerging technologies like GIS and Cityworks integration, virtual 3D, side scanning and laser profiling, as well as popular defect catalogs like PACP and WRc. The initial cost of the WinCan software is more expensive; however, when considering the annual maintenance cost over three years it is the more cost-effective option.

Initial Hardware & Software Cost (including installation)	
WinCan	ITPipes
\$53,138	\$34,900

Annual Maintenance Costs	
<i>After 3rd annual fee, WinCan is less expensive than ITPipes</i>	
WinCan	ITPipes
\$6,028	\$14,500
\$6,028	\$14,500
\$6,028	\$14,500
\$18,084	\$43,500

The cost of the referenced software from Sansom Equipment Company is in the amount of \$53,138. Funding is requested to come from reserves using the \$100,000 allowance in the Department’s 5-yr Capital Improvements Plan for IT/Computer Systems Hardware Upgrades.

Staff recommended the Board to recommend the City Council to approve the purchase of this software.

Sandra Trail made a motion to approve. Kathy Nobles seconded. The motion unanimously passed.

The Board considered Final Bulk Water Purchase & Sale Agreement with Marshall County, TN.

Darren Gore met with Marshall County representatives at Consolidated Utility District’s (CUD) office on Thursday October 10, 2019. Marshall County currently has a moratorium on building in their water system due to lack of capacity and inability to serve new development. Marshall County anticipates constructing a new drinking water plant but would like to purchase water for an interim period prior to

completing this project. Marshall County is connected to CUD's water systems and had originally approached CUD about purchasing 200,000 gpd of drinking water from them. CUD's board is reluctant to sell water to them due to the outstanding, unexecuted Water Supply contract with the Corps of Engineers on J. Percy Priest reservoir.

Staff discussed our ability to supply an additional 200,000 gpd into CUD's system and there are no challenges that are foreseen. MWRD's future requirement, under water restrictions during a drought in 2035, is a yield of 15.14 MGD; 200,000 gpd represents 1.3% of that total. MWRD is currently contracted with the Corps for 12.9 MGD during a drought period; 200,000 gpd represents 1.6% of that total.

The final terms in the contract are summarized be as follows:

- Contract is a three-party contract between Marshall County, Consolidated Utility District of Rutherford County and the City of Murfreesboro.
- Contract is limited to 7-yrs with six, one-year automatic renewal options subject to the following requirements:
 - Requirements for extending the agreement into the fifth year will require Marshall County approved drinking water treatment plant plans from the Tennessee Department of Environment and Conservation that affords the County the ability to provide sufficient quantities of water to offset the quantity supplied by City and transported by CUD.
 - Requirements for extending the agreement into the sixth and seventh year will require Marshall County letting the bid and starting construction for an approved drinking water treatment plant that affords the County the ability to provide sufficient quantities of water to offset the quantity supplied by City and transported by CUD.
- Contract terms limit the flow to a maximum of 216,000 gallons per day.
- Terms restrict the flow to coincide with MWRD's nonessential use reductions goals when a drought or other emergency is declared by the Mayor.
- Contract terms define the sale of water to be based on MWRD's wholesale rate, or \$2.35 per 1,000 gallons, subject to change annually based MWRD's cost of service study, system audit, or other appropriate method.
- Contract terms afford CUD the ability to charge a transportation rate of \$1.17 per 1,000 gallons, subject to change annually based on CUD's cost of service study or other study.

Marshall County's Board of Public Utilities has agreed to the terms of the contract as has Consolidated Utility' Board of Commissioners.

Selling 216,000 gallons per day to Marshall County at \$2.35 per 1,000 gallons equals \$185,235 per year in water sales revenue.

Staff recommended that the Board approve the final contract for bulk water purchase and sale to Marshall County.

Kathy Nobles made a motion to approve. Dr. Carter seconded. The motion unanimously passed.

The Board considered Department participation in upsizing water main in West Point Section 3.

There are two proposed industrial development projects within the area known as West Point Commercial Subdivision, which is west of Salem Hwy and south of I-24. Warrior Drive, within this commercial subdivision is proposed to be extended for economic development purposes under State

Industrial Access Grant through TDOT. This TDOT funding does not include utilities within the roadway. The roadway extension and waterline upgrade will assist with these two industrial projects currently moving through the process and also make an additional 40 acres available for additional economic development opportunities.

The City is the recipient of the TDOT grant and will enter into a project development agreement with the developer to construct the public infrastructure and utilities required to be installed within the roadway. The roadway extension is speeding up the timing of when the public infrastructure and utilities would normally be installed.

When staff received the news about these development projects and the possibility of being large water users, we requested that Smith Seckman Reid (SSR) perform some water modeling for the area. SSR has an existing water model for the Department and staff provided the proposed water and fire flow demands of these large users. The water modeling determined that the existing 8" water mains along the existing portions of Warrior Dr. and Beasie Rd. can remain, but to provide the anticipated fire flows for the developments and area, a 12" water main would be required for the remaining portion of Warrior Drive.

SEC, Inc. has submitted cost estimates for both 8" and 12" water main installations, 8" being the standard and typical water main size installed for a commercial development. The difference in the 8" and 12" water main is \$109,477, which would be the Department's participation amount and contribution to assist this industrial development.

Staff has estimated the water connection fees for the two proposed developments. The total estimated daily water usage is estimated at 144,000 gallons per day (gpd) or 553 single family units (sfu's) where 260 gpd equals 1 sfu. The standard water connection fee per sfu is \$1200, which would be a total of \$664,615 in water connection fees; therefore, the standard water connection fees for these two developments alone will more than fund the cost of the participation.

This participation recommendation is somewhat consistent with the Department's participation policy, within our approved Policies, Procedures & General Design Requirements adopted in 2009 by the Board & Council.

1. Prior to dedication and acceptance of the improvements by the City, the Developer requesting reimbursement must present to the City Council a detailed statement of the actual eligible costs and the City Council in its discretion may amend the agreement, and the reimbursement amount, to reflect the actual project costs.
2. Should a project be eligible for participation by the City due to upsizing of a water or sewer line, the Department reserves the right to publicly bid the project or the portion of the project eligible for participation.
3. Participation in the cost to upsize water and/or sewer lines shall be in accordance with established policies in effect. The Department or Developer can prepare a schedule of upsize participation, based on recent bid results or agreed upon unit pricing, which the Department and the Developer may accept in lieu of publicly bidding, subject to approval of the Water and Sewer Board and City Council.

4. The Department will only participate on that portion of sewer deeper than twelve (12) feet deep, if the sewer is upsized and if the material changes.
5. Sewer must extend to the limits of construction at strategic locations for future extension.

Staff recommended the Board recommend to City Council approval of the water participation for the larger water main.

It is requested that participation in the amount of \$109,477 come from the Department's working capital reserves. There are adequate reserves to fund this amount.

Brian Kidd made a motion to approve. Dr. Carter seconded. The motion unanimously passed.

Staff updated the Board regarding the Overall Creek Pump Station Upgrades.

The Board previously approved various upgrades to the Overall Creek Pump Station due to equipment age. The approved upgrades included new variable frequency drives (VFDs) designed to utilize the existing soft starters as backup devices, improvements to the existing pump controls by upgrading the existing control panel with a new programmable logic controller (PLC), a new Human Machine Interface (HMI), new local network switch, and new 240 watt, 24 volt DC power supply; a new stand-alone bubbler level system; a new backup ultrasonic level system; and a new cellular remote terminal unit (RTU). JBS Task Order 18-06 and MRS agreement were approved at the December 11, 2018 Board meeting. SSR Task Order 1841009.0 was approved at the June 26, 2018 Board meeting.

During SSR design, staff requested additional upgrades to the station to improve station functionality, operation, and maintenance. These additional upgrades include replacement of old and problematic check valves, a new permanent bypass pumping connection, and structural evaluation and design of a new wet well cleaning access way. These upgrades were requested and authorized on August 20, 2018.

Following the approval of the upgrades to the existing OCPS, the Board approved a needed expansion of the OCPS to essentially double the station's capacity. As part of this expansion, the existing pump control panel must again be upgraded or replaced to accommodate the new pumps. Doing the panel upgrade now, rather than waiting for the expansion project, is more cost efficient.

In addition, the station experienced a failure of one of the existing soft starters which is designed to serve as a backup to the new VFDs. Staff identified that the soft starters are now obsolete and replacement parts cannot be purchased. Doing this work now is necessary to avoid potential complete failure of the soft starters which could result in sanitary sewer overflows.

It is anticipated that SSR will perform the additional design services related to the upgrades due to their previous design services for the upgrades project. It is also anticipated that John Bouchard & Sons will perform the additional construction activities using the Master Services Agreement and MR Systems will perform additional controls and integration services using the Master Services Agreement.

The original approved total project cost is \$310,000 consisting of \$125,000 for electrical upgrades, \$110,000 for instrumentation and controls upgrades, \$20,000 for possible HVAC upgrades, \$20,000 for possible bypass pumping, and \$35,000 for engineering services.

The original approved total “as bid” project cost is \$385,692.06 consisting of \$135,966.50 for electrical upgrades, \$105,796.00 for instrumentation and controls upgrades, \$15,517.00 for possible HVAC upgrades, \$56,981.00 for bypass pumping, and \$34,650 for engineering services.

The estimated recommended additional upgrades cost is \$173,680.90 consisting of \$102,248.90 for soft starters removal and replacement, \$56,987.00 for control panel upgrades, and \$14,445 for additional engineering services. The total estimated project cost with additional services is \$559,372.96.

Staff presented and discussed the Water Resources Dashboard Performance for April 2020.

Staff presented the Financial Reports for the year ending April 30, 2020.

There being no further business, the meeting was adjourned.

John Sant Amour, Chairman



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MEMORANDUM

DATE: June 18, 2020
TO: Water Resources Board
FROM: Alan Cranford
SUBJECT: Tank Actuator Modifications
Stones River Water Treatment Plant

Summary

Staff is requesting to purchase equipment components for the existing actuators at each of the water storage tanks. These modifications will allow the controlling of the actuators by allowing them to modulate or allow partial opening/closing capability as opposed to fully open or fully closed.

Each tank has a pre-existing Rotork actuator. The 4-20 mA kit purchase and install is required to be performed by Eco-Tech, Inc. through a sole source procurement. Eco-Tech, Inc. is the only authorized points of sale for Rotork actuators, control systems, parts and services in Tennessee.

Background

A challenge facing Murfreesboro's water system is associated with the fact that the Stones River Water Treatment Plant (SRWTP) fills a single pressure plane that then stores water in five distribution storage tanks (DSTs) spread throughout the service area. Unfortunately, because each tank is located at different distances from the SRWTP and the demands in the areas surrounding each tank vary, the tanks fill and drain at different rates. Certain customers near the SRWTP experience very high water pressure, and we believe the distribution system loses a lot of water through leakage in these high pressure areas.

In order to alleviate these challenges, a solution was proposed in the Water Resource Integration Plan (WRIP) that would add two booster pumping stations near the Tiger Hill and Stoney Meadows DSTs to fill these tanks more quickly. The estimated one-time capital costs were \$870,000 with \$7,500 annual operating costs.

A better solution has been identified. By modifying the actuators which allow them to modulate, or partially open and close, Specific Energy's Distribution System Optimizer (DSO) system can be incorporated to better manage the filling and draining the DST's. The DSO solution will allow the filling of the Tiger Hill and Stoney Meadows tanks faster, will balance the hydraulics of the system to reduce peak pressures (which is anticipated to reduce water loss in the system), will reduce pressure surges by controlling the speed of opening and closing of the valves on each tank,

Water Resources Department

300 NW Broad Street * P.O. Box 1477 * Murfreesboro, TN 37133-1477 * Office: 615 890 0862 * Fax: 615 896 4259
TTY 615 848 3214 * www.murfreesborotn.gov

and will integrate the distribution system water quality to the operation of the high service pumps to improve both water quality and energy efficiency.

The proposed cost of the DSO solution is estimated at \$150,000, including the first year of annual service for the software interface, communications, updates, and data storage. After that, the annual service will cost \$8,000 per year.

The DSO solution is expected to afford the department over \$700,000 in cost savings. Staff is not asking the Board to consider approval of the DSO system at this time; however, we will be bringing a proposal to the Board at next month's meeting for your consideration.

Fiscal Impact

The costs associated with modifying the actuators at each of the tanks, including installation, is \$24,300. These improvements have been budgeted in the Department's FY21 capital expenditures in the amount of \$32,000.

Recommendation

Staff requests the Water Resources Board recommend to the City Council approving the sole source purchase from Eco-Tech, Inc. in accordance with their quote.

Attachments

Eco-Tech quote

Rotork Quotation - CUS091385-00-2

Your reference: RSS Add FOLO/CPT to 10 Units 061720
Our reference: CUS091385-00-2
Date: 6/17/2020
Quotation expiry: 8/16/2020



Rotork Controls Inc.
 675 Mile Crossing Blvd
 Rochester, NY 14624
 US

Phone: +1 585 247 2304
Web: www.rotork.com

Murfreesboro Water & Sewer Dept.
 5528 Sam Jared Drive
 Murfreesboro, TN 37130
 US

Please quote our reference on all correspondence and purchase orders.

For the attention of: **Mike Papula**

We are pleased to submit our quotation for the item(s) listed below.

This quotation is open for acceptance until midnight on the expiry date stated above and is conditional on the terms of the relevant Rotork Conditions of Sale applying, copies of which are available on Rotork’s website (www.rotork.com/en/about-us/index/customers) or on request.

Typical payment terms are Net Monthly Account, payable within 30 days from end of month of invoicing (subject to status prior to, and at time of delivery). Any other terms must be agreed in writing.

COMMENTS

- * Serial numbers must be provided to ensure parts quoted are correct and interchangeable with the original equipment.
- * Unless otherwise stated all painted items will be supplied in our standard part finish.

QUOTATION VALIDITY PERIOD

This quotation is valid for acceptance for 60 days.

CURRENCY

All prices are quoted in US Dollars.

PRICES

The prices detailed in our quotation are NET.

Valve tag number	Description	Qty	Unit price	Amount
	RSS - Travel Fee Mileage	262.00	0.58	151.96
	RSS - Travel Fee Per Diem	4.00	75.00	300.00
	RSS - Labor	48.00	168.00	8,064.00
	IQT Pro Conversion Kit Folomatic plus CPT	10.00	1,741.00	17,410.00
			Total	
			USD	\$25,925.96

Best Regards,

Clint Campbell
 Service Coordinator – ECFS
 Clint.campbell@rotork.com
 585.719.1251



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MEMORANDUM

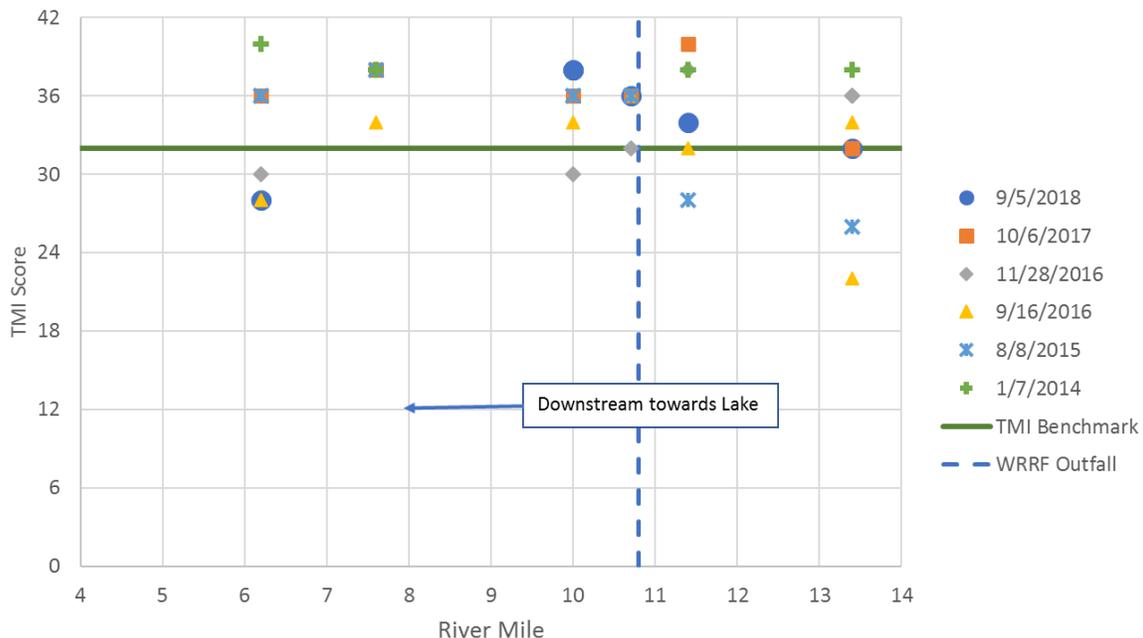
DATE: June 18, 2020
TO: Water Resources Board
FROM: Darren Gore
SUBJECT: Extension of SSR Task Order 09-47-001.2 (Amendment #7)
for Summer 2020 East and West Fork Stones River Bioassessment Sampling and
J. Percy Priest Reservoir Stratification Study

Summary Statement

AquaAeTer has completed its water quality and stream assessments for the West and East Fork Stones River commissioned for 2014-2019. The bioassessment monitoring results were very encouraging and demonstrate that the West Fork Stones River is healthy and meeting its designated uses. We believe the attached summary of work and associated task order is necessary to continue this work through the summer of 2020, as a next installment of developing the protocol that we believe will help create a new permitting framework for the City of Murfreesboro with the Tennessee Department of Environment and Conservation (TDEC).

Background

These sampling results for the West Fork Stones River (2014 thru 2018) are depicted in the chart below:



All results demonstrate the West Fork is exceeding the standard for Tennessee Macroinvertebrate Index (TMI) of 32 (scores above the horizontal dashed line) of Murfreesboro’s ecoregion. Additionally, the assessments demonstrate that the effluent being discharged from the Water Resource Recovery Facility (WRRF) is not impacting stream health (left of dashed vertical line). TMI scores assess biological integrity of streams. Macroinvertebrates are used by TDEC as indicator organisms to determine if a stream supports fish and aquatic life.

The continued sampling efforts and TMI scores are intended to support the strategy of approaching TDEC to offer alternate permitting potentials to the City of Murfreesboro as we attempt to get ahead of the growth projected in the City’s Murfreesboro 2035 Comprehensive Plan. One of the main overarching goals that the Department has over the next twenty (20) years is to influence the regulatory framework focusing on reclaimed water.

In addition to the macroinvertebrate sampling, staff has asked AquAeTer to conduct another stratification study of J. Percy Priest. This study is to demonstrate that during stratified conditions in the reservoir, the phosphorus being discharged from Murfreesboro’s Water Resource Recovery Facility (WRRF) is not getting into the lower reaches or deeper part of the lake where Smyrna is withdrawing water to supply their drinking water plant. Past assertions have been made that phosphorus from Murfreesboro’s WRRF had been getting to the bottom of the lake during summer time conditions, binding with manganese, and causing problems at Smyrna’s drinking water treatment plant and creating “black” water discharge at certain residents (see photo).



Recommendation

Approve amendment #7 to SSR Task Order 09-47-001.2 to allow for continued biological sampling of the West and East Fork Stones River.

Fiscal Impact

The extension to sampling and monitoring the West and East Fork Stones River and J. Percy Priest stratification study is a **net additional fee of \$108,800** from previous approved fee ceilings. Staff recommends funding coming from the Department’s working capital reserves. MWSD’s 5-yr CIP earmarked \$150,000 for Stones River Water Quality studies for FY21.

