WATER RESOURCES BOARD

Tuesday, July 28, 2020
Operations & Maintenance Facility
1725 South Church Street
3:30 PM

A G E N D A

---

1. Consent Agenda:
   A. Consider sole source purchase of Pit Raider & Nutri Pro odor control products 2
   B. Consider purchase of GE GlobalCare Support 4
   C. Consider WRRF Zetag 8160 Polymer sole source purchase 8
   D. Consider SSR Engineering Task Order 17-41-016.0 Amendment No. 1, Northeast Regional Pumping Station and Conveyance 11

2. Consider minutes from the June 23, 2020 meeting 21

3. Consider HOBAS Pipe Inspection Final Change Order and review of results 26

4. Consider bids for 2020/2021 Sanitary Sewer Rehabilitation Contract 30

5. Consider Specific Energy Distribution System Optimizer System sole source purchase 37

6. Consider purchase of Specific Energy Pump Asset Management System for membrane feed pump station 43

7. Dashboard

8. Other business

9. Adjourn

. . . . . creating a better quality of life.

MEMORANDUM

DATE: July 20, 2020

TO: Water Resources Board

FROM: Jimmy Stacey

SUBJECT: State Chemical - Sole Source Purchase

Background

In 2013, Operations and Maintenance noticed an increase in the number of odor complaints from the Saratoga Drive area. After investigating the matter, it was found the odor was coming from the Kensington Drive Pump Station which is fed by Tortuga Court Pump Station. The force main between these two pump stations is long and often experiences low velocity. These factors create an odorous and corrosive conditions.

Operations and Maintenance conducted a trial of Pit Raider, a sole source proprietary odor control product, to improve these conditions. It is a bacteria-based hydrogen sulfide treatment combined with a nutrient supplement furnished by State Chemical Products. The trial demonstrated Pit Raider reduced hydrogen sulfide to a minimal level, virtually eliminating the odor and greatly reducing corrosive effects to the manholes. The chemicals were purchased and distributed through the Kensington Pump Station to control ongoing odor issues. Our odor complaints diminished, and the department works closely with a state chemical representative to minimize costs by maintaining optimal feed rates during summer dry and winter wet months.

Recommendations

Staff recommends the Water Resources Board recommend to City Council to approve the sole source purchase of Pit Raider and Nutri Pro odor control from State Industrial Products.

Fiscal Impact

State Chemical pricing for FY21 to distribute chemicals periodically to the Kensington Pump Station will be $1,427 for Pit Rader and $408.75 for Nutri Pro (per 55-gallon drum). The department has budgeted $50,000 in the operating account *Pump Station Operations - Odor Control.*

Attachment

State Chemical Pricing

State Chemical Solutions

Care for Work Environments®

July 18, 2020

Jimmy,

State Chemical pricing for 55 gallons for both Nutri Pro and Pit Raider for the City of Murfreesboro for the Fiscal year of 2020/2021 is as follows. During this period there will be no price increases on the product.

The price per product will be as follows:

Pit Raider D55 delivered price $1427.90

Nutri Pro D55 delivered price $408.75

Please feel free to contact me if you have any questions and as always it is a pleasure working with your team.

Best Regards,

Sherri Johnson
Territory Manager
615-972-5196 cell

Craig Adams
District a Sales Manager
State Industrial Products
855-386-8553

. . . creating a better quality of life

MEMORANDUM

DATE: July 28, 2020

TO: Water Resources Board

FROM: Ryan Potts

SUBJECT: Request to Purchase GE GlobalCare Support

Background

Our GE GlobalCare software support will expire on August 7, 2020. This software support renewal is for the GE iFix application that the Water and Wastewater Plants use to view and control the operations of the plant and remote sites. It is critical that this part of the control system continue to function as needed to enable the operators to monitor and control the processes. The GE GlobalCare Support renewal includes technical support for any issues with the iFix application and software updates.

The pricing is available single sourced from our appointed distributor, Automatech.

Recommendation

Staff recommends the Water Resources Board recommend to City Council approving the purchase of the referenced GE GlobalCare Support for 1 year in the amount of $30,153.60.

Fiscal Impact

Funding for the support would come from prepaid maintenance accounts for water and wastewater. Cost for 1-year renewal is $30,153.60.

Exhibits

GE iFix Support 2020

AutomaTech®
We Make Plant Information Flow

Remit Payment Only To:

By Electronic: Bank of America
1401 Elm Street 2nd Floor
Dallas TX, 75202
ABA Information: 111000012
Account Name: GE Digital LLC
Account Number: 4451103219

Quote #	**BMIQ-04012020-370840**
Quote Date	May 14, 2020
Expiration Date	Aug 7, 2020
Quote Revision	1
Currency	USD
Customer RFQ	
Payment Terms	Net Due in 30 Days

Primary SalesPerson **Ed Trainor**

Primary Sales Email *Orders@automatech.com*

Primary Sales Phone 508-830-0088 x 4

Vendor information: GE Digital LLC, 2700

Camino Ramon, San Ramon, CA, 94583

Bill To:	End User:
MURFREESBORO WATER PO BOX 1477 MURFREESBORO, TN 37133 **US**	MURFREESBORO WATER & SEWER 2032 BLANTON DRIVE MURFREESBORO, TN 37129-0000 **US**
Bill To CSN: 12364000	End User CSN: 13322900

IFIX

Serial No.	Base Serial Number	Type of License	Part No.	Part Description	Comments	Quantity	Level	Renewal Date	Price
3-06441401-003-001			IF58PDUNLEN-S	iFix v5.8 Plus Development Unlimited Points English SCADA Synchronization		1	Premier	Aug 6, 2021	$2,377.44
3-06441401-009-001			IF58PDUNLEN-S	iFix v5.8 Plus Development Unlimited Points English SCADA Synchronization Backup License		1	Premier	Aug 6, 2021	$1,188.80
3-25348601-003-001			IF59PDUNLEN-SE	iFix v5.9 Plus Development Unlimited Points English SCADA Synchronization Electronic Signature		1	Premier	Aug 6, 2021	$2,905.44
3-25348601-008-001			IF59PRUNLEN-SE	iFix v5.9 Plus Runtime Unlimited Points English SCADA Synchronization Electronic Signature Backup License		1	Premier	Aug 6, 2021	$1,140.80
					TOTAL	4		Aug 6, 2021	$7,612.48
								IFIX Subtotal	**$7,612.48**

DRIVER

Serial No.	Base Serial Number	Type of License	Part No.	Part Description	Comments	Quantity	Level	Renewal Date	Price

3-06441401-006-001			DR-G00P001	Drivers IGS- Industrial Gateway Server for Basic Points 1 Additional IGS Protocols		1	Premier	Aug 6, 2021	$184.00
3-06441401-012-001			DR-G00P001	Drivers IGS- Industrial Gateway Server for Basic Points 1 Additional IGS Protocols Backup License		1	Premier	Aug 6, 2021	$92.00
3-25345501-003-001			DR-G00P253V0	Drivers IGS- Industrial Gateway Server for Basic Points 253 Additional IGS Protocols IOT Gateway plug in No Tags		1	Premier	Aug 6, 2021	$184.00
3-25345501-006-001			DR-G00P253V0	Drivers IGS- Industrial Gateway Server for Basic Points 253 Additional IGS Protocols IOT Gateway plug in No Tags Backup License		1	Premier	Aug 6, 2021	$92.00
					TOTAL	4		Aug 6, 2021	$552.00
								DRIVER Subtotal	**$552.00**

ICLIENT

Serial No.	Base Serial Number	Type of License	Part No.	Part Description	Comments	Quantity	Level	Renewal Date	Price
3-06441401-015-001			IC58TSDEN-C015	iClient v5.8 Thin-Terminal Services Development English 15 Client		1	Premier	Aug 6, 2021	$4,078.88
3-06441401-018-001			IC58TSDEN-C015	iClient v5.8 Thin-Terminal Services Development English 15 Client Backup License		1	Premier	Aug 6, 2021	$2,039.36
3-25348601-013-001			IC59TSDEN-C017E	iClient v5.9 Thin-Terminal Services Development English 17 Client Electronic Signature		1	Premier	Aug 6, 2021	$4,917.44
3-25348601-016-001			IC59TSDEN-C017E	iClient v5.9 Thin-Terminal Services Development English 17 Client Electronic Signature Backup License		1	Premier	Aug 6, 2021	$2,458.72
					TOTAL	4		Aug 6, 2021	$13,494.40
								ICLIENT Subtotal	**$13,494.40**

HISTORIAN

Serial No.	Base Serial Number	Type of License	Part No.	Part Description	Comments	Quantity	Level	Renewal Date	Price
3-06441401-021-001			HS60E0000500000-M2	Historian v6.0 Enterprise 5000 Points Two Mirror		1	Premier	Aug 6, 2021	$4,854.72
3-25348601-019-001			HS70S0000250000	Historian v7.0 Standard 2500 Points		1	Premier	Aug 6, 2021	$2,184.80
					TOTAL	2		Aug 6, 2021	$7,039.52
								HISTORIAN Subtotal	**$7,039.52**

PORTAL

Serial No.	Base Serial Number	Type of License	Part No.	Part Description	Comments	Quantity	Level	Renewal Date	Price

3-25348601-022-001			PO35E005	Portal v3.5 Enterprise 5 CALs		1	Premier	Aug 6, 2021	$1,455.20
					TOTAL	1		Aug 6, 2021	$1,455.20
								PORTAL Subtotal	**$1,455.20**

Total: **$30,153.60**

Send Purchase Order and/or Correspondence to: ORDERS@AUTOMATECH.COM

PLEASE LIST THE FOLLOWING AS THE VENDOR ON YOUR PO:

GE Digital LLC
2700 Camino Ramon
San Ramon, CA 94583-9130

This Quote does not include any freight charges or applicable taxes. All Items are Commercial items. Please include the Quote Number from this document on your Purchase Order.

This order is expressly conditioned upon Customer's acceptance of the attached GE Terms and Conditions. GE Digital LLC is not bound by any terms on Customer's order which attempt to impose any condition at variance with GE's terms attached hereto. GE's failure to object to provisions contained in any of Customer's forms shall not be deemed an acceptance of any of Customer's terms or a waiver of the provisions of GE's terms and conditions which shall constitute the entire, final, and exclusive statement of the agreement between the parties.

City of MURFREESBORO TENNESSEE

. . . creating a better quality of life

MEMORANDUM

DATE: July 2, 2020

TO: Water Resources Board

FROM: John Strickland

SUBJECT: Request to Purchase Zetag 8160 Polymer

SUMMARY

Consider the purchase of Zetag 8160 Polymer, which is used at the Water Resource Recovery Facility (WRRF) as a coagulant to dewater sludge, from sole source Solenis LLC.

STAFF RECOMMENDATION

Recommend to City Council approving the purchase of Zetag 8160 Polymer from sole source Solenis LLC at a cost of $1.75/pound through September 30, 2020, $1.80/pound 10/1/20 to 9/30/22, and $1.85/pound 10/1/22 to 9/30/23.

BACKGROUND INFORMATION

TDEC and the EPA require proper disposal of solids removed from the treatment process. In 2000, the WRRF began dewatering sludge, so that the solids could be disposed in the landfill. From the beginning, Fournier dewatering presses using Zetag 8160 Polymer have been effectively used to accomplish this task. Fournier exclusively uses Zetag 8160 Polymer and its effectiveness has been confirmed through In-House and independent testing. The estimated annual cost for polymer is $190,000 and the per pound price over time is tabulated below:

Price/Pound	Effective Dates
$1.75	Current to September 30, 2020
$1.80	October 1, 2020 to September 30, 2022
$1.85	October 1, 2022 to September 30, 2023

FISCAL IMPACT

The expenses for Zetag 8160 Polymer are reflected in the Fiscal Year 2020-21 Operating Budget. The prices will be good through September 30, 2023.

ATTACHMENTS

Sole Source Letter
Contract Pricing

solenis.com

Re: Sole Source

To Whom It May Concern:

This letter is written to confirm that Solenis LLC is the sole source manufacturer of the following product(s):

Zetag 8160

In addition to this product, Solenis also packages the Zetag 8160 to a specific package size of 500KG to complement the size/weight requirements the City of Murfreesboro, TN.

Our products contain unique formulations which make them among the best in the industry and they are protected by patents, trademarks and other service marks. These products are available only from Solenis LLC or its authorized agents, distributors and resellers.

For more information on Solenis products, please contact your authorized representative or visit: www.Solenis.com

Sincerely,

Your Solenis Team
2475 Pinnacle Drive
Wilmington, DE 19803

solenis.com

July 9, 2020

Mr. Greg Hicks
City of Murfreesboro
300 Southeast Broad Street
Murfreesboro, TN 37130
ghicks@murfreesborotn.gov

RE: Pricing for Zetag 8160

Solenis LLC is pleased to offer the following pricing for Zetag 8160:

PRODUCT	PRICE	EFFECTIVE DATES
ZETAG 8160 SSK NA 500KG	$1.75	Current - September 30, 2020
ZETAG 8160 SSK NA 500KG	$1.80	October 1, 2020 – September 30, 2022
ZETAG 8160 SSK NA 500KG	$1.85	October 1, 2022 – September 30, 2023

Either party can terminate this agreement with 60 days written notice.

Solenis manufactures among the highest quality, most cost-effective polymers in the world and provides reliable technical service and sales support to our customers.

Thank you for the opportunity to continue to be your polymer supplier.

Sincerely,

Dan Iorio
Regional Sales Manager
Midwest, NA

City of MURFREESBORO TENNESSEE

. . . creating a better quality of life

MEMORANDUM

DATE: July 22, 2020

TO: Water Resources Board

FROM: Valerie Smith

SUBJECT: Northeast Regional Pump Station (NERPS) & Conveyance Design
Smith Seckman Reid Engineering (SSR)
Task Order Amendment - 17-41-016.01

SUMMARY STATEMENT

Staff is requesting approval for Amendment #1 (attached) to SSR Task Order 17-41-016.0, which is the design of the NERPS and all associated conveyances. Staff has requested changes to the scope of work as defined below.

BACKGROUND

Since 2011, staff has proposed this regional pumping station near the Stones River Water Treatment Plant. At the July 17, 2017 meeting, the Board approved Engineering Design services for the NERPS and Conveyances. The Task Order total was broken down into three major categories:

- Planning/Report/Survey Phase Hourly with an Estimated Price of: $ 247,055
- Design: Hourly with an Estimated Price of: $1,397,340
- Bidding and Construction Phase: Hourly with an Estimated Price of: $ 586,855
- Total (Not to Exceed) Estimate: $2,231,250

The original scope of work entailed the design of both gravity sewer and force main, along with abandonment of three (3) large pump stations (PS #14, #26 & #27); pump station 14 (see attached exhibit).

Staff has requested a couple of changes to the scope of work. The first is to design an additional gravity sewer extension approximate 850' to abandon an additional pump station along English Hill Drive (PS #32) and the other change is to survey a new route for a portion of the sewer forcemain to the Tommy Hord property instead of through the rear of the Oak Leigh Subdivision.

The amount of this additional work and Amendment is $30,640. Staff believes that these changes will ultimately save the Department money with regard to overall easement purchases and the decommissioning of the electric service to PS#32.

There will still be some timing coordination of this project with the City's planned extension of Cherry Lane from Memorial Boulevard to State Route 840.

RECOMMENDATION

Staff recommends approval of SSR Task Order Amendment #1 (17-41-016.01) in the amount of $30,640 for a total revised Task Order amount of $2,261,890.

FISCAL IMPACT

The Northeast Regional Pump Station (NERPS) is the largest or most significant capital construction project foreseen in the next five (5) years. Staff established a sinking fund for this project and "sunk" $3.4M of earmarked money into the Department's working capital reserves to help pay for this capital project, since fiscal year 2015. FY21 has set aside $500,000 as a reserve expense into the working capital account as well. Additionally, in the FY17-FY21 5-yr Capital Improvement Plan, staff has identified $2,500,000 in engineering expenses and $20.5M for construction expenses.

While these funds are designated to come from the Department's working capital reserves, staff will investigate funding these projects through State Revolving Fund (SRF) loans administered through the TN Department of Environment and Conservation (TDEC) or through the TN Municipal League (TML) bond fund.

ATTACHMENTS

SSR Task Order 17-41-016.0 Memo
SSR Task Order Amendment
Northeast Regional Pumping Station Exhibit

MEMORANDUM

To:	Darren Gore
From:	Brent Fowler
Date:	July 21, 2020
Re:	Northeast Regional Force Main Route Revisions and Additional Services
Project Name:	Northeast Regional Pumping Station and Force Main
Project Number:	1741016.0

Darren,

Per WWRF Staff request, this memorandum provides information regarding revisions and additional engineering services for the proposed Northeast Regional Force Main route including decommissioning the existing English Hills Pump Station No. 32.

Background

The Board previously approved SSR Task Order 1741016.0 for the engineering report, design, and construction administration services for a new Northeast Regional Pumping Station and Force Main (NERPS/FM) conveying sewage to the Water Resource Recovery Facility Headworks. Decommissioning 3 existing pump stations, each to be served by gravity sewer and conveyed to the new NERPS, is also included in the project.

During initial planning meetings with Staff, a preferred NERFM route, a preferred NERPS location, and gravity sewer routes were identified. Later, MWRD decided to revise an approximately 5,400 linear feet section of the force main beginning at River Road and terminating at the Water Resource Recovery Facility Headworks. Refer to Route Revision 1 shown on the attached sketches. The revised route minimizes the number of impacted property owners and thus, minimizes the number of required easement acquisitions.

Additionally, MWRD staff identified another existing pump station – English Hills PS No. 32 – that can be decommissioned and served by gravity sewer, approximately 850 linear feet in length, and conveyed to the new NERPS. Refer to Route Revision 2 on the attached sketch. Decommissioning this pump station will reduce operation and maintenance (O&M) costs of the MWRD sewage collection system.

Recommendation

SSR recommends the MWRD proceed with the route revisions as they will minimize impacted property owners and reduce system O&M costs. The route revisions will require additional engineering services, including topographic, planimetric, natural resources field surveys and design of the new gravity sewer for English Hills PS 32. Topographic and planimetric surveys are included in engineering services offered in SSR Task Order 17410160. The natural resources survey is outside of the Task Order scope as a reimbursable expense but is referenced herein overall project cost valuation.

Project Costs

The original Board-approved Task Order 1741016.0 is $2,231,250.00. The cost of the additional engineering services for the revisions described is tabulated below.

2995 Sidco Dr., Nashville, TN 37204
Tel: 615.383.1113 · Fax: 615.386.8469 · www.ssr-inc.com

Additional Task Order 1741016.0 Engineering Services Revise Force Main Route Decommission English Hills PS No. 32	
Description	**Fee Estimate [1]**
English Hills PS 32 Sewer Survey and Sewer Easement	$2,500
Stream Crossing Permit	$1,500
English Hills Gravity Sewer Design, Plans, and Specification	$6,640
NERFM Route Revision Survey	$20,000
Total Estimated SSR Add Services Fee	**$30,640**

Notes:

1. Costs include design, bidding, and construction administration services.

The total cost for engineering services, including this amendment, is $2,351,890.00. The cost to complete the work for additional natural resources field survey is $2,500 and is not included in the engineering fee for Task Order 1741016.0. Rather, the cost is a reimbursable expense.

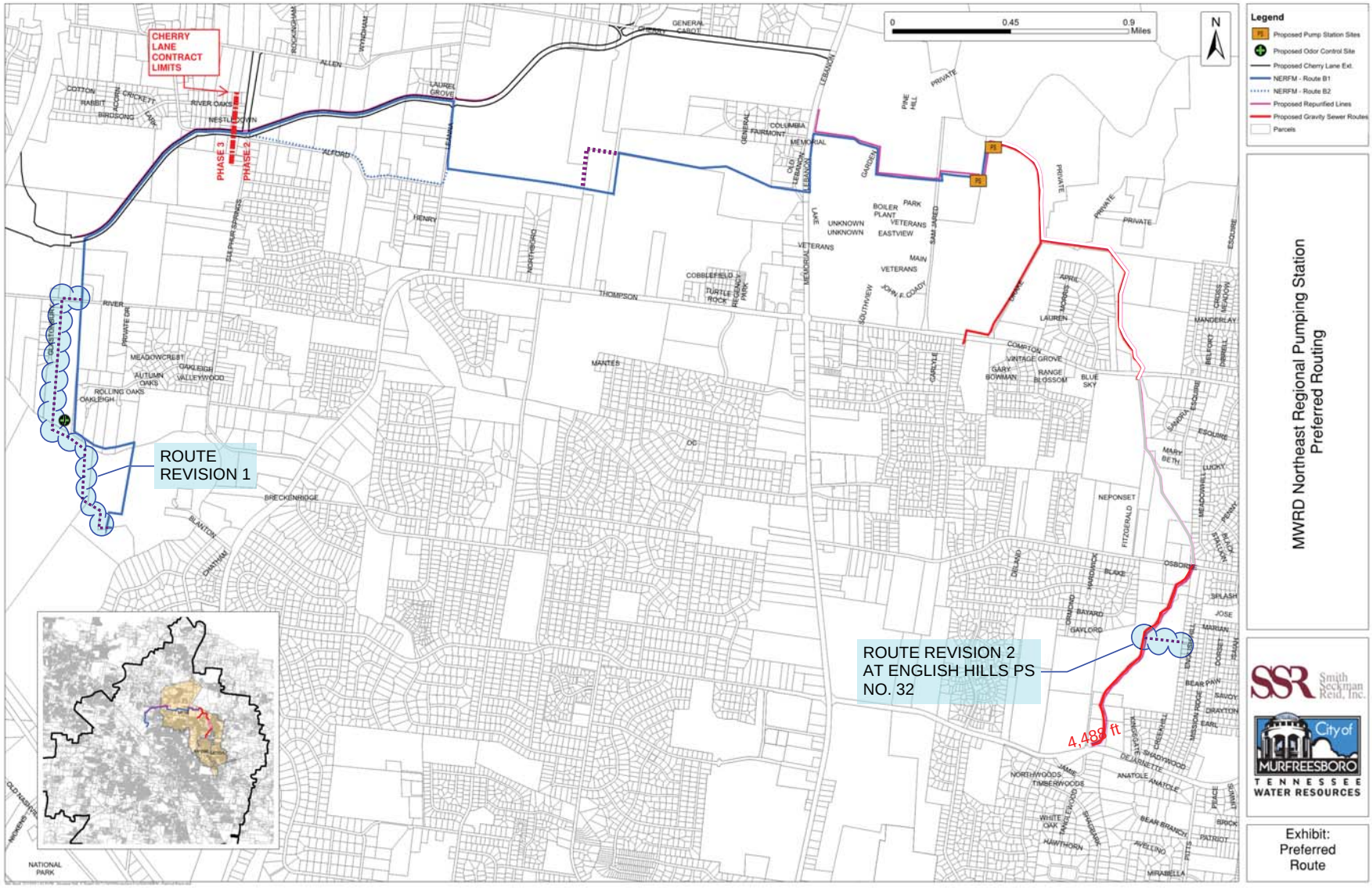
If you need additional information, please contact me.

