CHARLES TOWN UTILITY BOARD
AGENDA

WEDNESDAY, APRIL 14, 2021

Regular Meeting | **661 South George Street, Charles Town, WV 25414** | **4:00 PM**

CALL TO ORDER

1. **APPROVAL OF MINUTES**
   a. Approval of March 24, 2021 Regular Meeting Minutes
      UB Minutes March 24, 2021.pdf
   b. Approval of April 7, 2021 Special Meeting Minutes
      UB Minutes April 7, 2021.pdf

2. **PUBLIC COMMENT**
   This portion of the agenda is designed for members of the general public to share thoughts on items of interest in the community. By law, Board members may ask clarifying questions or discuss procedural matters but are not permitted to discuss the policy merits of any issue unless it is scheduled for discussion.

   Until such time as Governor Justice revokes Executive Order 09-20 or any subsequent executive order that is primarily intended to address the public health emergency and spread of COVID-19 by restricting public gatherings and invoking physical distancing, public access to the meeting room will be restricted. Members of the public may still submit written comments to kstolipher@ctubwv.com that will be read aloud. Up to 20 minutes of time will be allotted for reading public comments.

   The public is invited to attend this meeting via webcast (www.ctubwv.com - Board Meetings - Meeting Agendas and Minutes 2021). The public may also attend the meeting by accessing the following zoom link: https://zoom.us/j/93837440098?pwd=NGtEYTZ4VUh1TVc0QzRMQ3BpenVrZz09
   or by calling 1-301-715-8592 and entering the Meeting ID 938 3744 0098 and Passcode 658581.

3. **UNFINISHED BUSINESS**
   a. 2021 Draft Sewer Strategic Plan
      SSP 04012021 REV.pdf

4. **NEW BUSINESS**
   a. GDF
   i. Water - Phase II Hydrogeological Study (ERI)

GDF Phase II Proposal.pdf

ii. Sewer - Solids Handling Evaluation & Charles Town WWTP Process Evaluation
Solids Handling Evaluation.pdf
Charles Town WWTP Process Evaluation.pdf

b. RK&K

i. Task Order No. 17 - Facility Plan
Task Order No. 17.pdf

ii. Task No. 7 SOW Change No. 2 - Jetts Farm Pump Station Modifications
Task No. 07.pdf

c. Funding Strategies for the Renewal and Replacement Projects and Collection System Projects

d. Possible Executive Session of the Board pursuant to the following statutory exception to the Open Governmental Proceeds Act): WV State Code Section §6-9A-4(b)(12) – To discuss any matter which, by express provision of federal law, or state statute or rule of court is rendered confidential, or which is not considered a public record within the meaning of the Freedom of Information Act, specifically in this case, matters protected by Attorney-Client Privilege that relate to development project planning along Patrick Henry Way.

5. **MANAGER REPORTS**
   a. Utility Manager Report
   UM Report 04.14.2021.pdf
   b. Chairman Report

6. **APPROVAL OF BILLS**
   a. April 14, 2021
   Board Report 4.14.21.pdf

7. **INFORMATION ONLY - NEXT MEETING - APRIL 28, 2021 AT 4:00 PM**

8. **ADJOURNMENT**

March 24, 2021

The Charles Town Utility Board held a virtual meeting on March 24, 2021 at 4:00 p.m. Members of the Board present were Pete Kubic, Duke Pierson, Jacquelyn Milliron and Tommy Stocks. Also present were Hoy Shingleton, Kristen Stolipher, and Ashley Stottlemyer. The Vice Chairman called for changes or corrections to the March 10, 2021 regular meeting minutes. Motion by Duke, second by Tommy, with discussion from Jacquelyn, the Board approved the minutes as amended. One public comment was received from Heidi Parker.

Next discussed was the Draft Safety Management Plan. Kristen noted the document will be a working draft and amended as needed. She did not receive any comments from the Board. Motion by Duke, second by Tommy, with discussion from Jacquelyn, the Board approved the plan as a working document and any amendments be brought back to the Board for approval.

The Board next discussed the Water Treatment Plant Line Survey by GDF. Chris Eckenrode from GDF, gave a brief overview on the proposed one-mile line survey along Route 9 from the existing water treatment plant to Evitts Run for a new NPDES discharge line. The effort would cost an estimated $10,000. This would better define a cost and process for discharge instead of transporting solids to the wastewater treatment plant. Motion by Tommy, second by Duke, the Board approved moving forward with the line survey.

Chris also discussed the Stage 1 Hydrogeologic Study by Terracon which identified new water supply well locations for the water treatment plant. The next phase would consist of picking three locations and move forward with an ERI test to solidify that ground water is available before digging wells. The Utility currently only has the river as a backup water source. Kristen suggested using the bond refunding money toward this effort. Duke noted there may be infrastructure funding available through a federal grant the Municipalities and the County are due to receive. Motion from Duke, second by Tommy, the Board approved Phase 1 study. Chris also mentioned he would have the sludge options for the wastewater plant finalized by the end of the week and requested a workshop at the plant to discuss.

The Vice Chairman next opened the floor for discussion on the Route 9 Sewer Project Resolution No. 14 – Contractor Pay Application No. 014, Hatch Invoices and CTUB Reimbursement. Kristen provided this is the second to the last pay application, as a number of the punch list items have been completed. Motion by Duke, second by Tommy, with discussion from Jacquelyn, the Board approved Route 9 Sewer Project Resolution No. 14.

Next discussed was the HACH Lead and Copper Sampling Contract. Kristen mentioned the contracted service would include the sampling of lead and copper from start to finish. This would eliminate staff's involvement and liability in the sampling process. Motion by Duke, second by Jacquelyn, the Board approved the contract with Hach for one year, with a caveat that staff investigate to see whether there are other firms that may offer this service to compare costs.

The next item on the agenda discussed was Miller Station – Request from Owner. Hoy is still looking into this issue and not ready to provide a response at this time. This item was for information only and will be discussed further at a later meeting.

The Approval of Bills was next discussed. Motion by Duke, second by Tommy, with discussion from Jacquelyn, the Board approved the payment of bills. Next, was the Utility Manager Report. Kristen briefed the Board on this month's efforts including an update on rate equalization. The Ordinance Committee unanimously supported staff's recommended option and will forward that to City Council on April 5th. Also, the Office of Disciplinary Council provided a written response to Tim Stranko's question which will be provided in the Manager's Report next meeting. Jacquelyn requested

the contract with Tim be included as well. Kristen also mentioned she would be discussing the Fairfax Boulevard extension with the Board at a later meeting.

Next, John Stump from Steptoe & Johnson, gave a presentation on the Open Meetings Act. Jacquelyn mentioned she attended the last Safe Drinking Water Collaborative meeting with Daryl. The meeting was adjourned at 5:50 p.m. The April 14th regular meeting will be held virtually at 4:00 p.m.

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Chairman Secretary

April 7, 2021

The Charles Town Utility Board held a special meeting workshop on April 7, 2021 at 4:00 p.m. at 842 S. George Street. Members of the Board present were Daryl Hennessy, Tommy Stocks and Jacquelyn Milliron. Also present were Kristen Stolipher, April Shultz, Ashley Stottlemyer, Joe Burris, Chris Eckenrode and Jim Balliet.