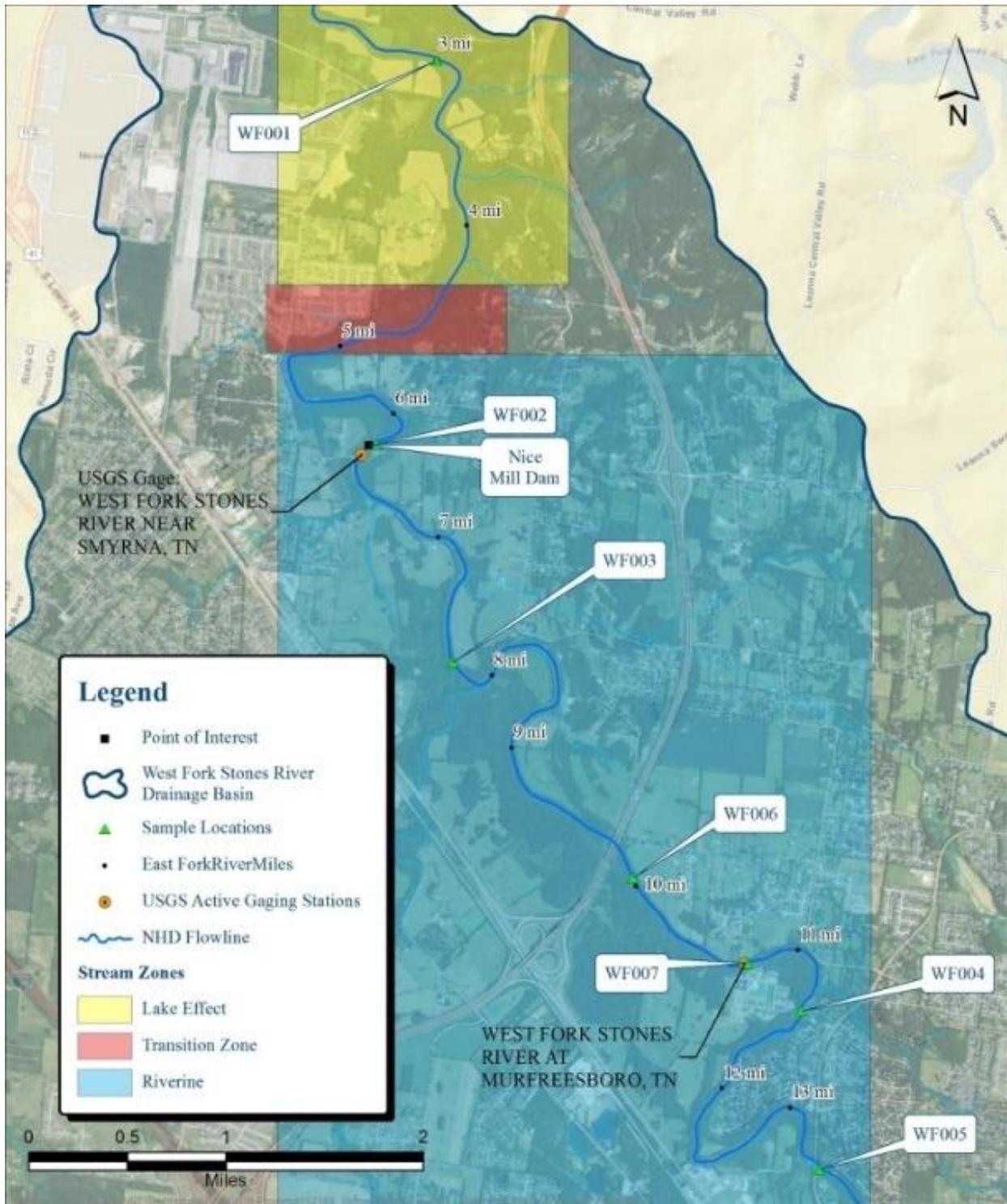
Fiscal Impact History of Task Order

	Date	Cost	Description
Initial Task Order	March 2014	\$207,000	Bioassessment sampling & development of antidegradation criteria and 7Q10 to support expanded NPDES permit
Amendment #1	May 2014	\$14,261	Expanded sampling for NPDES permit application
Amendment #2	October 2015	\$12,000	NPDES Permit Application Preparation
Amendment #3	July 2016	\$98,920	E. & W. Fork Sampling Summer and Winter 2016/17
Amendment #4	Sept 2016	\$20,300	E. Coli sampling
Amendment #5	June 2017	\$61,600	W. Fork Summer 2017 Sampling
Amendment #6	December 2018	\$90,500	E. & W. Fork Summer and Winter Sampling 2018 Summer 2019
Amendment #7	June 2020	\$108,800	E. & W. Fork Summer Sampling 2020 and JPP stratification study
	Total	\$613,281	

Attachments

- SSR Amendment to Task Order 09-47-001.2 Amendment #7
- AquAeTer Proposal to Conduct Water Quality and Biological Analyses of the East Fork and West Fork Stones River
- AquAeTer Proposal to Conduct a Stratification Study and Additional Water Quality Data Collections of the West Fork Stones River, East Fork Stones River, and the Stones River/Percy Priest Lake for the Murfreesboro Water and Sewer Department

Attachment 1



AMENDMENT TO OWNER-ENGINEER AGREEMENT
Engineering Work Order 09-47-001.2
Amendment No. 7.

1. *Background Data:*

- a. Effective Date of Owner-Engineer Agreement: May 2, 2014
- b. Owner: Murfreesboro Water Resources Department
- c. Engineer: Smith Seckman Reid, Inc
- d. Project: West Fork NPDES Application

2. *Description of Modifications:*

- a. Spring/Summer Sampling for 2020 and Fall Sampling for 2020. In order to continue establishing a baseline of data to support MWRD's contention that the Murfreesboro Water Resource Recovery Facility (MWRRF) effluent is helping rather than hurting the overall health of the West Fork Stones River, and to further that baseline for a potential NPDES permit application on the East Fork Stones River, two additional sampling events will occur in the Spring/Summer of 2020 and the Fall of 2020. It is anticipated that there will be two meetings at MWRD to review the results of these efforts and one meeting with TDEC. The approximate cost of this effort is \$67,600.00. An additional dye test for lake stratification in J. Percy Pries Reservoir is included as an optional service, if authorized by MWRD. The approximate cost of this optional effort is \$41,100.00

3. Agreement Summary (Reference only)

- a. Original Agreement amount: \$ 207,000.00
- b. Net change for prior amendments: \$ 297,581.00
- c. This amendment amount: \$ 67,600.00
- d. Adjusted Agreement amount: \$ 572,181.00
- e. Optional dye study amount: \$ 41,100.00

The foregoing Agreement Summary is for reference only and does not alter the terms of the Agreement.

Owner and Engineer hereby agree to modify the above-referenced Agreement as set forth in this Amendment. All provisions of the Agreement not modified by this or previous Amendments remain in effect. The Effective Date of this Amendment is _____.

OWNER:

ENGINEER:

By: _____

By:  Andrew Johnson, PE

Title: _____

Title: Principal

Date Signed: _____

Date Signed: June 18, 2020



June 17, 2020

202621

Mr. Brent Fowler, P.E.
Smith Seckman Reid, Inc.
2995 Sidco Drive
Nashville, Tennessee 37204

Sent via e-mail to BFowler@ssr-inc.com

RE: Proposal to Continue to Conduct Water Quality and Biological Analyses of the East Fork Stones River and the West Fork Stones River for the Murfreesboro Water and Sewer Department

Dear Mr. Fowler:

At your request, AquAeTer, Inc. has prepared a Scope of Work to continue providing water quality analyses and biological analyses of the East Fork Stones River and the West Fork Stones River. A separate proposal will be prepared as requested for performing a dye trace to monitor Percy Priest Lake during a stratified time. The biological investigations are to be conducted in both streams to continue to develop a database to determine if these streams are meeting their designated uses. Additionally, the East Fork Stones River is an excellent Reference Stream which has the same stream order as the West Fork Stones River and has similar basin characteristics. The work will include biological and nutrient data collection to evaluate the health of both Rivers. Previous studies have demonstrated that nutrient loadings from the outfall do not impair the biological health of the stream. These data will be collected over one summer period and one fall period with field collections for macroinvertebrates and water quality during each season, and three individual 90-day time-series Biochemical Oxygen Demand (BOD) analyses. The biological and nutrient data can then be submitted to the State to provide additional real data to demonstrate that the West Fork Stones River is meeting its designated use and is not impaired. The biological study area extends on the West Fork Stones River from Nice Mill Dam Recreation area to the City of Murfreesboro Greenway Trailhead and on the East Fork Stones River from the transition zone of the backwaters of Percy Priest Lake and the free flowing portion of the river to the upstream extent of the Coleman Farm.

SCOPE OF WORK

AquAeTer has prepared the following scope of work for this project. The scope of work will include monitoring both the East Fork Stones River and the West Fork Stones River to assess the current status with regards to their designated uses.

Work Plan

A Work Plan was previously developed for the work in 2015. No amendments to the Work Plan are required. We would suggest this Work Plan be provided to multiple TDEC personnel for their concurrence and to let them know that they will be invited to attend the field surveys.

Stream Investigations

The West Fork Stones River is currently listed as impaired due to nutrient enrichment and sedimentation. Biological studies that have been completed by the state and various other organizations appear to have not followed the Standard Operating Procedures established by the state. Also, there is no specific impairment that is caused by nitrate other than the 10 mg/L drinking water standard for nitrate or for orthophosphate, which literature suggests is not toxic at over 100 mg/L. Nitrate and phosphate are not toxic to fisheries or macrobenthos at the concentrations that have been found in the previous sampling events. It is used by algae for primary productivity, but no algae studies have been completed by the State to demonstrate that the algal populations are not healthy. Murfreesboro's algae studies conducted by AquAeTer have shown that the algae provide a positive dissolved oxygen addition to the West Fork Stones River (+0.3 mg/L or more). The other issue here is that the water quality regulations promulgated by the Tennessee Department of Environment and Conservation has a DO of 5 mg/L at all times versus the more normal DO standard for southern streams of 5 mg/L as a 24-hr average with no 8 hour period during the 24-hour day being less than 4 mg/L. In other words, TDEC's water quality standard does not allow for the natural diurnal cycle that is expected due to primary productivity. This is a fallacy within the TDEC regulations since natural systems can result in diurnal DOs less than a fixed 5 mg/L DO standard and still be a non-impaired stream with healthy aquatic resources. The biological investigations will be done to determine if the current diurnal DO swing negatively or positively affects the aquatic resources of the two rivers.

To continue building the database of data for the West Fork Stones River, we propose to do the following investigations:

1. Macrobenthological Collections will be conducted at six stations on the West Fork Stones River and at three locations on the East Fork Stones River, a total of nine stations. One event will be completed during the summer months, while the other one will be completed during a fall month. Based on conversations with Deedee Kathman, October would be the latest month to sample. AquAeTer will follow the TDEC SOP

for macrobenthos collections. AquAeTer will collect the macrobenthos samples in the field and bring them back to the laboratory for sorting and identification of the macrobenthos under the microscope. One part of the TDEC macrobenthological standard operating procedure uses a field procedure that takes about 1 hour to complete in the field and then calls for laboratory confirmation of the rapid field bioassessment. According to the State SOP, the field rapid bioassessment cannot be relied on to make assessments or conduct statistical metrics on the macrobenthological community. The semi-quantitative method described in the SOP will be utilized. Macrobenthos specimens will be identified to the species level, except for chironomids which will be identified to the genus, and a third party will be used to verify the reference collection. Macrobenthos will be collected sometime between June to as late as October during periods when high flows have not occurred for 2 weeks prior to the specimen collection period, per the TDEC SOP.

During the macrobenthic sample collections an invitation will be extended to TDEC to attend the sampling event to observe the techniques being utilized by **AquAeTer**. This will allow TDEC to visually witness that all State SOPs are being followed as written in the 2017 *Standard Operating Procedures for Macroinvertebrate Stream Surveys*.

During each macrobenthic sample event, habitat assessments will be completed. The TDEC SOP will be followed when completing the habitat assessment at each station. Discharge measurements of the stream will be made at each station during the collection.

2. Water Quality analyses will be performed during the macrobenthic collection and will include samples from the locations of which the macrobenthos were collected. The following is a list of the proposed analyses for each sample:
 - a. Nitrogen including:
 - i. Total Kjeldahl nitrogen (TKN);
 - ii. Ammonia nitrogen; and
 - iii. Nitrite + nitrate nitrogen.
 - b. Phosphorous:
 - i. Total phosphorus; and
 - ii. Dissolved orthophosphate; and,
 - c. In-situ water quality measurements that will include instantaneous water temperature, dissolved oxygen, pH and specific conductivity at 25°C.

3. 90-Day time-series Biochemical Oxygen Demand
Monthly water samples will be collected from three locations during two different months, the first of which will coincide with the macrobenthos collection. These will

also be done at a different time than the Assimilative Capacity Study. The proposed locations for collection are as follows:

- a. Upstream from the current POTW outfall on the West Fork Stones River;
 - i. Will serve as a background sample to characterize the upstream contributions.
- b. Current effluent; and
- c. Downstream from the current POTW outfall near WF003 from 2014 sampling;
 - i. Will allow for a correlation of the high TMI score with nitrogen and phosphorus concentrations.

Samples will be transported back to the **AquaAeTer** lab and set up for future analysis. Nine (9) individual water quality samples will be taken from each sample location. These samples will be taken at approximately Time 0, Day 5, Day 10, Day 15, Day 20, Day 30, Day 45, Day 60, and Day 90. The following nutrients will be analyzed:

- a. TKN (Time 0 and Day 90);
- b. Nitrite + Nitrate;
- c. Ammonia;
- d. Total Phosphorus; and,
- e. Dissolved orthophosphates.

Dissolved oxygen content will be measured approximately 18 times throughout the duration of the 90-day period. These oxygen measurements will be recorded and used to calculate a BOD for each sample. This calculation will provide the amount of dissolved oxygen needed by aerobic organisms to breakdown organic material over a specific time period, in this case 90 days.

The end result will provide the ultimate carbonaceous biochemical oxygen demand as well as the potential nitrogenous oxygen demand for the stream and effluent samples.

Meetings

We have included costs for three meetings over the course of the study. We anticipate one meeting with the State to discuss the results of field activities following the completion of the study. The other meeting is intended for periodic updates during the course of the study.

Report

At the completion of all field events, one full report will be developed summarizing the findings of all events. In addition, a separate BOD sample report will be provided.

SCHEDULE

AquAeTer is prepared to begin this project upon authorization from the City of Murfreesboro. The Work Plan is complete. It is anticipated that the field work for the benthic investigation will take place in the early summer months, while the second investigation will target collection in September or October. The BOD samples take 90 days to complete plus time for the final analytical laboratory results to be provided. It is likely that this portion of the work will extend into the following year. These dates are subject to change due to weather conditions.

Assuming the weather cooperates, it is anticipated that the first draft of the summary report will be available in the Fall of 2020, not including any ongoing BOD sample results.

COST ESTIMATE

AquAeTer has prepared a cost estimate for this work, as presented in Table 1. The total estimated cost is \$67,600. This cost includes water quality collection, two macroinvertebrate sampling events, and three collections of water for the time-series BOD analysis, including the 90-day monitoring of water samples. We have also included costs of three meetings during the course of the work. The summer 2020 sample is currently scheduled for a three day event due to the expected time demands of TDEC.

PROJECT EXPERIENCE

AquAeTer professionals have extensive water quality and NPDES Permitting project experience in 29 states, 1 territory and 6 foreign countries. A few projects pertinent to this project include work in Tennessee, Georgia, Alabama, Florida, South Carolina, North Carolina, Arkansas, Louisiana, Texas, and Oklahoma.

Our team has conducted numerous comprehensive water quality and TMDL analyses including nutrient eutrophication issues as well as biological investigations. Previous work experience includes:

- East Fork Stones River, Murfreesboro, Tennessee;
- West Fork Stones River, Murfreesboro, Tennessee;
- Harpeth River, Franklin, Tennessee;
- Cumberland River, Nashville, Tennessee;
- Mill Creek, a tributary to the Cumberland River, Nashville, Tennessee;
- Overall Creek, a tributary to the Cumberland River, Nashville, Tennessee;
- Tennessee River, Counce, Tennessee;
- Tennessee River, New Johnsonville, Tennessee;
- Clinch River, Oak Ridge and Clinton, Tennessee;
- Duck River, Columbia, Tennessee;

- Pigeon River, Tennessee;
- French Broad River, Tennessee;
- Pigeon River, North Carolina;
- Tombigbee River, Naheola, Alabama;
- Intracoastal Waterway, Gulf Shores, Alabama;
- Alabama River, Burkville, Alabama;
- Alabama River, Yellow Bluff, Alabama;
- Huntsville Spring Branch/Indian Creek, Redstone Arsenal, Alabama;
- Tennessee River, Decatur, Alabama;
- Tombigbee River, Naheola, Alabama;
- Conecuh, Brewton, Alabama;
- Escambia River and Escambia Bay, Pensacola, Florida;
- St. Johns River, Palatka, Florida;
- Hillsborough Bay, Tampa, Florida;
- Manatee River, Bradenton, Florida;
- North and West Bays, Panama City, Florida;
- Turtle River, Brunswick, Georgia;
- North Newport River, Georgia;
- Conasauga, Coosawattee and Oostanaula Rivers, Dalton, Georgia;
- Chattahoochee River, Atlanta, Georgia;
- Ocmulgee and Altamaha Rivers, Georgia;
- Flint River, Woodbine and Oglethorpe, Georgia;
- Savannah River, Augusta, Georgia;
- Broad River/Savannah River/Lake Murray, Elberton, Georgia;
- Ouachita River, Camden and Crossett, Arkansas;
- Red River, Ashdown and Fulton, Arkansas;
- Arkansas River, Little Rock, Arkansas;
- Arkansas River, Russellville, Arkansas;
- Pearl River, Monticello, Mississippi;
- Tennessee River, Calvert City, Kentucky;
- Arkansas River, Muskogee, Oklahoma;
- Grand Neosho River, near Pryor, Oklahoma;
- Mississippi River, Cordova, Alton, and Sauget, Illinois;
- Illinois River, Ottawa and Henry, Illinois;
- Illinois River, Liverpool, Illinois;
- Wabash River, Cowling, Illinois;
- Rock River, Rockford and Joslin, Illinois;
- St. Joseph River, Auburn, Indiana;
- Lake Michigan, Whiting, Indiana;
- Wabash River, Terre Haute, Indiana;
- Des Moines River, Eddyville, Iowa;
- Fox River, Twin Locks, Wisconsin;
- Superior Bay, Duluth, Minnesota;
- St. Louis River, Cloquet, Minnesota;

- Embarrass River, Aurora, Minnesota;
- Fields Brook/Ashtabula River, Ashtabula, Ohio;
- Lake Erie, Ashtabula, Ohio
- Ohio River, Cincinnati, Ohio
- Paint Creek, Greenville, Ohio
- Amuay Bay, Amuay, Venezuela;

PROJECT TEAM

AquAeTer will assign Mike Corn, P.E. (TN), BCEE as Sr. Technical Director. Mr. Corn worked with Smith Seckman Reid on the original Wasteload Allocation Study for the West Fork Stones River in the early 1980's. He recently directed the field work on the East Fork Stones River and West Fork Stones River. Mr. Corn has been involved in TMDL, assimilative capacity studies, and water quality investigations including biological investigations defining impacts of poor or good water quality on the overall health of the stream. He has also conducted dispersion modeling and permit negotiations, for over 40 years. He has studied over 200 stream, river, lake, estuary, and open ocean systems both in the U.S. and abroad. He has assisted the USEPA, Athens, in the calibration of the dynamic (WASP) wasteload allocation model on the Alabama River near Montgomery, Alabama. He has completed numerous water quality projects in USEPA, Region 4, including projects in Tennessee, Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, and South Carolina.

John Michael Corn, P.E. (TN) will serve as the Project Manager. Mr. Corn directed the most recent wasteload allocation study for the West Fork Stones River and has been managing the biological and water quality data collection studies in the West Fork and East Fork Stones Rivers since 2013. Mr. Corn has more than 18 years' experience in conducting water quality surveys.

Other **AquAeTer** staff members who will assist on the project include Dr. Deedee Kathman, Jerrod Manning, and Rachel Stribling. Other staff may be employed as needed to complete the project.

STANDARD CONTRACTUAL TERMS

This project will be conducted pursuant to AquAeTer's contractual terms provided in the Standard Contractual Terms section of this proposal. AquAeTer will use good engineering and scientific practices consistent with the profession and regulatory requirements. Payment will be due 30 days after receipt of invoice. Acceptance of this proposal, standard contractual terms, and attachments can be accomplished by signing and returning one copy (along with an accompanying purchase order) to the following address:

AquAeTer, Inc.
215 Jamestown Park, Suite 100
Brentwood, TN 37027

This proposal will remain valid if accepted within 30 days from June 17, 2020.

CONCLUDING REMARKS

If you have questions or comments pertaining to this proposal, please contact us by telephone at (615) 373-8532, by FAX at (615) 373-8512, or by e-mail at jmcom@aquater.com or anunnery@aquater.com. We appreciate the opportunity to assist you on this project.

Sincerely,

AquAeTer, Inc.