Attachments

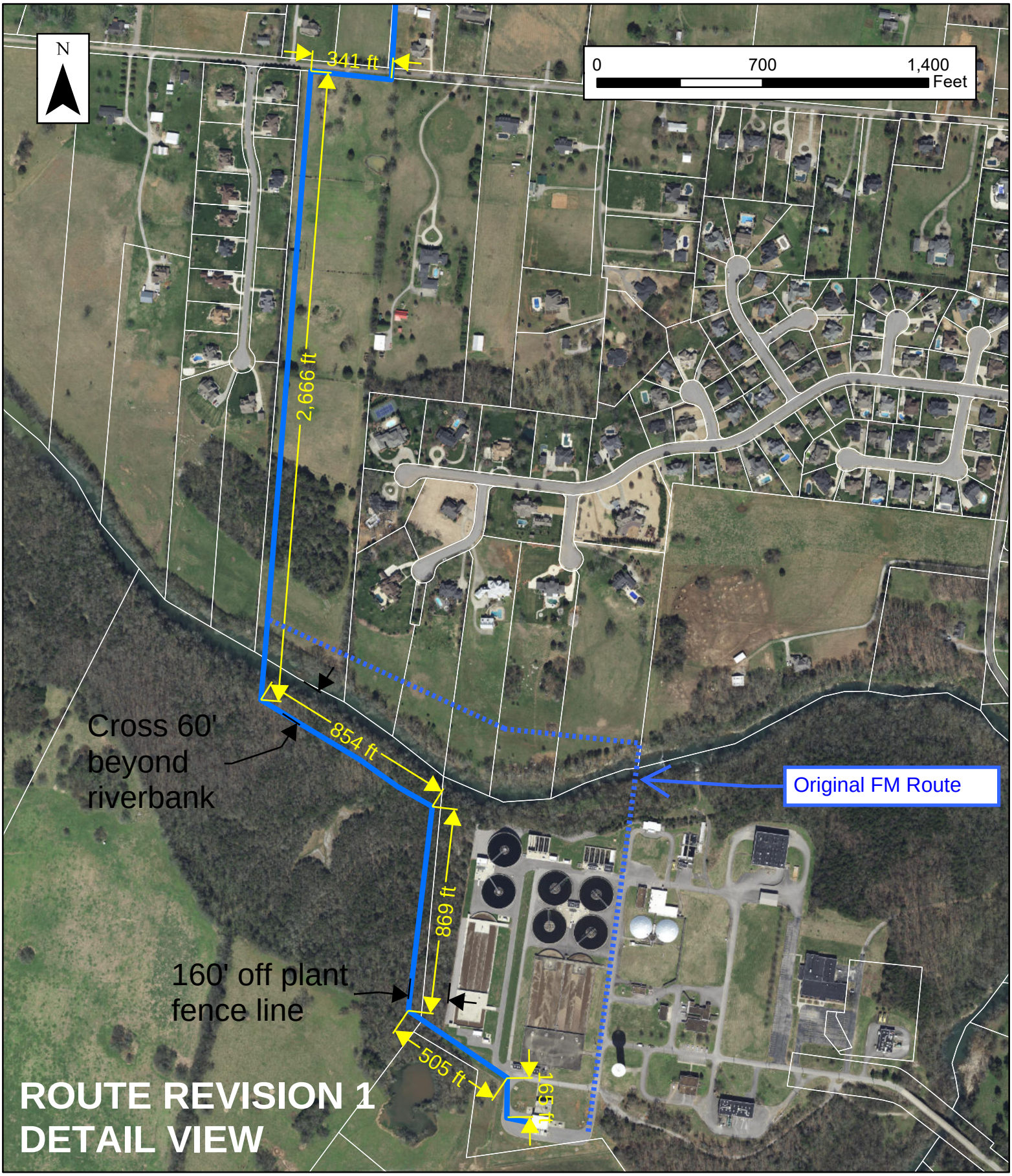
1. Route Revision Sketches.
2. Amendment No. 1 to SSR Task Order 1741016.0

2995 Sidco Dr., Nashville, TN 37204
Tel: 615.383.1113 · Fax: 615.386.8469 · www.ssr-inc.com

Attachment A. Illustration of NERPS Location and Conveyance Routing



T:\Team41\2017\17410160\Project Management\Contracts and Fee Letters\Subconsultants\External_____-Historic\Scope of Work-CulturalResources_NERPS.doc



MWRD North Regional Pump Station

Proposed Cherry Lane to MWWRF

AMENDMENT TO OWNER-ENGINEER AGREEMENT
Engineering Task Order 17-41-016.0
Amendment No. 1 .

1. *Background Data:*

   a. Effective Date of Owner-Engineer Agreement: August 3, 2017

   b. Owner: Murfreesboro Water Resources Department

   c. Engineer: Smith Seckman Reid, Inc.

   d. Project: Northeast Regional Pumping Station and Conveyance

2. *Description of Modifications:*

   a. In addition to the scope described in Task Order 17-41-016.0, this modification includes:

   Understanding of Modifications
   The OWNER desires to revise the Northeast Regional Force Main route beginning on the north side of the W. Fork Stones River at River Road and terminating at the Water Resource Recovery Facility (WRRF) Headworks. The OWNER desires to decommission the existing English Hills PS 32 and serve the drainage area by gravity sewer conveyed to the Northeast Regional Pumping Station.

   ENGINEER's Scope of Services
   ENGINEER's scope of service will include the following tasks:
   - Survey and design of approximately 850 linear feet of 8-inch gravity sewer from the existing English Hills PS 32 and connecting to the proposed 24-inch sewer along Bear Branch.
   - Easement preparation for proposed gravity sewer from English Hills PS 32.
   - Preparation and submittal of Bear Branch stream crossing permit for proposed gravity sewer from English Hills PS 32.
   - Survey of approximately 5,400 linear feet of 30-inch diameter force main from River Road to the WRRF Headworks.

   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
   No change in the time of completion is anticipated as a result of this amendment.

   Reimbursable Expenses
   - Outside Plotting and Printing: Reimbursable at Cost

Copyright © 2008 National Society of Professional Engineers for EJCDC. All rights reserved.

- Out of Town Travel: Reimbursable at Cost
- Geotechnical Exploratory Investigations, if required: Reimbursable at Cost
- Cultural and Natural Resources Field Investigations: Reimbursable at Cost

Exclusions

- Demolition design, drawings, and specifications for the existing English Hills PS 32. MWRD will take necessary action to demolish the pump station.

3. Agreement Summary (Reference only)
   a. Original Agreement amount: $2,231,250.00
   b. Net change for prior amendments: $0.00
   c. This amendment amount: $30,640.00
   d. Adjusted Agreement amount: $2,351,890.00

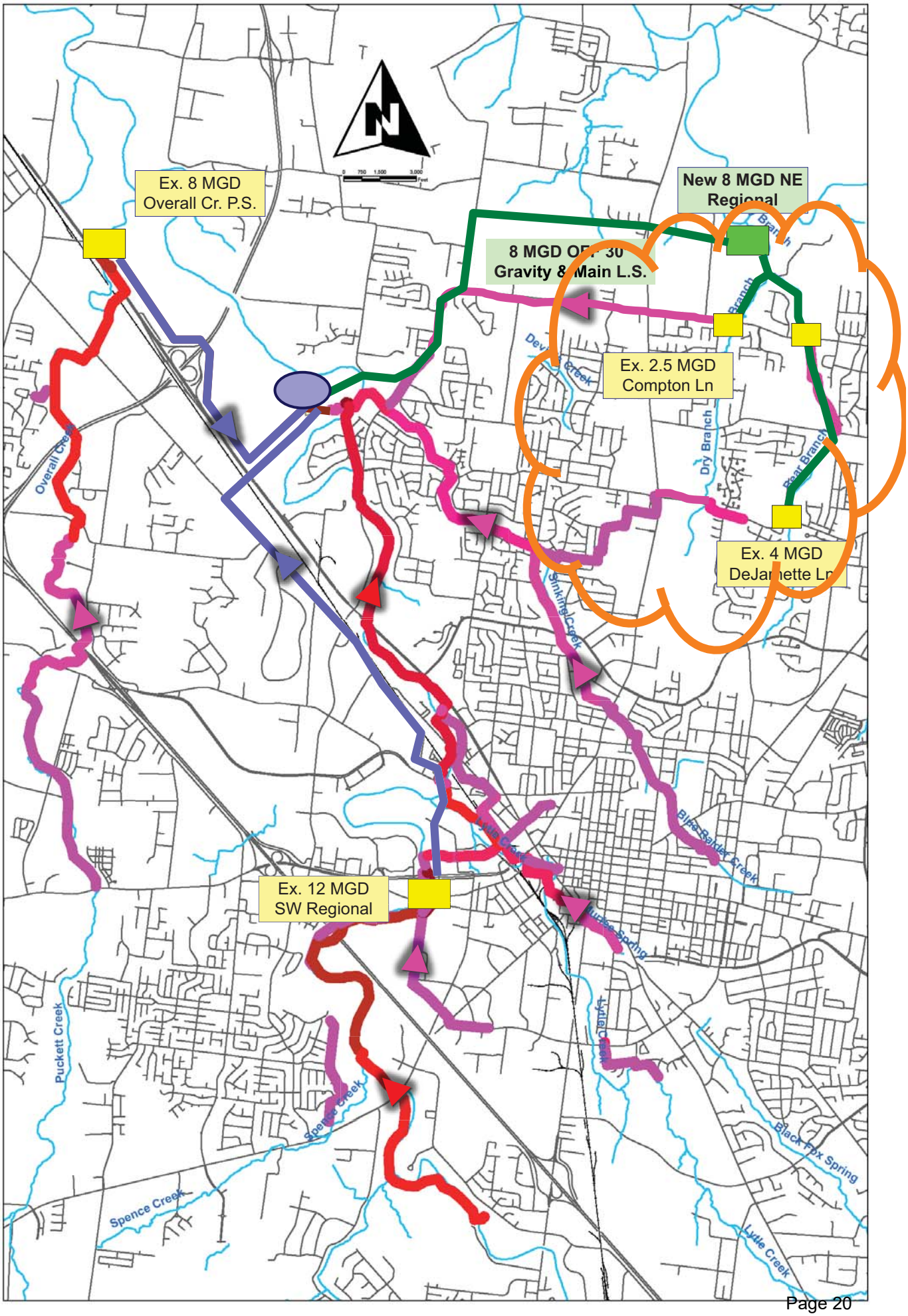
The foregoing Agreement Summary is for reference only and does not alter the terms of the Agreement.

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 _____.

Copyright © 2008 National Society of Professional Engineers for EJCDC. All rights reserved.

OWNER:	ENGINEER:
By:	By:
Title:	Title: Principal
Date Signed:	Date Signed: 7/21/2020

Copyright © 2008 National Society of Professional Engineers for EJCDC. All rights reserved.


Ex. 8 MGD
Overall Cr. P.S.
New 8 MGD NE
Regional
8 MGD OF 30
Gravity & Main L.S.
Ex. 2.5 MGD
Compton Ln
Ex. 4 MGD
DeJarnette Ln
Ex. 12 MGD
SW Regional
Overall Creek
Dry Branch
Bear Branch
Sinking Creek
Lytle Creek
Black Boiler Creek
Puckett Creek
Spence Creek
Black Fox Spring

MINUTES
MURFREESBORO WATER RESOURCES BOARD
June 23, 2020

The Murfreesboro Water Resources Board met on Tuesday, June 23, 2020 in the conference room at the Operations and Maintenance Building, 1725 S. Church Street. Consistent with the Governor's Executive Order, members of the Water Resources Board participated by electronic means as has been determined 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, Ms. Sandra Trail, Ms. Kathy Nobles, Mr. Kirt Wade, and Ms. Madelyn Scales-Harris. Also present were Darren Gore, Michele Pinkston, Roman Hankins, Robert Haley, Ryan Potts, Marshall Fall, Steve Tate, Sharon Seibert, Donald Hughes, Jimmy Stacey, Matt Powers, Alan Cranford, Joe Russell, John Strickland, Randy McCullough, Brent Fowler, Linda Sullivan, Mike Bernard, and Ronnie Martin along with other members of the public.

The Consent Agenda was presented for the following considerations:

A. Consider renewal of Memorandum of Understanding with MTSU –

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.

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.

Staff would like to renew the MOU without changes and recommended that the Board recommend to City Council renewal of the MOU.

The 2020-21 fiscal year budget included $50,000 for the MTSU education services and would be paid out of stormwater funds.

B. Consider ADS Professional Services Contract Year 1 extension –

Currently the Department is contracted with ADS, LLC to operate and maintain the Department's 19 permanent sewer flow monitors and seven 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.

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

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.

C. Consider revision to CUD/MWRD boundary –

Staff proposes to swap a small area, within the Stones River National Battlefield along Wilkinson Pike, with Consolidated Utility District (CUD). 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.

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

D. Consider Tiger Hill, Mill St., Halls Hill Water Tanks Change Control Form 1 –

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.

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

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.

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

The May 26, 2020 Board Minutes were unanimously accepted as presented.

The Board considered sole source Rotork tank actuator modifications purchase.

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.

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 staff believes 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, balance the hydraulics of the system to reduce peak pressures (which is anticipated to reduce water loss in the system), reduce pressure surges by controlling the speed of opening and closing of the valves on each tank, 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.

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.

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

Sandra Trail made a motion to approve. Dr. Carter seconded. The motion unanimously passed.

The Board considered 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.

AquAeTer 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. Staff believes the 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).

All results demonstrate the West Fork is exceeding the standard for Tennessee Macroinvertebrate Index (TMI) of 32 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. 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 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 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 summertime conditions, binding with manganese, and causing problems at Smyrna's drinking water treatment plant and creating "black" water discharge at certain residents.

Staff recommended that the Board approve Amendment No. 7 to SSR Task Order 09-47-001.2 to allow for continued biological sampling of the West and East Fork Stones River.

The extension to the stratification study is a net additional fee of $108,800 from previous approved fee ceilings. Staff recommended funding coming from the Department's working capital reserves. MWRD's 5-yr CIP earmarked $150,000 for Stones River Water Quality studies for FY21.

Dr. Carter made a motion to approve. Kirt Wade seconded. The motion unanimously passed.

The Board considered SSR Task Order 18-41-009.0, Amendment No. 1 for Overall Creek Pump Station Upgrade additions.

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), 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.

Staff recommended the Board recommend City Council 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.

The estimated recommended additional upgrades cost is $173,680.90 consisting of $102,248.90 for soft starters removal and replacement, $56,987 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.

Dr. Carter made a motion to approve. Kirt Wade seconded. The motion unanimously passed.

Under Other Business, the Board considered Outside City Sanitary Sewer request for a proposed Rutherford County Fire and EMS station.

Rutherford County has requested outside city sewer service for a proposed County Fire and EMS Station on Rockvale Elementary School property. Sewer service to this facility meets consideration criteria due to a Fire and EMS Station meeting a higher benefit to the public than annexation affords:

Staff recommended the Board recommend approval to City Council serving the proposed Rutherford County Fire and EMS Station as an outside the City sewer customer.

Sandra Trail made a motion to approve. Dr. Carter seconded. The motion unanimously passed.

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

Staff presented the Financial Reports for the year ending May 31, 2020.

There being no further business, the meeting was adjourned.

_____

John Sant Amour, Chairman

City of MURFREESBORO TENNESSEE

. . . creating a better quality of life

MEMORANDUM

DATE: July 23, 2020

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: Sewer Interceptor Inspection
Inspection Results &
Final Change Order

BACKGROUND

After having two pipe failures along our Southwest Sewer Interceptor, which is Hobas pipe, staff brought a Task Order (TO) to the August 2019 Board meeting for approval, through our Master Services Agreement with S&ME. The TO was to prepare bid specifications for televising/inspecting our Hobas Sewer Interceptor Sewer Mains 15 feet in depth and greater. Bids were received September 18th and the project was awarded to Vortex Services, LLC in the amount of $185,401.66.

Vortex was able to complete the majority of the inspection in October, except for a portion of the interceptor under Hwy 99 (Salem Hwy) and 2 sewer segments upstream. These sections were full of debris due to a sag or other issue inside of the tunnel under Hwy 99. Right after Vortex completed this initial inspection, the wet weather began and it wasn't until early June that O&M felt comfortable that they could by-pass the sewer, clean the line and keep the remaining sewer inside the pipe down enough for Vortex to re-mobilize and attempt to finish the full scope of the work.

Travis Wilson, with S&ME will be present to give a brief presentation of the findings, however, in short, the inspection found five sewer segments that staff felt were critical and in need of repair prior to another winter season. Four of the five were found in October and S&ME has determined the best repair method is to install a cured in place liner for the length of each segment from manhole to manhole. These line segments have been placed in the 2020/2021 Sewer Rehabilitation Project for repairs, which is the next item on the agenda for approval. Since the fifth segment, being under Hwy 99, wasn't able to be televised until June, a repair method hasn't been determined. Staff is hopeful that we would be able to repair this segment as well prior to this coming winter season.

Since complete, the project is ready to close out and the final balancing change order is attached. The final change order increases the contract amount by $9,429.77 as well as adds 242 days since the project was on hold by the Department due to wet weather.

RECOMMENDATION

Staff recommends that the Board recommend to the City Council approval of the Final Change Order.

FISCAL IMPACT

Funding for this work was not budgeted, so funding was approved from the Department's working capital reserves. The change order increases the contract amount by $9,429.77 for a final contract amount of $ 194,831.43.

ATTACHMENTS

S&ME Recommendation
Change Order #1

July 22, 2020

Ms. Valerie Smith, PE
Assistant Director
Murfreesboro Water Resource Department
220 NW Broad Street
Murfreesboro, TN 37130

RE: HOBAS INSPECTION PROJECT – PAY APPLICATION NO. 2 & FINAL CHANGE ORDER

Dear Ms. Smith:

Please find attached the pay application listed above. We have reviewed the work submitted by the contractor and have reviewed the associated billed line items and have found no discrepancies.

Round 2 of the Lidar Inspection work was performed on June 17, 2020, and included the remaining pipes which were not completed during Round 1 inspections (October 2019) due to backwater within the pipe segments. The delay in the time between Round 1 and Round 2 inspections was due to wet weather periods which resulted in continuous increased flow levels within the pipe segments. The contractor was unable to complete the inspections during these conditions and was required to wait until drier periods when flow levels decreased.

MWRD O&M staff assisted the contractor during both Round 1 and Round 2 inspections by performing cleaning prior to the inspections. Additionally, as a result of the backwater conditions experienced during Round 1 inspections, MWRD crews set-up and maintained pumps to lower the flow level in a portion of the segments within the project area.

A field directive was issued and approved by MWRD staff such that the contractor could remain on-site while flows were being lowered to an acceptable level. A final change order is also attached which includes all additions and deducts relating to the project bid items.

Please let me know if you have any questions regarding this pay application and final change order.

Sincerely,

S&ME, INC.

Travis E. Wilson, PE
Principal Project Manager

Murfreesboro Water Resource Department
220 NW Broad Street
Murfreesboro, TN 37130
PHONE: (615) 848-3202 |

CR# 1
Date Issued: 7/22/2020

CHANGE REQUEST FORM (CRF)

Owner Contract No.
Project Name: Murfreesboro 2019 HOBAS Inspection Project
Engineer: S&ME, Inc.
Contractor: Vortex Services

Requested By: Murfreesboro Water Resource Department
Drawing: N/A
Problem Desc: This CRF is to adjust final quantities from the original scope and additional quantities per MWRD staff.

Revised Scope Description/Details

Item No.	Description	Qty	Unit	Unit Price	Item Total
ADD					
1A	Mobilization	1	LS	$6,500.00	$6,500.00
1B	CCTV Team Standby for Bypass Set-up	4	EA	$2,000.00	$8,000.00
DEDUCT					
2A	MSI Inspection	755.6	LF	$4.00	$3,022.40
2B	PACP CCTV Data Post Processing/Report	755.6	LF	$0.20	$151.12
2C	MSI Condition Report Post Processing	755.6	LF	$2.50	$1,889.00
2D	Lidar X Section Report Post Processing	755.6	LF	$0.01	$7.55
2E	Reverse Setup	8	EA	$0.01	$0.08
3E	Reverse Setup	8	EA	$0.01	$0.08
				CHANGE IN CONTRACT VALUE	**$9,429.77**
				ORIGINAL CONTRACT VALUE	$185,401.66
				REVISED CONTRACT VALUE AFTER CHANGE ORDER #1	**$194,831.43**

Contractor Acknowledgement:

- ☐ No Change in Contract Amount is required.
- ☐ No Change in Contract Time is required.
- ☑ A Change in Contract Amount is required: **$9,429.77**
- ☑ A Change in Contract Time is required: **242**

Architect / Engineer / Inspector / RPR

Contractor

Proceed with Execution

☐ Yes ☐ No

Owner's Representative

Distribution: Engineer, Owner; Central Files

. . . creating a better quality of life

MEMORANDUM

DATE: July 21, 2020

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: 2020-2021 Sanitary Sewer Rehabilitation
Award of Contract
Project File #20025

BACKGROUND

At the March 24, 2020 Board meeting the Board approved the Engineering, Construction Administration & Resident Inspection necessary for this next sanitary sewer rehabilitation project with S&ME.