The workshop was held at the Charles Town wastewater treatment plant to review components included in the Renewal & Replacement Project, as well as sludge handling options. Chris Eckenrode and Jim Balliet of GDF were present to provide an overview to the Board. The topic will be brought back to the Board at the next regular meeting to discuss further and decide on the best sludge handling option.

The April 7, 2021 special meeting workshop adjourned at 5:35 p.m. The April 14th regular meeting will be held virtually at the CTUB office located at 661 S. George Street.

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Chairman Secretary



SEWER STRATEGIC PLAN

DRAFT

2021-2024

CHARLES TOWN UTILITY BOARD

661 South George Street, Suite 101
Charles Town, West Virginia 25414

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Charles Town Utility Board (CTUB)
Sewer Strategic Plan
2021-2024

Adopted:

_____

BOARD OF DIRECTORS

Daryl Hennessy, Chairman - dhennessy@charlestownwv.us

Pete Kubic, Vice Chairman

Thomas Stocks, Treasurer

Keith Pierson, City of Ranson Mayor

Jacquelyn Milliron

CTUB MANAGEMENT

Kristen M. Stolipher, Utility General Manager – kstolipher@ctubwv.com

April L. Shultz, Assistant Utility Manager – ashultz@ctubwv.com

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EXECUTIVE SUMMARY

Purpose

The purpose of this Sewer Strategic Plan (SSP) is to document the Charles Town Utility Board's (CTUB) existing wastewater collection and treatment system to establish a plan for conveyance of all wastewater that will be generated within the region to the CTUB wastewater treatment plants during current and future periods of growth. The plan will evaluate future plans and implementation strategies both physically and financially. Another major purpose of this SSP is the identification of wastewater peak flows and the evaluation of the capacity of the existing collection and conveyance system to convey these peak flows without backups of wastewater into homes and businesses and without sanitary sewer overflows. The City of Charles Town, by and through CTUB first published a SSP in 2007. The most recent revision to the SSP was approved by CTUB on April 25, 2018. Pursuant to a resolution for a tri-annual SSP update, the current revision serves as the required April 2021 update. The SSP is adopted by the CTUB Board of Directors. Upon adoption, development of actions to implement the SSP can begin. The SSP provides an overall high-level direction to prioritize resources and achieve future success.



Since the adoption of the last SSP, CTUB, through the City of Charles Town, acquired the assets of the City of Ranson Sewer System and the Jefferson County Public Service District. These acquisitions occurred on July 1, 2018 and January 1, 2019, respectively. The wastewater treatment and collection systems of the consolidated regional utility are reviewed herein. Growth has been increasing in the region and will be monitored to ensure that appropriate measures are taken to address future capital improvements, operation and maintenance as well as capacity needs. Growth projections are included in this SSP, and will be, in part, considered in determining the timing of those future capital improvements. Communication with local planning and zoning authorities to acquire accurate growth projections is essential for successful monitoring of growth. This plan details the growth within the system based on growth projections provided by the local planning and zoning agencies.

Scope

The principal issues examined as part of this revision to the SSP include the following:

- Customer satisfaction and public education
- Analyze growth scenarios and develop plant and collection system expansion needs.
- Evaluate the existing wastewater collection system and treatment process in relation to future flows, loads and discharge standards.
- Assess system improvement needs, including capital costs and O&M requirements.
- Develop timeframes associated with necessary system improvements to encompass the plants and collection system.
- Update planning for future sewerage facilities to serve existing and expanded service area.

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Plan Updates

CTUB has committed to updating this document on a tri-annual basis. Adjustments to the SSP are based on the condition and performance of the overall system, updated construction data and new information regarding growth. Previously published SSP's serve as guidance to achieve accuracy in planning and to enhance the development of current and historical data. The accuracy of the planning process continues to be enhanced through the development of current data and historical data captured in previous SSP's. CTUB makes every effort to involve customers, officials and stakeholders in this process.

Tri-annual updating is expected to proceed in accordance with the following schedule:

- January New data, information, and comments solicited from stakeholders
- February Plan updated. Board of Directors workshop to review DRAFT SSP
- March Draft Plan issued for comments
- April Plan revised, adopted and published

Project Planning

Since the last SSP was adopted, the consolidation of utilities has provided the opportunity to evaluate efficiencies and operational modifications to allow for costs savings and value engineering of capital improvements. This SSP serves as a framework for decision making outlining the specific goals, strategies and objectives for the purpose of planning for future capital improvements based on a 10-year planning period from 2021 to the year 2031. The Renewal and Replacement project detailed below has been discussed in prior SSP's and addresses needs at the CTWWTP and TWWTP as a result of aging infrastructure and critical equipment replacement. There are also numerous collection system projects that are currently designed or in design that will address improved efficiencies and upgrade or decommission pump stations to reduce operation and maintenance costs. Based on analysis of available information the following recommendation outline projected near and long-term improvements:

- Completion of Renewal and Replacement project
    - Charles Town Wastewater Treatment Plant (CTWWTP)
        - One fine screen
        - Grit removal
        - Three (3) influent pumps and control upgrades
        - SBR control panel upgrade
        - UV system upgrade
        - Sludge handling system and building
        - Lime Feed System
        - Main Utility Disconnect, ATS and MCC-1 Replacement
        - Wiring/Conduit and SCADA Replacement
    - Tuscawilla Wastewater Treatment Plant (TWWTP)
        - Two fine screens and channel modifications/Removal of existing fine drum screens
        - MBR Equipment upgrades
- Completion of the 2021 collection system projects
- Fairfax Crossing Parallel Line
- Forrest Avenue Pump Station relocation
- Future - Expansion of CTWWTP from 1.5 MGD to 3.5-4.0 MGD
- Future - Tuscawilla Phase 2 Upgrade to 1.0 MGD.

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Project Recommendations

Critical infrastructure upgrades will be detailed in this SPP. This will include a review of completed projects and future capital improvements. Since the last version of the SSP, consolidation of the CTUB, Ranson and JCPSD sewer utilities has been executed which was a monumental accomplishment for the regional utility. Several projects noted above were initiated prior to consolidation and remain necessary for proper operation of the system. In addition to the system wide improvements, it is necessary to begin planning and engineering for expansion of the CTWWTP in the next 10 years.

Financial

The projected costs associated with the projects outlined above are detailed in this plan. CTUB is in the process of initiating a four-step process of rate equalization as well as development of a Capital Improvement Plan that will initiate evaluation of Capacity Improvement fees which may impact how these projects are financed. CTUB continues to pursue a strategy for funding upgrades, and expansions in a manner that will minimize the burden to the current and future ratepayers. The Board intends to fund the costs for the renewal and replacement project and the facility expansions through conventional rate impacts, payment of prior bonds and Capacity Improvement Fees (CIFs). The CTWWTP and TWWTP Phase 2 Upgrade to 1.0 MGD would require separate funding strategies in a future SSP publication. CTUB is also currently developing a class cost of service study to reassess rate and connection fees that need to be implemented to adequately fund operation and maintenance as well as future capital and growth-related projects. If the current sewer rates are insufficient to generate funds prior to the next phase of expansion, the City can consider increasing rates to defray the capital costs.