Andy Nunnery, Ph.D., P.G. (TN)
Operations Manager



John Michael Corn, P.E. (TN)
President

cc: Michael R. Corn, P.E. (TN), BCEE
Deedee Kathman, Ph.D.

TABLE 1. COST ESTIMATE TO PERFORM MACROINVERTEBRATE SURVEY

CATEGORY	TASK 1 SITE EVALUATION, WORK PLAN, HEALTH&SAFETY PLAN		TASK 2 WATER QUALITY ANALYSES		TASK 3 MACROBENTHOS COLLECTION EVENT		TASK 4 LONG-TERM BOD		TASK 5 THREE MEETINGS		TASK 6 SUMMARY REPORT		TOTAL HOURS	BILL RATE	TOTAL COST
	(hrs)	(\$)	(hrs)	(\$)	(hrs)	(\$)	Per Sample	Flat Rate	(hrs)	(\$)	(hrs)	(\$)	(hrs)	(\$/hr)	(\$)
LABOR															
Sr. Technical Consultant															
Michael R. Corn, P.E.		\$0	1	\$305	1	\$305			12	\$3,660	2	\$610	16	\$305	\$4,880
Project Manager															
John Michael Corn, P.E.		\$0	4	\$800	12	\$2,400			24	\$4,800	4	\$800	44	\$200	\$8,800
Project Scientist/Engineer															
Amy Shaw, Ph.D., P.E.		\$0	1	\$120	0	\$0			20	\$2,400	18	\$2,160	39	\$120	\$4,680
Deedee Kathman		\$0	6	\$600	32	\$3,200				\$0	8	\$800	46	\$100	\$4,600
Jerrold Manning		\$0	6	\$480	24	\$1,920				\$0		\$0	30	\$80	\$2,400
Rachel Stribling		\$0	6	\$480	32	\$2,560				\$0	2	\$160	40	\$80	\$3,200
Technician															
		\$0		\$0		\$0				\$0		\$0	0	\$55	\$0
Administrative															
		\$0	0	\$0	0	\$0				\$0	2	\$130	2	\$65	\$130
Total Labor Expenses	0	\$0	24	\$2,785	101	\$10,385	\$2,100	\$21,000	56	\$10,860	36	\$4,660	217		\$49,690
EXPENSES															
Copies, Fax, Telephone															
				\$25		\$25		\$50		\$50		\$100			\$250
Travel and Per Diem															
Rental Car and Gas		\$0										\$0			\$0
Laboratory Expenses															
Sort, ID, Data Entry, Supplies						\$5,500									\$5,500
Equipment Rentals															
GPS				\$45		\$45									\$90
Water Quality Multi-Probe				\$275		\$275									\$550
Miscellaneous Equipment				\$200		\$250									\$450
Shipping				\$250		\$250									\$500
Total Expenses		\$0		\$795		\$6,345		\$50		\$50		\$100			\$7,340
ANALYTICAL LABORATORY															
TKN, NO2+NO3, NH3			20	\$1,540											\$1,540
TP, PO4			20	\$880											\$880
Total Laboratory Expenses		\$0		\$2,420		\$0		\$0		\$0		\$0			\$2,420
SUB-CONTRACTOR															
Third Party Verification						\$4,840									\$4,840
Total Sub-Contractor Costs		\$0		\$0		\$4,840		\$0		\$0		\$0			\$4,840
Sub-Total All Categories		\$0		\$6,000		\$21,570		\$21,050		\$10,910		\$4,760			\$64,290
Contingency		\$0.00		\$309		\$1,111		\$1,084		\$562		\$245			\$3,310
GRAND TOTAL		\$0		\$6,309		\$22,681		\$22,134		\$11,472		\$5,005			\$67,600



215 Jamestown Park, Suite 100 • Brentwood, TN 37027 • (615) 373-8532

June 17, 2020

202621

Mr. Brent Fowler, P.E.
Smith Seckman Reid, Inc.
2995 Sidco Drive
Nashville, Tennessee 37204

Sent via e-mail to BFowler@ssr-inc.com

RE: Proposal to Conduct a Stratification Study and Additional Water Quality Data Collections of the West Fork Stones River, East Fork Stones River, and the Stones River/Percy Priest Lake for the Murfreesboro Water and Sewer Department

Dear Mr. Fowler:

At your request, AquAeTer, Inc. has prepared a Scope of Work to provide additional water quality studies and analyses for the East Fork Stones River, the West Fork Stones River, and Percy Priest Lake. The main focus of this work will be to perform a second dye trace to confirm the flow pathway of the stream through Percy Priest Lake. Last year's results indicated that the West Fork Stones River flows into Percy Priest and remains in the metalimnion when the Lake is stratified. A second study is recommended to show that this is not a one-time phenomenon. Additional water quality parameters are also recommended during this study.

SCOPE OF WORK

AquAeTer has prepared the following scope of work for this project. The scope of work will include monitoring both the East Fork Stones River and the West Fork Stones River to assess the current status with regards to their designated uses.

Work Plan

A dye trace was conducted during the 2016 WLA study and again in late summer of 2019. The Work Plan will be amended as needed to include additional water quality parameters.

Stream Investigations

TDEC has listed Percy Priest Lake's designated use as a water supply as "threatened" by phosphorus from the West Fork Stones River and the City of Murfreesboro's outfall. This description has not been described by TDEC and data used as the basis for this description have not been provided, despite requests by the City. The stratification study completed last year showed that the West Fork Stones River was not hydraulically connected to the hypolimnion, which is where the Smyrna water intake structure draws water. Additional data taken indicate large phosphorus concentrations in the Lake bed sediments. It is expected that this phosphorus is more likely to be released to the sediment when the water column in contact with the sediment is anoxic or anaerobic, which occurs when the Lake becomes stratified.

We would suggest analyses of the water and sediments during a non-stratified condition as well. We have included a second round of water quality sampling in this proposal.

Dye Study

Rhodamine WT dye will be injected at the Murfreesboro Water Resources Recovery Facility. Four locations, dependent upon the availability of appropriate equipment, are proposed for deploying dye monitoring equipment, as follows:

- a. West Fork Stones River, downstream from Nice Mill Dam, but upstream from the embayment;
- b. West Fork Stones River, upstream from confluence with the East Fork Stones River, in the embayment area;
- c. Stones River, within approximately one mile downstream from the confluence;
- d. Stones River, near Jefferson Street Bridge.

At each location within Percy Priest, sondes will be deployed in the epilimnion, metalimnion, and hypolimnion. Each sonde will monitor water quality and Rhodamine. The sondes will be deployed for approximately 2 to 5 days, dependent upon the time of travel.

A fifth station will be monitored for water quality constituents near the water intake facility on the East Fork Stones River near I-840, operated by Consolidated Utilities District. No equipment will be deployed, but water quality will be monitored at this location.

In addition to the sonde deployment and retrieval, 4 River trips will be conducted. The first will be an initial trip to assess the water quality at the three locations. The other three will be conducted to supplement the dye monitoring sondes. If the dye has not reached the sondes at the time of retrieval, one of the trips will be used to find the dye with the equipment on the boat.

At each station, sediment samples will be collected, once during the dye study, and once following the end of stratification. These samples will be analyzed for metals and nutrients. It is anticipated that equipment will be able to collect the sediment samples. However, if the equipment cannot collect sediment at the station, AquAeTer may send our certified divers to collect sediment. Diving costs have not been included. If diving is necessary, AquAeTer will send a change order to cover the costs of the equipment.

The inclusion of this station will allow us to determine if the downstream water treatment plant is being subjected to different conditions in the water. The post-stratification event is intended to show the difference in water column constituents when the lower levels are not anoxic.

Meetings

We have not included separate costs for meetings for this portion of ongoing work. We assume that we can discuss these results at one of the meetings proposed for the macroinvertebrate sampling work.

Report

At the completion of all field events, one full report will be developed summarizing the findings of all events. In addition, a separate BOD sample report will be provided.

SCHEDULE

AquAeTer is prepared to begin this project upon authorization from the City of Murfreesboro. The Work Plan is complete. It is anticipated that the field work for the stratification investigation will take place beginning in July 2020. It is anticipated that the Lake will be stratified in August or September. The post stratification event is expected to occur in October or November 2020.

It is anticipated that the first draft of the summary report will be available in the Fall or Early Winter of 2020, depending upon the timing of the post-stratification monitoring.

COST ESTIMATE

AquAeTer has prepared a cost estimate for this work, as presented in Table 1. The total estimated cost is \$41,100. This cost includes monitoring in the Lake, the dye study, and a follow-up monitoring event-post stratification.

PROJECT EXPERIENCE

AquaTer professionals have extensive water quality and NPDES Permitting project experience in 29 states, 1 territory and 6 foreign countries. A few projects pertinent to this project include work in Tennessee, Georgia, Alabama, Florida, South Carolina, North Carolina, Arkansas, Louisiana, Texas, and Oklahoma.

Our team has conducted numerous comprehensive water quality and TMDL analyses including nutrient eutrophication issues as well as biological investigations. Previous work experience includes:

- East Fork Stones River, Murfreesboro, Tennessee;
- West Fork Stones River, Murfreesboro, Tennessee;
- Harpeth River, Franklin, Tennessee;
- Cumberland River, Nashville, Tennessee;
- Mill Creek, a tributary to the Cumberland River, Nashville, Tennessee;
- Overall Creek, a tributary to the Cumberland River, Nashville, Tennessee;
- Tennessee River, Counce, Tennessee;
- Tennessee River, New Johnsonville, Tennessee;
- Clinch River, Oak Ridge and Clinton, Tennessee;
- Duck River, Columbia, Tennessee;
- Pigeon River, Tennessee;
- French Broad River, Tennessee;
- Pigeon River, North Carolina;
- Tombigbee River, Naheola, Alabama;
- Intracoastal Waterway, Gulf Shores, Alabama;
- Alabama River, Burkville, Alabama;
- Alabama River, Yellow Bluff, Alabama;
- Huntsville Spring Branch/Indian Creek, Redstone Arsenal, Alabama;
- Tennessee River, Decatur, Alabama;
- Tombigbee River, Naheola, Alabama;
- Conecuh, Brewton, Alabama;
- Escambia River and Escambia Bay, Pensacola, Florida;
- St. Johns River, Palatka, Florida;
- Hillsborough Bay, Tampa, Florida;
- Manatee River, Bradenton, Florida;
- North and West Bays, Panama City, Florida;
- Turtle River, Brunswick, Georgia;
- North Newport River, Georgia;
- Conasauga, Coosawattee and Oostanaula Rivers, Dalton, Georgia;
- Chattahoochee River, Atlanta, Georgia;
- Ocmulgee and Altamaha Rivers, Georgia;
- Flint River, Woodbine and Oglethorpe, Georgia;
- Savannah River, Augusta, Georgia;

- Broad River/Savannah River/Lake Murray, Elberton, Georgia;
- Ouachita River, Camden and Crossett, Arkansas;
- Red River, Ashdown and Fulton, Arkansas;
- Arkansas River, Little Rock, Arkansas;
- Arkansas River, Russellville, Arkansas;
- Pearl River, Monticello, Mississippi;
- Tennessee River, Calvert City, Kentucky;
- Arkansas River, Muskogee, Oklahoma;
- Grand Neosho River, near Pryor, Oklahoma;
- Mississippi River, Cordova, Alton, and Sauget, Illinois;
- Illinois River, Ottawa and Henry, Illinois;
- Illinois River, Liverpool, Illinois
- Wabash River, Cowling, Illinois;
- Rock River, Rockford and Joslin, Illinois;
- St. Joseph River, Auburn, Indiana;
- Lake Michigan, Whiting, Indiana;
- Wabash River, Terre Haute, Indiana;
- Fox River, Twin Locks, Wisconsin;
- Superior Bay, Duluth, Minnesota;
- St. Louis River, Cloquet, Minnesota;
- Embarrass River, Aurora, Minnesota;
- Fields Brook/Ashtabula River, Ashtabula, Ohio;
- Lake Erie, Ashtabula, Ohio
- Ohio River, Cincinnati, Ohio
- Paint Creek, Greenville, Ohio
- Amuay Bay, Amuay, Venezuela;

PROJECT TEAM

AquaEter will assign Mike Corn, P.E. (TN), BCEE as Technical Director. Mr. Corn worked with Smith Seckman Reid on the original Wasteload Allocation Study for the West Fork Stones River in the early 1980's. He recently directed the field work on the East Fork Stones River. Mr. Corn has been involved in TMDL and assimilative capacity studies, as well as the subsequent dispersion modeling and permit negotiations, for over 40 years. Mr. Corn has been involved in multiple diffuser design/installation projects, including Alaska, Louisiana, Illinois, and other states. Mr. Corn recently directed the work designing the diffuser that is to be installed at the Ferro facility. He has studied over 200 stream, river, lake, estuary, and open ocean systems both in the U.S. and abroad. He has assisted the USEPA, Athens, in the calibration of the dynamic (WASP) wasteload allocation model on the Alabama River near Montgomery, Alabama. He has completed numerous water quality projects in USEPA, Region 4, including projects in Tennessee, Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, and South Carolina.

John Michael Corn, P.E. (TN) will serve as the Project Manager. Mr. Corn recently managed the simulation and design of the diffuser that is to be installed at the Ferro facility. Mr. Corn has more than 15 years' experience in conducting water quality surveys.

Other **AquAeTer** staff members who will likely assist on the project include Jerrod Manning, Rachel Stribling, Amy Shaw, and Georgia Caplan. Other staff may be employed as needed to complete the project.

STANDARD CONTRACTURAL TERMS

This project will be conducted pursuant to AquAeTer's contractual terms provided in the Standard Contractural Terms section of this proposal. AquAeTer will use good engineering and scientific practices consistent with the profession and regulatory requirements. Payment will be due 30 days after receipt of invoice. Acceptance of this proposal, standard contractual terms, and attachments can be accomplished by signing and returning one copy (along with an accompanying purchase order) to the following address:

AquAeTer, Inc.
215 Jamestown Park, Suite 100
Brentwood, TN 37027

This proposal will remain valid if accepted within 30 days from June 17, 2020.

CONCLUDING REMARKS

If you have questions or comments pertaining to this proposal, please contact us by telephone at (615) 373-8532, by FAX at (615) 373-8512, or by e-mail at jmcom@aquater.com or anunnery@aquater.com. We appreciate the opportunity to assist you on this project.

Sincerely,

AquAeTer, Inc.



Andy Nunnery, Ph.D., P.G. (TN)
Operations Manager



John Michael Corn, P.E. (TN)
President

cc: Michael R. Corn, P.E. (TN), BCEE

TABLE 1. COST ESTIMATE TO PERFORM STRATIFICATION STUDY

CATEGORY	TASK 7 STRATIFICATION STUDY			TASK 8 SUMMARY REPORT FOR STRATIFICATION		TOTAL HOURS	BILL RATE	TOTAL COST
	(hrs)		(\$)	(hrs)	(\$)	(hrs)	(\$/hr)	(\$)
LABOR								
Sr. Technical Consultant								
Michael R. Corn, P.E.	4		\$1,220	2	\$610	6	\$305	\$1,830
Project Manager								
John Michael Corn, P.E.	16		\$3,200	4	\$800	20	\$200	\$4,000
Project Scientist/Engineer								
Amy Shaw, Ph.D., P.E.	40		\$4,800	16	\$1,920	56	\$120	\$6,720
Jerrod Manning	40		\$3,200		\$0	40	\$80	\$3,200
Georgia Caplan	40		\$3,000	24	\$1,800	64	\$75	\$4,800
Rachel Stribling			\$0		\$0	0	\$80	\$0
Technician								
Administrative	4		\$260	2	\$130	6	\$65	\$390
Total Labor Expenses	144		\$15,680	48	\$5,260	192		\$20,940
EXPENSES								
Copies, Fax, Telephone			\$50		\$100			\$150
<u>Equipment Rentals</u>								
GPS								\$0
Boat			\$1,250					\$1,250
Water Quality Cast								
Water Quality Multi-Probe			\$1,000					\$1,000
Hydrolabs			\$5,846					\$5,846
Rhodamine WT			\$1,073					\$1,073
Miscellaneous Equipment			\$400					\$400
Shipping			\$500					\$500
Total Expenses			\$10,119		\$100			\$10,219
ANALYTICAL LABORATORY								
TKN, NO2+NO3, NH3 (water)	20 samples		\$2,145					\$2,145
TP, PO4 (water)	20 samples		\$1,287					\$1,287
Metals (total and dissolved, wate	20 samples		\$3,089					\$3,089
TP (sediment)	8 samples		\$275					\$275
Metals (soil)	8 samples		\$286					\$286
TKN, NO2+NO3, NH3 (sed.)	8 samples		\$825					\$825
Lab Environmental Fee			\$24					\$24
Total Laboratory Expenses			\$7,931		\$0			\$7,931
Sub-Total All Categories			\$33,730		\$5,360			\$39,090
Contingency			\$1,734		\$276			\$2,010
GRAND TOTAL			\$35,464		\$5,636			\$41,100



... creating a better quality of life

MEMORANDUM

DATE: June 17, 2020
TO: Water Resources Board
FROM: Darren Gore
SUBJECT: Consider Additional Services for Overall Creek Pump Station Upgrades Change in Scope

SUMMARY

Change in scope to Overall Creek Pumping Station improvements to include additional upgrades of \$102,248.90 for soft starters removal and replacement, \$56,987.00 for control panel upgrades, and \$14,445 for additional engineering services, totaling \$173,680.90.

BACKGROUND

The Board previously approved various upgrades to the Overall Creek Pump Station due to equipment age. The approved upgrades included new variable frequency drives (VFDs) designed to utilize the existing soft starters as backup devices, improvements to the existing pump controls by upgrading the existing control panel with a new programmable logic controller (PLC), a new Human Machine Interface (HMI), new local network switch, and new 240 watt, 24 volt DC power supply; a new stand-alone bubbler level system; a new backup ultrasonic level system; and a new cellular remote terminal unit (RTU). JBS Task Order 18-06 and MRS agreement were approved at the December 11, 2018 Board meeting. SSR Task Order 1841009.0 was approved at the June 26, 2018 Board meeting.

During SSR design, Staff requested additional upgrades to the station to improve station functionality, operation, and maintenance. These additional upgrades include replacement of old and problematic check valves, a new permanent bypass pumping connection, and structural evaluation and design of a new wet well cleaning access way. These upgrades were requested and authorized on August 20, 2018.

Staff brought the re-budgeting information to the Board last month detailing the additional scope of work and updated cost estimates.

RECOMMENDATION

Approve SSR additional design services related to the upgrades project, as well as, John Bouchard & Sons revisions to task order 18-06 for additional construction activities itemized in their proposal and MR Systems performing additional controls and integration services per the attached proposal.

FISCAL IMPACT

The estimated recommended additional upgrades cost is **\$173,680.90** consisting of \$102,248.90 for soft starters removal and replacement, \$56,987.00 for control panel upgrades, and \$14,445 for additional engineering services.

The total estimated project cost with additional services is revised to **\$559,372.96**.

ATTACHMENTS

SSR Engineering Task Order 18-41-009.0 Amendment No. 1

JBS Quotation dated March 31, 2020.

MR Systems Quotation dated April 22, 2020.

AMENDMENT TO OWNER-ENGINEER AGREEMENT
Engineering Task Order 18-41-009.0
Amendment No. 1

1. *Background Data:*

- a. Effective Date of Owner-Engineer Agreement: August 16, 2018
- b. Owner: Murfreesboro Water Resources Department
- c. Engineer: Smith Seckman Reid, Inc.
- d. Project: Overall Creek Pump Station Upgrades

2. *Description of Modifications:*

- a. In addition to the scope described in Task Order 18-41-009.0, this modification includes:

Understanding of Modifications

The OWNER desires to upgrade the existing PLC-based control to accommodate the future expansion of the Overall Creek Pump Station (OCPS), replace 4 existing soft starters, replace 2 check valves, install a permanent bypass pump connection, and perform a structural evaluation of the existing wet well for the installation of a new 4-foot diameter access chamber and hatch.

ENGINEER's Scope of Services

ENGINEER's scope of service will include the following tasks:

- Design and coordination of control panel upgrade to accommodate the future expansion of the pump station which includes 4 new pumps, variable frequency drives with soft starter bypasses, new generator, and other upgrades for a fully operable facility.
- Design of the replacement of 4 existing soft starters with 4 new soft starters and coordination of related controls and standby generator operation.
- Design of replacement of 2 existing check valves.
- Design of a new permanent bypass pump connection located on the existing 18-inch force main.
- Structural evaluation of wet well for access chamber and hatch

Deliverables

ENGINEER will deliver to the OWNER the following:

- Deliverables as indicated in the original task order to include modifications listed above.