S&ME completed the project design and bids were received July 14th. Only two bids were received although at least ten contractors picked up plans and specifications. One of the bids received was a "No Bid". A recommendation from S&ME along with the bid tabulation is attached. The Base Bid of the project includes 3,515 linear feet of open cut sewer main replacements, 2,600 linear feet of cured in place pipe (CIPP), lining and/or repairing 52 manholes which is approximately 375 vertical feet of manhole lining and 80 sewer lateral repairs. The Additive Alternate Bid includes 1303 linear feet of CIPP lining of 36" to 54" diameter Hobas Pipe. This Additive Alternate is to make repairs to the pipe segments identified in the Lidar TV Inspections as having structural issues and are in need of immediate repair.

S&ME recommends awarding the Base Bid in the amount of $2,788,172 as well as accepting the Additive Alternate in the amount of $1,461,920, to SBW Constructors, LLC (SBW) in the amount of $4,250,092. They were the lowest responsible and responsive bidder for the project, they also were the contractor on three previous rehabilitation projects and were very good to work with.

Is has been our practice to budget $1.25M from the Rate Funded Budget and $1.25M from Working Capital Reserves yearly +/- for sewer rehabilitation. Staff requests to go over and above this amount this year due to the structural repairs necessary for the large Hobas Interceptor lines. Staff did not want these Hobas repairs to take away from the typically sewer system rehabilitation.

RECOMMENDATION

Staff recommends that the Board recommend to the City Council approval of expending an additional $1,750,092 from Working Reserves and to award the contract to SBW in the amount of $4,250,092.

FISCAL IMPACT

Funding for the Engineering, Construction Administration, Inspection and Construction was approved from a combination of 2020/2021 Budget & Working Capital Reserves.

Funding Source	Budgeted Amount	Construction Expenditures	Remaining
Rate Funded Operating Budget 2020-21	$1,250,000	$0	$1,250,000
Working Reserves 2020-21	$1,250,000	$0	$1,250,000
Engineering & Inspection Expenditures	$448,000	$98,889	$349,111
Additional Requested Working Reserves 2020-21	$1,750,092	$0	$1,750,092
Total	**$4,698,092**	**$98,889**	**$4,599,203**

ATTACHMENTS

S&ME Recommendation
Bid Tabulation
Rehab Locations Map

July 15, 2020

Ms. Valerie Smith, PE
Assistant Director
Murfreesboro Water Resource Department
220 NW Broad Street
Murfreesboro, TN 37130

RE: Recommendation of Award – 2020 Murfreesboro Rehabilitation Project

Dear Ms. Smith:

Bids for the 2020 Rehabilitation Project were received on July 14, 2020. In response to the project advertisement, we received two (2) bid packets; however, one of those packets contained a "No Bid" letter. Although only two bid packets were received, there was positive participation in the bidding process from around the country as ten (10) contractors picked up plans and attended the mandatory pre-bid meeting. With much of the work in this project being performed by "specialty" contractors, a number of those that ordered plans could participate in the project as a prime bidder or as a subcontractor to the prime.

The project consisted of Base Bid Items and Add-Alternate Items. SBW Constructors, LLC, was the apparent low bidder for the project. The Base Bid is in the amount of $2,788,172.00. The Add-Alternate is in the amount of $1,461,920.00. The Total Bid Price for the Base Bid and Add-Alternate Bid is $4,250,092.00. It is noted that the Total Bid Price was within 4% of the Engineering Estimate.

SBW Constructors, LLC has recently completed several projects with Murfreesboro Water Resource Department with satisfactory results, three of which were similar size and scope. Additionally, as required in the bid package, each bidder was to submit a list of major subcontractors such that references could be verified. Each of the subcontractors have also performed work for Murfreesboro Water Resource Department with satisfactory results. SBW Constructors, LLC, is recommended as the successful, responsive, and responsible low bidder for the project. A tabulation of the bids is attached for your use.

Based on previous discussions with MWRD staff and the significance of the repairs included in both the Base Bid and Add-Alternate Bid, it is recommended that both be accepted. If you concur with our recommendation, please provide formal notice from the board authorizing the award of the contract to SBW Constructors, LLC. Once approval is granted, we will notify the contractor of the award and will transmit the conformed documents to them for execution and attachment of bonds and insurance.

Sincerely,

S&ME, INC.

Travis E. Wilson

Travis E. Wilson, PE
Principal Project Manager

Attachment – Certified Bid Tabulation

S&ME, Inc. - Murfreesboro | 630 Broadmor Blvd, Suite 130 | Murfreesboro, TN 37129 | p 615.295.2801 |

Murfreeesboro Water Resource Department - 2020 Sanitary Sewer Rehabilitation Project
(S&ME Project No. 548120003, MWRD Project No. 20025)
Bid Opening: July 14, 2020 2:00 p.m. Local Time

Item No.	Item Description	Total Estimated Quantity	Unit	SBW Constructors, LLC	
				Unit Price	Total Price
1	**21-Inch Gravity Sewer**				
a.	15 mm CIPP	25	LF	$ 1,600.00	$ 40,000.00
b.	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	1	EA	$ 7,800.00	$ 7,800.00
c.	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	1	EA	$ 6,500.00	$ 6,500.00
2	**18-inch Gravity Sewer**				
a.	9 mm CIPP	350	LF	$ 370.00	$ 129,500.00
b.	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	1	EA	$ 5,300.00	$ 5,300.00
3	**15-Inch Gravity Sewer**				
a.	10.5 mm CIPP	80	LF	$ 390.00	$ 31,200.00
b.	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	1	EA	$ 6,000.00	$ 6,000.00
c.	Service Lateral Repair - CIPP Connection Only (Up to 3 Linear Feet)	1	EA	$ 5,000.00	$ 5,000.00
4	**12-Inch Gravity Sewer**				
a.	PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point - 6-foot to 12-foot Depth	51	EA	$ 350.00	$ 17,850.00
b.	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	EA	$ 6,600.00	$ 6,600.00
5	**10-Inch Gravity Sewer**				
a.	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	8	EA	$ 4,400.00	$ 35,200.00
b.	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	20	EA	$ 3,500.00	$ 70,000.00
c.	PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point - 6-foot to 12-foot Depth	2,513	LF	$ 245.00	$ 615,685.00
6	**21-Inch Gravity Sewer**				
a.	6 mm CIPP	2,042	LF	$ 63.00	$ 128,646.00
b.	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	32	EA	$ 4,300.00	$ 137,600.00
c.	Service Lateral Repair - CIPP Connection Only (Up to 3 Linear Feet)	6	EA	$ 3,300.00	$ 19,800.00
d.	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 0-foot to 6-foot Depth	5	EA	$ 2,650.00	$ 13,250.00
e.	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	2	EA	$ 3,750.00	$ 7,500.00
f.	Mainline Sewer Point Repair 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	2	EA	$ 6,800.00	$ 13,600.00
g.	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	EA	$ 7,100.00	$ 7,100.00
h.	Mainline Sewer Point Repair 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	EA	$ 20,000.00	$ 20,000.00
i.	Mainline Sewer Point Repair 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	EA	$ 5,600.00	$ 5,600.00
j.	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	EA	$ 10,500.00	$ 10,500.00
k.	Mainline Sewer Point Repair 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	EA	$ 13,000.00	$ 13,000.00
l.	Mainline Sewer Point Repair at Service Connection 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Paved	1	EA	$ 25,000.00	$ 25,000.00
m.	Mainline Sewer Point Repair at Service Connections 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to 2 Existing Lateral Lines - Paved	1	EA	$ 9,000.00	$ 9,000.00
n.	Mainline Sewer Sectional Open Cut Repair 6-foot to 12-foot Depth - Paved	40	LF	$ 275.00	$ 11,000.00
o.	Sectional Open Cut Repair and 2 Service Lateral Connections 6-foot to 12-foot Depth - Paved	70	LF	$ 280.00	$ 19,600.00
p.	PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point - 0-foot to 6-foot Depth	280	LF	$ 230.00	$ 64,400.00
q.	PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point - 6-foot to 12-foot Depth	340	LF	$ 265.00	$ 90,100.00
r.	PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point - 12-foot to 18-foot Depth	60	LF	$ 480.00	$ 28,800.00
7	**Service Laterals**				
a.	Pre CCTV Inspection of Service Laterals (All Mainline Diameters)	85	EA	$ 400.00	$ 34,000.00
b.	Remove Intruding Lateral Tap or Gasket	5	EA	$ 800.00	$ 4,000.00
c.	Dye Test Lateral	5	EA	$ 500.00	$ 2,500.00
d.	Repair Service Lateral- CIPP Beyond 25-Linear Feet	100	LF	$ 50.00	$ 5,000.00
e	Replacement - 0 foot to 6 foot Depth Cut Beyond First 25-Linear Feet	25	LF	$ 57.00	$ 1,425.00
f.	Replacement - 6 foot to 12 foot Depth Cut Beyond First 25-Linear Feet	25	LF	$ 67.00	$ 1,675.00
g.	Replacement - 12-foot to 18-foot Depth Cut Beyond First 25-Linear Feet	25	LF	$ 81.00	$ 2,025.00
h.	Replacement - 18-foot to 24-foot Depth Cut Beyond First 25-Linear Feet	25	LF	$ 105.00	$ 2,625.00
i.	New Cleanout Installation	25	EA	$ 1,200.00	$ 30,000.00
j.	Expose Existing Cleanout - 0 foot to 3 foot Depth and Install New Box - Unpaved	10	EA	$ 950.00	$ 9,500.00
k.	Expose Existing Cleanout - 0 foot to 3 foot Depth and Install New Box - Paved	10	EA	$ 950.00	$ 9,500.00
8	**Manholes - Subsurface Rehabilitation**				
a.	Lining 48-inch Diameter Manhole	335	VF	$ 340.00	$ 113,900.00

Murfreeesboro Water Resource Department - 2020 Sanitary Sewer Rehabilitation Project
(S&ME Project No. 548120003, MWRD Project No. 20025)
Bid Opening: July 14, 2020 2:00 p.m. Local Time

Item No.	Item Description	Total Estimated Quantity	Unit	SBW Constructors, LLC	
				Unit Price	Total Price
b.	Lining 72-inch Diameter Manhole	15	VF	$ 525.00	$ 7,875.00
c.	Prep and Reline Manhole Connection on Previously Lined Manholes	3	EA	$ 850.00	$ 2,550.00
d.	Grout Pipe Connections	4	EA	$ 275.00	$ 1,100.00
e	Plug Abandoned Line at Manhole	1	EA	$ 600.00	$ 600.00
f.	Core Penetration to Existing Manhole - 4-inch to 8-inch Diameter	1	EA	$ 3,400.00	$ 3,400.00
g.	Excessive Leak Stop In Manhole	125	Gal	$ 350.00	$ 43,750.00
h.	Install New Manhole Invert and Bench	1	EA	$ 800.00	$ 800.00
i.	Repair Existing Manhole Bench & Invert	1	EA	$ 800.00	$ 800.00
j.	Install Inside Drop Bowl and Associated Piping	1	VF	$ 1,750.00	$ 1,750.00
k.	Lining of Two 2,000 gallon grease trap - 94" x 78"	2	VF	$ 23,000.00	$ 46,000.00
9	**Church Street Realignment (To Be Performed in Dry Weather)**				
a.	8-inch Gravity Sewer - PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point	105	LF	$ 400.00	$ 42,000.00
b.	Install New 4-foot Diameter Precast Concrete Manhole	1	EA	$ 7,500.00	$ 7,500.00
c.	Replace Existing Manhole with New 4-foot Diameter Precast Concrete Manhole	2	EA	$ 5,000.00	$ 10,000.00
d.	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 0-foot to 6-foot Depth	4	EA	$ 2,500.00	$ 10,000.00
10	**Broad Street Repairs (To Be Performed in Dry Weather)**				
a.	18-inch Diameter Mainline - CIPP - 10.5 mm	99	LF	$ 345.00	$ 34,155.00
b.	12-inch Diameter Mainline - CIPP - 9 mm	343	LF	$ 137.00	$ 46,991.00
c.	Lining 48-inch Diameter Manhole	23	VF	$ 340.00	$ 7,820.00
d.	Lining 60-inch Diameter Manhole	10	VF	$ 370.00	$ 3,700.00
e.	12-inch Diameter Mainline Sewer Point Repair 12-foot to 18-foot Depth - Sectional Open Cut Repair - Unpaved	35	LF	$ 850.00	$ 29,750.00
f.	18-inch Diameter Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	EA	$ 30,000.00	$ 30,000.00
11	**Pavement Removal and Replacement**				
a.	Asphalt	20,000	SF	$ 12.00	$ 240,000.00
b.	Asphalt - TDOT Requirements Along State Roadway, Including Traffic Control	2,000	SF	$ 14.00	$ 28,000.00
c.	4-inch Binder Course (ONLY on Palmer Dr and Boston St)	27,000	SF	$ 7.00	$ 189,000.00
d.	Finished Concrete (Driveways/Sidewalks)	400	SF	$ 27.00	$ 10,800.00
e.	Concrete (Curb & Gutter)	300	LF	$ 75.00	$ 22,500.00
f.	Infrared Pavement Restoration	2,000	SF	$ 8.00	$ 16,000.00
12	**Cash Alloances**				
a.	Soils and Concrete Testing	Allowance	LS		$ 2,000.00
b.	Cured-In-Place Pipe Testing Laboratory Services	Allowance	LS		$ 4,000.00
13	**Additional Work if Ordered by Owner/Engineer**				
a.	Crushed Stone	500	CY	$ 40.00	$ 20,000.00
b.	Flowable Fill	200	CY	$ 100.00	$ 20,000.00
c.	CIPP Lateral Transition Adder	20	EA	$ 500.00	$ 10,000.00
d.	Heavy Cleaning for Mainline	250	LF	$ 11.00	$ 2,750.00
e.	Heavy Cleaning for Laterals	50	LF	$ 6.00	$ 300.00
14	**Contsruction Contingency**				
a.	Construction Contingency				$ 75,000.00
			BASE BID TOTAL PRICE:		**$ 2,788,172.00**

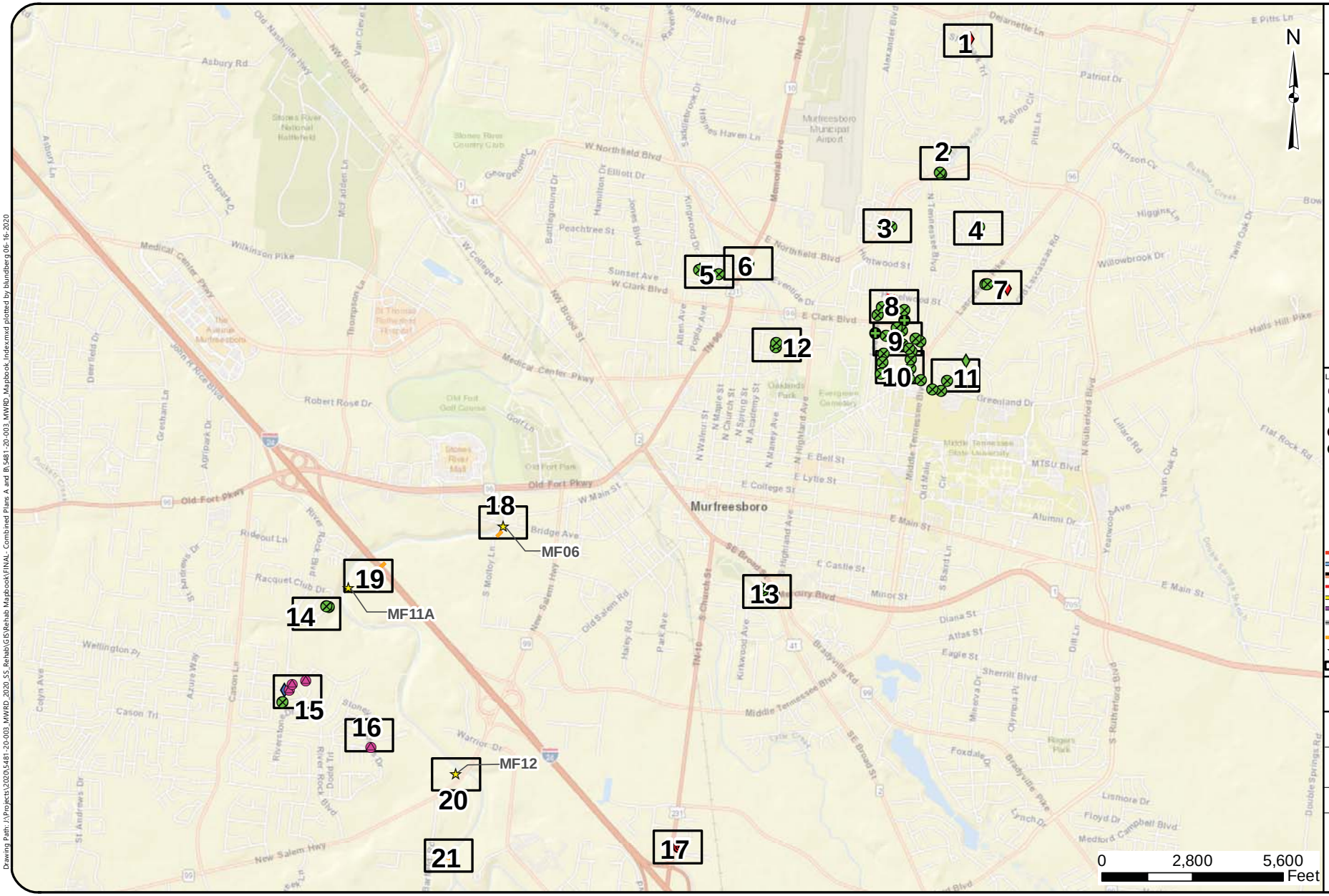
Murfreeesboro Water Resource Department - 2020 Sanitary Sewer Rehabilitation Project
(S&ME Project No. 548120003, MWRD Project No. 20025)
Bid Opening: July 14, 2020 2:00 p.m. Local Time

ADD-ALTERNATE HOBAS CIPP LINING (To Be Performed in Dry Weather)					
Item No.	Item Description	Total Estimated Quantity	Unit	SBW Constructors, LLC	
				Unit Price	Total Price
1	HOBAS 54-Inch Gravity Sewer				
a.	54-inch CIPP for Sanitary Sewer Mainline	330	LF	$ 1,560.00	$ 514,800.00
b.	54-inch Pre-liner for Sanitary Sewer Mainline	330	LF	$ 11.00	$ 3,630.00
c.	Heavy Cleaning for Mainline	330	LF	$ 11.00	$ 3,630.00
2	HOBAS 48-Inch Gravity Sewer				
a.	48-inch CIPP for Sanitary Sewer Mainline	480	LF	$ 980.00	$ 470,400.00
b.	48-inch Pre-liner for Sanitary Sewer Mainline	480	LF	$ 11.00	$ 5,280.00
c.	Heavy Cleaning for Mainline	480	LF	$ 16.00	$ 7,680.00
3	HOBAS 36-Inch Gravity Sewer				
a.	36-inch CIPP for Sanitary Sewer Mainline	250	LF	$ 1,100.00	$ 275,000.00
b.	36-inch Pre-liner for Sanitary Sewer Mainline	250	LF	$ 11.00	$ 2,750.00
c.	Heavy Cleaning for Mainline	250	LF	$ 21.00	$ 5,250.00
4	Mainline Grouting				
a.	Grout Leaking Joint Sections of Sewer Mainline (54-inch Diameter Pipe)	150	Gal	$ 300.00	$ 45,000.00
b.	Grout Leaking Joint Sections of Sewer Mainline (48-inch Diameter Pipe)	75	Gal	$ 300.00	$ 22,500.00
c.	Grout Leaking Joint Sections of Sewer Mainline (36-inch Diameter Pipe)	50	Gal	$ 300.00	$ 15,000.00
5	Cash Allowances				
a.	Soils Testing	Allowance			$ 10,000.00
b.	Cured-In-Place-Pipe Testing Laboratory Services	Allowance			$ 6,000.00
6	Construction Contingency				
a.	Construction Contingency				$ 75,000.00
			ADD-ALTERNATE TOTAL PRICE:		**$ 1,461,920.00**

BASE BID AND ADD-ALTERNATE TOTAL BID PRICE:	**$4,250,092.00**

I do certify that the above is a true and correct copy of the bids received:

Travis E. Wilson, PE
July 15, 2020
S&ME, Inc.
Tennessee License No. 106436



Murfreesboro 2020 Rehabilitation Project

For:

Murfreesboro Water Resource Department

Legend

- Manhole Grout Connections
- Manhole Lining - Full
- New Manhole
- Manhole Reline Pipe Connections
- Mainline Point Repair at SVC Connection
- Mainline Point Repair at Taps
- Mainline External Point Repair
- Mainline Sectional OCR
- Mainline CIPP
- Mainline Open Cut Replacement
- Mainline Realignment
- Lateral CIPP
- Lateral CIPP - Connection Only
- Lateral OCLR
- Lateral Capped - Do Not Reinstate
- Alternate HOBAS CIPP
- Flow Monitors
- Mapbook Index

SCALE:
1 " = 2,750 '

DATE:
6/16/2020

S&ME PROJECT NO.
5481-20-003

Index

Drawing Path: J:\Projects\2020\5481-20-003_MWRD_2020_SS_Rehab\GIS\Rehab Mapbook\FINAL- Combined Plans A and B\5481-20-003_MWRD_Mapbook_Index.mxd plotted by blundberg 06-16-2020

. . . creating a better quality of life

MEMORANDUM

DATE: July 21, 2020

TO: Water Resources Board

FROM: Alan Cranford

SUBJECT: Specific Energy Distribution System Optimizer
Stones River Water Treatment Plant

Summary

In June staff brought a request to purchase equipment to modify the existing actuators at all five storage tanks. In addition, staff gave a brief overview of Specific Energy's Distribution System Optimizer and the plan to bring the request for Specific Energy's Distribution System Optimizer (DSO) system to the July meeting. Staff is requesting the Board to approve the purchase of Specific Energy's DSO system.

Background

The challenge facing Murfreesboro's water system is associated with the fact that the Stones River Water Treatment Plant (SRWTP) fills a single pressure zone 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. Generally, the three tanks closest to the SRWTP fill more quickly and the furthest two tanks, Tiger Hill and Stoney Meadows fill the slowest. This has led to two primary challenges for the SRWTP operations staff. First, maintaining suitable water quality in Tiger Hill and Stoney Meadows DSTs can be challenging. Because of their slower fill times and longer residence times within these tanks, it has been a challenge for operations staff to maintain a consistent chlorine residual in these tanks. Second, in order to fill these tanks with fresh water, all three of the closer DSTs must already be full. Certain customers near the SRWTP experience very high-water pressure, and it is believed the distribution system loses a lot of water through leakage in these high-pressure areas.