INTRODUCTION

Background

The Mission of the Charles Town Utility Board (CTUB) is to provide reliable water and sewer services that protect public health and the environment with financial accountability, regional stewardship, and superior customer service. Specific goals and key areas of focus are:

Customer Service – Provide efficient and effective level of service to meet customer and stakeholder expectations.

Environmental Stewardship – Take advantage of opportunities to invest in energy efficiency, renewable energy, water and sustainable practices that protect the environment. Meet all applicable regulatory notification and reporting requirements.

Infrastructure Maintenance – Properly manage, operate and maintain all parts of the wastewater collection system and provide best service in a cost-effective manner to the customer.

Financial Stability – Manage the CTUB finances to support the Utility needs and maintain reasonable sewer rates.

Workforce Planning and Development – Provide team-oriented workforce that is fully trained, fairly compensated, and accountable with clearly defined career paths for the evolving work environment.

Operational Optimization – Improve functions that support the administrative, financial, technical and field activities and provide the best service to the customer.

CTUB is a combined water and sewer utility that provides sanitary sewerage collection and treatment services for approximately 8,015 sewer customers comprising residential, commercial, industrial and public authority entities within the municipalities of the City of Charles Town, the City of Charles Town as well as the surrounding areas within Jefferson County. The County has a population of just over 57,000 and encompasses 212 square miles.

CTUB has a five (5) member Board of Directors that meets twice monthly to consider issues of substance for Utility operations, making recommendations to the Utility Manager regarding infrastructure management, finances and other policy questions. Subsequent to the Utility consolidation, the Board of Directors has representation from the City of Ranson and Jefferson County (including a voting member and non-voting County Commission liaison). The Board of Directors are appointed by the Mayor and Council of the City of Charles Town and serve staggered four-year terms. In addition to the appointment of the Board of Directors, the City of Charles Town is responsible for the following as it pertains to CTUB:

1) Retains ownership of the assets of the system
2) Authorization of all changes in rates and charges for the water and sewer system
3) Issuance of bonds, notes and other debt obligations secured by the gross revenues of the system
4) Approval of capital projects for the water and sewer system which are not in the "normal course of business"; and
5) Approval of real property condemnations for the System.

CTUB has 31 full-time employees, 2 part-time employees and a sewer operating budget of roughly $6 million annually. Infrastructure assets include three (3) wastewater treatment plants, 125 miles (over 100 miles of gravity and over 25 miles of force main) and 47 pump stations.

Utility Consolidation



Consolidation has been discussed for many years and throughout various SSP's. On July 1, 2018 and January 1, 2019, the acquisition of the City of Ranson Sewer system and JCPSD, respectively, by the City of Charles Town were complete. The consolidation efforts included incorporation of both the City of Ranson and JCPSD current rates and charges to the City of Charles Town Sewer Tariff. This acquisition can be attributed to the dedicated agencies and officials from Charles Town, Ranson and Jefferson County that had the foresight to acknowledge the environmental and operational efficiencies as well as economies of scale of utility consolidation. Thanks to all of those that participated in this monumental accomplishment.

Post consolidation, CTUB operates three wastewater facilities: the Charles Town Wastewater Treatment Plant (CTWWTP), the Tuscawilla Wastewater Treatment Plant (TWWTP) and the Deerfield Sewer Treatment Plant (not connected to the larger CTUB system as it serves the Deerfield residential development near Shepherdstown).

CTUB maintains over 125 miles of collection lines and 47 pumping stations which transfer flows from the customer point of connection to the treatment facilities. CTUB has the ability to treat flows interchangeably between the CTWWTP and TWWTP facilities through the Huntfield Transfer Pump stations.

Facilities Plan Summary

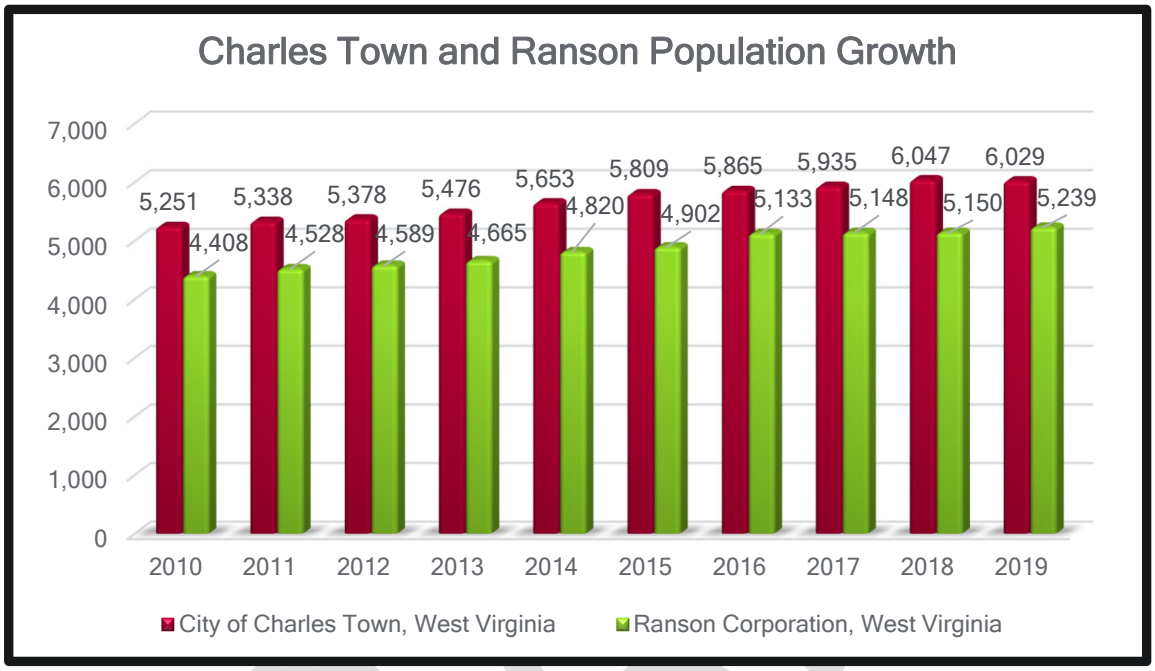
The period used for planning efforts for the Renewal and Replacement projects and 2021 collection system projects are based on a 10-year planning period. This period is the basis for evaluating population growth, estimating treatment capacity requirements, operational needs and evaluating treatment process alternatives. The overall planning period extends from 2021 to 2031 which includes short-term and long-term planning objectives. CTUB intends to complete a sewer master plan in 2021 upon completion of the sewer modeling efforts to assist with development of updated capacity improvement fees requirements and capital improvement projects for the next 15 years. Any capital projects identified in the sewer master plan will be included in future SSP's.