Time of Completion

The project will be delayed as required to approve this amendment and approximately 10 weeks for John Bouchard and Sons and MR Systems to procure equipment and controls hardware and complete the modifications.

Reimbursable Expenses

- Outside Plotting and Printing: Reimbursable at Cost
- Out of Town Travel: Reimbursable at Cost

Exclusions

3. Agreement Summary (Reference only)	
a. Original Agreement amount:	\$34,650.00
b. Net change for prior amendments:	\$0.00
c. This amendment amount:	\$14,445.00
d. Adjusted Agreement amount:	\$49,095.00

The foregoing Agreement Summary is for reference only and does not alter the terms of the Agreement.

Owner and Engineer hereby agree to modify the above-referenced Agreement as set forth in this Amendment. All provisions of the Agreement not modified by this or previous Amendments remain in effect. The Effective Date of this Amendment is _____.

OWNER:

ENGINEER:

_____ 

By: _____

By: Andrew Johnson

Title: _____

Title: Principal

Date Signed: _____

Date Signed: June 16, 2020

JOHN BOUCHARD & SONS Co.

CONSTRUCTION SERVICES DIVISION
DIVISION
MECHANICAL CONTRACTING
BOUCHARD FIRE PROTECTION
ELECTRICAL CONTRACTING



INDUSTRIAL DISTRIBUTION
PUMPING SYSTEMS
AIR COMPRESSORS
INDUSTRIAL SALES

MACHINE SERVICES DIVISION
REPAIR / FABRICATION / SHOP SERVICES

FOUNDRY DIVISION
IRON CONSTRUCTION CASTINGS

March 31, 2020

Re. Overall Creek PS New Soft Starts

We are pleased to offer a bid for the following scope of work; this bid is based on the plans and specifications as issued, up through and including no Addendum's.

Electrical Scope of Work

- Remove (4) existing soft starts.
- Provide and install (4) new soft starts.
- Replace line side wiring if necessary.
- Rework control wiring as needed.
- Dispose of existing soft starts per owner's direction.

Electrical Exclusions of Work

- Bid Bond
- Working Sundays
- Expediting of materials

Cost for the above; See Murfreesboro Service Contract Rate Sheet – 2018 (Overall Creek PS Upgrades Base Bid.

Any payment received by credit card will result in extra charges per transaction equal to the sum of transaction charged to us.

We appreciate the opportunity to provide this bid, please advise if you have any questions.

State of Tennessee Contractors License

ID Number: 00000319

Lic Status: Active

Expiration Date: 01/31/2021

CMC; CE; MU-A,B; HC-C; BC-17; Unlimited

Sincerely,

Jesse Sutphin

Electrical Estimator / Project Manager

Jesse.Sutphin@jbouchard.com

Office: 615-256-0112

Direct: 615-690-0176

Cell: 615-405-4413

Fax: 615-256-2427

Murfreesboro Service Contract Rate Sheet - 2018

Overall Creek PS Soft Start Installation 3/31/2020

Description	Qty (hrs)	Rate	Extended
Project Mgr (RT)	14	\$75.00	\$1,050.00
Project Mgr (OT)		\$110.00	\$0.00
Superintendent (RT)	10	\$67.00	\$670.00
Superintendent (OT)		\$100.50	\$0.00
Pipefitter/Welder (RT)		\$52.00	\$0.00
Pipefitter/Welder (OT)		\$78.00	\$0.00
Sprinkler Fitter (RT)		\$44.00	\$0.00
Sprinkler Fitter (OT)		\$66.00	\$0.00
Electrician (RT)	168	\$52.00	\$8,736.00
Electrician (OT)	84	\$78.00	\$6,552.00
Apprentice/Helper (RT)	56	\$37.00	\$2,072.00
Apprentice/Helper (OT)	28	\$55.50	\$1,554.00
Expediter/Delivery (RT)		\$29.00	\$0.00
Expediter/Delivery (OT)		\$43.50	\$0.00
Machine Shop Millwright (RT)		\$60.00	\$0.00
Machine Shop Millwright (OT)		\$90.00	\$0.00
HVAC/Plb Service Tech (RT)		\$66.00	\$0.00
HVAC/Plb Service Tech (OT)		\$99.00	\$0.00
Air Compressor Tech (RT)		\$66.00	\$0.00
Air Compressor Tech (OT)		\$99.00	\$0.00
Laborer - Skilled (RT)		\$32.00	\$0.00
Laborer - Skilled (OT)		\$48.00	\$0.00
Laborer - Unskilled (RT)		\$23.00	\$0.00
Laborer - Unskilled (OT)		\$34.50	\$0.00

Equipment	Qty (hrs)	Rate/Hr	Extended
Welder		\$15.00	\$0.00
Power Threader		\$10.00	\$0.00
Mini/Midi Hammer		\$10.00	\$0.00
Variable Reach Forklift	55	\$27.00	\$1,485.00
Pickup Truck	252	\$15.00	\$3,780.00
Scissor Lift		\$19.00	\$0.00
Skid Steer		\$25.00	\$0.00
Boom Man Lift		\$29.00	\$0.00
Cat 420D Backhoe		\$34.00	\$0.00
Street Plate		\$7.00	\$0.00
185 CFM Compressor		\$15.00	\$0.00
ECM 350*		N/A	
Air Track Drill*		N/A	
Pipe Laser		\$21.00	\$0.00
Total Station EDM		N/A	
15 ton Boom Truck*		\$115.00	\$0.00
30-50 Ton RT Crane*		N/A	
80 Ton Crawler Crane*		N/A	
3" Submersible Pump		\$12.00	\$0.00
6" Hydraulic Pump		\$17.00	\$0.00

Materials & Subcontractors		
Materials		\$4,465.00
Irby soft starts		\$56,044.00
Irby Startup		\$6,400.00
Irby estimated shipping		\$2,500.00
Markup on Material & Subcontractors	10.00%	\$6,940.90

TOTAL ESTIMATE \$102,248.90



April 22, 2020

Bill of Materials and Labor

Qty	Tag/Loop	Description
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MR Systems, Inc. is pleased to offer our services for the Overall Creek Pumps Station Upgrade Project for Murfreesboro, TN Water and Sewer Department.

Scope of Work

Owner Requested Changes to original scope for sub panel at OCPS PLC Includes:

- Replace originally specified Compact Logix with Control Logix
- Add second Stratix Ethernet Switch for additional pumps
- Incorporate additional hardware/software changes as noted in most recent Control Narrative
- All necessary design work to implement the changes in this scope

OCPS PLC

Pump Station Building - Electrical Room PLC (subpanel replacement only)

		Remove A-B Compact Logix PLC from scope
		Add A-B Control Logix PLC to scope
1		A-B Control Logix #1756-A10 10-slot Chassis
1		A-B Control Logix #1756-L85E CPU
4		A-B Control Logix #1756-IA16 Digital Input Module 16 point
1		A-B Control Logix #1756-IF8H Analog Input Module 8 channel
2		A-B Control Logix #1756-OA16 Digital Output Module 16point
1		A-B Control Logix #1756-PA72 Power Supply
1		A-B Control Logix #1756-TBCH Wiring Arm
6		A-B Control Logix #1756-TBNH Wiring Arm

Notes:

- [Verify L85E CPU is necessary](#)
- [10 slot rack required for additional I/O to add 4 pumps](#)

UPS

Upgrade UPS to APC SMT2200C
 Replace SMT1500C with SMT2200C

1

RT-RTD

Supply Specified RTD & Cable from SSR Submittal Review
 TURCK Miniature Temperature Transmitter and Cordset

1

SWITCH

Provide Second Stratix Switch to match designed
 Stratix 5700 w/10 Ethernet ports

1

HW/SW

Incorporate Additional Hardware / Software as noted in most recent Control Narrative and upcoming discussions.

1

- Incorporate future pumps 5-8 (VFD & Bypass Soft Start)
- Incorporate RTD as stated above
- Additional relays, wiring, programming for auto transfer when in generator mode

Notes:

[HW/SW is a budgetary estimate for review purposes using high level information only. A final cost will be determined once there is a specific list provided to MR Systems after SSR and Murfreesboro review.](#)

[DeviceNet is no longer to be used. With the removal of Device Net there is no I/O for signals from VFD's or Soft Starters. Final I/O requirements will need to be discussed as a difference may change the scope of work in this quotation.](#)

Customer: Murfreesboro, TN
 Project: Overall Creek PS Upgrades CO
 MR Quote #: Q20-7497, Rev. CO Budgetary



April 22, 2020

Bill of Materials and Labor

Qty	Tag/Loop	Description
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Panel real estate is at a premium. Assuming all of the above items are integrated there will most likely be a need to provide sub panels on the sides of the panel.

All work in this scope is assumed to be performed as part of the subpanel project. Any future work to aid in startup or additional modifications to the additional pumps would be quoted separately.

Project Labor

One Lot		Project Engineering, Electrical Design, Mechanical Design, Drafting & Administrative Labor (including Travel & Living expenses) as required to perform final system design as noted in this document.
N/A		This line intentionally left blank
One Lot		PLC Control Strategy Design & Programming Labor (including Travel & Living expenses if necessary) to be performed as noted in this document.
One Lot		Field Service (including Travel & Living expenses) to provide installation supervision calibrations, startup, training, etc. as noted in this document.
N/A		This line intentionally left blank
1 Year		Onsite Comprehensive Warranty (including Travel & Living expenses)
One Lot		Freight

Subtotal of Labor and Materials: \$56,987

State Sales Tax - NOT INCLUDED: \$

Total Project Cost: \$56,987

General Notes:

- A *** Sales Representation ***
 David Foster, P.E., of MR Systems, Inc. is the local Sales Contact. David may be reached at 678-325-2828 (Office) or 770-519-1293 (Cell).
- B *** Technical Questions ***



April 22, 2020

Bill of Materials and Labor

Qty	Tag/Loop	Description
		For technical or scope of supply questions contact Dan Sheehy, of MR Systems, Inc. Dan may be reached at 678-325-2844 (Office) or 704-467-0303 (Cell).
C	* Installation of Conduit and Wire *	This quotation DOES NOT INCLUDE the supply or physical installation of conduit or wire unless specifically noted above.
D	* Equipment Installation *	This quotation DOES NOT INCLUDE physical installation of field instruments, pipe, tubing, fittings, isolation valves, instrument stands, instrument mounts, control panels, antennas, masts, wooden poles, or other devices or other equipment unless specifically noted above.
E	* Wiring Terminations *	This quotation INCLUDES the termination of field wiring to field instruments, control panels, RTU panels, and/or other devices supplied under this scope of supply. Terminations of wiring to equipment supplied by Others are excluded unless specifically noted above.
F	* Fiber Optics Cable *	This quotation DOES NOT INCLUDE the supply or physical installation of Fiber Optic Cable.
G	* Fiber Optic Cable Termination *	This quotation DOES NOT INCLUDE termination or testing of fiber optics cable.
H	* Coaxial Cable Installation *	This quotation DOES NOT INCLUDE the physical installation of coaxial cable or other related components.
I	* Installation of Communications Towers or Poles *	This quotation DOES NOT INCLUDE the supply or physical installation of Communication Towers or Poles.
J	* Contractor License Information *	MR Systems' Tennessee Electrical Contractors License Number is 00057223 (Unlimited).
K	Intentionally left blank	
L	* Terms and Conditions *	MR Systems, Inc. General Terms & Conditions of Sale apply to any order resulting from this quotation. Please refer to the link provided below for a copy of our General Terms and Conditions of Sale. https://www.mrsystems.com/sellersterms/

Revision Notes:

Rev. 0 First Issue - 2020-04-22 - DAS



WATER RESOURCES

DASHBOARD PERFORMANCE

May 2020



MWRD FY2020-2024 CIP

NO.	PROJECT	2019-2020 2019	2020-2021 2020 Issue	2021-2022 2021 Issue	2022-2023 2022 Issue	2023-2024 2023 Issue	TOTAL
	Construction- Northeast Regional PS & Force Main						\$0
	Overall Creek PS & Force Main Upgrade						\$0
	Construction- Biosolids Processing Equipment						\$0
	TOTAL Capital Improvements funded from Debt Service	\$0	\$0	\$0	\$0	\$0	\$0

NO.	PROJECT	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	2023-2024 2024 FY	TOTAL
	Sewer rehab- Account 335	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$5,000,000
	Meters, Water/Sewer Taps, Hydrants - 280, 290, 300, 310	\$435,000	\$435,000	\$435,000	\$435,000	\$435,000	\$2,175,000
	Water lines- Account 320	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$1,750,000
	Sewer Lines - Account 330	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$1,750,000
	Biolsolids Processing Equip & Storage Sinking Fund	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000
	Walter Hill Dam Repair/Remediation Sinking Fund	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$625,000
	Lift Station Replacement Sinking Fund	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000
	NE Regional PS & FM Sinking Fund	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000
	GAC Replacement	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$625,000
	High Service Pumps & Membrane Pump Improv.		\$1,000,000				\$1,000,000
	Vehicle and Equipment Replacement	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$7,500,000
	TOTAL Capital Improvements funded from Rates	\$5,135,000	\$6,135,000	\$5,135,000	\$5,135,000	\$5,135,000	\$26,675,000

NO.	PROJECT	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	2023-2024 2024 FY	TOTAL
	W&S CAPITAL IMPROVEMENT PROJECTS						
	Misc FY20 Working Reserve Commitments	\$1,850,000					\$1,850,000
	Biosolids Processing Equipment & Storage Addition	\$1,000,000	\$9,500,000	\$5,500,000			\$16,000,000
	Replace Biosolids Polymer System	\$100,000	\$1,350,000				\$1,450,000
	Overall Creek Pump Station & Force Main Upgrade	\$500,000	\$7,500,000	\$4,300,000			\$12,300,000
	NE Regional Engineering Design	\$500,000	\$1,500,000	\$250,000	\$250,000		\$2,500,000
	NE Regional P.S. & Force Main		\$3,000,000	\$10,000,000	\$7,500,000		\$20,500,000
	Cherry Lane / Sazerac Sanitary Sewer		\$1,000,000	\$1,500,000			\$2,500,000
	SR840 Interchange Area Sanitary Sewer	\$200,000	\$1,100,000	\$1,100,000			\$2,400,000
	Joe B. Jackson Sanitary Sewer	\$50,000	\$750,000				\$800,000
	MWRRF Wet Weather Treatment Train Impr	\$50,000	\$150,000	\$500,000	\$2,500,000	\$2,500,000	\$5,700,000
	Mill Street Painting, Halls Hill and Tiger Hill Tank Repairs	\$1,000,000	\$1,800,000				\$2,800,000
	Replace Pall Membranes					\$650,000	\$650,000
	High Service PS & Membrane Feed Pump Improv.		\$2,500,000				\$2,500,000
	Direct Potable Reuse Demonstration			\$350,000	\$350,000		\$700,000
	Stones River Water Qual Sampling / NPDES Permitting	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$750,000
	Subtotal CAPITAL PROJECTS	\$5,400,000	\$30,300,000	\$23,650,000	\$10,750,000	\$3,300,000	\$73,400,000
	TRANSPORTATION (Water/Sewer Imp.)						
	Bradyville Pike			\$1,500,000	\$1,500,000	\$500,000	\$3,500,000
	Jones Blvd Widening		\$500,000	\$500,000			\$1,000,000
	Cherry Lane Repurified Main Extension (14,600 LF)		\$2,000,000	\$1,000,000			\$3,000,000
	Cherry Lane Sanitary Sewer Construction	\$150,000	\$1,000,000	\$1,500,000			\$2,650,000
	SR 99 Widening- Old Fort to Cason Lane		\$500,000	\$1,000,000			\$1,500,000
	St. Clair St.		\$500,000				\$500,000
	John Rice Blvd & Rucker Lane		\$200,000				\$200,000
	Maney Avenue Reconstruction - Phase 2		\$250,000	\$250,000			\$500,000
	Wilkinson Pike Reconstruction (MCP to TL)		\$650,000	\$650,000			\$1,300,000
	Subtotal TRANSPORTATION PROJECTS	\$150,000	\$5,600,000	\$6,400,000	\$1,500,000	\$500,000	\$14,150,000
	REHABILITATION						
	Sewer Rehabilitation - Maintenance Contract	\$2,770,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$8,770,000
	INFORMATION TECHNOLOGY PROJECTS						
	IT/Computer Systems Hardware Upgrades	\$350,000	\$100,000	\$100,000	\$100,000	\$100,000	\$750,000
	Electronic Content Management (Scanning/Imaging)		\$250,000	\$250,000			\$500,000
	IT Design Services & Consulting	\$100,000	\$100,000	\$100,000			\$300,000
	Comp Maintenance Management System (CMMS)		\$400,000	\$600,000			\$1,000,000
	Subtotal INFORMATION TECHNOLOGY PROJECTS	\$450,000	\$850,000	\$1,050,000	\$100,000	\$100,000	\$2,550,000
	TOTAL Projects from Working Capital Reserves	\$8,770,000	\$38,250,000	\$32,600,000	\$13,850,000	\$5,400,000	\$98,870,000

PROJECTED RESERVE FUND BALANCE REVENUE (TAPS)	\$8,000,000	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000
SINKING FUND DEPOSITS TO RESERVES FROM RATES	\$2,375,000	\$3,375,000	\$2,375,000	\$2,375,000	\$2,375,000
SECURED MIN. BALANCE FOR WORKING CAPITAL RESERVES	\$24,331,276	\$24,817,902	\$25,314,260	\$25,820,545	\$26,336,956
PROJECTED WORKING CAPITAL RESERVE BALANCE	\$83,220,668	\$55,845,668	\$33,120,668	\$29,145,668	\$33,620,668
FUNDS ABOVE SECURED MINIMUM BALANCE	\$58,889,392	\$31,027,766	\$7,806,408	\$3,325,123	\$7,283,712

Preliminary *Draft* 5-YR CAPITAL IMPROVEMENTS PLAN (CIP)
STORMWATER UTILITY FUND, FY20.-24

NO.	PROJECT	Originator	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	2023-2024 2024 FY	TOTAL
			<i>Projected</i>	<i>Budget</i>	<i>Pro Forma</i>	<i>Pro Forma</i>	<i>Pro Forma</i>	
	Neighborhood Projects (NP)							
NP-1	Memorial Blvd / Haynes Dr. Drainage Improvements	City Eng	\$125,000	\$50,000				\$175,000
NP-2	Mitchell-Nielson Drainage Project	City Eng	\$50,000					\$100,000
NP-3	Huntwood/Leaf Ave Neighborhood Drainage Imp.	City Eng	\$100,000	\$100,000				\$200,000
NP-4	Southern Meadows / Kimbro Woods Drainage Imp.	City Eng	\$500,000	\$500,000				\$1,025,000
NP-5	Liberty Dr. / Thatcher Trace Spring Box	City Eng	\$50,000	\$75,000				\$125,000
NP-6	Pennington Drive Drainage Repair/Upgrade (Added)	City Eng						\$0
NP-7	Gateway Pond Repair	Eng/MRSD						\$0
NP-8	Hardwood Drive Drainage Upgrade (Added)	City Eng	\$250,000					\$250,000
NP-9	Pacific Place/Riverrock Blvd Drainage Imp.	City Eng	\$0	\$0				\$0
	Subtotal		\$1,075,000	\$725,000				\$1,875,000
	Water Quality Improvement (Compliance) Projects (WQ)							\$0
WQ-1	Town Creek Bioretention BMP's @ Cannonsburgh	MWRD						\$0
WQ-2	Molloy Lane Water Quality Pond	MWRD	\$25,000	\$125,000	\$75,000			\$225,000
WQ-3	Rosebank Springs Constructed Wetlands	City Eng	\$35,000	\$165,000	\$115,000			\$350,000
WQ-4	Lee's Branch Stream Restoration	City Eng	\$25,000					\$25,000
WQ-5	West Fork Stones River at Cason Trail; bank repair	MWRD	\$140,000					\$180,000
WQ-6	Bear Branch Water Quality Mitigation	City Eng						\$0
WQ-7	Sinking Creek Headwater protection BMP	MWRD/Eng	\$30,000	\$50,000	\$150,000	\$150,000	\$150,000	\$530,000
WQ-8	Todd's Lake Regional Wetlands Improvements	City Eng						\$0
WQ-9	Hooper's Bottom Regional Water Quality Project	City Eng	\$25,000	\$150,000		\$175,000	\$175,000	\$550,000
WQ-10	Lytle Creek/Ridgley Road Bacteriological Reduction (Added)	MWRD	\$15,000	\$75,000	\$25,000			\$125,000
WQ-11	Memorial Blvd/VA Pond Trash Rack (Added)	MWRD						\$0
WQ-12	Spence Creek Restoration	MWRD/Eng	\$25,000	\$25,000	\$25,000			\$100,000
WQ-13	E. Lokey Ave Trash Rack at Sinking Creek	MWRD	\$30,000	\$75,000				\$105,000
WQ-14	Sinking Creek/ Northfield Blvd Commercial Retrofit Study/Project	MWRD	\$25,000	\$50,000	\$100,000			\$185,000
WQ-15	Overall Street retrofit/ bioretention - streetscape	MWRD	\$35,000	\$100,000				\$135,000
WQ-16	Downtown planter box retrofits study/project	MWRD	\$50,000	\$50,000				\$110,000
	Subtotal		\$460,000	\$865,000	\$490,000	\$325,000	\$325,000	\$2,620,000
	Public Drainage/Streets Participation Projects (PD)							\$0
PD-1	Maney Avenue Phase 2	City Eng						\$50,000
PD-2	Town Creek Conveyance (Murfree Springs to Cannonsburgh)	City Eng	\$500,000	\$250,000	\$100,000			\$900,000
PD-3	Maple St. Alley Permeable Paver Project	City Eng						\$0
	Subtotal		\$500,000	\$250,000	\$100,000			\$950,000
	Totals		\$2,035,000	\$ 1,840,000	\$ 590,000	\$ 325,000	\$ 325,000	\$ 5,445,000