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.

Since then, a better solution has been identified. By modifying the actuators to 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 DSTs. 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, 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 $145,500, 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 not including maintenance that would be required of the two pump stations is constructed.

Fiscal Impact

The cost for Specific Energy's DSO is $145,500. This is budgeted in the Department's FY21 capital expenditures.

Recommendation

Staff requests the Water Resources Board recommend to the City Council approving the sole source purchase from Specific Energy in accordance with their proposal.

Attachments

Specific Energy Distribution System Optimizer Background
Specific Energy Distribution System Optimizer Proposal

SPECIFIC ENERGY

Memorandum

DATE: July 1, 2020

TO: Darren Gore, Alan Cranford- MWRD

CC: Perry Steger

FROM: Mike Bernard

RE: Distribution System Optimizer (DSO) Proposal

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. Generally, the three tanks closest to the SRWTP fill more quickly and the furthest two tanks, Tiger Hill and Stoney Meadows fill the slowest. This has led to two primary challenges for the SRWTP operations staff. First, maintaining suitable water quality in Tiger Hill and Stoney Meadows DSTs can be challenging. Because of their slower fill times and longer residence times within these tanks, it has been a challenge for operations staff to maintain a consistent chlorine residual in these tanks. Second, in order to fill these tanks with fresh water, all three of the closer DSTs must already be full. When they are full, the distribution system hydraulics change dramatically, raising the required pressure on the high service pumps (HSPs) as well as the average pressure on the distribution system. This has several unintended consequences including higher electric demands from the high service pumps, elevated risks of line breaks due to transients and water hammer, and elevated water loss in the distribution system. As we have seen in the first several weeks of data from the newly installed Dynamic Pump Optimizer (DPO) on the HSPs, it is also pushing the HSPs to operating points that are potentially damaging to these assets.

POTENTIAL SOLUTIONS

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 draw through the distribution system and fill these tanks more quickly. It was also proposed to include small mixed oxidant generators to the booster stations to potentially generate a longer lasting chlorine residual in these remote tanks. The proposed capital cost of this option was estimated at $870,000, and the yearly operating costs were estimated at $7,500. It turns out that due to the distribution pipe networking in the vicinity of the

Stoney Meadows DST, this alternative would not have worked for that system. It is still an operable alternative for the Tiger Hill DST.

Specific Energy instead proposes to utilize our Distribution System Optimizer (DSO) system to better manage the filling and draining of your five distribution storage tanks (DSTs). This alternative would involve the integration of our intelligent system controllers at each DST location, and coordinate the distribution system data with the HSP DPO. This will allow the high service pumps to operate at their lowest specific energy, which should both reduce energy expenditures and extend the useful lives of these assets. The DSO will then coordinate the filling and draining of each tank by opening or closing the influent and effluent valves that already exist at each DST. MWRD staff will soon replace a card in the existing actuators on these valves to allow the modulating service necessary to accomplish this process. Our proposed 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, will reduce pressure transients by controlling the speed of opening and closing of the valves on each tank, and will integrate the distribution system water quality to the operation of the high service pumps to improve both water quality and energy efficiency.

FISCAL IMPACT

The proposed cost of the DSO solution is $145,500 including the first year of annual service for the software interface, communications, updates, and data storage per the attached proposal. After that, the annual service will cost $8,000 per year. Including $24,300 required to change out the valve actuators, this solution is $700,200 less expensive than the booster station alternative, and its annual costs will be approximately equal to that alternative.

SPECIFIC ENERGY

1978 S. Austin Avenue • Georgetown, Texas 78626 • 512-930-9415

July 1, 2020

Alan Cranford
Water Treatment Plant Manager
P.O. Box 1477
Murfreesboro, TN
615-848-3222

Proposal for intelligent Distribution System Optimizer (DSO)

Project Description

Specific Energy proposes to furnish five (5) Distribution System Optimizers (DSOs) to enable Murfreesboro Water Resources Department to control the inflows and outflows from their Distribution Storage Tanks to optimize the filling and draining of the tanks to improve water quality and reduce peak pressures at the Water Treatment Plant.

The DSOs will be installed by Customer into the Control Panel at each Distribution Storage Tank and will interface the existing modulating control valves, Hach Distribution Monitor Panels, and level sensors through the Programmable Logic Controllers (PLCs). The DSOs will estimate the inflow and outflow based upon a strapping algorithm correlated to the level sensor and tank geometry. The DSOs will control the position of the modulating valves to either balance the filling and draining of all five tanks concurrently, or will optimze the filling and draining based on individual water quality within each tank. This will be customizable by the Customer.

Configuration and Installation Support Phase

The Configuration and Installation Support Fee is a one-time fee that includes the following services **provided by Specific Energy:**

Standard Services

- Configure Specific Energy DSOs
- Deliver Specific Energy DIN-rail mountable hardware for field installation by others, including wiring instructions to connect the equipment to power and electrical equipment.
- Customized programming and written instructions to configure DSOs to communicate with the existing equipment.
- Unlimited support by Specific Energy's technical staff for the installation phase during normal business hours (Monday through Friday, 8 AM to 5 PM CT), including commissioning and initial troubleshooting.

Custom Services

- In order to configure the DSOs to meet Customer's requirements, several custom services will be required
    - A Full-Day site visit and Coordination meeting will be held at Customer's offices to confirm the operational sequences, water quality goals and constraints for the DSO System.
    - Existing pumpage, usage, and tank level date will be used to create a custom optimization algorithm to control the existing inlet and outlet control valves at each tank location.
    - Specific Energy personnel will assist with integrating the DSO devices into Customer's existing PLC control panels.
    - Specific Energy personnel will visit the sites once per quarter for the first year to confirm that the DSOs are operating correctly and make any modifications to assure that the system is achieving water quality goals.

Annual Service Fee includes these services **by Specific Energy**:

- DSO and cellular modem replacement upon failure
- Unlimited Cellular data plan
- Secure 24-hour operator interface with no license restrictions for number of concurrent users
- Telephone and email technical support during normal business hours (Monday through Friday, 8 AM to 5 PM CT)

Quotation for DSO Devices and Annual Service

					Total
DSO Hardware Configuration and Installation Support (CISF), System Modeling and Custom Algorithm Creation, Seasonal Calibration and Site Meetings	5	$	27,500	$	137,500
One year of Annual Service ($1600 per DSO)	5	$	1,600	$	8,000
			Proposal Total	**$**	**145,500.00**

Summary

I am pleased to prepare this proposal for your consideration. This proposal is valid for 180 days from the date of this proposal.

Respectfully submitted,

Mike Bernard

Signature

By signature below, I hereby agree to abide by the terms and conditions specified herein.

Murfreesboro Water Resources Department

By: _____ Date: _____

Signature of Authorized Signer

_____

Printed Name & Title of Authorized Signer

City of MURFREESBORO TENNESSEE

. . . creating a better quality of life

MEMORANDUM

DATE: July 23, 2020

TO: Water Resources Board

FROM: Alan Cranford

SUBJECT: Specific Energy Pump Asset Management for Membrane Feed Pump Station Stones River Water Treatment Plant

---

Summary

In March, Staff brought a request to the Board to purchase Specific Energy for the High Service Pump Station (HSPS) and in August of 2019 for the Raw Water Pump Stations. Originally it was intended to bring the HSPS and the Membrane Feed Pump Station to the Board together. However, to allow SSR to select the best pump for the High Service Pump Station Renovation, we needed to get the software monitoring for the HSPS as soon as possible. Staff is requesting the Board to approve the purchase of Specific Energy's Pump Asset Management System for the Membrane Feed Pump Station.

Background

The standard procedure previously for plant operators, operating raw and finished water pumps, was simply to turn on the pump that provides the flow needed for water demand. Operators did not have the tools to determine if a pump is operating on its pump curve or if the pump is operating efficiently. This fact was noticed on the day the operators gained access to the Specific Energy software. Since this time, all staff has received training on the use of the program and its importance. Operators have continuously used the Specific Energy to select pumps for the specified flow, at the lowest specific energy and operating on the pump curve.

The membrane pumps operate somewhat differently than the raw water pumps and high service pumps. Their function is to pump water through the Pall membrane systems. There are four pumps for the membrane feed pump station. To operate the membrane system there can be anywhere from one to four pumps operating at a time. They are not currently operated on efficiency or even necessarily in the preferred operating range. Staff currently has no way to determine the most efficient use of the membrane pumps without some type of interface like Specific Energy.

Staff has seen benefits at other locations that has justified the purchase of the software and equipment. Having seen that previously the pumps were operating off the curve and staff was not aware of this is likely the reason for the repairs need to the pumps. Repairs generally cost >$25,000 each time a pump is pulled and repaired.

Fiscal Impact

The cost for purchasing the Pump Asset Management and Optimization Software for the Membrane Feed Pump Station is $21,300 including the first year's annual service fees. Funding is in the FY21 capital budget. Cost for annual service fees for the Membrane Feed Pump Station is $5,600. This amount will be budgeted in the annual operating budget if approved.

The software does afford the Department a proposed payback given the assumed power reduction by running the pumps in optimal conditions. A 48 percent reduction in power pays back the purchase of the software in 5 months and a 13.5 percent reduction in power has a pay back of 2 years and 2 months.

Recommendation

Staff requests that the Board recommend to the City Council approving the purchase of Specific Energy for the membrane feed pump station in accordance with their proposal.

Attachments

Payback Period Exhibits on 48% and 13.5% Power Reductions
Specific Energy Membrane Feed Pump Station Proposal

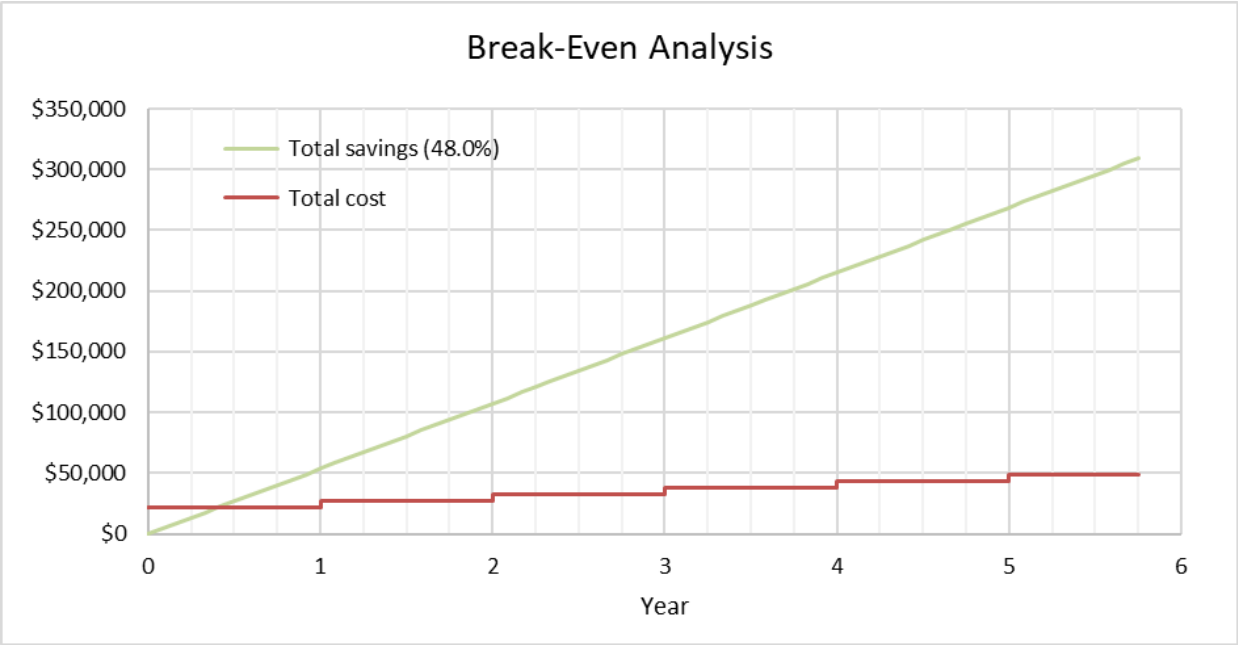
Payback Analysis at 48% Energy Reduction

Estimated Annual Savings			**$**	**53,760**
48.0% Energy Reduction	$	53,760		
Reduced Repair Costs	$	-		

Break-even Analysis

One-time Costs			**$**	**15,700**
Configuration and Installation Support Fee (CISF)	$	15,700		
Annual return			**$**	**48,160**
Estimated Annual Savings	$	53,760		
Annual Service Fee	$	(5,600)		
Break-even point (48.0% energy reduction)				**0 yrs, 5 mos**

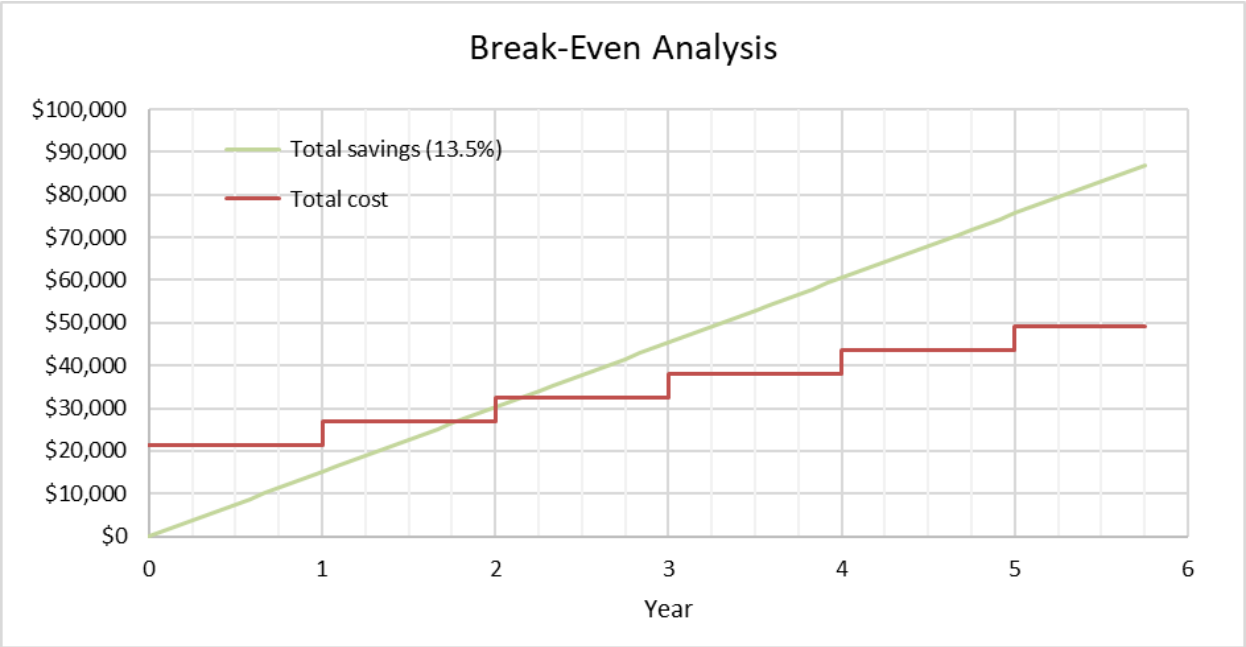
The chart below shows cumulative costs and savings as a function of time. It is based on the one-time costs and annual costs shown above.



Payback Analysis at 13.5% Energy Reduction

Estimated Annual Savings				**$**	**15,120**
	13.5% Energy Reduction	$	15,120		
	Reduced Repair Costs	$	-		
Break-even Analysis					
One-time Costs				**$**	**15,700**
	Configuration and Installation Support Fee (CISF)	$	15,700		
Annual return				**$**	**9,520**
	Estimated Annual Savings	$	15,120		
	Annual Service Fee	$	(5,600)		
	Break-even point (13.5% energy reduction)				**2 yrs, 2 mos**

The chart below shows cumulative costs and savings as a function of time. It is based on the one-time costs and annual costs shown above.



SPECIFIC ENERGY
1978 S. Austin Avenue • Georgetown, Texas 78626 • 512-930-9415

June 11, 2020

Alan Cranford
Water Treatment Plant Manager
P.O. Box 1477
Murfreesboro, TN
615-848-3222

Proposal for Pump Asset Management and Optimization

Project Description

Pump Asset Management and Optimization for: **Murfreesboro Water Resources Department**
Membrane Feed Pumps
5528 Sam Jared Rd
Murfreesboro, TN 37130

Description	Power (hp)		Notes
Pump 1	200	hp	VFD
Pump 2	200	hp	VFD
Pump 3	200	hp	VFD
Pump 4	200	hp	VFD

Overview of Services

Specific Energy proposes to furnish a Dynamic Pump Optimizer (DPO) configured for this pump station. The DPO implements Specific Energy's asset management and optimization technologies.

Specific Energy's DPO enables routine operator-initiated pump testing for comparison of current pump condition to ideal factory pump curves. The DPO calculates Pump Health Index (PHI), continually recalculates annualized excess energy costs due to worn pumps, and recommends pumps for repair or replacement based on a rigorous financial analysis. This financial analysis can be incorporated into a comprehensive pump asset management program to determine optimal scheduling of pump repairs.

Additionally, the DPO calculates the combination of pumps and speeds that satisfies current flow demand while maximizing energy efficiency. The DPO selects the most efficient combination of pumps and speeds that operates each pump within its Preferred Operating Range. As system conditions change throughout the day, the DPO recomputes the solution to ensure the station continues to operate at minimum specific energy (kWh/MG).

The DPO may be used in either Advisory Mode (operators use recommendations from the DPO to select which pumps and speeds to use) or DPO-Mode (pump station PLC uses recommendations from the DPO to continually operate the pump station at peak performance).

Detailed Scope of Services

Configuration and Installation Support Phase

The Configuration and Installation Support Fee is a one-time fee that includes the following services **provided by Specific Energy:**

Standard Services

- Configure Specific Energy equipment to match customer's specific application, including configuration of communications and modeling of station piping, pumps, and sensors.
- Deliver Specific Energy DIN-rail mountable hardware for field installation by others, including wiring instructions to connect the equipment to power and electrical equipment and controllers.
- Customized programming and written instructions to configure customer's equipment to communicate with the Specific Energy DPO.
- Unlimited support by Specific Energy's technical staff for the installation phase during normal business hours (Monday through Friday, 8 AM to 5 PM CT), including commissioning and initial troubleshooting. During this phase, the cellular or direct internet connection must be active so Specific Energy's staff can remotely monitor and troubleshoot the equipment.

The following items are not included in Specific Energy's Scope of Services, and are to be provided by others:

- Install Specific Energy DIN-rail mountable DPO inside existing pump station control panel (requires 12 VDC or 120 VAC from an uninterruptible power supply).
- Install instrumentation required by DPO: tank level or suction pressure, discharge pressure, pump station flow, and per pump powers, run statuses, and speeds.
- Configure pump station PLC to communicate with DPO.

Operational Phase

The Dynamic Pump Optimizer Annual Service Fee includes these services **by Specific Energy**:

- DPO and cellular modem replacement upon failure
- Unlimited Cellular data plan
- Secure 24-hour operator interface with no license restrictions for number of concurrent users
- Data logging at one-second resolution.
- Telephone and email technical support during normal business hours (Monday through Friday, 8 AM to 5 PM CT)
- Automatic updates for ongoing software enhancement, bug fixes, and security patches
- Monthly Pump Station Reports including individual pump report cards, delivered via email.

Quotation

Base fee ($8,500/station)	$	8,500		
CISF Pump Configuration Fee ($1,800/pump)	$	7,200		
Total One-Time Configuration and Installation Support Fee (CISF)			**$**	**15,700**
Base Fee, includes Specific Energy client interface, unlimited simultaneous users, one-second data logging, historical trending, exporting, alarm and event logging and reporting	$	3,200		
Power fee, Pumps up to 2000 hp ($3/hp * 800 hp)	$	2,400		
Power fee, Pumps > 2000 hp ($1.5/hp * 0 hp)	$	-		
Total Annual Service Fees			**$**	**5,600**
Proposal Total			**$**	**21,300**

Summary

I am pleased to prepare this proposal for your consideration. This proposal is valid for 90 days from the date of this proposal.

Respectfully submitted,

Mike Bernard

Signature

By signature below, I hereby agree to abide by the terms and conditions specified herein.