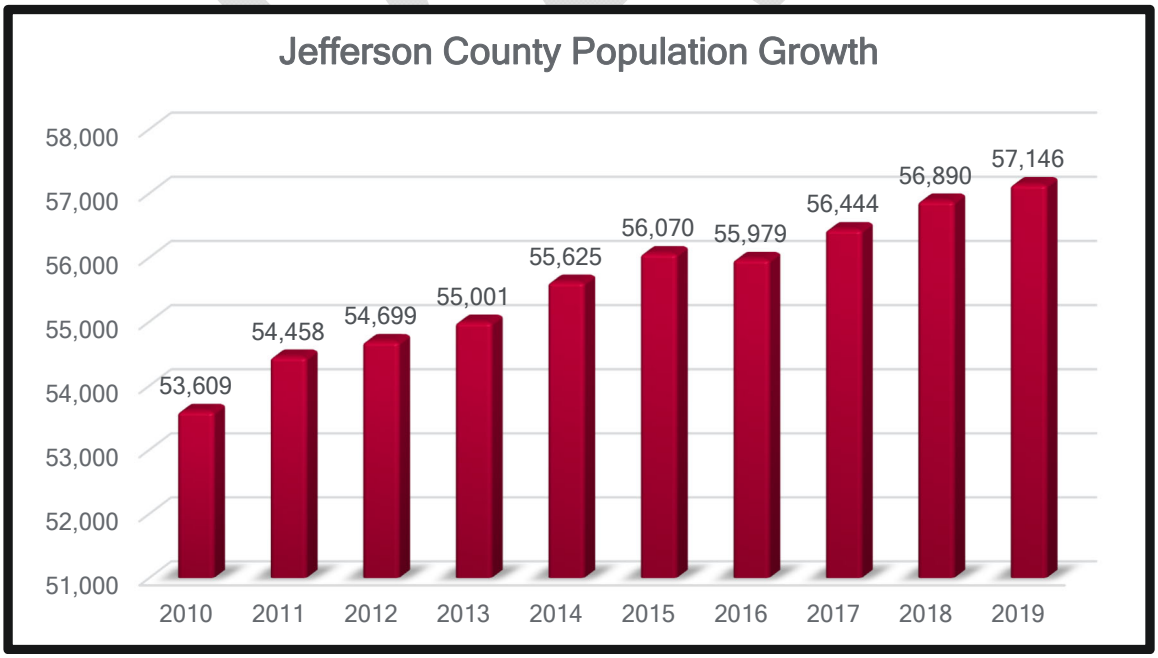
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EXISTING CONDITIONS

Regional Growth and Service Area

The City of Charles Town, City of Ranson and Jefferson County have continued to experience consistent growth since the issuance of the last SSP. A demonstrated in the charts below, the growth rates in the region have maintained a steady 1% growth increase on an annual basis:





Reference: Annual Estimates of the Resident Population for Incorporated Places in West Virginia: April 1, 2010 to July 1, 2019 (SUB-IP-EST2019-ANNRES-54). Source: U.S. Census Bureau, Population Division, Release Date: May 2020.

The City of Charles Town, City of Ranson and the Jefferson County Department of Planning, Zoning and Engineering have provided information regarding permits obtained since the issuance of the last SSP. Table 1.1 illustrates the past three years of residential and commercial development data. This historical data shows that an average of 129 residential units are built per year.

Table 1.1 - Development Growth Trend 2018-2020

			New Connections		
Region	**Subdivision**	**Type**	**2018**	**2019**	**2020**
County	Deerfield	Residential	2	1	2
County	Aspen Greens	Residential	10	10	18
County	Beallair	Residential	3	7	3
County	Locust Hill	Residential	6	6	0
County	Walnut Grove	Residential	1	0	2
County	Burr Park	Commercial	2	2	4
County	Somerset	Commercial	1	0	0
County	Cambridge	Residential	0	5	0
County	Woodland MHP	Residential	0	2	0
County	Charles Town	Residential	0	6	4
County	Tuscawilla	Residential	0	1	0
County	Orchard Hills	Residential	0	0	1
Charles Town	CT Limits	Commercial	1	1	1
Charles Town	CT Limits	Residential	6	3	5
Ranson	Ranson Limits	Commercial	0	0	2
Ranson	Ranson Limits	Residential	4	3	1
Ranson	President's Pointe	Residential	0	0	70
Ranson	Shenandoah Springs	Residential	34	30	7
Ranson	Briar Run	Residential	21	31	21
Ranson	Jefferson Crossing	Residential	24	0	36

Total Residential Building Permits	**111**	**105**	**170**
Total Commercial Building Permits	**4**	**3**	**7**

Future Development Projections

In addition to the historical information that was provided, future development forecasts were obtained from the City of Charles Town, City of Ranson and Jefferson County Department of Planning Zoning and Engineering that will be monitored to determine necessary improvements to the sewer system. For the purposes of these future projections and average annual build-out of 20 units per year for larger subdivisions/developments was used based on the historical trends of building within the County. These projections may vary depending on various economic factors such as growth and development trends. Details of the projections are presented in Table 1.2 and known historical data has been utilized for future volumetric capacity forecasting. A full copy of the Development Forecast is included in Appendix A.