EFFECTIVE UTILITY MANAGEMENT
Financial Viability
MWRD WORKING CAPITAL ACCOUNT SUMMARY

ESTIMATED Working Capital at 5/31/20

Board Designated (System Dev, Assessments, etc) as of 6/30/19	\$ 34,445,773	
Undesignated Excess Funds as of 6/30/19	48,028,398	
Estimated Reserve Revenue thru 5/31/20	6,701,868	
Estimated Reserve Expenditures thru 5/31/20	(5,998,768)	
		83,177,271

COMMITTED Reserves at 6/23/20

Warrior Dr. Westpoint S/D Watermain Participation	109,477	
Sewer Inspection Software - WinCan	53,138	
Specific Energy Pump Asset Management Software	26,100	
Hazen Sawyer Regulatory Assistance	203,700	
SSR - Biosolids Polymer System Replacement	112,235	
Rucker Lane Widening Sewer Extensions	74,095	
2018/19 Sewer Rehab Change Order #2	79,645	
S&ME - 2020 Sewer Rehab Design	440,450	
Tank Painting (Mill, Tiger, Halls Hill)	1,357,455	
ELI - Thompson Lane Utility Relocation TDOT	118,400	
SSR Task Order - High Service & Membrane Pumps	71,715	
JBS Task Order 19-05 - 3 Aerator Install WRRF	70,047	
Sewer Rehab Change Order #1	150,812	
ADS Temporary Flow Monitoring	69,000	
SEC Engineering Task Order - Salem Hwy Ph 3	17,100	
SSR Task Order Overall Creek PS Upgrade	672,939	
CIA - Cherry Lane Ph2 Utility Design	36,000	
ELI - Joe B. Jackson West P.S. and Sewer Design	39,000	
Sanitary Sewer 2019/20 Rehabilitation Contract	1,564,648	
CIS Software Upgrade V4	343,000	
Purchase of Two (2) Aerators at WRRF	38,302	
SSR Task Order - Mill, Tiger, Halls Hill Tank Painting	102,729	
SSR Task Order 201 Facilities Plan	178,818	
Biosolids Thermal Dryer Install (JBS & MR)	107,137	
Overall Creek P.S. Upgrades (VFD's)	275,428	
S&ME - 2019 Sewer Rehab Design	177,169	
WRRF Aerator 2A Gearbox Replacement	130,930	
Biosolids Small-scale Thermal Dryer	216,250	
H-S Blackman Park Sewer Design	180,000	
SEC Jones Blvd Utility Design Proposal	14,225	
Northeast Regional PS & Conv - SSR	1,836,298	
Bradyville Pike Utility Design - Neil-Schaffer	22,710	
Wilkinson Pike Utilities Design	10,190	
		8,899,142

APPROVAL Requests at 6/23/20

SSR Amend No. 7 - Bioassess Sampling & Stratification	108,800	
Overall Creek P.S. Upgrades Additions (SSR, MR, JBS)	173,681	282,481

BALANCE of Working Capital at 6/23/20 after COMMITMENTS **\$ 73,995,648**

DESIGNATED Projects Pending

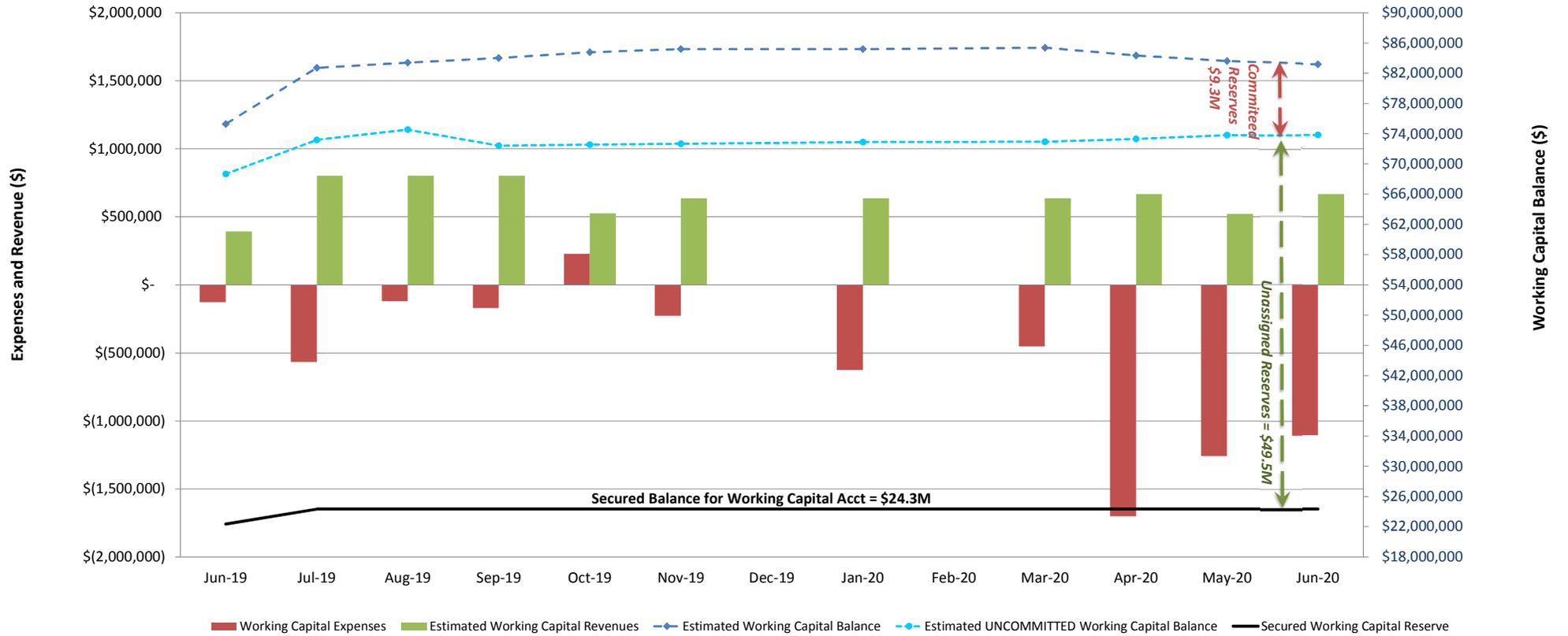
Specific Energy Distribution System Optimizer	150,000	150,000

ESTIMATED UNCOMMITTED Working Capital Reserves as of June 23, 2020 **\$ 73,845,648**

SECURED FY19-20 Operating and Maintenance Expenses **\$ 24,331,276**

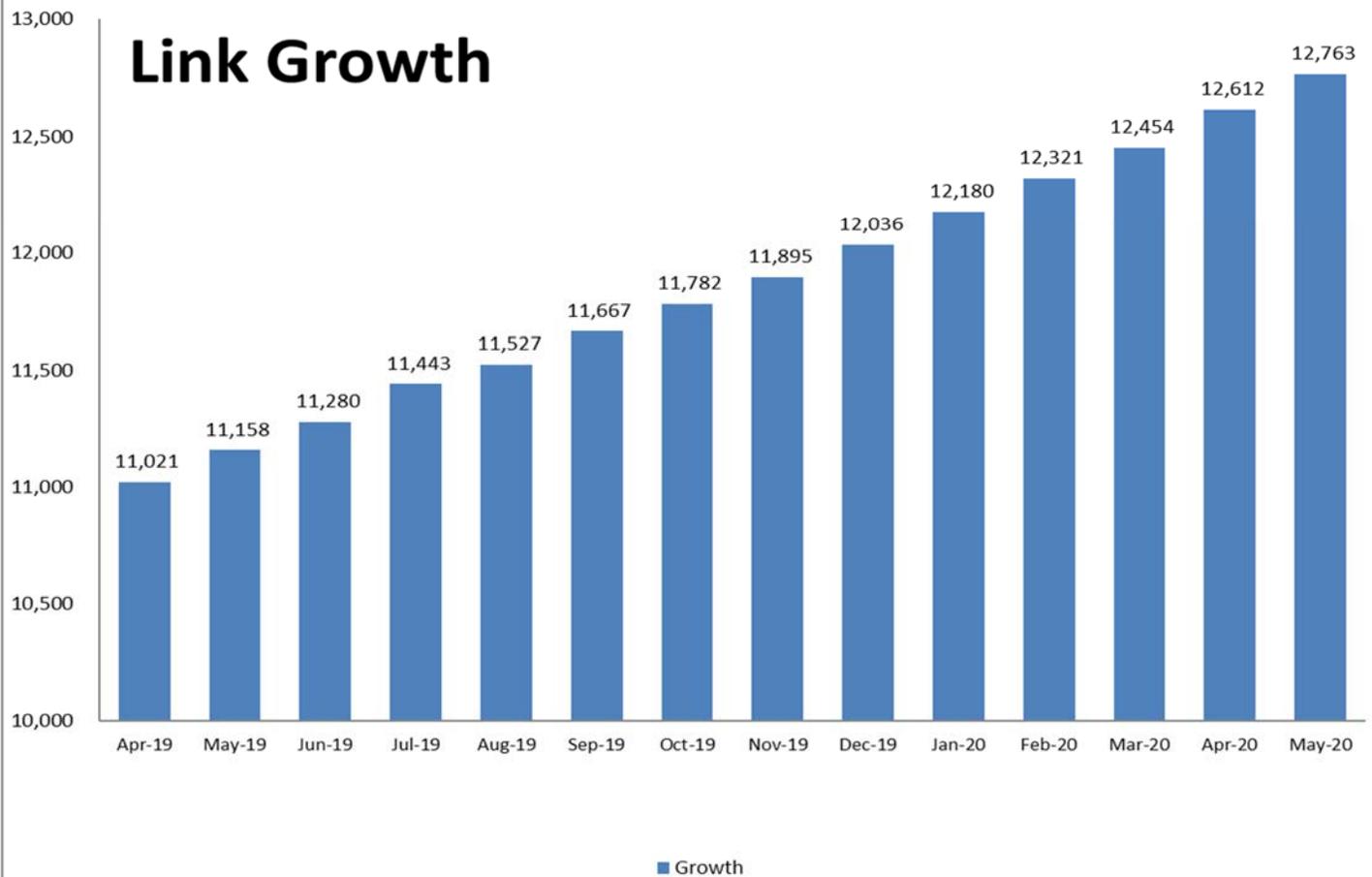
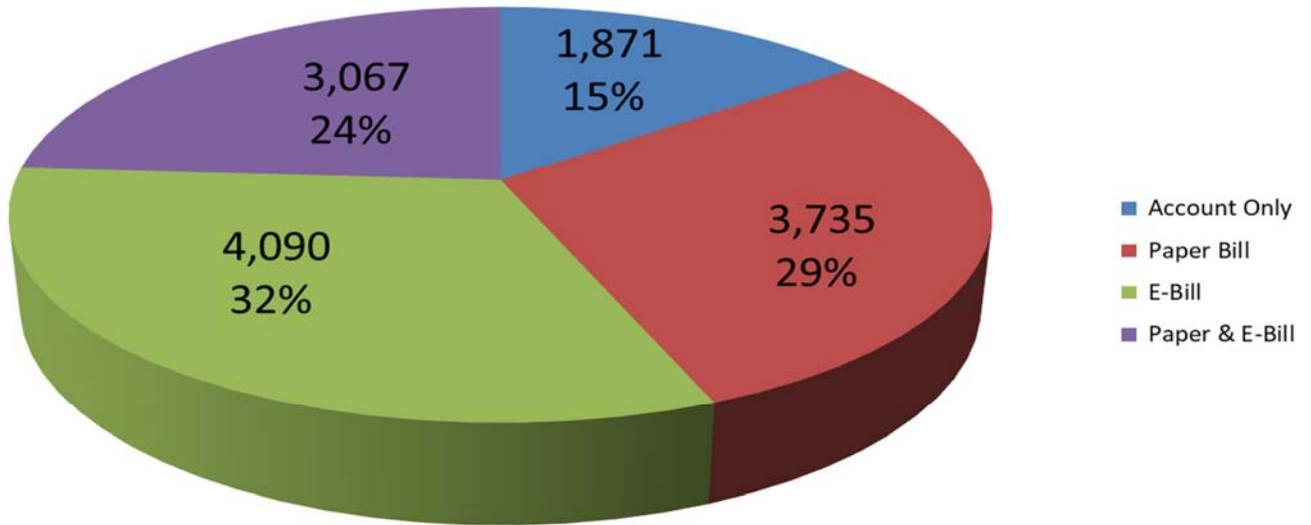
UNASSIGNED Working Capital Funds (Est. Uncommitted - Secured) **\$ 49,514,372**

MWRD Working Capital Reserves Dashboard

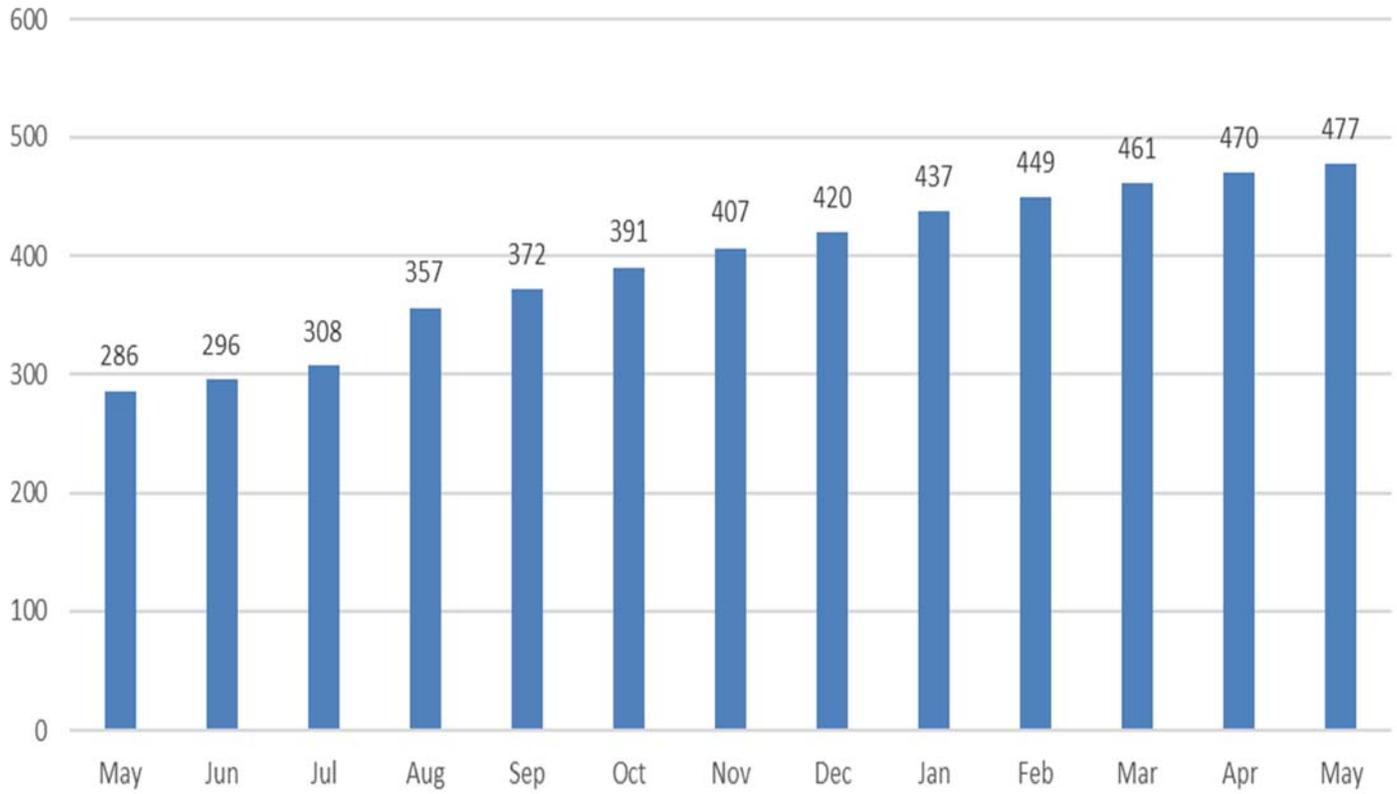


Working Capital Balance (\$)

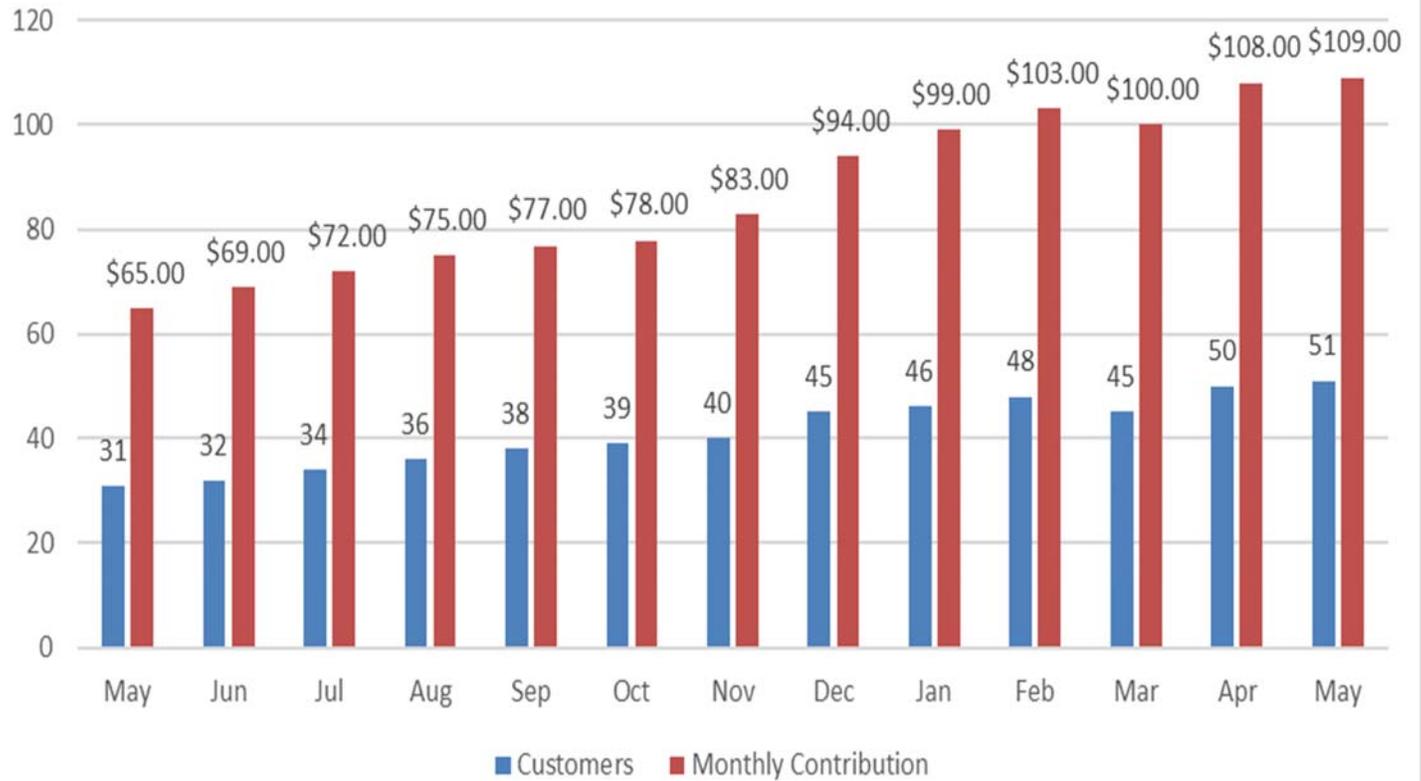
Infinity.Link Customers as of May 2020 = 12,763