MURFREESBORO WATER RESOURCES DEPARTMENT

By: _____ Date: _____

Signature of Authorized Signer

_____

Printed Name & Title of Authorized Signer

WATER RESOURCES

DASHBOARD PERFORMANCE

June 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 Rehabiliation - 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**

Prepared by: DGore 1/23/2020

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

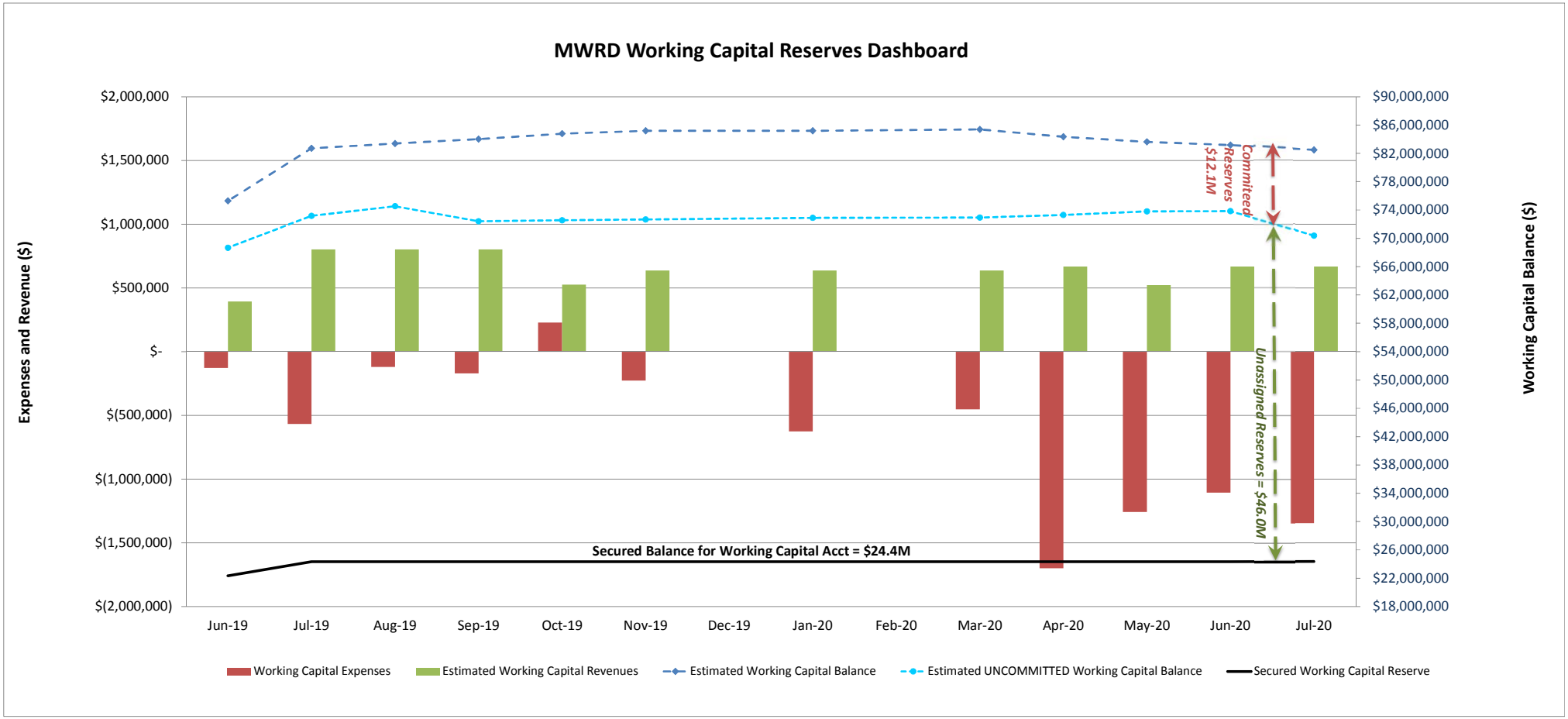
NO.	PROJECT	Originator	2019-2020 2020 FY	**2020-2021 2021 FY**	**2021-2022 2022 FY**	**2022-2023 2023 FY**	**2023-2024 2024 FY**	**TOTAL**
			Projected	*Budget*	*Pro Forma*	*Pro Forma*	*Pro Forma*	
	Neighborhood Projects (NP)							
NP-1	Memorial Blvd / Haynes Dr. Drainage Improvements	City Eng	$125,000	$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**

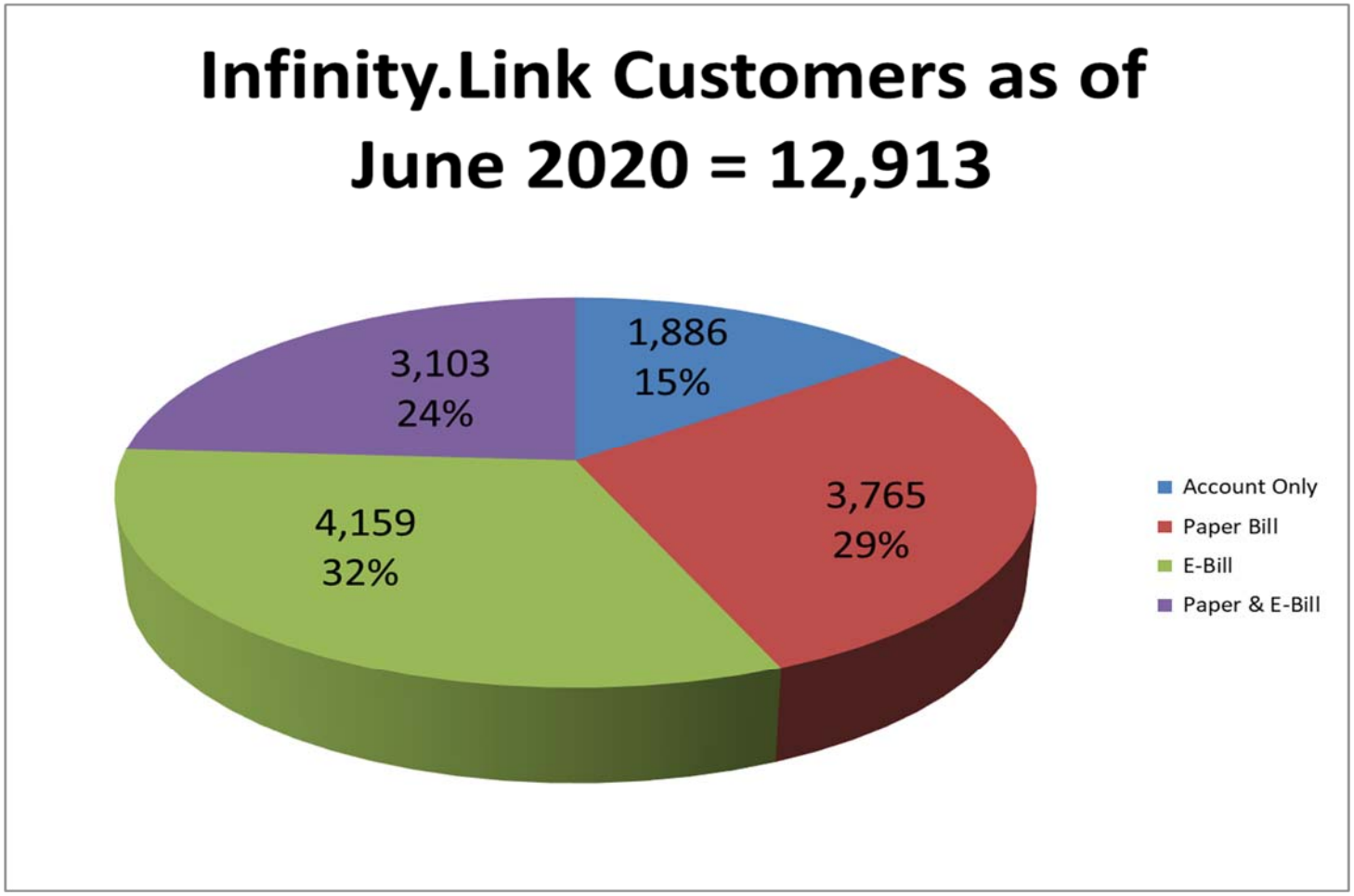
EFFECTIVE UTILITY MANAGEMENT

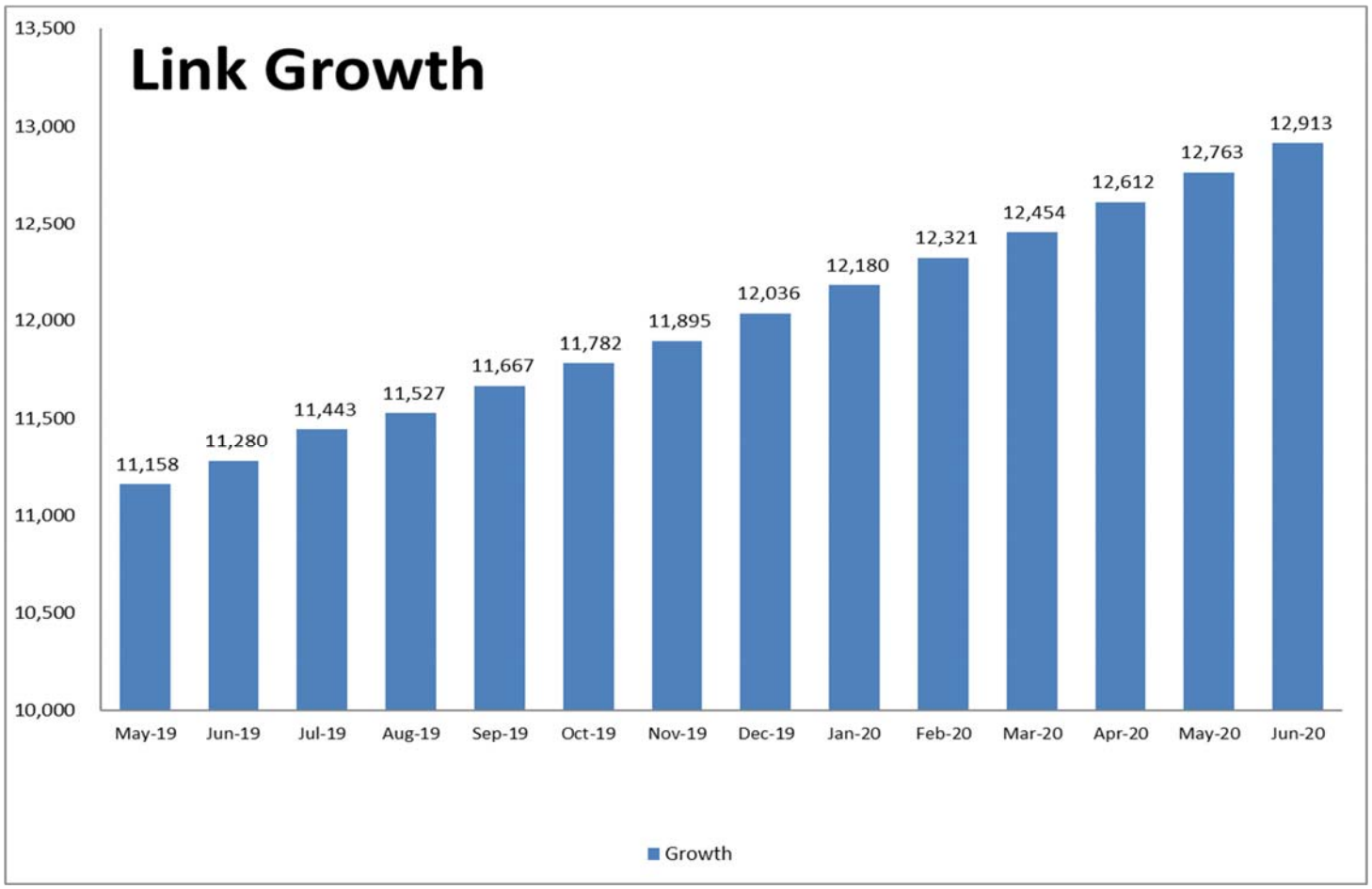
Financial Viability

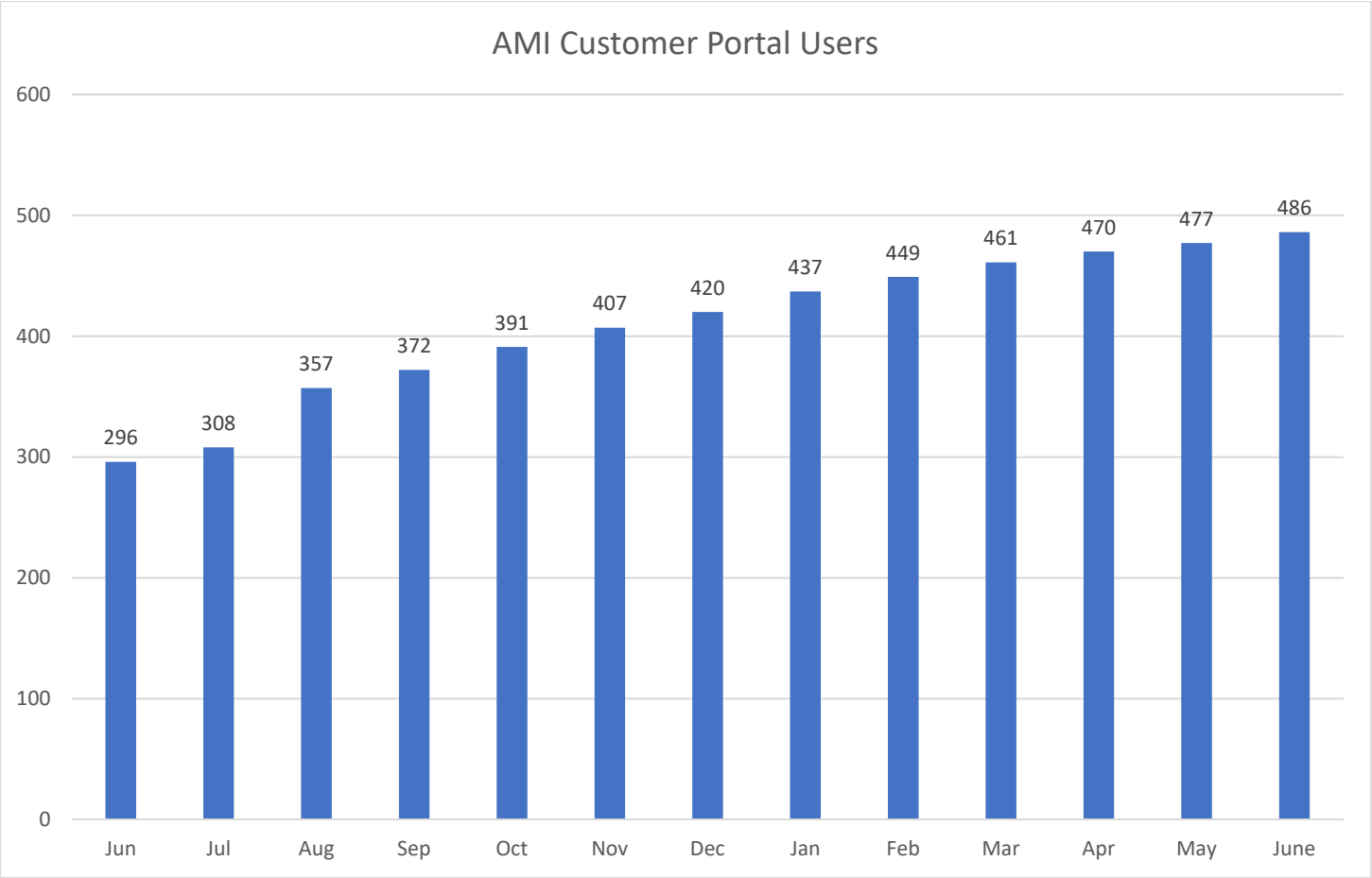
MWRD WORKING CAPITAL ACCOUNT SUMMARY

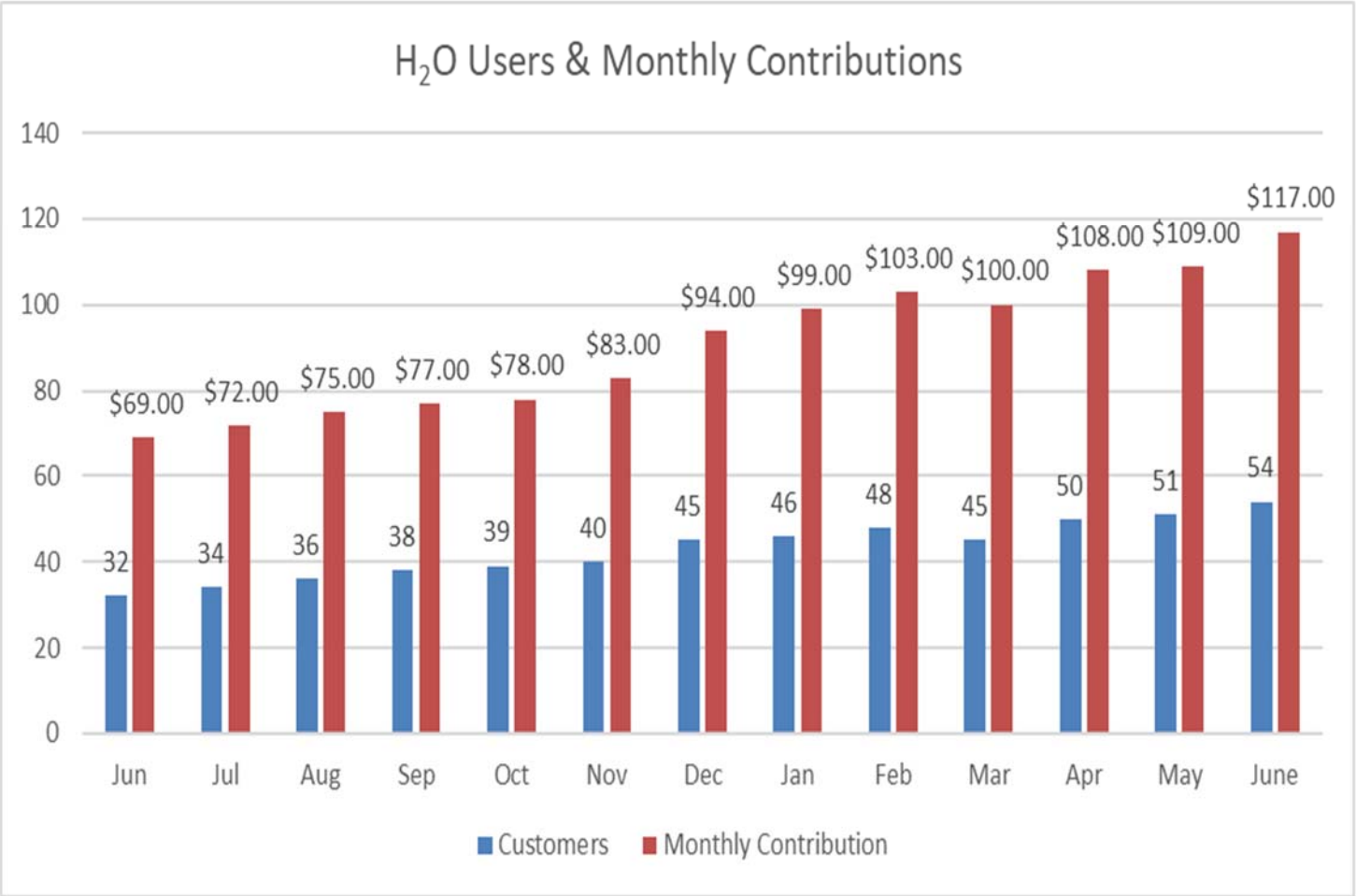
ESTIMATED Working Capital at 6/30/20			
Board Designated (System Dev, Assessments, etc) as of 6/30/19		$ 34,445,773	
Undesignated Excess Funds as of 6/30/19		48,028,398	
Estimated Reserve Revenue thru 6/30/20		7,368,868	
Estimated Reserve Expenditures thru 6/30/20		(7,344,419)	
			82,498,620
COMMITTED Reserves at 6/23/20			
SSR Amend No. 7 - Bioassess Sampling & Stratification	108,800		
Overall Creek P.S. Upgrades Additions (SSR, MR, JBS)	173,681		
Warrior Dr. Westpoint S/D Watermain Participation	109,477		
Sewer Inspection Software - WinCan	53,138		
Hazen Sawyer Regulatory Assistance	203,700		
SSR - Biosolids Polymer System Replacement	97,648		
Rucker Lane Widening Sewer Extensions	74,095		
2018/19 Sewer Rehab Change Order #2	79,645		
S&ME - 2020 Sewer Rehab Design	349,111		
Tank Painting (Mill, Tiger, Halls Hill)	903,283		
ELI - Thompson Lane Utility Relocation TDOT	90,900		
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		
SSR Task Order Overall Creek PS Upgrade	587,261		
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	1,020,606		
CIS Software Upgrade V4	343,000		
Purchase of Two (2) Aerators at WRRF	38,302		
SSR Task Order - Mill, Tiger, Halls Hill Tank Painting	93,539		
SSR Task Order 201 Facilities Plan	178,818		
Biosolids Thermal Dryer Install (JBS & MR)	107,137		
Overall Creek P.S. Updgrades (VFD's)	275,428		
S&ME - 2019 Sewer Rehab Design	139,026		
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	1,798,498		
Bradyville Pike Utility Design - Neil-Schaffer	22,710		
Wilkinson Pike Utilties Design	10,190	7,835,972	
APPROVAL Requests at 7/25/20			
Sewer Rehabilitation Project 2020/2021	4,250,092		
NE Regional Pump Station Engineering Amend#1	30,640	4,280,732	
BALANCE of Working Capital at 7/25/20 after COMMITMENTS			**$ 70,381,916**
DESIGNATED Projects Pending			
N/A		-	
ESTIMATED UNCOMMITTED Working Capital Reserves as of July 25, 2020			**$ 70,381,916**
SECURED FY20-21 Operating and Maintenance Expenses			**$ 24,363,800**
UNASSIGNED Working Capital Funds (Est. Uncommitted - Secured)			**$ 46,018,116**