Table 1.2 -CTUB Sewer Strategic Plan 2021-2024 Development Forecast

Development	Total Design EDUs	Total Built as of 2021	20 year forecast to be built	Total Flow	Beyond 20 year forecast	Year 1 2021	Year 2 2022	Year 3 2023	Year 4 2024	Year 5 2025	Year 6 2026	Year 7 2027	Year 8 2028	Year 9 2029	Year 10 2030	Years 11-20 2031-2040	TOTAL @ Year 20	TOTAL REMAINING
American Heritage (Huntwell)	500	0	500	75,000	200	0	0	0	20	20	20	20	20	20	20	160	300	200
Aspen Green	203	46	157	30,450	0	20	20	20	20	20	20	20	17	0	0	0	157	0
Beallair	372	112	260	55,800	0	20	20	20	20	20	20	20	20	20	20	60	260	0
Blackford Village	338	0	338	50,700	0	0	0	20	20	20	20	20	20	20	20	178	338	0
Breckenridge East	300	0	300	45,000	100	0	0	0	0	0	0	0	0	0	0	200	200	100
Briar Run	131	122	9	19,650	0	9	0	0	0	0	0	0	0	0	0	0	9	0
Burr Industrial Park & Bardane	200	170	30	30,000	0	3	3	3	3	3	3	3	3	3	3	0	30	0
Cambridge	134	85	49	20,100	0	5	5	0	0	0	0	0	0	0	0	39	49	0
Charles Town Infill	250	0	250	37,500	150	5	5	5	5	5	5	5	5	5	5	50	100	150
Clayhill Farm	300	0	300	45,000	20	0	0	0	0	0	20	20	20	20	20	180	280	20
Daniels Forest	192	0	192	28,800	0	0	0	0	0	0	20	20	20	20	20	92	192	0
Fritts Property	370	0	370	55,500	50	0	0	0	0	20	20	20	20	20	20	200	320	50
Harvest Hills	392	6	386	58,800	166	0	0	0	0	0	0	0	0	0	20	200	220	166
Huntfield	3,200	421	2,779	480,000	2,459	0	0	0	0	20	20	20	20	20	20	200	320	2459
Jefferson Heights North	262	0	262	39,300	122	0	0	20	20	15	15	15	15	15	15	10	140	0
Tate Manor	80	0	80	12,000	0	20	20	20	20	0	0	0	0	0	0	0	80	0
Lakeland Place / Lloyd's	600	0	600	90,000	220	0	20	20	20	20	20	20	20	20	20	200	380	220
Jefferson Orchards	888	0	888	133,200	688	0	0	0	0	0	0	0	0	0	0	200	200	688
Langlet	1,000	0	1,000	150,000	800	0	0	0	0	0	0	0	0	0	0	200	200	800
Lloyd Property	500	0	500	75,000	300	0	0	0	0	0	0	0	0	0	0	200	200	300
Locust Knoll	359	0	359	53,850	59	0	0	0	0	0	20	20	20	20	20	200	300	59
Magnolia Springs	300	0	300	45,000	0	20	20	20	20	20	20	20	20	20	20	100	300	0
Norborne Glebe	1,050	246	804	157,500	484	0	0	0	20	20	20	20	20	20	20	180	320	484
Old Town Ranson - Infill	250	0	250	37,500	150	5	5	5	5	5	5	5	5	5	5	50	100	150
Potomac Marketplace	54	0	54	8,100	0	0	5	5	5	5	5	5	5	5	5	9	54	0
President's Pointe	1,100	77	1,023	165,000	0	50	50	50	50	50	50	50	50	50	50	523	1,023	0
Prospect Place	170	0	170	25,500	0	0	0	0	0	9	9	25	25	25	25	52	170	0
Ranson Gateway / Boulevard	1,175	0	1,175	176,250	835	0	0	0	20	20	20	20	20	20	20	200	340	835
Shenandoah Springs	705	259	446	105,750	46	20	20	20	20	20	20	20	20	20	20	200	400	46
Stolipher	324	0	324	48,600	124	0	0	0	0	0	0	0	0	0	0	200	200	124
Washington Landing	274	0	274	41,100	0	0	0	0	50	50	50	50	50	24	0	0	274	0
Winchester Cold Storage	675	0	675	101,250	125	0	0	0	0	0	0	0	0	0	50	500	550	125
Windmill Crossing	150	146	4	22,500	0	1	1	1	1	0	0	0	0	0	0	0	4	0
Total Projected Development	**7,086**	**728**	**6,358**	**1,062,900**	**2,123**	**96**	**101**	**101**	**191**	**199**	**219**	**235**	**235**	**209**	**235**	**0**	**4,235**	**2,123**

The housing market in the region has continued in an upward trend with several large housing developments currently under construction. Commercial growth and the completion of the Rockwool Facility since the development of the last SSP have contributed to growth in the CTUB system.

WASTEWATER TREATMENT

Description of Existing Treatment Systems

CTUB operates three wastewater plants: the Charles Town Wastewater Treatment Plant (CTWWTP), the Tuscawilla Wastewater Treatment Plant (TWWTP) and the Deerfield Sewer Treatment Plant. These wastewater facilities are designed to process the wastewater collected throughout the community and return the treated water to the environment. The treat methods included a number of physical and biological processes designed to provide optimal conditions for nutrient removal. CTUB is regulated by the West Virginia Department of Environmental Protection (WVDEP) through the U.S. Environmental Protection Agency (EPA).

Charles Town Wastewater Treatment Plant (CTWWTP)

The CTWWTP is located on WV route 115 in Charles Town. The facility is a Sequencing Batch Reactor (SBR) treatment facility which operates as an Intermittent Cycle Extended Aeration System (ICEAS) and has a hydraulic capacity of 1.75 million gallons per day (MGD). Wastewater treatment components include preliminary treatment consisting of one (1) grinder (Muffin Monster) removed from service on April 8, 2019, one (1) coarse bar screen and compactor, one (1) grit removal system with a washer/compactor, one wet well with three (3) submersible pumps, an influent distribution box, three (3) SBR process trains operated in parallel with chemical addition for phosphorus removal, one (1) post SBR equalization tank, six (6) denitrification filters operated in parallel (currently bypassed) with chemical addition for phosphorus removal and carbon addition for denitrification, one (1) ultraviolet (UV) disinfection system and a utility water system (currently not in use). The solids handling consists of three (3) aerobic digesters operated in parallel, that were converted from secondary clarifiers, one (1) "day tank" digester, one (1) 573,000-gallon aerobic digester (currently not in use), one (1) sludge transfer pump, one (1) belt filter press with conveyor and one (1) lime silo with one (1) dry feed system and screw auger. The belt filter solids are land applied on farms permitted by the WV DEP.

The Charles Town facility originally consisted of primary treatment, activated sludge tanks, secondary settling basins, disinfection by chlorination, aerobic sludge digestion and sand drying beds. The plant was expanded in 1987 to include a third aeration basin and settling basin. Additionally, the plant added an open-channel Ultraviolet Disinfection (UV) unit and a belt filter press with the associated structures. The sand drying beds were removed as part of this expansion.

The plant was upgraded in 2001 and converted the SBR to an ICEAS process. The current influent pump station, headworks building and blower building were also constructed as part of this upgrade. The 573,000-gallon aerobic digester tank was added to the facility during an upgrade in 2005. The digester tank was built to provide additional sludge processing time and increased storage capacity in an effort to produce higher quality solids. Additionally, denitrification filters were installed at the facility in 2016, which included chemical addition facilities for a coagulant for phosphorus precipitation and carbon for denitrification.



The CTWWTP accepts non-domestic wastewater from the Charles Town Water Plant. The Utility Board currently hauls approximately 6,000-9,000 gallons per week of non-domestic liquid

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water treatment facility sludge from their existing plant to the CTWWTP digester for processing and thickening. This sludge which is 2-6% solids, consists primarily of river laden material such as sand and dirt along with an aluminum-based coagulant from the sedimentation basins and conventional sand filters. The contents are generally rich in total organic carbon (TOC) from the river source and are difficult to press with the existing Ashbrook belt filter press. The filtrate from the press is returned back to the headworks. The maximum daily permitted volume is 10,000 gallons. The designated NPDES discharge is Outlet No. 001.

The water treatment plant sludge requires a significant amount of polymer addition and adds to the total amount of generated dry tons. It also increases the amount of lime needed for raising the solids pH content. CTUB is currently pursing alternative options to treat and dispose of the water treatment facility sludge. The future plans consist of completely eliminating the sludge from the wastewater treatment facility process.

The CTWWTP operates under the West Virginia NPDES No. WV0022349. The current permit, reissued on July 21, 2016, expires on June 30, 2021. The permit renewal application to WVDEP was submitted in December 2020 and CTUB will be working with WVDEP on the permit renewal in the first half of 2021. The permit renewal will incorporate the CTWWTP and TWWTP along with the JCPSD Permit WV0083461 which includes the Industrial Users connected to the CTUB system.