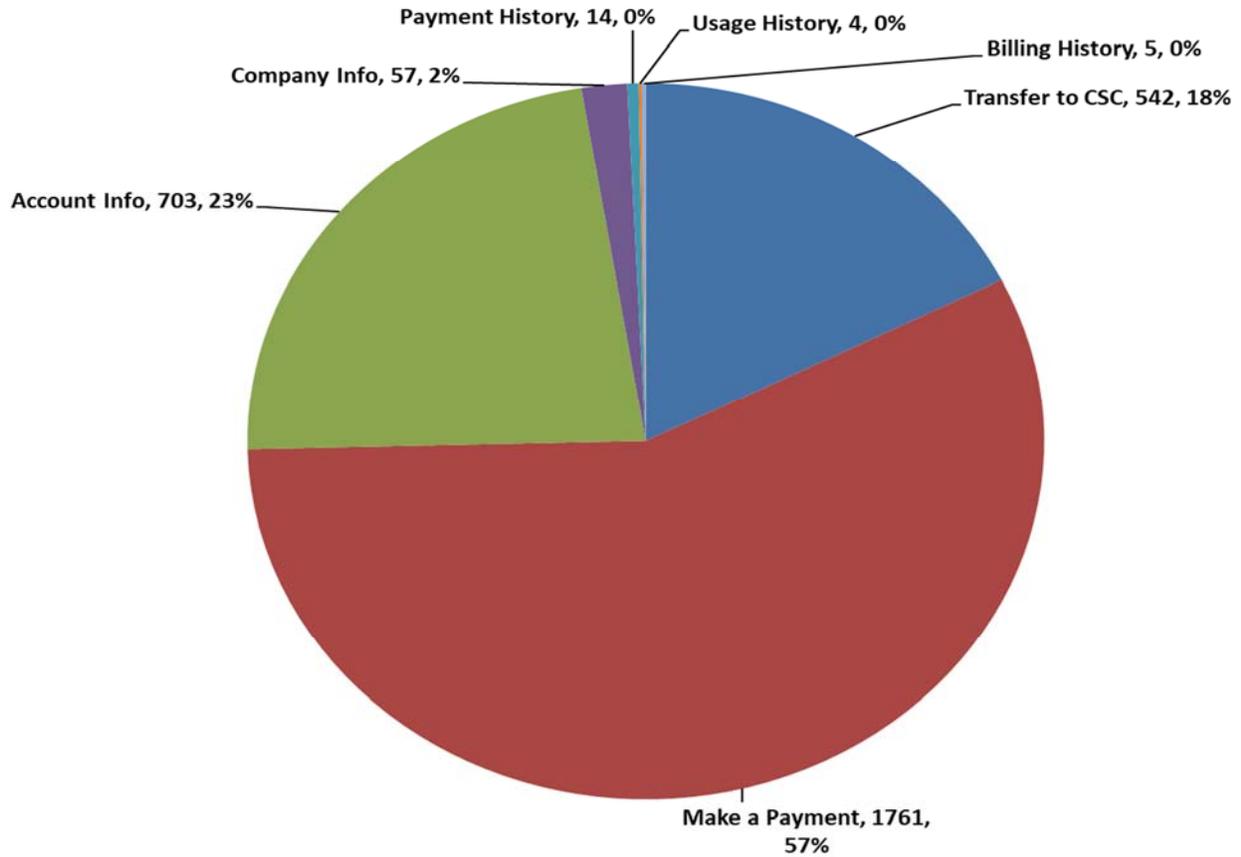
AMI Customer Portal Users



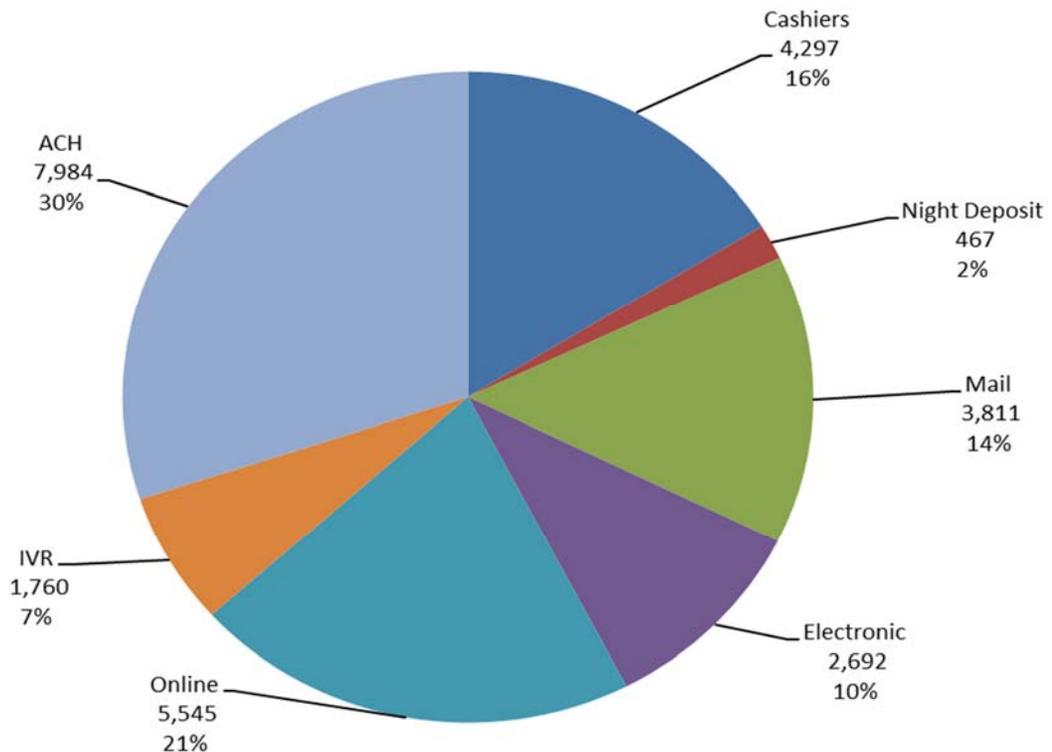
H₂O Users & Monthly Contributions



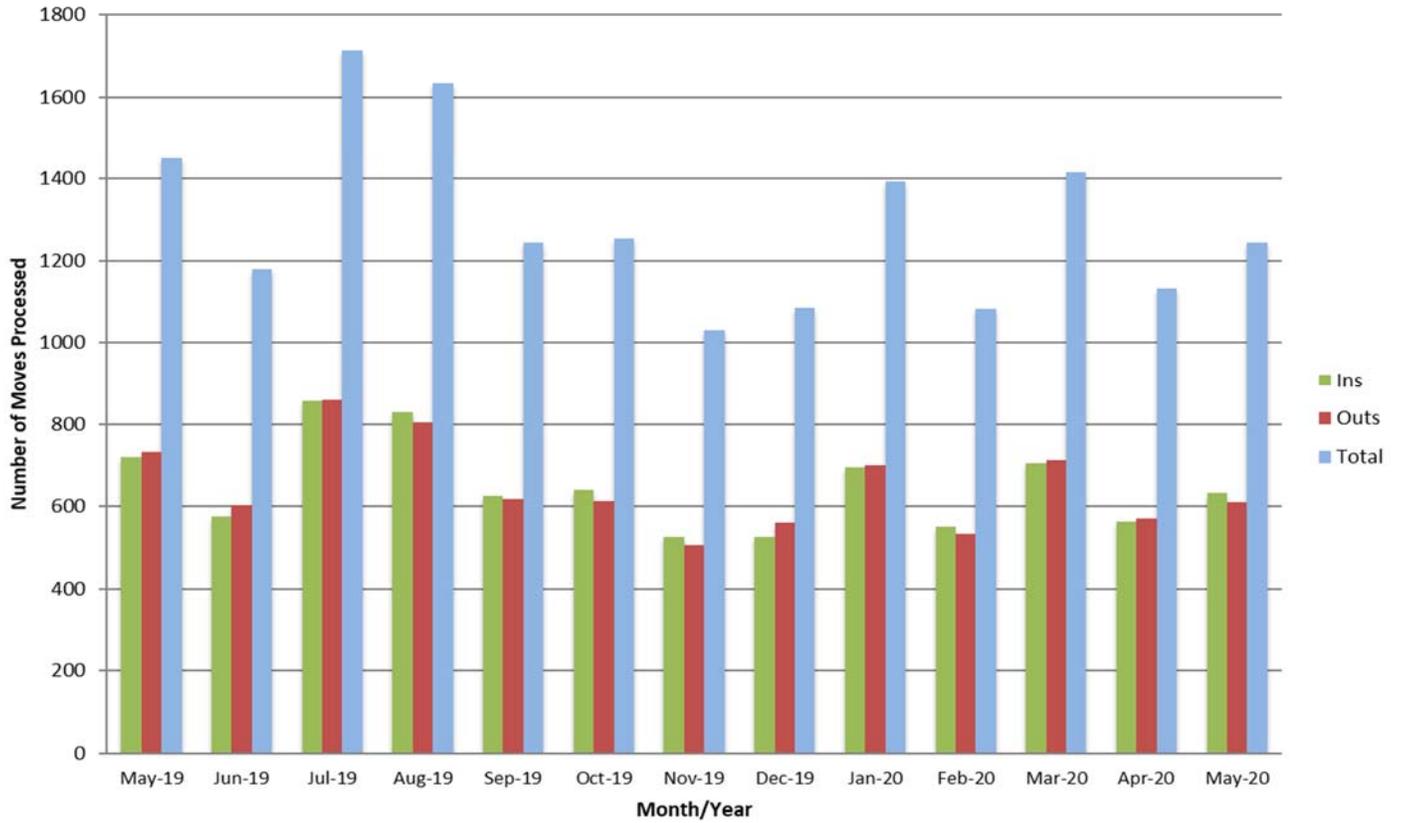
IVR Calls From 05/01-05/31/20 = 3,086



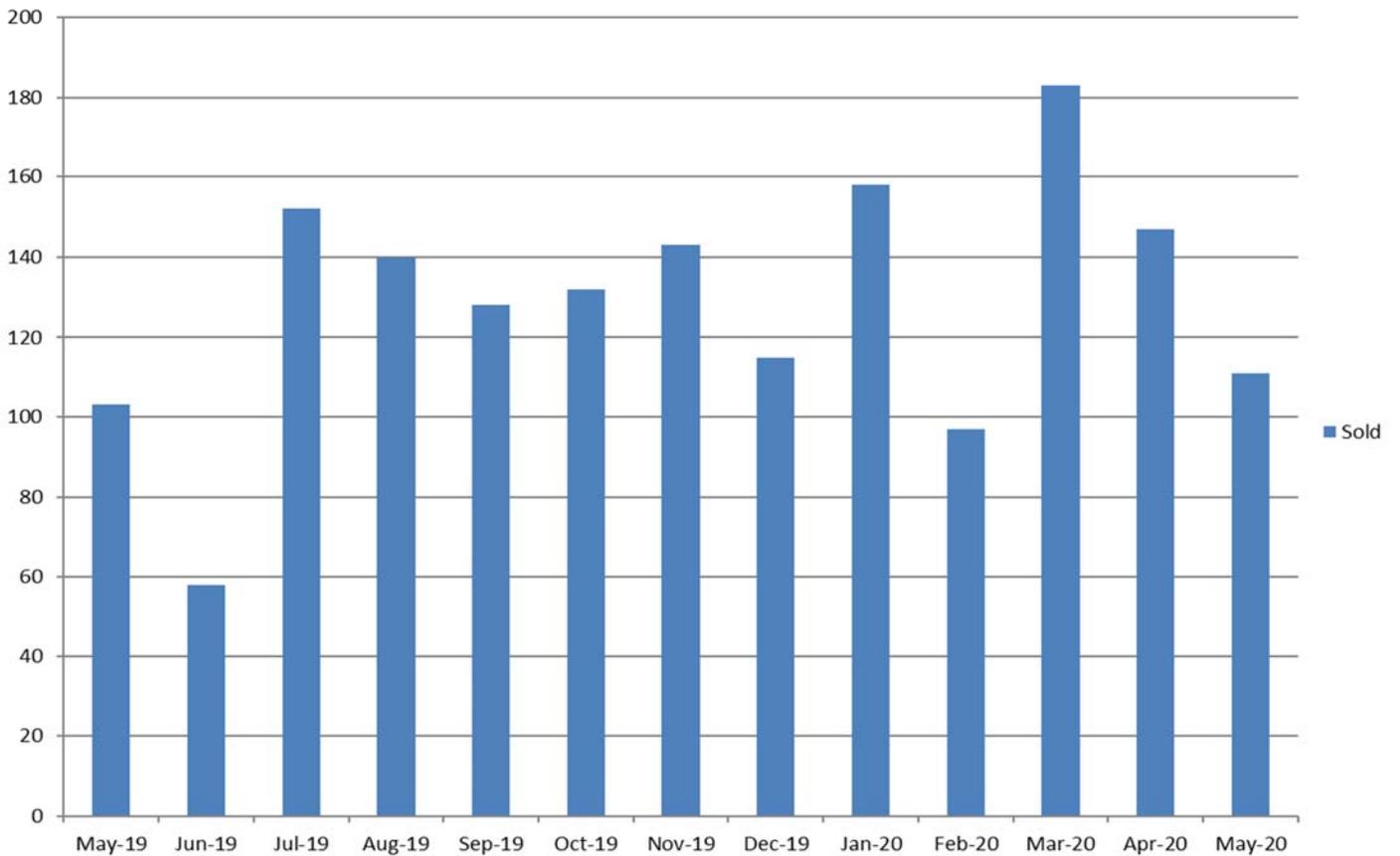
May 2020 Payments by Type



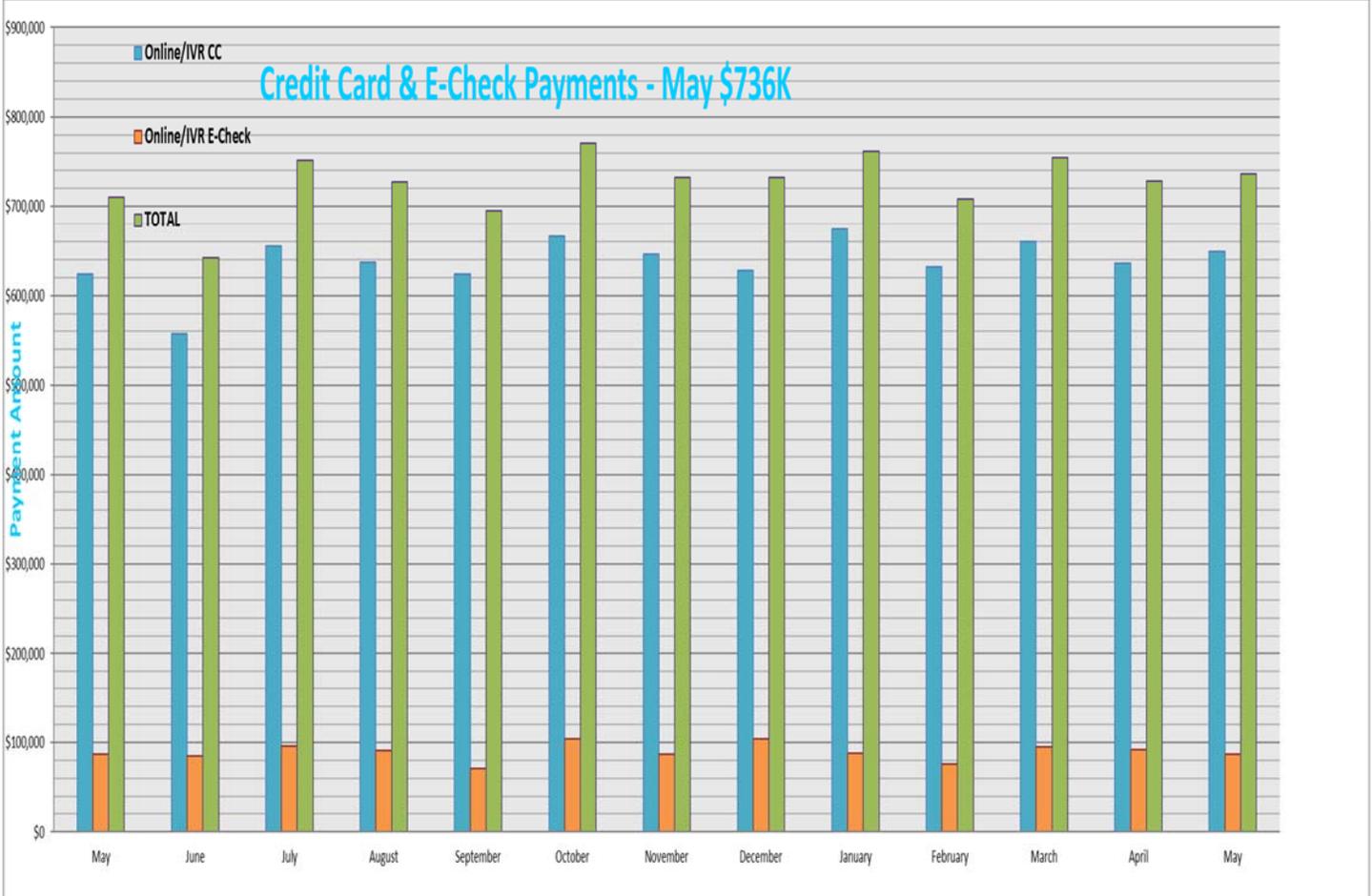
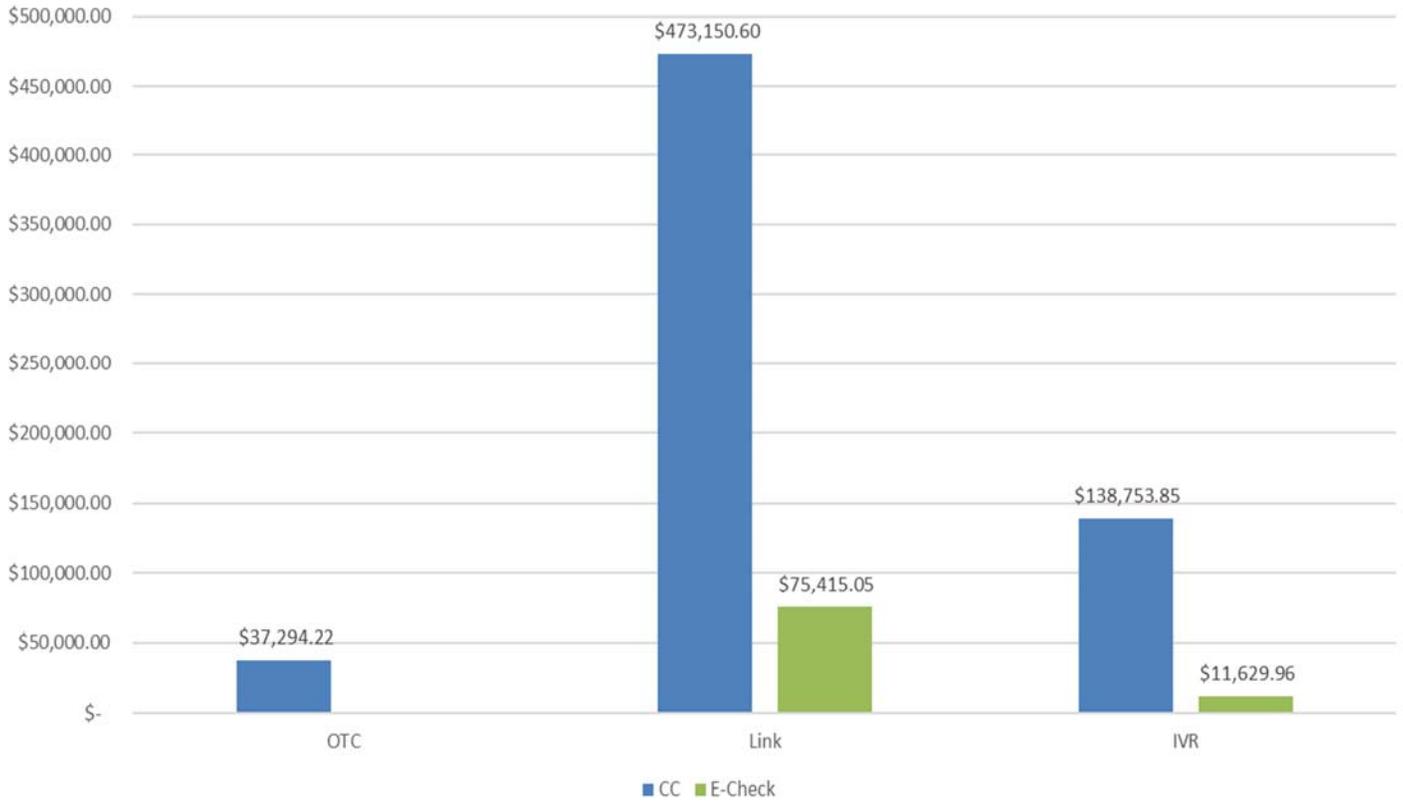
May Moves Processed = 1,244