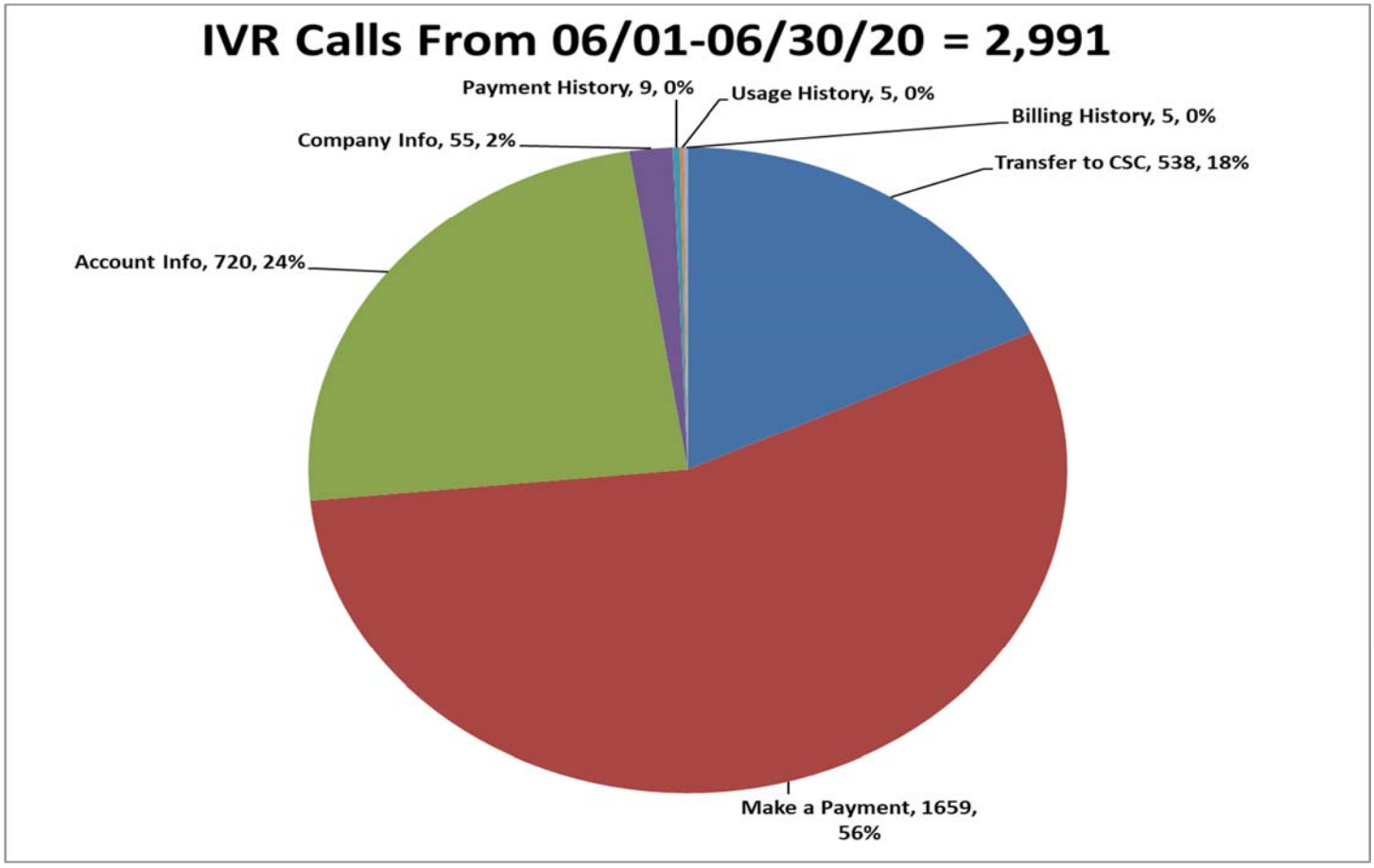

MWRD Working Capital Reserves Dashboard
Expenses and Revenue ($)
Working Capital Balance ($)
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
$(500,000)
$(1,000,000)
$(1,500,000)
$(2,000,000)
$90,000,000
$86,000,000
$82,000,000
$78,000,000
$74,000,000
$70,000,000
$66,000,000
$62,000,000
$58,000,000
$54,000,000
$50,000,000
$46,000,000
$42,000,000
$38,000,000
$34,000,000
$30,000,000
$26,000,000
$22,000,000
$18,000,000
Committed Reserves $12.1M
Unassigned Reserves = $46.0M
Secured Balance for Working Capital Acct = $24.4M
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Working Capital Expenses
Estimated Working Capital Revenues
Estimated Working Capital Balance
Estimated UNCOMMITTED Working Capital Balance
Secured Working Capital Reserve

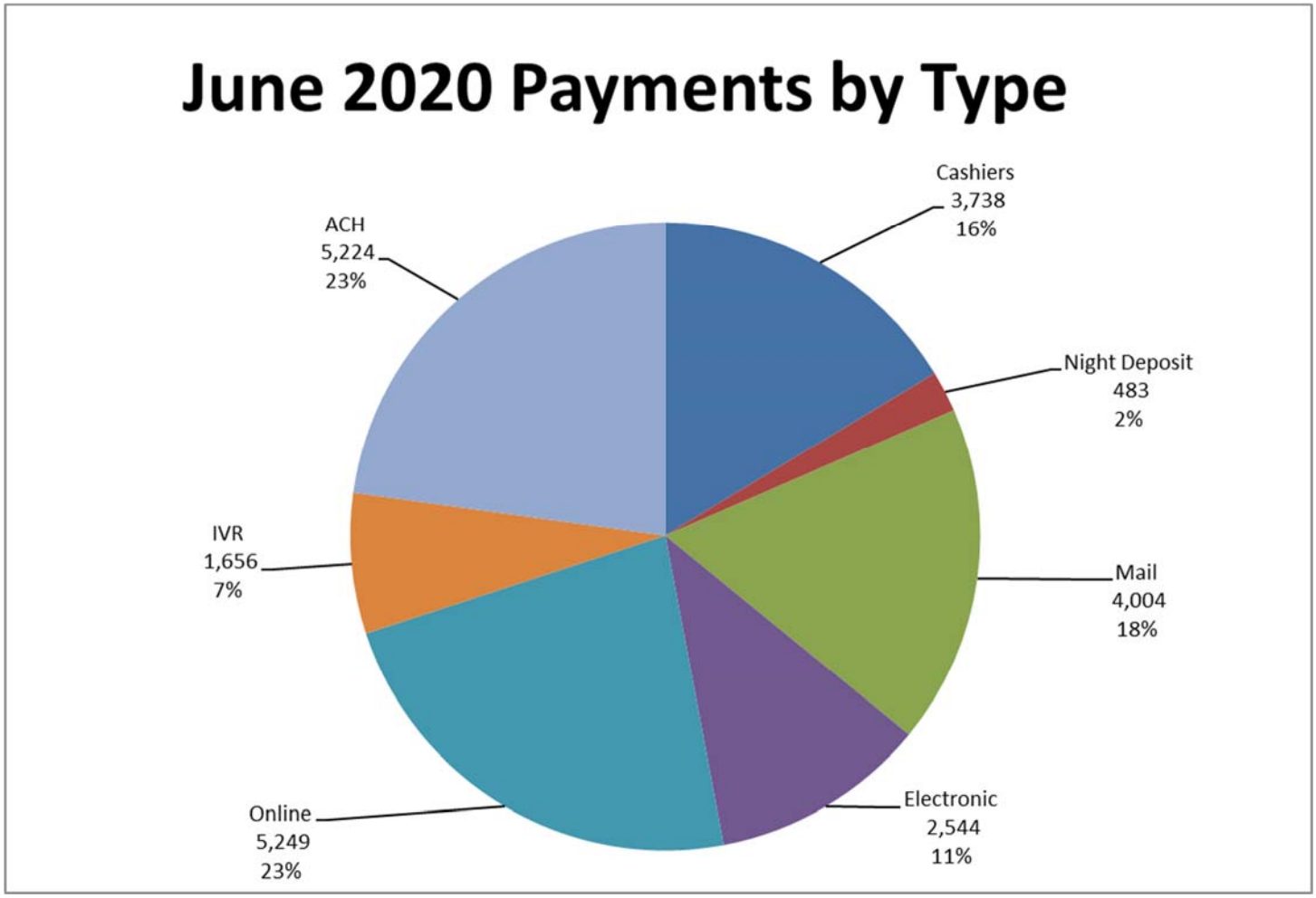

Infinity.Link Customers as of June 2020 = 12,913
1,886
15%
3,765
29%
4,159
32%
3,103
24%
Account Only
Paper Bill
E-Bill
Paper & E-Bill

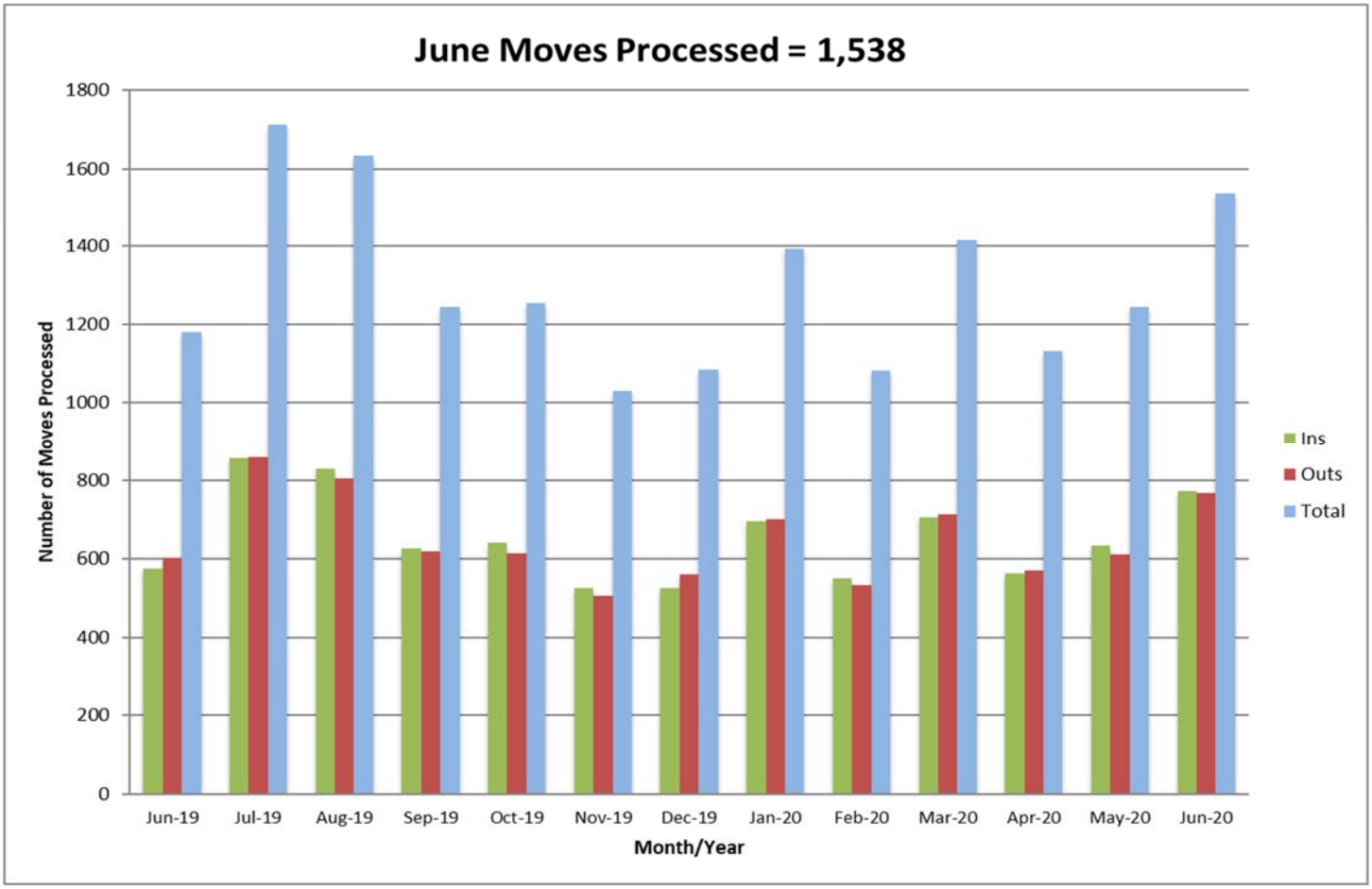

Link Growth
13,500
13,000
12,500
12,000
11,500
11,000
10,500
10,000
11,158
11,280
11,443
11,527
11,667
11,782
11,895
12,036
12,180
12,321
12,454
12,612
12,763
12,913
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Growth

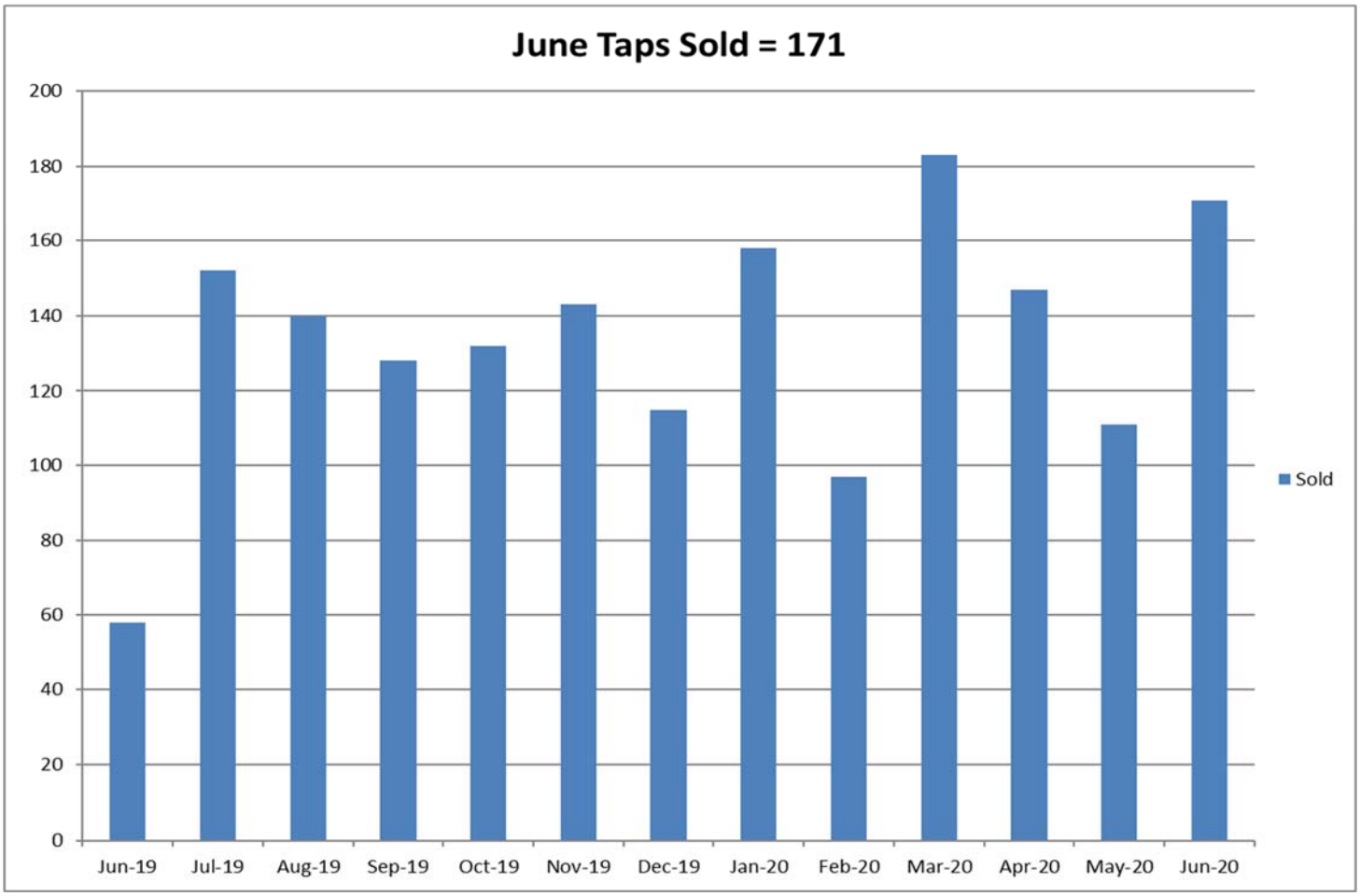

AMI Customer Portal Users
600
500
400
300
200
100
0
296
308
357
372
391
407
420
437
449
461
470
477
486
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
June

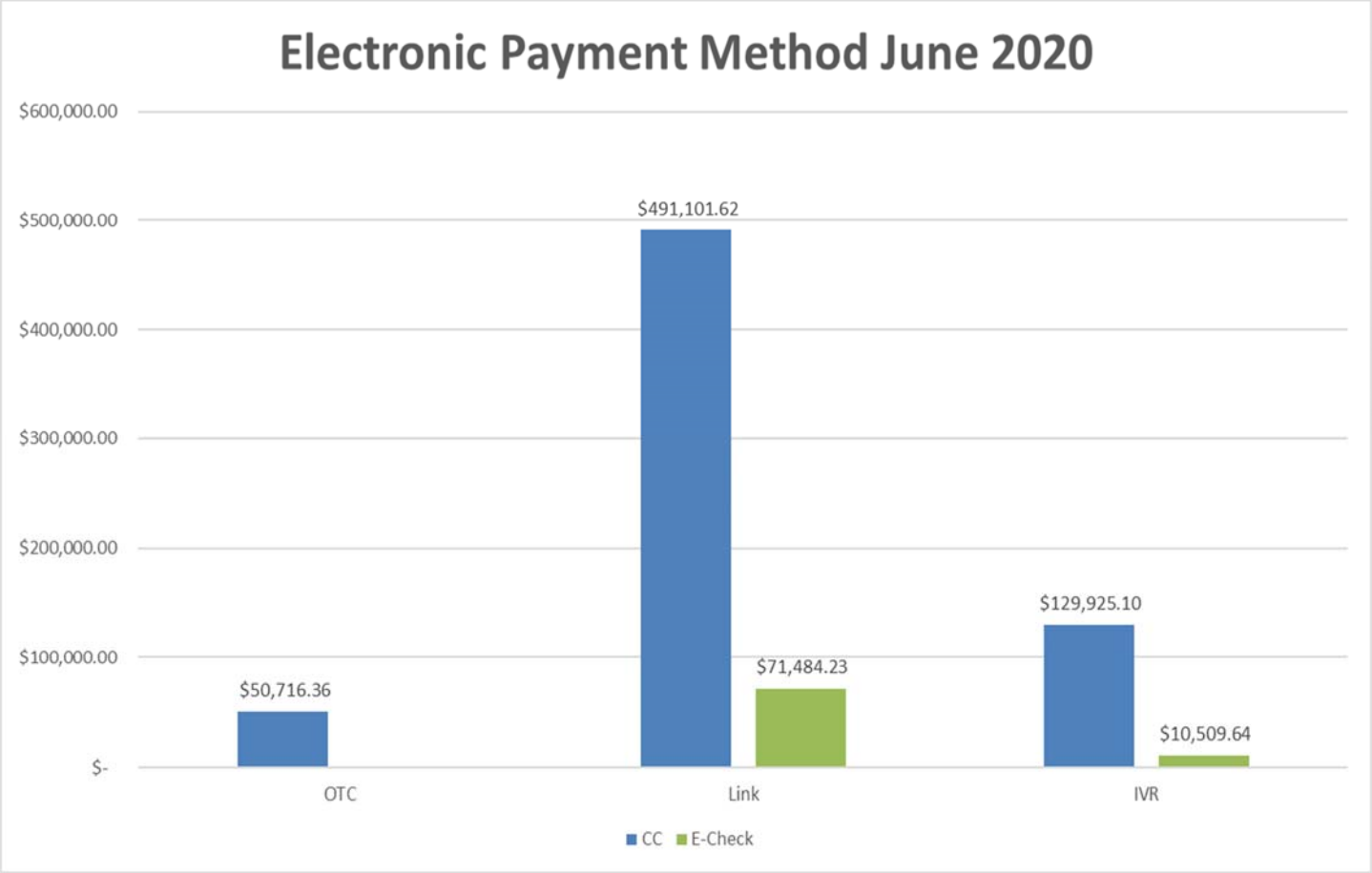

H_2O Users & Monthly Contributions
140
120
100
80
60
40
20
0
$69.00
$72.00
$75.00
$77.00
$78.00
$83.00
$94.00
$99.00
$103.00
$100.00
$108.00
$109.00
$117.00
32
34
36
38
39
40
45
46
48
45
50
51
54
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
June
Customers
Monthly Contribution

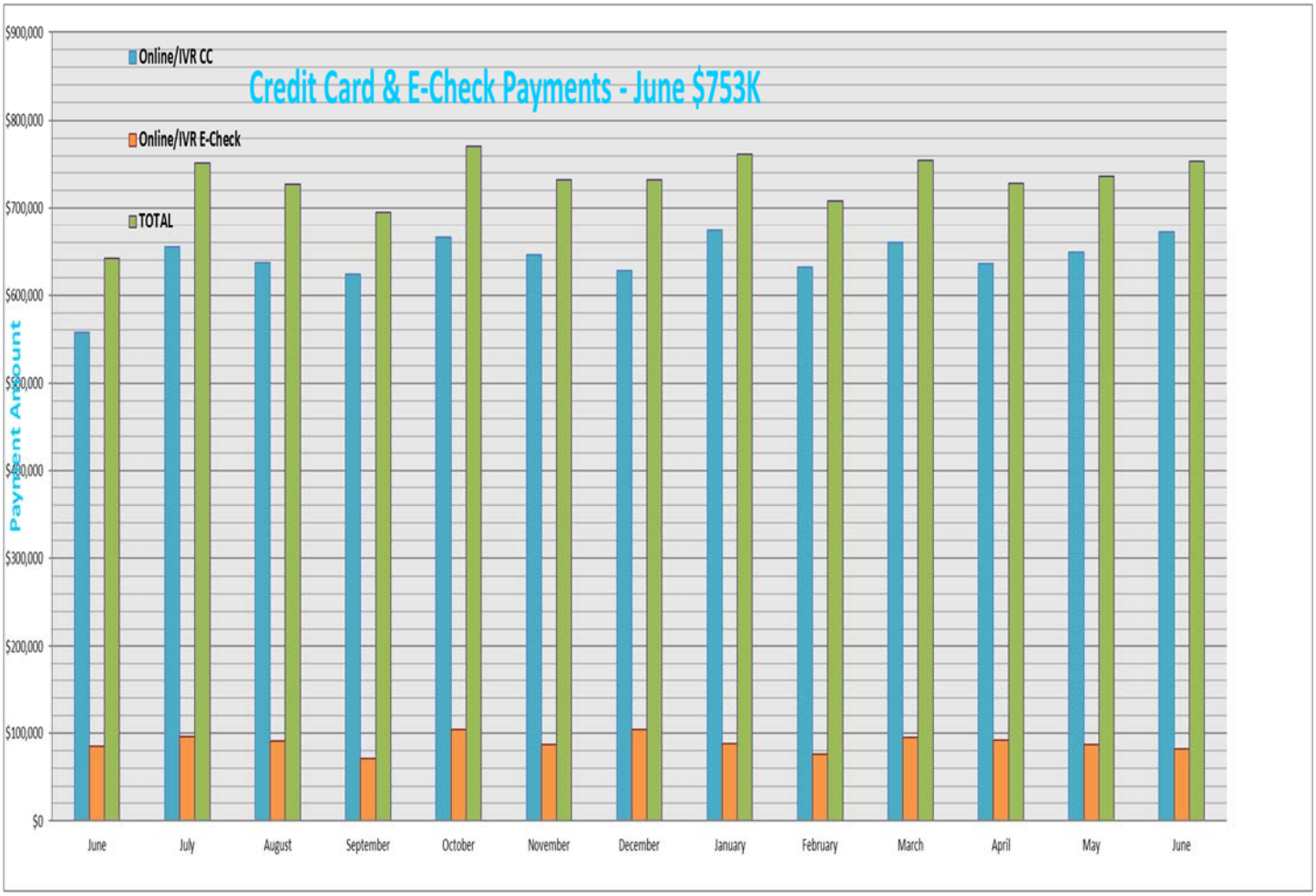

IVR Calls From 06/01-06/30/20 = 2,991
Payment History, 9, 0%
Usage History, 5, 0%
Billing History, 5, 0%
Company Info, 55, 2%
Transfer to CSC, 538, 18%
Account Info, 720, 24%
Make a Payment, 1659, 56%