The CTWWTP is permitted for an annual average flow of 1.75 million gallons per day (MGD). Additionally, if the facility discharges 90% (1.58 MGD) or more of its permitted flow over 3 consecutive months, a Plan of Action must be developed and submitted to the Department. The 2018 monthly average effluent flows for November and December exceeded 1.58 MGD. The monthly average influent flows during 2018 compared to the same month's monthly average effluent flow ranged from 0.239 to 0.808 MGD greater.

This facility serves a population equivalent of approximately 17,500 persons in the City of Charles Town, the City of Ranson and the surrounding areas of Jefferson County and discharges treated wastewater through Outlet No. 001 to Evitts Run, approximately 4.5 miles from its mouth, of the Shenandoah River of the Potomac River.

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CTWWTP Flows and Loading

Historical flow and loading data have been compiled and analyzed for the system. This data provides the basis for projecting future flows and loadings to better understand the timing when a capacity restriction may occur at one of the treatment processes and thus must be addressed in order to provide adequate capacity to serve future growth. Table 1.3 summarize the historical and current values for flow, BOD, TSS, NH3, TN and TP concentrations.

TABLE 1.3: CTWWTP PLANT FLOWS 2018-2020

2018			2019			2020		
	TOTAL	AVERAGE		TOTAL	AVERAGE		TOTAL	AVERAGE
JANUARY	32.66	1.05	JANUARY	51.37	1.66	JANUARY	39.05	1.26
FEBRUARY	30.25	1.08	FEBRUARY	43.72	1.56	FEBRUARY	36.74	1.27
MARCH	32.34	1.04	MARCH	44.32	1.43	MARCH	36.76	1.19
APRIL	31.04	1.04	APRIL	37.29	1.24	APRIL	33.32	1.11
MAY	52.19	1.68	MAY	45.1	1.45	MAY	35.50	1.15
JUNE	39.84	1.33	JUNE	33.83	1.13	JUNE	33.44	1.11
JULY	39.86	1.29	JULY	39.09	1.26	JULY	34.45	1.11
AUGUST	43.63	1.41	AUGUST	33.33	1.08	AUGUST	32.65	1.05
SEPTEMBER	42.24	1.41	SEPTEMBER	30.89	1.03	SEPTEMBER	32.43	1.08
OCTOBER	45.50	1.47	OCTOBER	32.86	1.06	OCTOBER	33.91	1.09
NOVEMBER	50.36	1.68	NOVEMBER	30.65	1.02	NOVEMBER	33.49	1.12
DECEMBER	50.97	1.64	DECEMBER	36.55	1.18	DECEMBER	40.39	1.3
Annual Total	**490.87**	**1.34**	**Annual Total**	**459**	**1.26**	**Annual Total**	**422.13**	**1.15**

Table 1.4 below summarizes the historical plant flow for the CCWWTP from 2016 through 2020. The percent plant capacity on a Maximum 3-month average daily flow basis varied from 71% to 95%. The plant expansion has been noted in the past several SSP's and is further discussed in the future projects section of this SSP. Growth has continued to increase and will be monitored to ensure that appropriate measures are taken to address sewer infrastructure and capacity needs in order to meet the needs of the regional utility.

It should be noted that 2018 was a year of extraordinary rainfall, however the 2019 running average approached the permit conditions as well. Based on this review, there are several optimization efforts that have been recommended by CTUB Engineer's Gwin, Dobson & Foreman in advance of the CTWWTP expansion that may extend the service life of the existing facility, enhance process operations and provide additional capacity and improve treatment efficiencies. These optimization efforts include proper digesting of sludge through the addition of equipment which will reduce costs for sludge handling and disposal.

Table 1.4: Historical Plant Flow CTWWTP

Year	Total Annual Flow (MG)	Annual Average Daily Flow (MGD)	Average Daily Flow (3 month max.)	Permit Capacity (MGD)	Percent Capacity (Average 3 month max/Permit)
2016	419	1.14	1.26	1.75	72%
2017	393	1.25	1.43	1.75	82%
2018	491	1.34	1.67	1.75	95%
2019	459	1.25	1.56	1.75	89%
2020	420	1.15	1.25	1.75	71%

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The CTWWTP and TWWTP Facilities share total effluent loading limits to the Chesapeake Bay via Outfall 003. Table 1.5 below details the outlets associated with WV0022349:

Table 1.5: WV/NPDES WV0022349 Outfall Descriptions	
Outfall ID	**Project Description**
001	Charles Town Plant outlet to Evitts Run
002	Tuscawilla Plant outlet regardless of whether it is discharged to Evitts Run or used for spray irrigation
202	Contribution of the total load from the Tuscawilla Plant that is used by the golf course for spray irrigation
203	Contribution of the total load from the Tuscawilla Plant that is discharged directly to Evitts Run through the new effluent line
003	Total load actually discharged to Evitts Run. This is the calculated sum of the loads determined from Outlet 001 and Internal Outlet 203.

The effluent limits for Outfall 001 are listed below in Tables 1.6 through 1.8 and the minimum sampling and monitoring frequencies are listed in Table 1.6.

Table 1.6: NPDES EFFLUENT LIMITS (OUTLET 001) BOD5, TSS AND AMMONIA-NITROGEN						
Effluent Characteristics	**Monthly Average Loading Rate, lbs./day**	**Weekly Average Loading Rate, lbs./day**	**Max Daily Loading Rate, lbs./day**	**Monthly Average Concentration, mg/L**	**Weekly Average Concentration, mg/L**	**Max Daily Concentration, mg/L**
BOD5	301	N/A	601	20.6	N/A	41.2
TSS*	438	N/A	876	30	N/A	60
Ammonia-Nitrogen as N	60	N/A	120	4.1	N/A	8.2

Table 1.7: TMDL ANNUAL WASTELOAD ALLOCATIONS: NITROGEN AND PHOSPHOROUS			
Effluent Characteristics	Charles Town Plant (Outfall 001)	Tuscawilla Plant (Outfall 203)	Annual Total Load Limit (Outfall 003)
Total Nitrogen	32,115 lbs.	10,740 lbs.	42,855 lbs.
Total Phosphorus	3,577 lbs.	1,790 lbs.	5,367 lbs.