May Taps Sold = 111



Electronic Payment Method May 2020

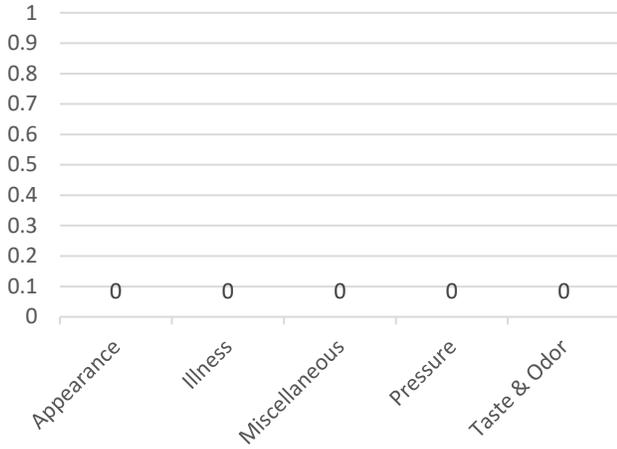


STONES RIVER WATER TREATMENT PLANT

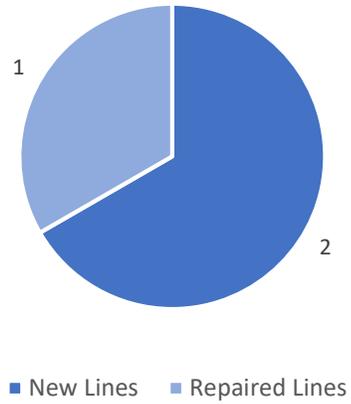
Dashboard Report

May 2020

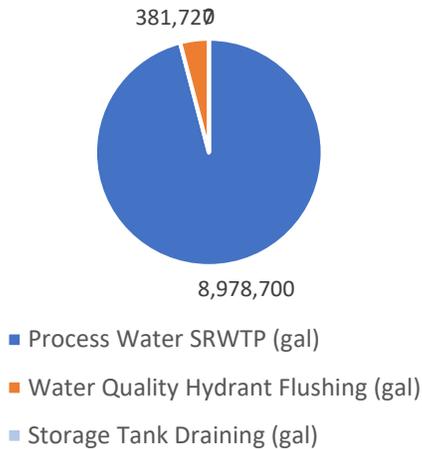
Drinking Water Laboratory Section Water Quality Complaints



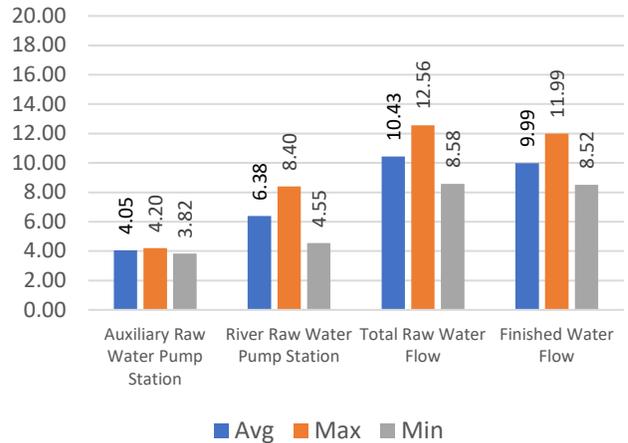
Drinking Water Laboratory Section New & Repaired Lines Tested



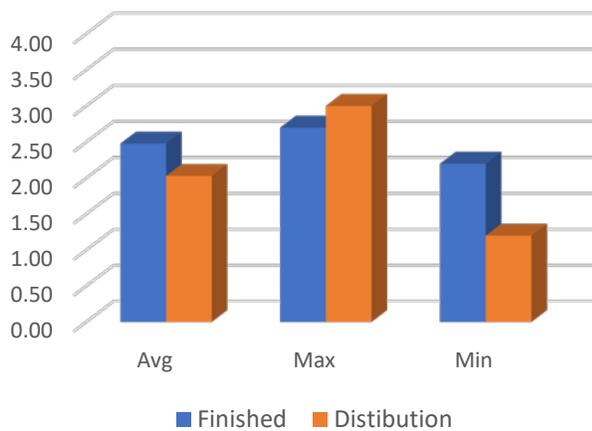
Water Quality Water Used Not Sold



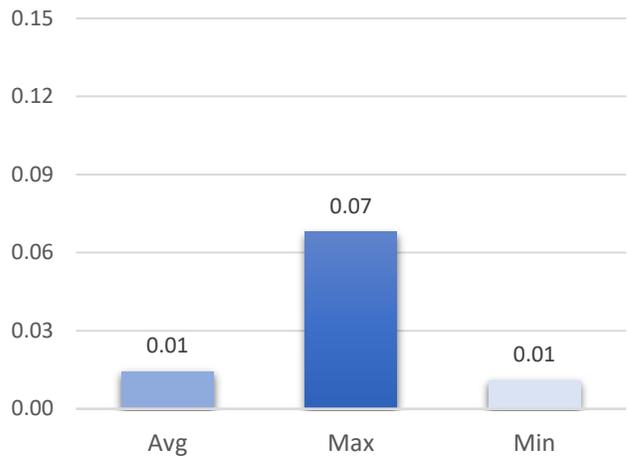
Plant Operations Section Flow (MGD)



Plant Operations Section Chlorine (mg/L)



Plant Operations Section Finished Turbidity (NTU)

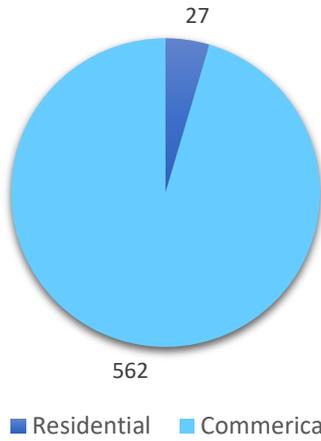


STONES RIVER WATER TREATMENT PLANT

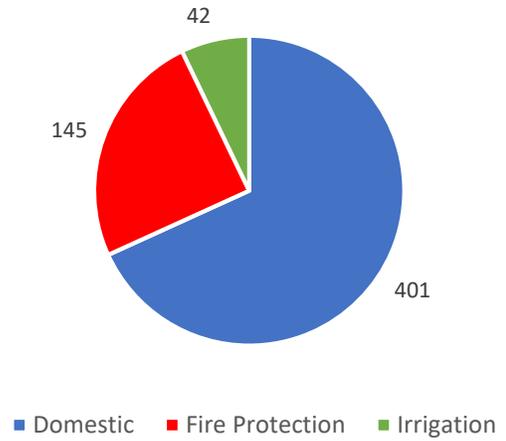
Dashboard Report

May 2020

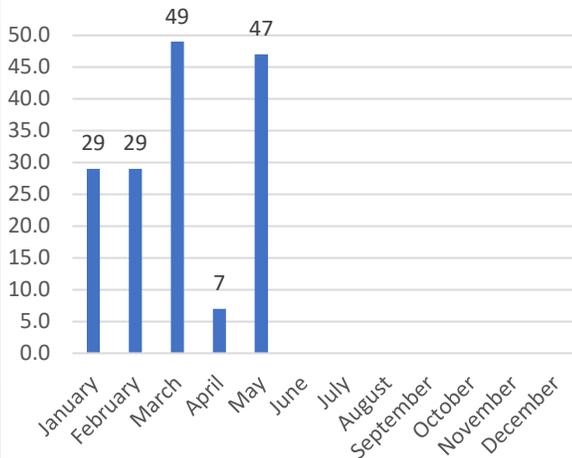
Cross-Connection Control Section Number of Devices Tested By Category



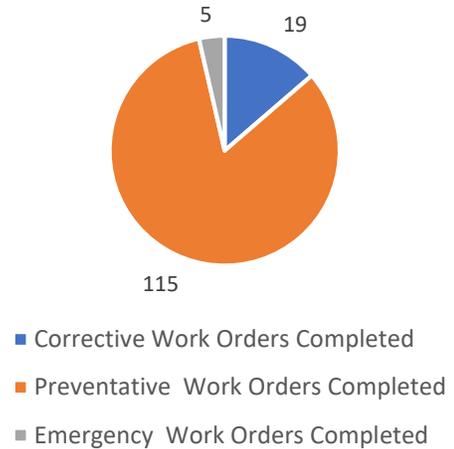
Cross-Connection Control Section Number of Devices Tested



Drinking Water Operations Section Pall Membrane Module Pin Count



Drinking Water Maintenance Section Work Order Status

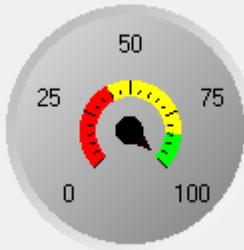


MURFREESBORO WATER RESOURCE RECOVERY FACILITY

DASHBOARD REPORT

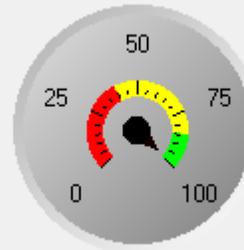
May, 2020

**BOD PERCENT
REMOVAL**



98.9

**AMMONIA PERCENT
REMOVAL**

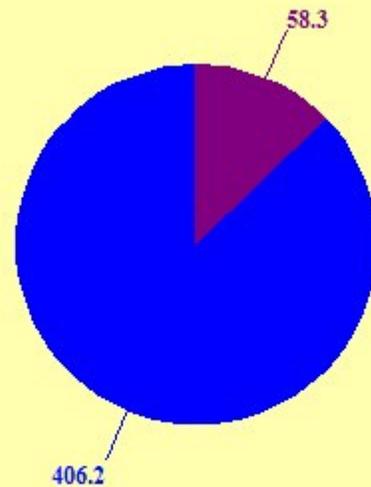


98.9

452.289
**MILLION GALLONS
TREATED**

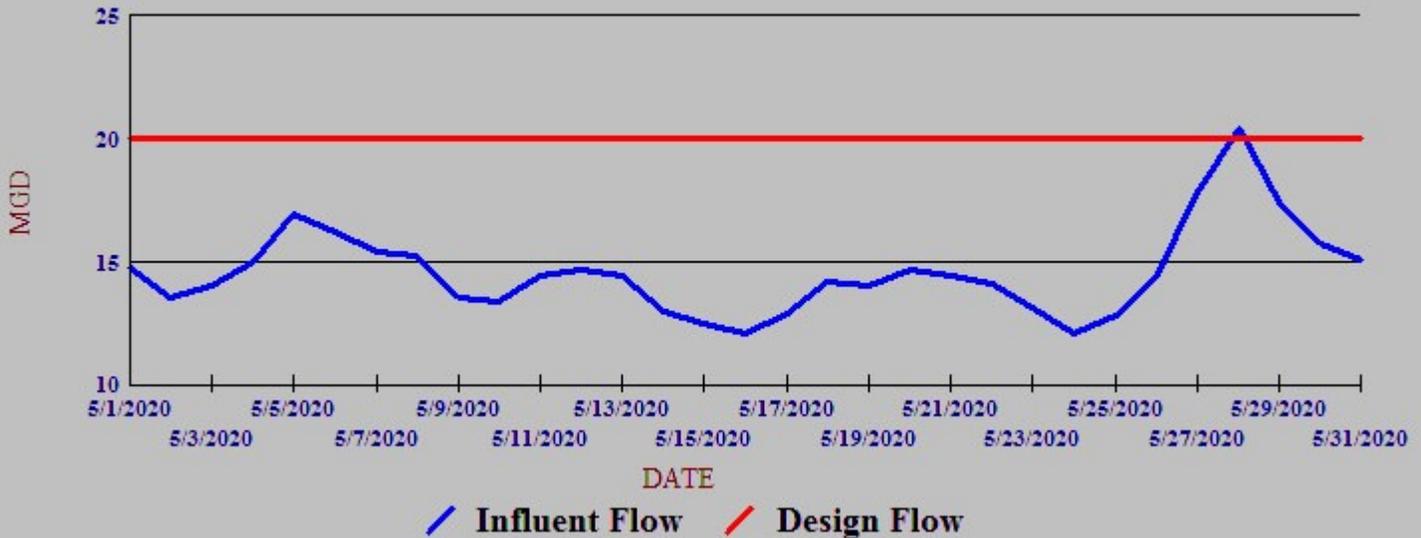
2,150.01
**TONS
BIOSOLIDS
REMOVED**

EFFLUENTS

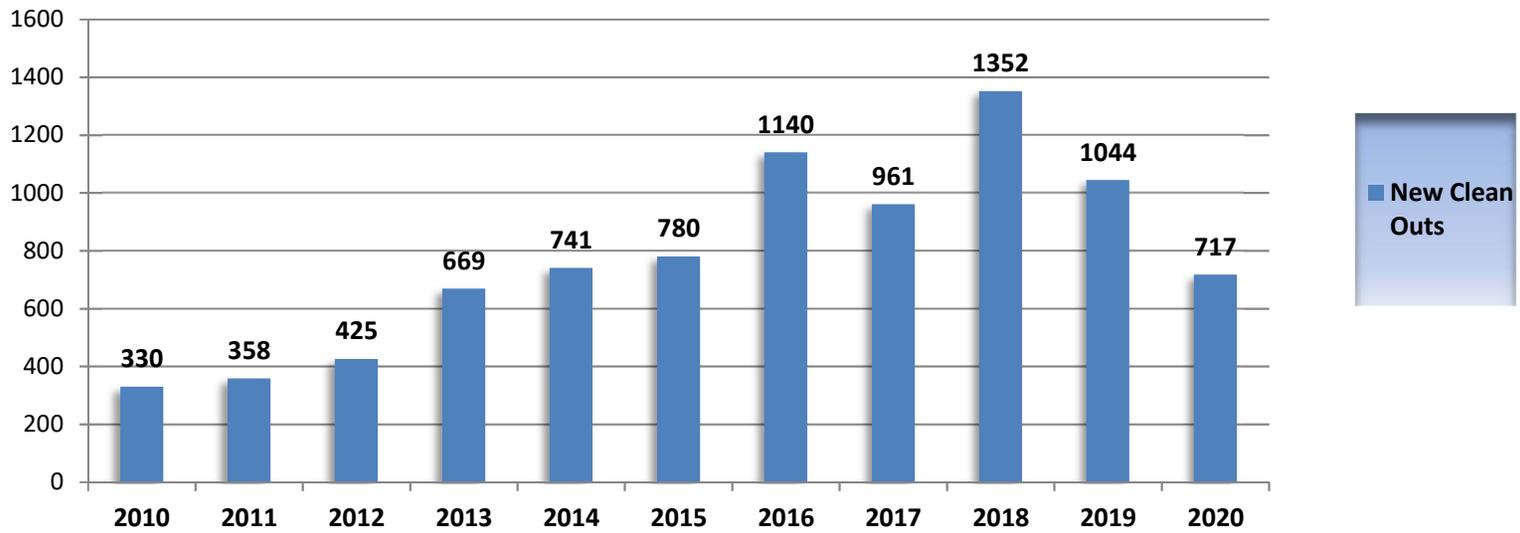


MGD
■ DISCHARGE ■ REUSE

AVERAGE INFLUENT FLOW



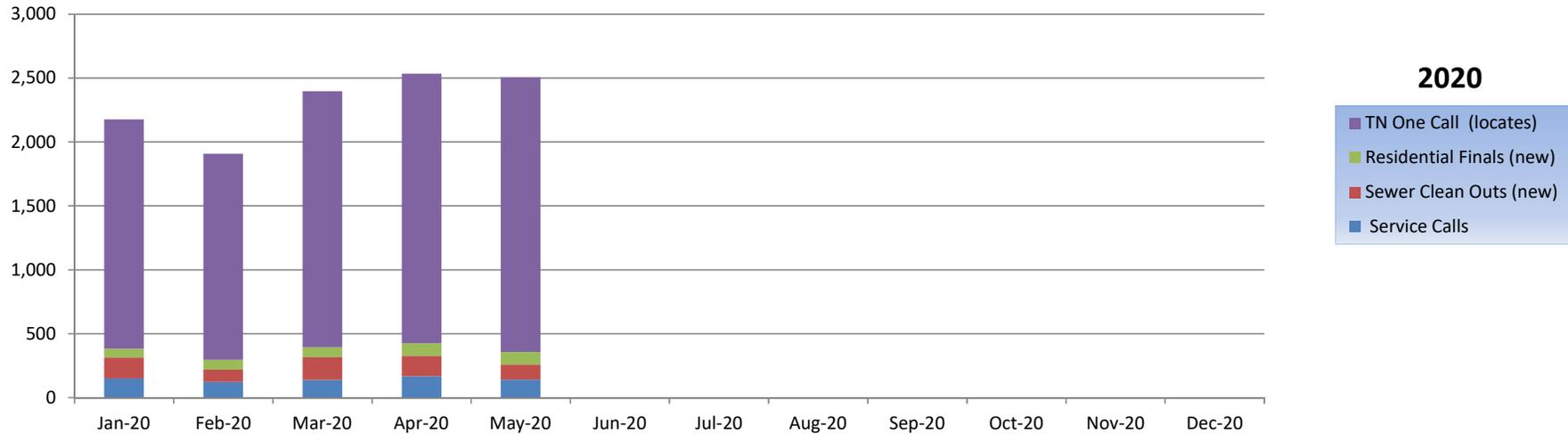
NEW SEWER CLEAN OUTS



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
New Clean Outs	330	358	425	669	741	780	1140	961	1352	1044	717

** For the calendar year Jan-Dec*

OPERATIONS & MAINTENANCE MONTHLY TOTALS



	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Total
Service Calls	148	123	138	166	139								
Sewer Clean Outs (new)	166	94	177	161	119								
Residential Finals (new)	68	79	77	96	97								
TN One Call (locates)	1,794	1,611	2,004	2,110	2,149								
TOTAL	2,176	1,907	2,396	2,533	2,504								11,516