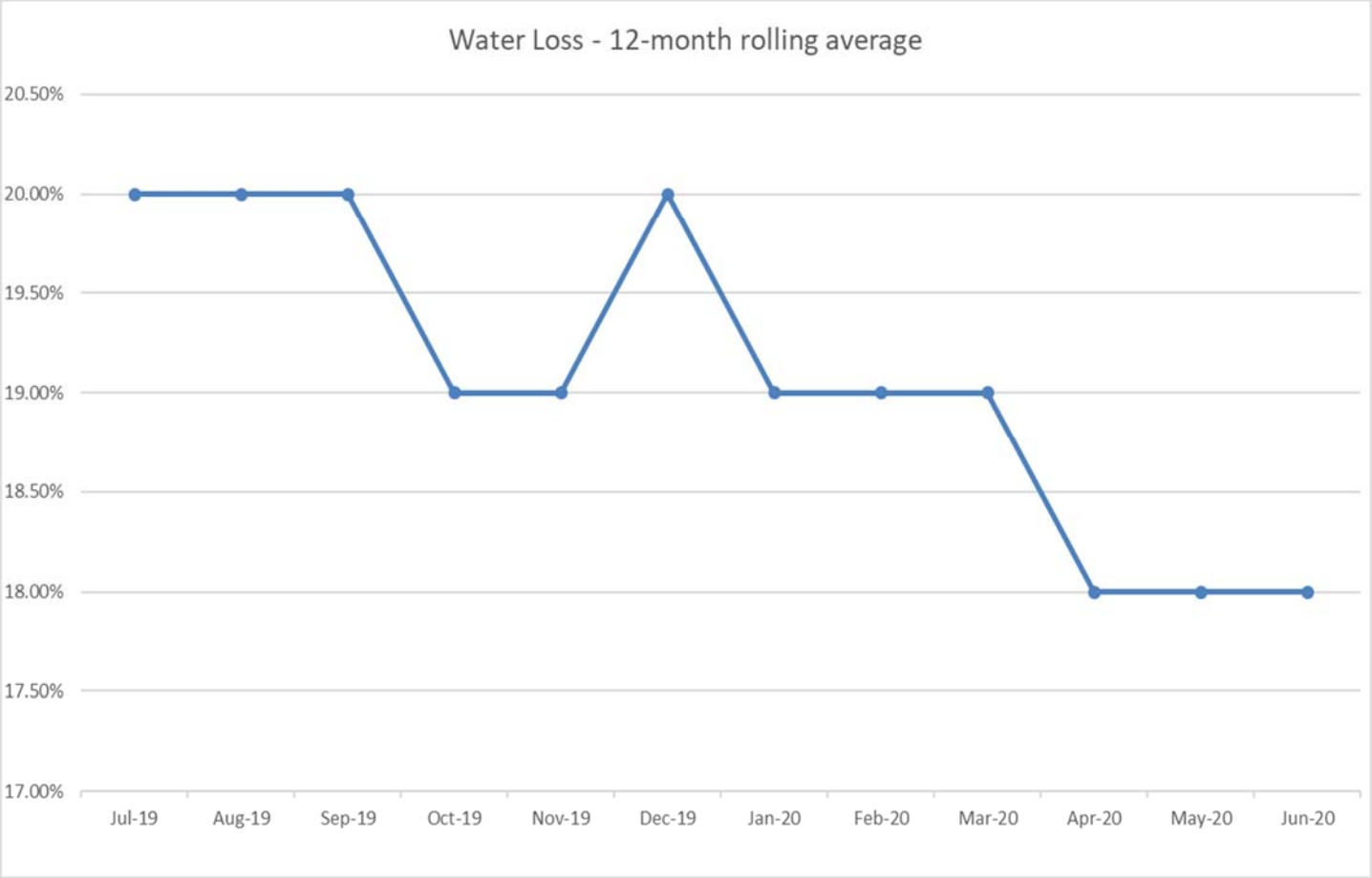

June 2020 Payments by Type
Cashiers 3,738 16%
ACH 5,224 23%
Night Deposit 483 2%
IVR 1,656 7%
Mail 4,004 18%
Online 5,249 23%
Electronic 2,544 11%


June Moves Processed = 1,538
Number of Moves Processed
1800
1600
1400
1200
1000
800
600
400
200
0
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Month/Year
Ins
Outs
Total


June Taps Sold = 171
200
180
160
140
120
100
80
60
40
20
0
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Sold


Electronic Payment Method June 2020
$600,000.00
$500,000.00
$400,000.00
$300,000.00
$200,000.00
$100,000.00
$-
$50,716.36
$491,101.62
$71,484.23
$129,925.10
$10,509.64
OTC
Link
IVR
CC
E-Check

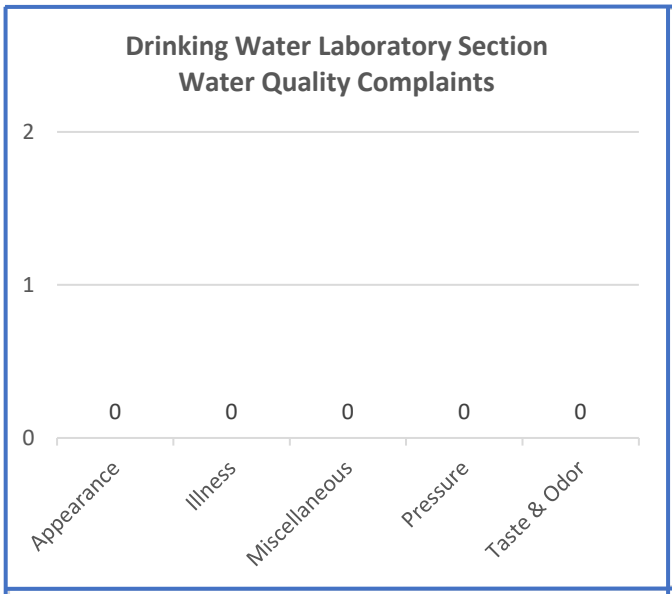

Online/IVR CC
Online/IVR E-Check
TOTAL
Credit Card & E-Check Payments - June $753K
Payment Amount
$900,000
$800,000
$700,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
June
July
August
September
October
November
December
January
February
March
April
May
June

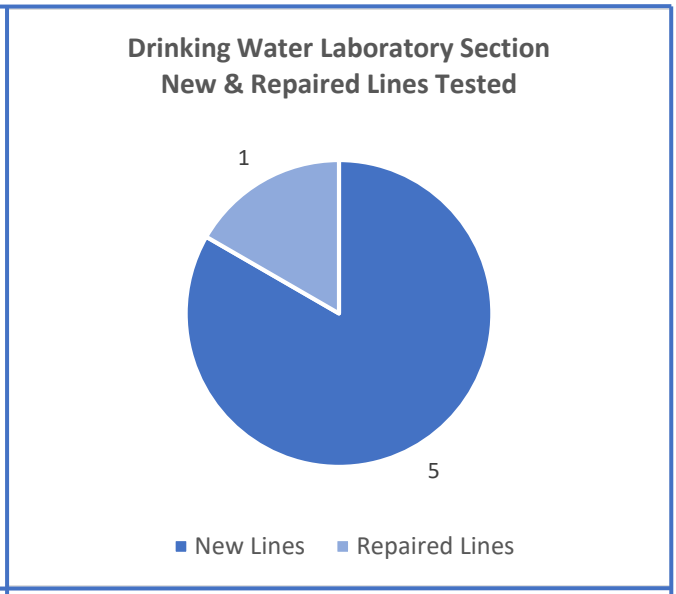

Water Loss - 12-month rolling average
20.50%
20.00%
19.50%
19.00%
18.50%
18.00%
17.50%
17.00%
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20

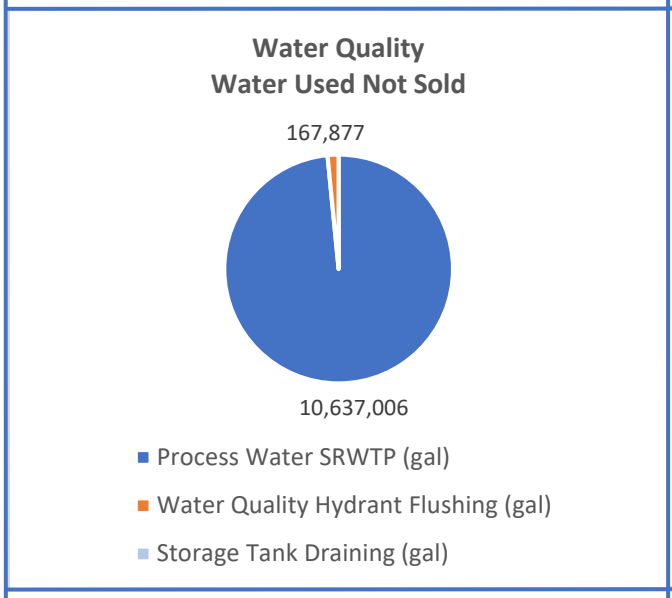
STONES RIVER WATER TREATMENT PLANT

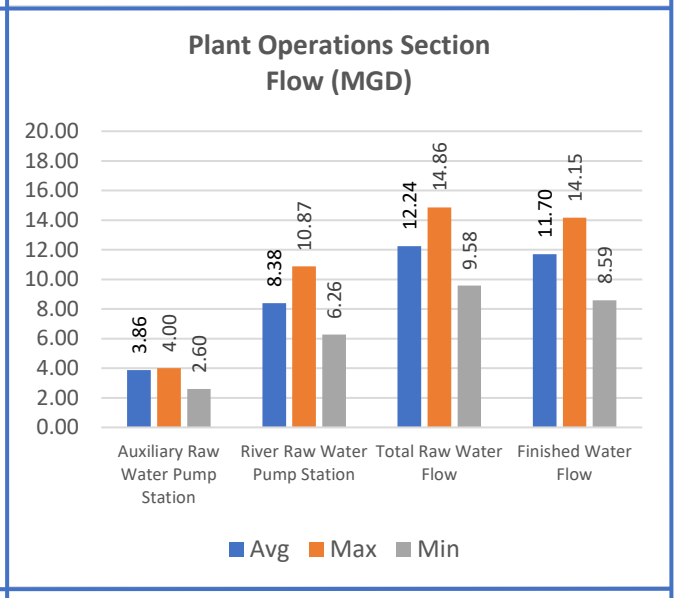
Dashboard Report

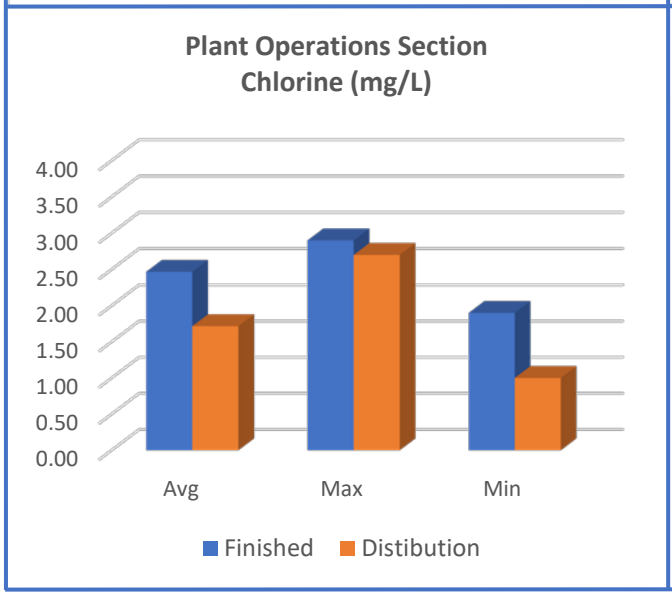
June 2020

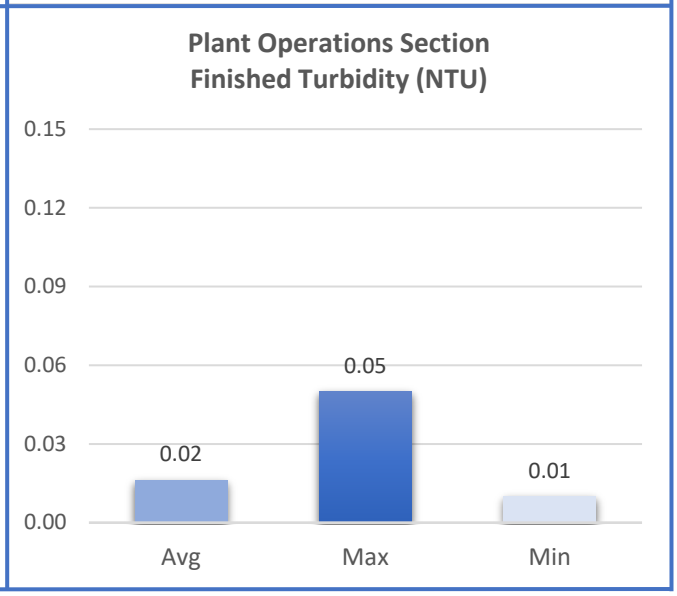








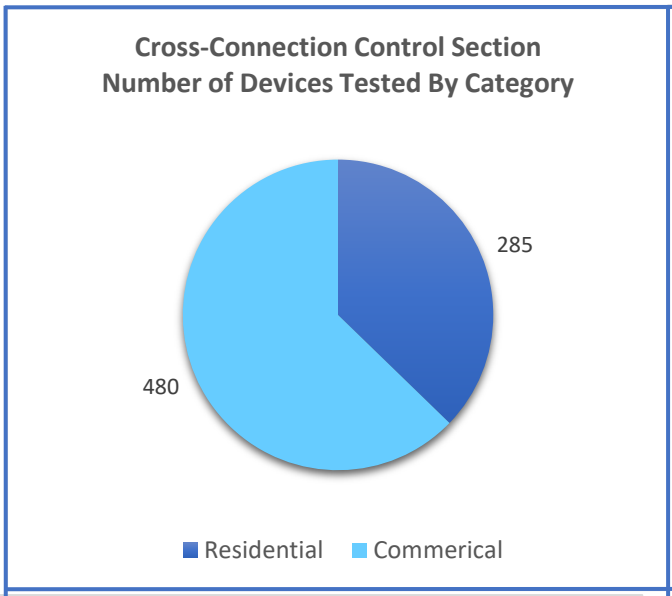


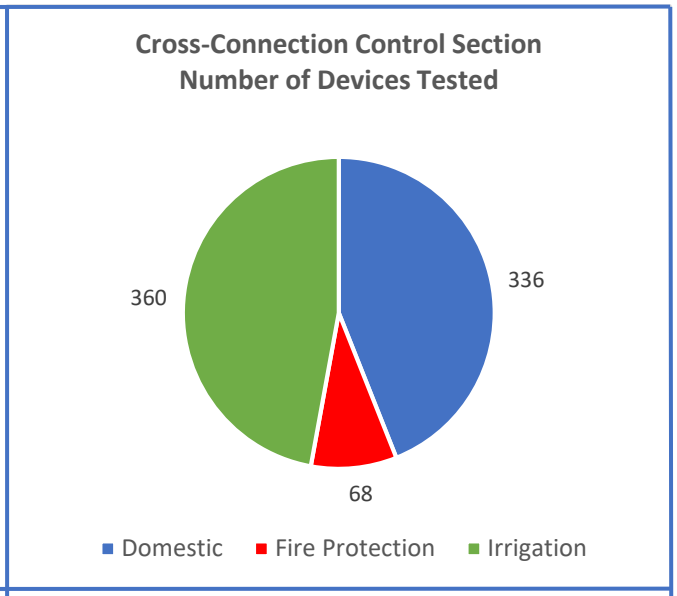


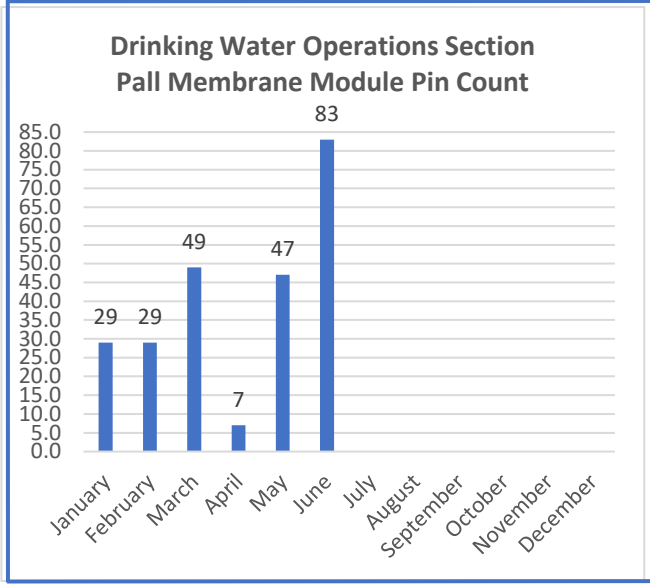
STONES RIVER WATER TREATMENT PLANT

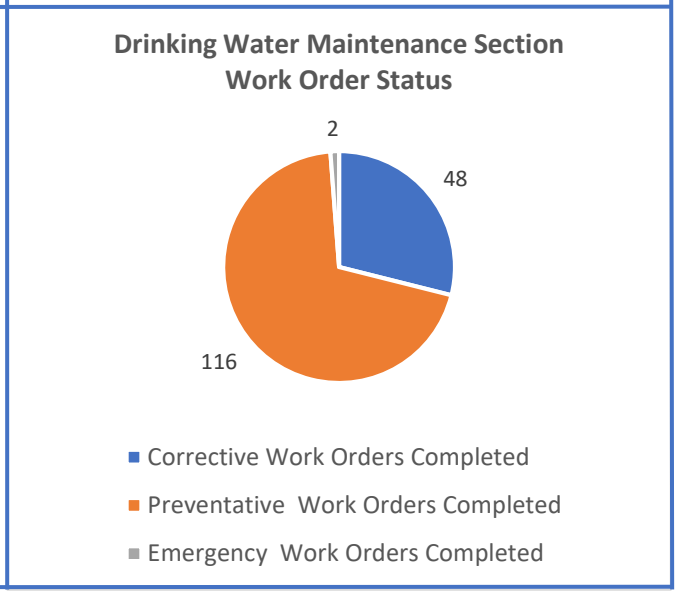
Dashboard Report

June 2020





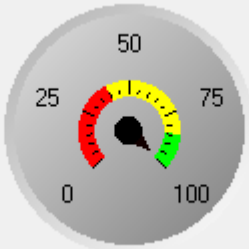
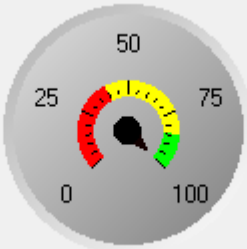




MURFREESBORO WATER RESOURCE RECOVERY FACILITY

DASHBOARD REPORT

June, 2020

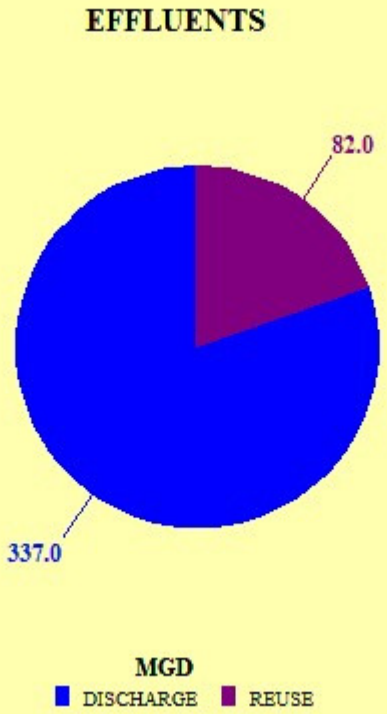
BOD PERCENT REMOVAL	AMMONIA PERCENT REMOVAL
	