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Table 1.8: EFFLUENT LIMITS (OUTFALL OO1); COLIFORM, RESIDUAL CHLORINE, Ph AND D.O.		
Effluent Characteristics	**Maximum**	**Minimum**
Fecal Coliform	200 Counts/100 mL (Geo. Mean) 400 Counts/100 mL (Maximum)	N/A
pH	9	6
Dissolved Oxygen (All Year)	N/A	6.0 mg/L at anytime

Table 1.9: ANNUAL NPDES PERMIT MINIMUM MONITORING REQUIREMENTS (OUTLET 001)		
Effluent Characteristics	**Measurement Frequency**	**Sample Type**
BOD5	Once per week	24-hour composite
BOD5 % Removal	Four per month	Calculated
Total Suspended Solids (TSS)	Once per week	24-hour composite
Suspended Solids % Removal	Four per month	Calculated
Fecal Coliform	Once per week	Grab
pH	Once per week	Grab
Dissolved Oxygen	Once per week	Grab
Ammonia Nitrogen	Once per week	24-hour composite
Total Nitrogen as N (Monthly)	Once per week	24-hour composite
Total Nitrogen as N (Yearly)	Once per year	Calculated
Total Phosphorous (Monthly)	Once per week	24-hour composite
Total Phosphorous (Yearly)	Once per year	Calculated
Total Copper	Once per quarter	24-hour composite
Total Lead	Once per year	24-hour composite
Total Zinc	Once per year	24-hour composite
Total Arsenic as As	Once per year	24-hour composite
Total Cadmium	Once per year	24-hour composite
Hexavalent Chromium	Once per year	24-hour composite
Cyanide	Once per year	Grab
Total Mercury as Hg	Once per month	Grab
Total Nickel	Once per year	24-hour composite
Total Silver	Once per year	24-hour composite
Total Hardness as CaCO3	Once per 6-month period	Grab
Total Aluminum	Once per quarter	24-hour composite
Chloride as Cl	Once per quarter	24-hour composite
Chronic Tox. - Cerlodaphina Dubia	Once per year	24-hour composite
Chronic Tox. - Pimephales Promelas	Once per year	24-hour composite
Flow	Continuous	Measured

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Annual effluent loading limits contained in the permit were established under the Chesapeake Bay Total Maximum Daily Load (TMDL) for total nitrogen (TN) and total phosphorus (TP). The Charles Town and Tuscawilla Facilities share total effluent loading limits to the Chesapeake Bay via Outfall 003. The other discharge limits are typical water quality - based limitations developed by the West Virginia Department of Environmental Protection.

Table 1.10: SUMMARY CTWWTP FLOW DATA AND LOADING REVIEW

Flow Type	Measurement Frequency	Remarks
Minimum Hourly Flow *	0.138	Minimum daily flow for the period from January 2016-December 2019
Monthly Average Flow*	1.5	Monthly average flow for the period from January 2016- December 2019
Permitted Plant Capacity*	1.75	WVDEP Permitted Plant Capacity
Permitted Maximum 3 Month Average Flow	1.58	90% Permitted Plant Capacity
Maximum Monthly Average Flow*	2.22	Maximum monthly average flow occurred in September 2018
Maximum Weekly Flow	1.39	Log Pearson Type III analysis of 50% probability occurrence of all from January 2016 through December 2019 flow events
35% Probability Occurrence, Peak Flow	1.55	Log Pearson Type III analysis of 35% probability occurrence of all from January 2016 through December 2019 flow events
20% Probability Occurrence, Peak Flow	1.9	Log Pearson Type III analysis of 20% probability occurrence of all from January 2016 through December 2019 flow events
Maximum 3 month Running Average	2	Log Pearson Type III analysis of 9% probability occurrence of all from January 2016 through December 2019 flow events
Maximum Daily Flow	2.2	Log Pearson Type III analysis of 5% probability occurrence of all from January 2016 through December 2019 flow events
Peak Hourly Flow	2.56	Log Pearson Type III analysis of 2% probability occurrence of all from January 2016 through December 2019 flow events
Peak Instantaneous Flow*	4.34	Maximum system flow of 4.339 MGD recorded from January 2016 through December 2019

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Tuscawilla Wastewater Treatment Plant (TWWTP)

The TWWTP is a Biological Nutrient Removal (BNR) intergraded with a Membrane Bio-Reactor (MBR) treatment facility having a hydraulic capacity of 0.50 million gallons per day (MGD). Wastewater treatment components include preliminary treatment consisting of one (1) coarse bar screen and compactor, one (1) grit removal system with a washer/compactor, one (1) flow equalization impoundment, one (1) wet well with four (4) submersible pumps and two (2) fine drum screens and compactor, two (2) BNR process treatment trains operated in parallel, chemical addition for phosphorus removal and carbon addition for denitrification, three (3) MBR basins operated in parallel, one (1) ultraviolet (UV) disinfection system and a utility water system. The solids handling consists of an aerobic digester. Liquid aerobic sludge is transported to the CTWWTP for further processing and disposal. The facility primarily serves the Tuscawilla Hills Subdivision and Locust Hills area. Treated wastewater is discharged to the Tuscawilla Golf Course ponds and irrigation system (to the west) and also into Evitts Run, which is a tributary to the Shenandoah River, via a pumping system (to the east). The upgraded TWWTP has been in operation since 2014. In August of 2020 the MBR filters in Basin #3 were replaced with Toray Filters. The TWWTP operates under the West Virginia NPDES No. WV0022349. The current permit, reissued on July 21, 2016, expires on June 30, 2021. The permit renewal application to WVDEP was submitted in December 2020 and CTUB will be working with WVDEP on the permit renewal in the first half of 2021. The permit renewal will incorporate the CTWTTP and TWWTP along with the JCPSD Permit WV0083461 which includes the Industrial Users connected to the CTUB system. The TWWTP is permitted for an annual average flow of 0.5 million gallons per day (MGD).

TWWTP Flows and Loading

Historical flow and loading data have been compiled and analyzed for the system. This data provides the basis for projecting future flows and loadings to better understand the timing when a capacity restriction may occur at one of the treatment processes and thus must be addressed in order to provide adequate capacity to serve future growth. Table 2.1 summarize the historical and current values for flow, BOD, TSS, NH3, TN and TP concentrations.

TABLE 2.1: TWWTP PLANT FLOWS 2018-2020

2018			2019			2020		
	TOTAL	AVERAGE		TOTAL	AVERAGE		TOTAL	AVERAGE
JANUARY	4.00	0.13	JANUARY	6.25	0.2	JANUARY	0	0
FEBRUARY	3.52	0.13	FEBRUARY	4.98	0.18	FEBRUARY	0	0
MARCH	3.71	0.12	MARCH	7.53	0.24	MARCH	0	0
APRIL	3.79	0.13	APRIL	5.28	0.18	APRIL	0	0
MAY	6.29	0.20	MAY	7.88	0.25	MAY	0	0
JUNE	8.27	0.28	JUNE	3.75	0.12	JUNE	0	0
JULY	5.97	0.19	JULY	4.2	0.14	JULY	0	0
AUGUST	7.42	0.24	AUGUST	3.75	0.12	AUGUST	1.09	0.16
SEPTEMBER	8.94	0.30	SEPTEMBER	3.64	0.12	SEPTEMBER	0	0
OCTOBER	7.10	0.23	OCTOBER	3.97	0.13	OCTOBER	0	0
NOVEMBER	10.90	0.36	NOVEMBER	3.66	0.12	NOVEMBER	0	0
DECEMBER	8.31	0.27	DECEMBER	0.35	0.01	DECEMBER	0	0
Annual Total	**78.22**	**0.21**	**Annual Total**	**55.24**	**0.15**	**Annual Total**	**1.09**	**0.013**

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Table 2.2 summarizes the historical plant flow for the TWWTP from 2016 through 2020. The percent plant capacity on a Maximum 3-month average daily flow basis varied from 35% to 65%.