MWRD - OPERATIONS & MAINTENANCE

ASPHALT QUOTES

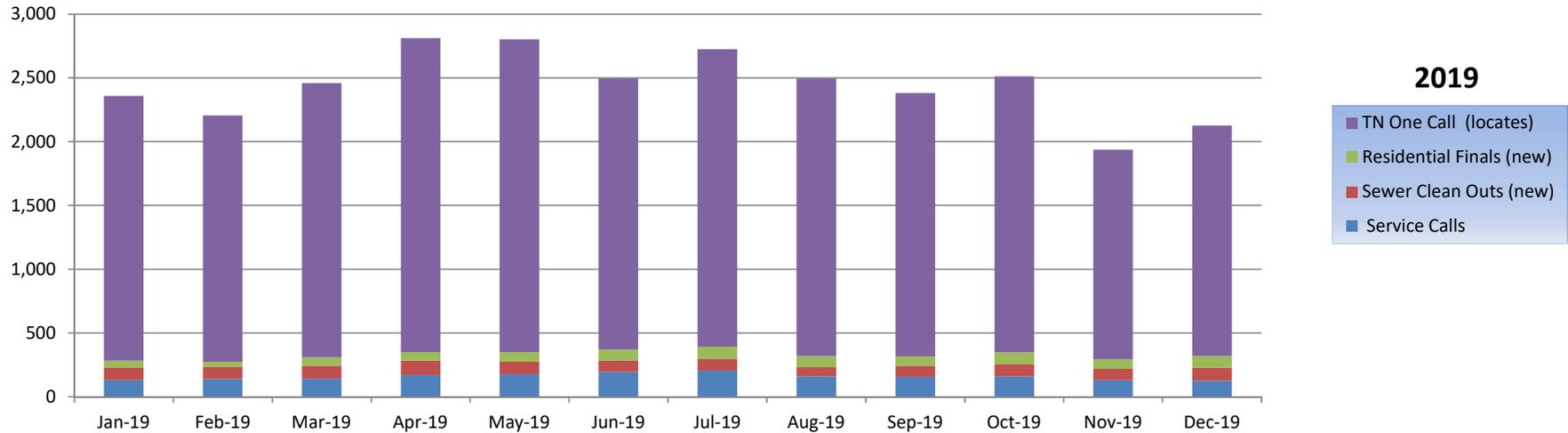
	Blue Water		Hawkins		Vulcan		Notes
	<i>Binder</i>	<i>Topping</i>	<i>Binder</i>	<i>Topping</i>	<i>Binder</i>	<i>Topping</i>	
Jul	\$49.00	\$61.00	\$48.50	\$60.50	\$58.00	\$67.50	
Aug	\$49.00	\$61.00	\$48.50	\$60.50	\$58.00	\$67.50	
Sep	\$49.00	\$61.00	\$48.50	\$60.50	\$58.00	\$67.50	
Oct	\$50.25	\$66.25	\$49.98	\$65.00	\$58.00	\$66.24	
Nov	\$50.25	\$62.50	\$48.50	\$61.25	\$56.84	\$65.96	
Dec	\$65.00	\$75.00	\$52.50	\$64.75	\$56.84	\$65.96	
Jan	\$65.00	\$75.00	\$47.50	\$60.50	\$56.84	\$65.96	
Feb	\$65.00	\$75.00	\$47.50	\$60.50	\$56.84	\$65.96	
Mar	\$65.00	\$75.00	\$47.50	\$60.50	\$56.84	\$65.96	
Apr	\$65.00	\$75.00	\$47.50	\$60.50	\$56.84	\$65.96	
May	\$65.00	\$75.00	\$54.78	\$62.88	\$55.78	\$63.88	
Jun							

MWRD OPERATIONS & MAINTENANCE

ASPHALT PURCHASES

<i>Date</i>	<i>Approval</i>	<i>Vendor</i>	<i>Type</i>	<i>Rate</i>	<i>Qty</i>	<i>Total</i>	<i>FY Total</i>
7/23	DH	Hawkins	BM	\$48.50	23.97	\$1,162.55	\$1,162.55
7/23	DH	Hawkins	411E	\$60.50	8.00	\$484.00	\$1,646.55
7/23	DH	Hawkins	411E	\$60.50	54.06	\$3,270.63	\$4,917.18
7/26	DH	Hawkins	BM	\$48.50	71.84	3,484.24	\$8,401.42
7/29	DH	Hawkins	BM	\$48.50	90.02	4,365.97	\$12,767.39
7/30	DH	Hawkins	BM	\$48.50	79.41	3,851.39	\$16,618.77
7/30	DH	Hawkins	BM	\$48.50	72.00	3,492.00	\$20,110.77
7/31	DH	Hawkins	BM	\$48.50	85.00	\$4,122.50	\$24,233.27
8/27	DH	Hawkins	BM	\$48.50	80.67	\$3,912.50	\$28,145.77
8/27	DH	Hawkins	BM	\$48.50	7.98	\$387.03	\$28,532.80
8/28	DH	Hawkins	411E	\$60.50	10.04	\$607.42	\$29,140.22
8/29	DH	Hawkins	411E	\$60.50	15.97	\$966.19	\$30,106.40
10/31	DH	Hawkins	BM	\$48.50	10.00	\$485.00	\$30,591.40
10/31	DH	Hawkins	411E	\$60.50	14.04	\$849.42	\$31,440.82
10/31	DH	Hawkins	411E	\$60.50	10.09	\$610.45	\$32,051.27
11/25	DH	Hawkins	411E	\$61.25	20.03	\$1,226.84	\$33,278.10
12/23	DH	Hawkins	411E	\$64.75	14.00	\$906.50	\$34,184.60
12/31	DH	Hawkins	BM	\$52.50	88.02	\$4,621.05	\$38,805.65
12/31	DH	Hawkins	411E	\$64.75	9.89	\$640.38	\$39,446.03
1/31	DH	Hawkins	411E	\$60.50	11.99	\$725.40	\$40,171.43
2/17	DH	Hawkins	411E	\$60.50	6.00	\$363.00	\$40,534.43
3/20	DH	Hawkins	411E	\$60.50	15.02	\$908.71	\$41,443.14
3/30	DH	Hawkins	411E	\$60.50	15.19	\$919.00	\$42,362.13
3/31	DH	Hawkins	411E	\$60.50	18.02	1,090.21	\$43,452.34
5/21	DH	Hawkins	BM	\$47.50	5.13	243.68	\$43,696.02

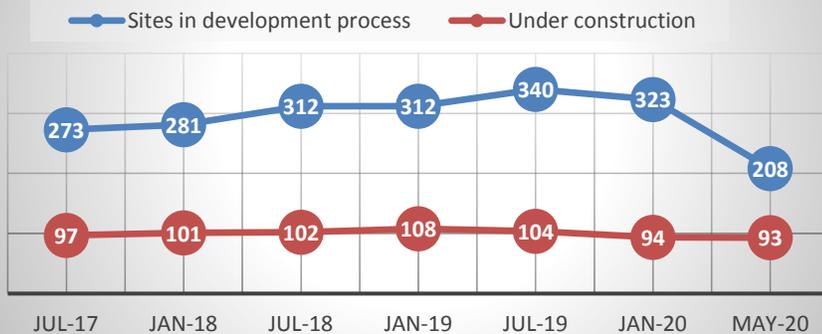
OPERATIONS & MAINTENANCE MONTHLY TOTALS



	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Total
Service Calls	129	138	139	168	176	193	205	159	156	159	128	124	1,874
Sewer Clean Outs (new)	100	95	104	115	97	91	93	72	85	94	89	102	1,137
Residential Finals (new)	52	41	65	65	76	84	93	86	75	94	75	91	897
TN One Call (locates)	2,076	1,931	2,150	2,463	2,452	2,125	2,334	2,177	2,064	2,165	1,645	1,807	25,389
TOTAL	2,357	2,205	2,458	2,811	2,801	2,493	2,725	2,494	2,380	2,512	1,937	2,124	29,297

Stormwater Dashboard - May 2020

Construction Phase Inspections of Stormwater Control Measures (SCMs)



Inspection Program

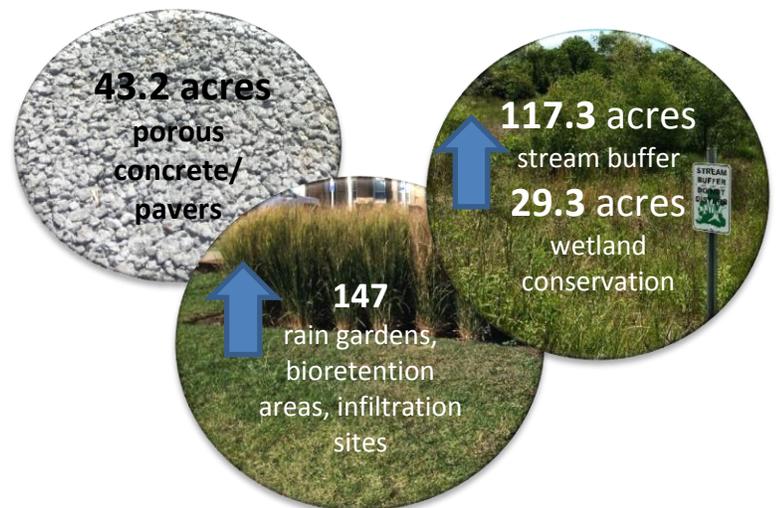
Stormwater Post Construction Inspections



Education and Outreach



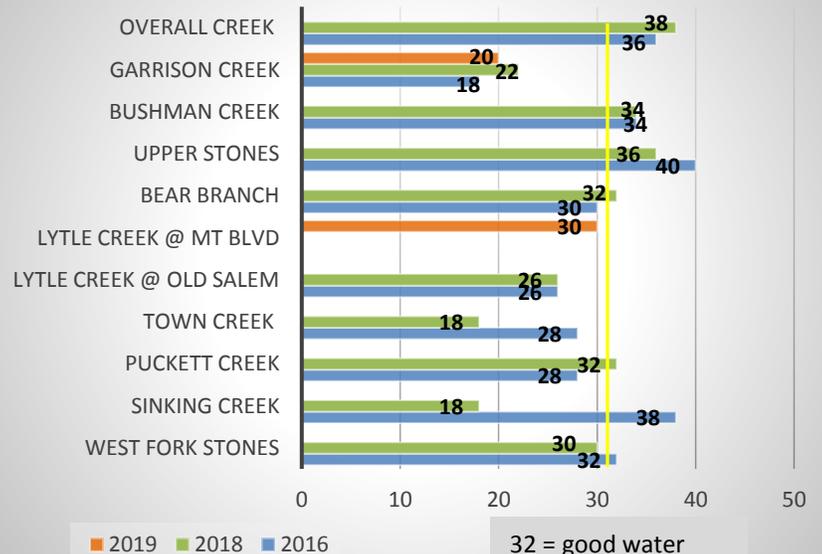
LID/ Green Infrastructure

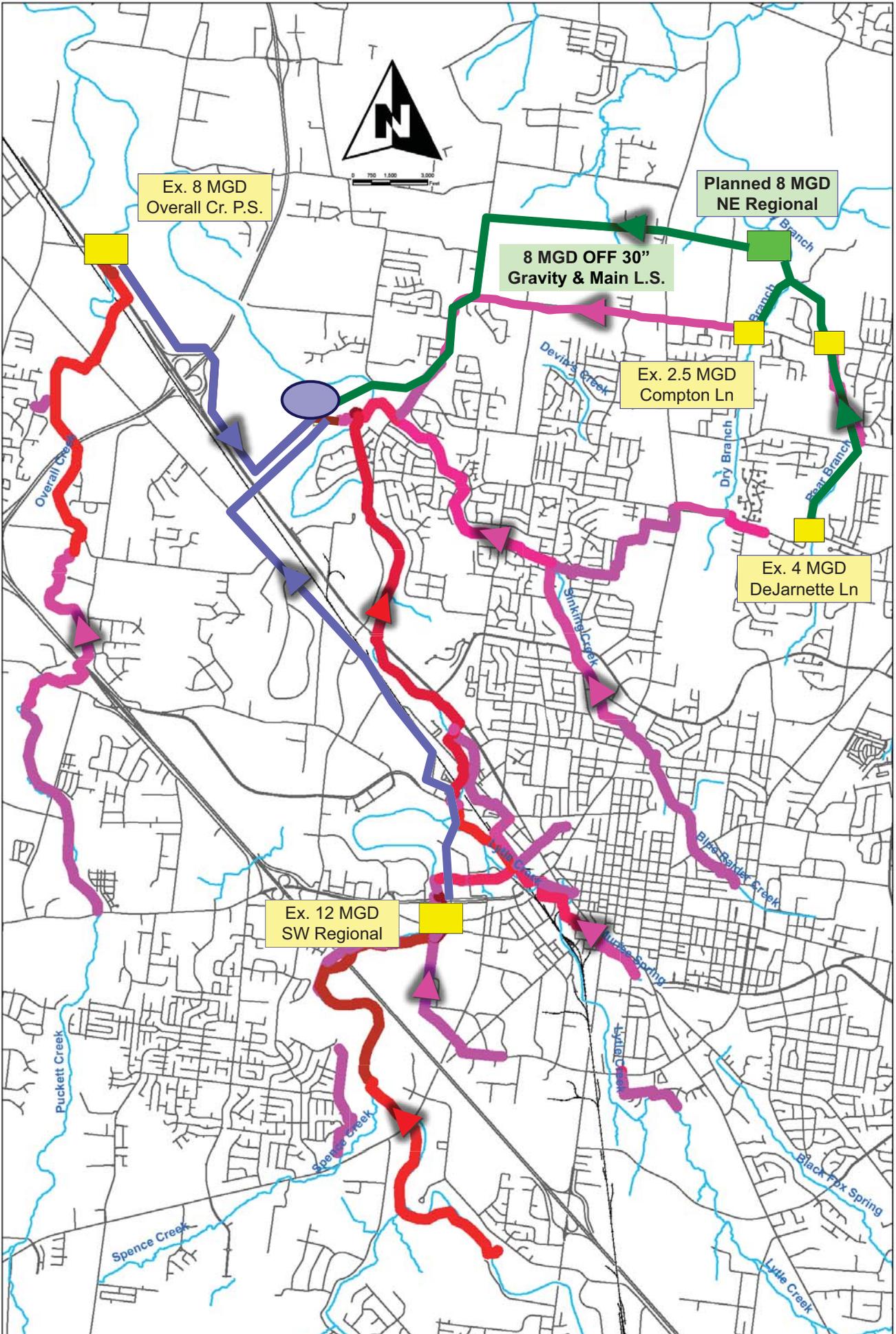


Stormwater Infrastructure

	May	YTD	Total
Junction Boxes	32	274	16,852
Headwalls	13	127	6,997
Ponds	3	18	536
Gravity Mains	4,962 ft	36,515 ft	706.8 miles
Weirs	4	10	319
WQ Units	1	3	115
Underground Storage	0	0	30

Water Quality Scorecard





**MURFREESBORO WATER RESOURCES DEPARTMENT
OPERATING REVENUES AND EXPENDITURES
ELEVEN MONTHS ENDED MAY 31, 2020**

	YTD ACTUAL	ANNUAL BUDGET	% TO BUDGET
Operating Revenues			
Water Revenue	\$ 14,622,710	\$ 16,654,000	88%
Repurified Revenue	\$ 27,470	\$ 26,000	106%
Wastewater Revenue	\$ 26,971,330	\$ 29,804,000	90%
Other Income	\$ 710,144	\$ 596,000	119%
Total Operating Revenues	\$ 42,331,654	\$ 47,080,000	90%
Operating Expenses			
Water Operating Expenses	\$ 8,890,356	\$ 11,526,114	77%
Wastewater Operating Expenses	\$ 9,992,907	\$ 12,829,162	78%
Total Operating Expenses	\$ 18,883,264	\$ 24,355,276	78%
Net Earnings from Operations	\$ 23,448,390	\$ 22,724,724	103%
WATER REVENUES			
Metered Water	\$ 13,306,122	\$ 15,200,000	88%
Water Adjustments	\$ (14,065)	\$ (26,000)	54%
Private Fire Protection	\$ 104,323	\$ 112,000	93%
Service Initiation Fees	\$ 217,935	\$ 230,000	95%
Late Fees	\$ 701,323	\$ 700,000	100%
Non-Payment Fees	\$ 115,080	\$ 180,000	64%
Returned Payment Fees	\$ 6,900	\$ 8,000	86%
Cross Connection	\$ 166,010	\$ 225,000	74%
Enernoc	\$ 19,082	\$ 25,000	76%
Miscellaneous	\$ -	\$ -	
TOTAL WATER REVENUES	\$ 14,622,710	\$ 16,654,000	88%
REPURIFIED REVENUES			
Repurified Revenue	\$ 27,470	\$ 26,000	106%
TOTAL REPURIFIED REVENUES	\$ 27,470	\$ 26,000	106%
WASTEWATER REVENUES			
Enernoc	\$ 7,004	\$ 5,000	140%
Sewer Charges	\$ 26,564,478	\$ 29,500,000	90%
Sewer Adjustments	\$ (74,337)	\$ (140,000)	53%
Surveillance	\$ 35,112	\$ 38,000	92%
Sampler	\$ 16,500	\$ 18,000	92%
BOD	\$ 256,112	\$ 275,000	93%
Amonia	\$ 51,402	\$ 60,000	86%
Septage Charges	\$ 104,890	\$ 45,000	233%
STEP Revenue	\$ 10,169	\$ 3,000	339%
TOTAL SEWER REVENUES	\$ 26,971,330	\$ 29,804,000	90%
OTHER INCOME			
Interest Earnings	\$ 526,770	\$ 400,000	132%
Inspections	\$ 136,009	\$ 166,000	82%
Miscellaneous	\$ 47,365	\$ 30,000	158%
TOTAL OTHER INCOME	\$ 710,144	\$ 596,000	119%

**MURFREESBORO WATER RESOURCES DEPARTMENT
 OPERATING REVENUES AND EXPENDITURES
 ELEVEN MONTHS ENDED MAY 31, 2020**

	YTD ACTUAL	ANNUAL BUDGET	% TO BUDGET
Water Operating Expenses			
Water Source	\$ 116,187	\$ 208,000	56%
Water Treatment	\$ 3,416,519	\$ 4,259,169	80%
Water Storage	\$ 26,050	\$ 67,300	39%
Water Distribution	\$ 1,389,402	\$ 1,776,098	78%
Cross Connection	\$ 285,124	\$ 351,959	81%
Water Plant Administration	\$ 611,404	\$ 977,419	63%
AMI Field Services	\$ 675,286	\$ 919,329	73%
O&M Admin Allocation (40%)	\$ 226,353	\$ 229,594	99%
Customer Service Allocation (50%)	\$ 580,526	\$ 690,837	84%
Engineering Allocation (40%)	\$ 309,472	\$ 463,758	67%
Field Inspection Allocation (25%)	\$ 111,745	\$ 112,868	99%
Admin Allocation (40%)	\$ 1,142,290	\$ 1,469,782	78%
Total Water Operating Expenses	\$ 8,890,356	\$ 11,526,114	77%
Wastewater Operating Expenses			
Wastewater Collections	\$ 1,732,166	\$ 2,213,855	78%
Wastewater Rehab	\$ 106,264	\$ 158,500	67%
Wastewater Pump Stations	\$ 756,433	\$ 779,924	97%
Wastewater Industrial Surveillance	\$ 266,991	\$ 320,878	83%
Wastewater House Services	\$ 11,899	\$ -	
Wastewater Treatment	\$ 2,146,590	\$ 2,953,269	73%
Wastewater Disposal	\$ 523,791	\$ 727,407	72%
WRRF Administration	\$ 739,556	\$ 916,888	81%
STEP System	\$ 2,475	\$ 24,000	10%
Repurified Treatment	\$ 39,073	\$ 121,000	32%
Repurified Distribution	\$ 4,345	\$ 29,500	15%
Repurified Disposal	\$ 230,391	\$ 309,797	74%
O&M Admin Allocation (60%)	\$ 339,530	\$ 344,391	99%
Customer Service Allocation (50%)	\$ 580,526	\$ 690,837	84%
Engineering Allocation (60%)	\$ 464,208	\$ 695,638	67%
Field Inspection Allocation (75%)	\$ 335,235	\$ 338,605	99%
Admin Allocation (60%)	\$ 1,713,435	\$ 2,204,674	78%
Total Sewer Operating Expenses	\$ 9,992,907	\$ 12,829,162	78%

**MURFREESBORO WATER RESOURCES DEPARTMENT
OPERATING REVENUES AND EXPENDITURES
ELEVEN MONTHS ENDED MAY 31, 2020**

SUMMARY OF NET TAP FEES	YTD ACTUAL	ANNUAL BUDGET	% TO BUDGET
Water Taps/Reserves	\$ 534,248	\$ 500,000	107%
Sewer Taps/Reserves	\$ 4,705,683	\$ 5,500,000	86%
Special Assessment Districts	\$ 1,467,756	\$ 2,000,000	73%
	<u>\$ 6,707,687</u>	<u>\$ 8,000,000</u>	<u>84%</u>

DEBT SERVICE	YTD ACTUAL	ANNUAL BUDGET	% TO BUDGET
Principal	\$ 11,327,539	\$ 11,547,588	98%
Interest	\$ 1,715,012	\$ 1,940,732	88%
	<u>\$ 13,042,551</u>	<u>\$ 13,488,320</u>	<u>97%</u>

Debt Coverage Ratio	YTD ACTUAL	ANNUAL BUDGET	% TO BUDGET
Operating Net Earnings	\$ 23,448,390	\$ 22,724,724	103%
Debt Service	\$ 13,042,551	\$ 13,488,320	97%
	1.80	1.68	