99.0	99.6

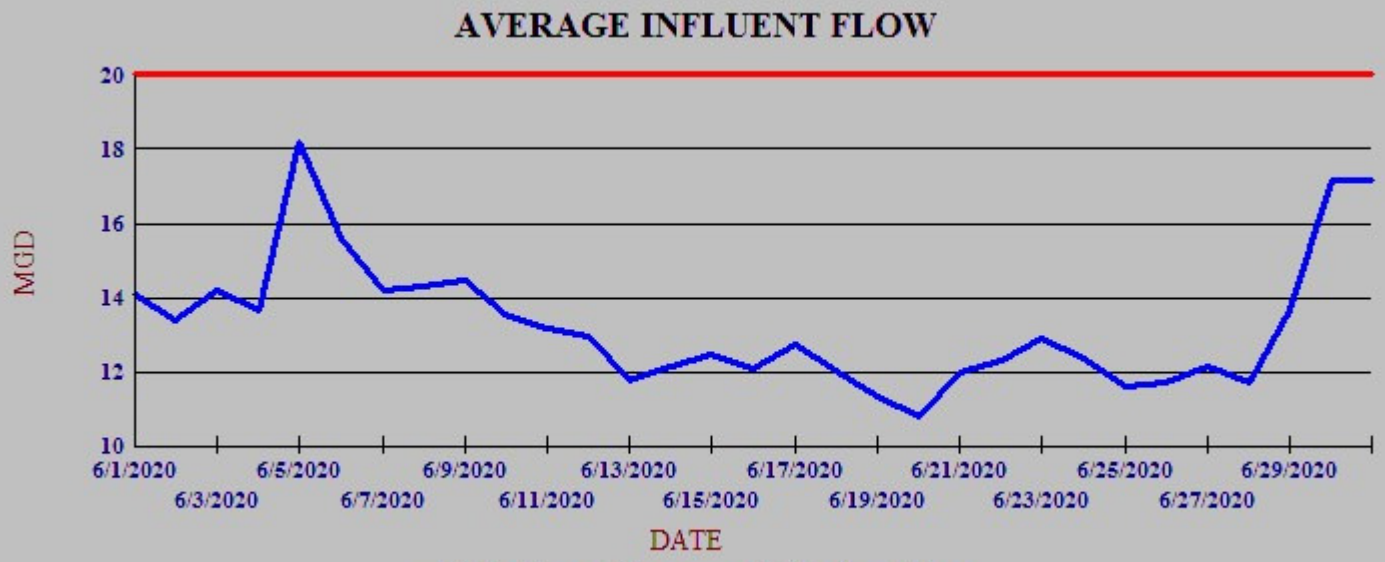
394.876

MILLION GALLONS TREATED

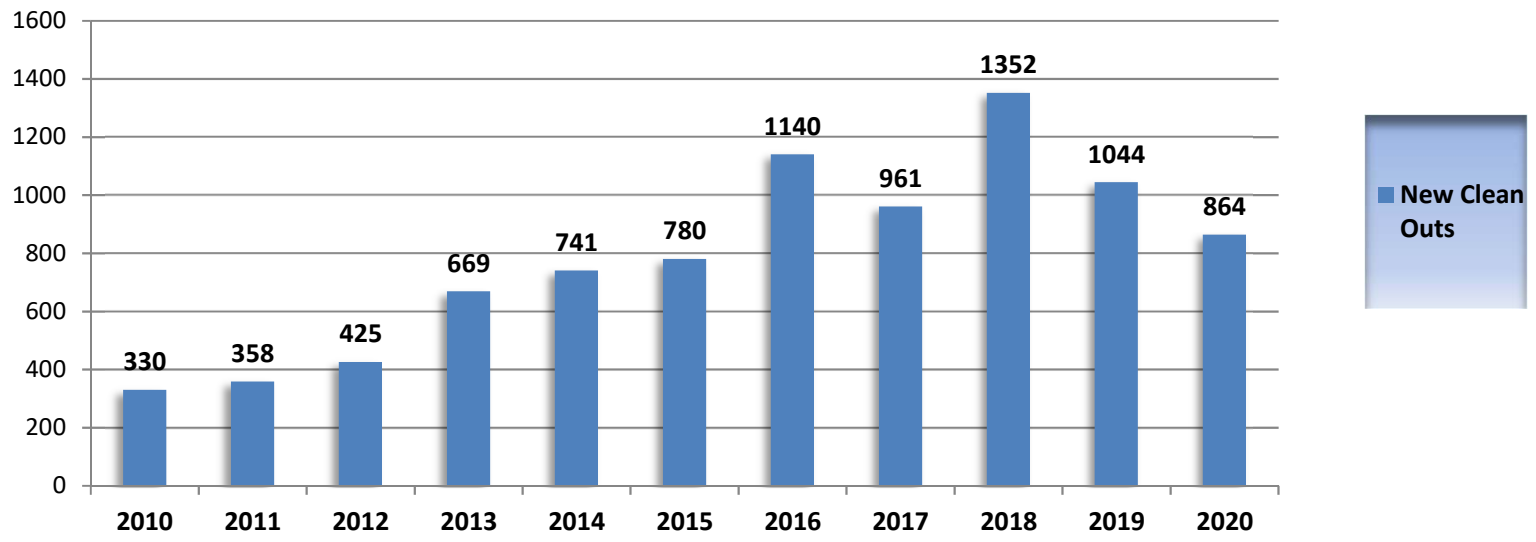
2,227.77

TONS BIOSOLIDS REMOVED





NEW SEWER CLEAN OUTS

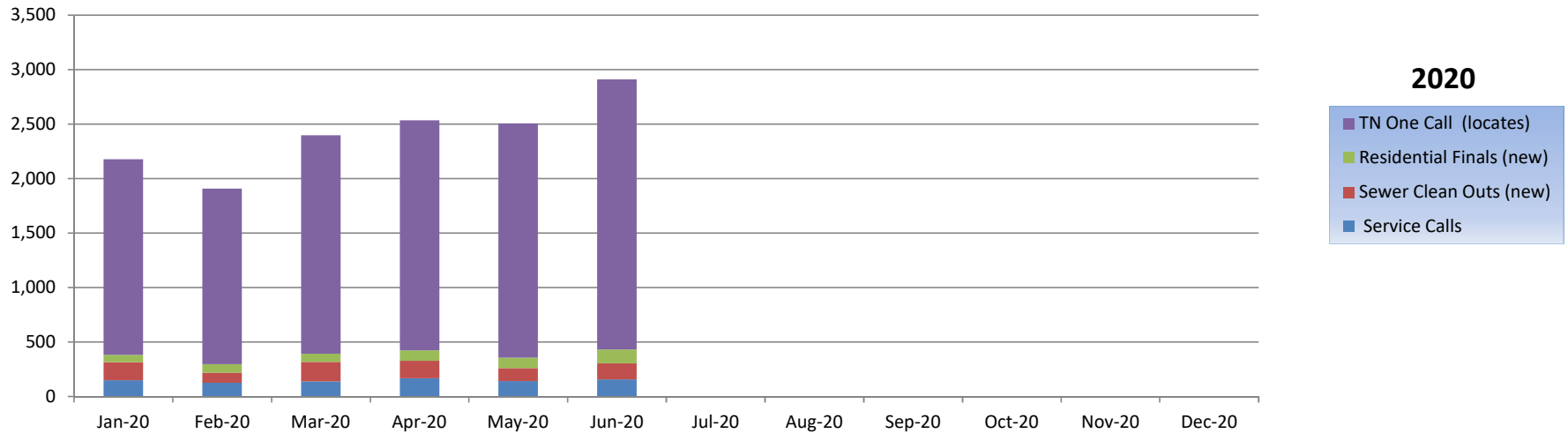


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
New Clean Outs	330	358	425	669	741	780	1140	961	1352	1044	864

** For the calendar year Jan-Dec*

7/23/2020

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	156							
Sewer Clean Outs (new)	166	94	177	161	119	147							
Residential Finals (new)	68	79	77	96	97	126							
TN One Call (locates)	1,794	1,611	2,004	2,110	2,149	2,481							
TOTAL	**2,176**	**1,907**	**2,396**	**2,533**	**2,504**	**2,910**							**14,426**

MWRD - OPERATIONS & MAINTENANCE

ASPHALT QUOTES

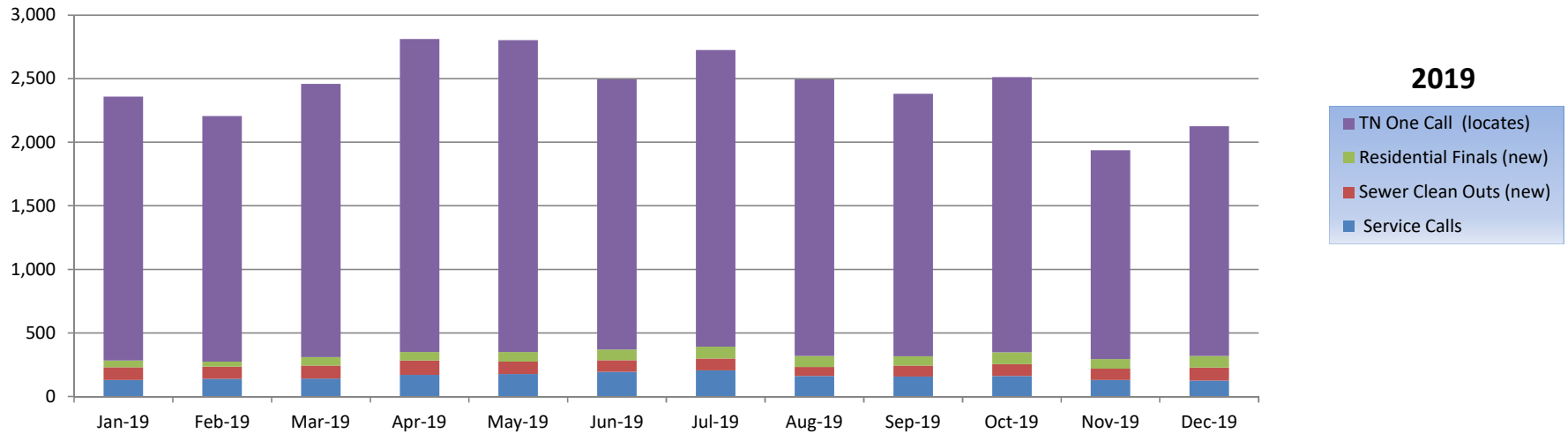
	Blue Water		Hawkins		Vulcan		Notes
	Binder	*Topping*	*Binder*	*Topping*	*Binder*	*Topping*	
Jul	*$49.00*	*$61.00*	$48.50	$60.50	$58.00	$67.50	
Aug	*$49.00*	*$61.00*	$48.50	$60.50	$58.00	$67.50	
Sep	*$49.00*	*$61.00*	$48.50	$60.50	$58.00	$67.50	
Oct	*$50.25*	*$66.25*	$49.98	$65.00	$58.00	$66.24	
Nov	*$50.25*	*$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	*$65.00*	*$75.00*	$54.78	$62.88	$55.78	$63.88	

MWRD OPERATIONS & MAINTENANCE

ASPHALT PURCHASES

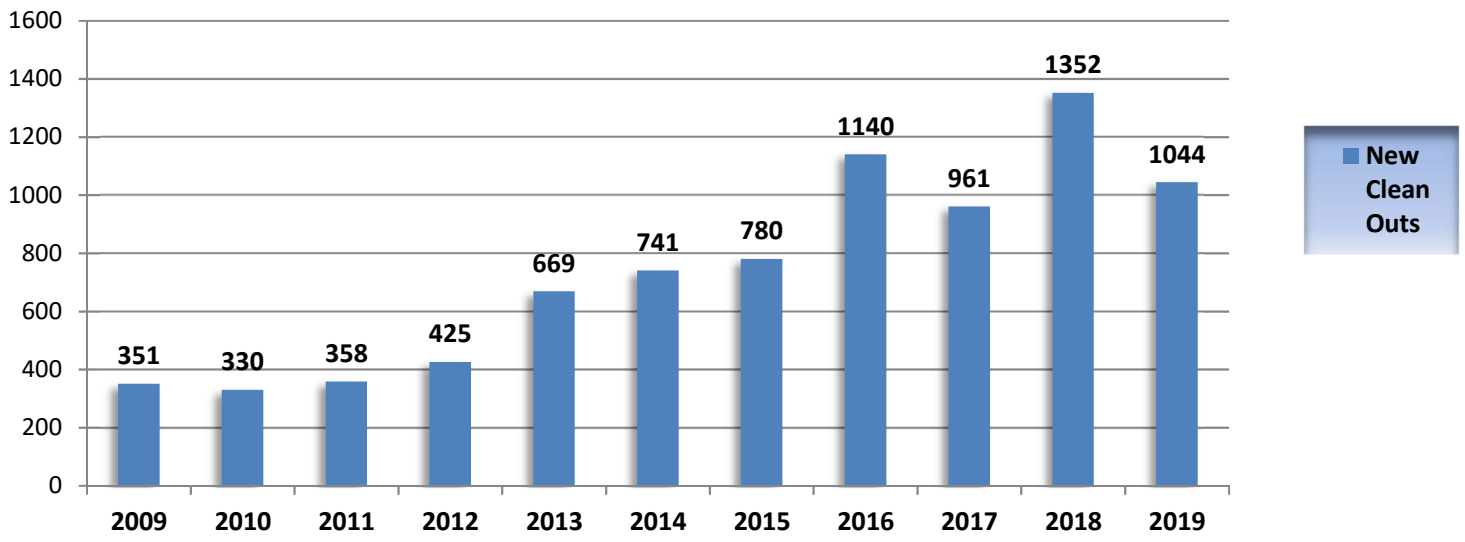
Date	Approval	Vendor	Type	Rate	Qty	Total	FY Total
7/23	DH	Hawkins	BM	$48.50	23.97	$1,162.55	$1,162.55
7/23	DH	Hawkins	411E	$60.50	8.00	$484.00	$1,646.55
7/23	DH	Hawkins	411E	$60.50	54.06	$3,270.63	$4,917.18
7/26	DH	Hawkins	BM	$48.50	71.84	3,484.24	$8,401.42
7/29	DH	Hawkins	BM	$48.50	90.02	4,365.97	$12,767.39
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
6/16	DH	Hawkins	BM	$47.50	80.04	3,801.90	$47,497.92
6/19	DH	Hawkins	411E	$60.50	37.98	2,297.79	$49,795.71
6/19	DH	Hawkins	BM	$47.50	89.90	4,270.25	$54,065.96
6/22	DH	Hawkins	411E	$60.50	15.05	910.53	$54,976.48

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**

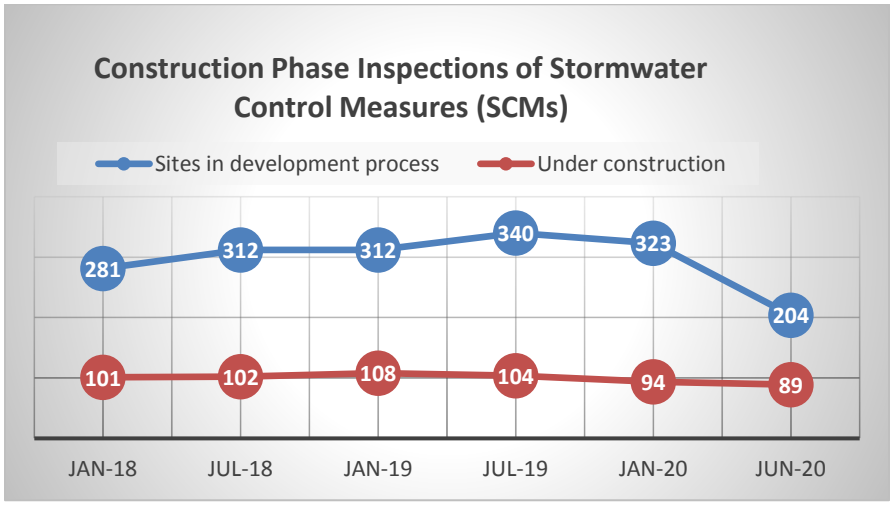
NEW SEWER CLEAN OUTS



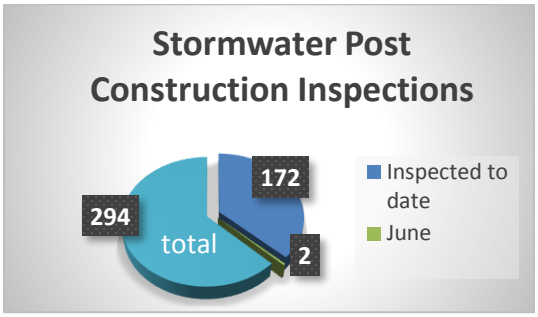
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
New Clean Outs	351	330	358	425	669	741	780	1140	961	1352	1044

** For the calendar year Jan-Dec*

Stormwater Dashboard - June 2020

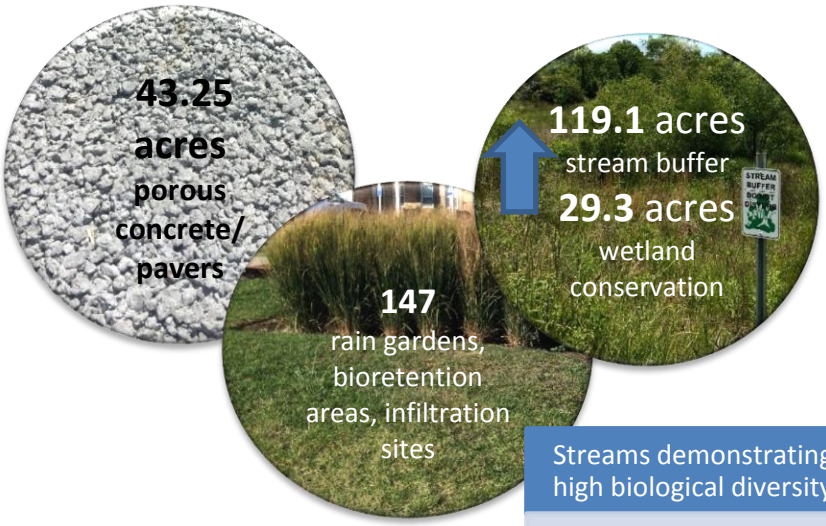


Inspection Program



Education and Outreach

LID/ Green Infrastructure



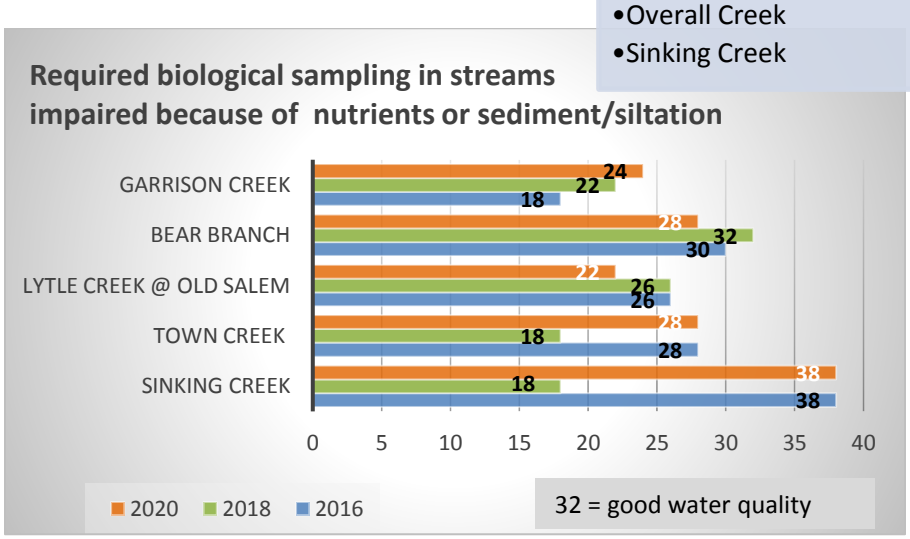
Streams demonstrating high biological diversity

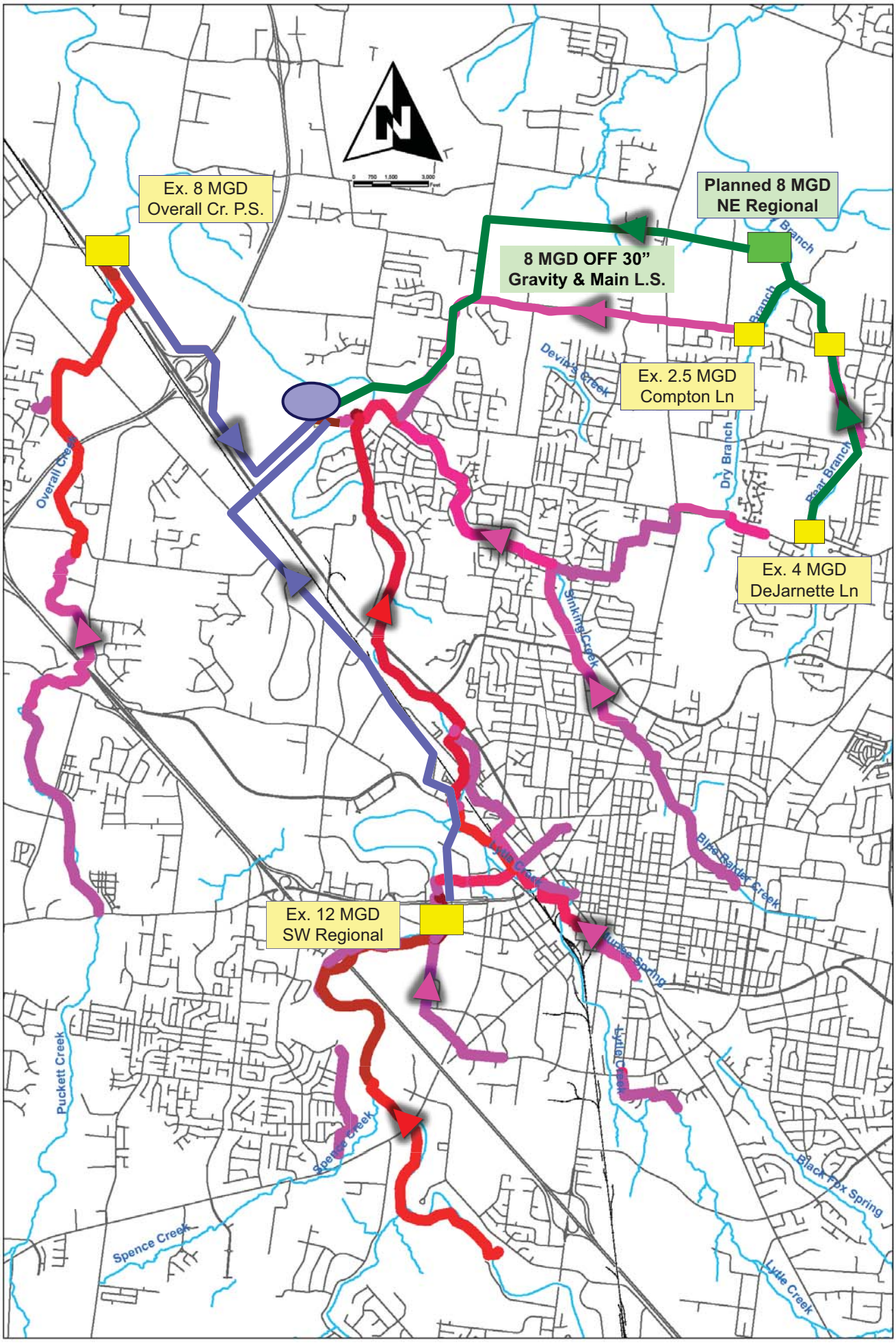
- Upper West Fork Stones River
- Bushman Creek
- Overall Creek
- Sinking Creek

Stormwater Infrastructure

	June	YTD	Total
Junction Boxes	16	290	16,870
Headwalls	14	141	7,009
Ponds	4	22	540
Gravity Mains	2,980 ft	39,495 ft	707.3 miles
Weirs	4	14	323
WQ Units	0	3	115
Underground Storage	0	0	30

Stream scorecard




Ex. 8 MGD
Overall Cr. P.S.
Planned 8 MGD
NE Regional
8 MGD OFF 30"
Gravity & Main L.S.
Ex. 2.5 MGD
Compton Ln
Ex. 4 MGD
DeJarnette Ln
Ex. 12 MGD
SW Regional
Overall Creek
Devin's Creek
Dry Branch
Bear Branch
Sinking Creek
Lyle Creek
Black Bandy Creek
Puckett Creek
Spence Creek
Black Fox Spring