Table 2.2: Historical Plant Flow TWWTP

Year	Total Annual Flow (MG)	Annual Average Daily Flow (MGD)	Average Daily Flow (3 month max.)	Permit Capacity (MGD)	Percent Capacity
2016	49	0.13	0.32	0.5	65%
2017	48	0.14	0.28	0.5	56%
2018	78	0.21	0.31	0.5	63%
2019	55.24	0.15	0.22	0.5	45%
2020	1.09**	0.16	0.16	0.5	32%

* Data for 2013 and 2014 are excluded due to start-up of the new facility.

** TWWTP was offline for the majority of 2020 due to MBR replacement

Table 2.3: NPDES EFFLUENT LIMITS (OUTLET 002) BOD5, TSS AND AMMONIA-NITROGEN

Effluent Characteristics	Monthly Average Loading Rate, lbs./day	Max Daily Loading Rate, lbs./day	Monthly Average Concentration, mg/L	Max Daily Concentration, mg/L
BOD5	42	83	10	20
TSS*	125	250	30	60
Ammonia-Nitrogen	8.3	16.7	2	4

Table 1.7: TMDL ANNUAL WASTELOAD ALLOCATIONS: NITROGEN AND PHOSPHOROUS

Effluent Characteristics	Charles Town Plant (Outfall 001)	Tuscawilla Plant (Outfall 203)	Annual Total Load Limit (Outfall 003)
Total Nitrogen	32,115 lbs.	10,740 lbs.	42,855 lbs.
Total Phosphorus	3,577 lbs.	1,790 lbs.	5,367 lbs.

Table 2.4: EFFLUENT LIMITS (OUTFALL OO2); COLIFORM, RESIDUAL CHLORINE, Ph AND D.O.

Effluent Characteristics	Maximum	Minimum
Fecal Coliform	200 Counts/100 mL (Geo. Mean) 400 Counts/100 mL (Maximum)	N/A
pH	9	6
Dissolved Oxygen (All Year)	N/A	6.0 mg/L at anytime

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Annual effluent loading limits contained in the permit were established under the Chesapeake Bay Total Maximum Daily Load (TMDL) for total nitrogen (TN) and total phosphorus (TP).

Nutrient offsets continue to enhance the City's ability to expand wastewater treatment capacity in light of the nutrient removal requirements of the Chesapeake Bay Program. Because the Tuscawilla WWTP is adjacent to the Locust Hills Golf Course, a portion of its effluent flow is utilized for course irrigation. Telemetry triggers the use of the Tuscawilla Effluent Line for direct discharge to Evitts Run (Outlet 203) when flows exceed Golf Course irrigation use.

Annual reports are submitted to WVDEP for reporting period September through August. Table 2.5 demonstrates CTUB's ability to achieve Chesapeake Bay nutrient limits:

Table 2.5: Nutrient Reporting

Year	CTWWTP Nitrogen lbs/year	CTWWTP Phosporous lbs/year	TWWTP Nitrogen lbs/year	TWWTP Nitrogen lbs/year	Total Nitrogen (Outlet 003) ***Annual Limit 42,855***	Total Phosphorous (Outlet 003) ***Annual Limit 5,367***	Golf Course Total Nitrogen (Outlet 202)	Golf Course Total Phosphorous (Outlet 202)
2016-2017	20,755	1,396	1,633	254	20,922	1,422	1,466	228
2017-2018	20,544	1,523	1,623	303	21,260	1,675	906	151
2018 - 2019	23,235	1,898	3,410	709	26,250	2,351	395	256
2019-2020	29,699	2,520	1,185	194	29,701	2,520	1,183	194

Deerfield Treatment Plant

The Deerfield Sewer Treatment Plant is located off Route 480 on Southpaw Lane between Route 9 and Shepherdstown. The facility consists of two adjacent Ashco re-circulating sand filter wastewater treatment plants, one pump station and twelve septic tanks with associated piping. The effluent from this system is distributed just below ground level into two disposal fields.

The Deerfield operates under the West Virginia Department of Environmental Protection Underground Injection Control Permit No. 1503-20-037. The current permit was renewed in December 2020 with an expiration date of 2026. The monitoring requirements are detailed in Table 3.1:

Table 3.1: DEERFIELD PERMIT MINIMUM MONITORING REQUIREMENTS

Effluent Characteristics	Measurement Frequency	Sample Type
Dissolved Oxygen	Once per 6 months	Grab
BOD, 5-day	Once per 6 months	Grab
Total Suspended Solids (TSS)	Once per 6 months	Grab
Total Nitrogen	Once per 6 months	Grab
Total Phosphorous	Once per 6 months	Grab
Flow	Once per 6 months	Grab
Fecal Coliform	Once per 6 months	Grab
pH	Once per 6 months	Grab

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Performance and Capacity of Existing Treatment Systems

Effluent results indicate that both the CTWWTP and TWWTP facilities produce effluent water quality consistently meeting the permit requirements. The effluent data demonstrates that BOD and TSS concentrations are generally below the 30-day average permit value. Average monthly effluent NH3 concentrations are also observed to be below the minimum daily maximum permit values.

Flow projections for the CTWWTP indicate expansion improvements will be necessary within the next ten years. The 2018 SSP indicated expansion of the CTWWTP to 2.25 MGD and a potential future expansion of the TWWTP Phase 2 Expansion to 1.0 MGD. Based on the data in Table 1.10, growth projections in Table 1.2 and Appendix A, CTUB will begin preliminary evaluation of options for regional wastewater facility needs and expansion in 2024/2025 based on the extensive time required to design and permit a substantial plant upgrade. It is anticipated that the CTWWTP upgrade may need to be increased based on growth projections to 3.5 – 4.0 MGD. This is substantiated by the flow data and anticipated growth in the region.

Nutrient Management

Nutrient Management continues to be critical in the regulatory permitting and treatment of sanitary sewer. Previous versions of the SSP documented the history of the implementation of US Environmental Protection Agency (USEPA) 2010 Chesapeake Bay Watershed Initiative. As a headwater partner in the Chesapeake Bay Program, West Virginia established permitted Total Nitrogen and Total Phosphorous pounds. CTUB continues to follow changes in the regulatory requirements to determine necessary changes that may be forthcoming in the Watershed Implementation Program (WIP). CTUB is compliant with nutrient management requirements. CTUB must report nutrient removal for the annual period September 1 to August 31. Table 4.1 depicts permitted pounds and actual pounds removed for the period 2017 through current reporting.

Table 4.1: Nutrient Management

	Total Permitted Nitrogen (lbs/yr)	Total Reported (lbs/yr)	Total Permitted Phosphorous (lbs/yr)	Total Reported (lbs/yr)
2017-2018	42,855	21,260	5,367	1,675
2018-2019	42,855	26,250	5,367	2,351
2019-2020	42,855	29,701	5,367	2,520

Forecasted capacity must now also be based on nutrient limitations. In addition to volumetric capacity, nutrient limits will be a factor in determining the timing of capital projects. The ability to achieve the reported levels, as shown in Table 4.1, will eliminate the need for the CTWWTP Nutrient Removal Phase 2 Project.

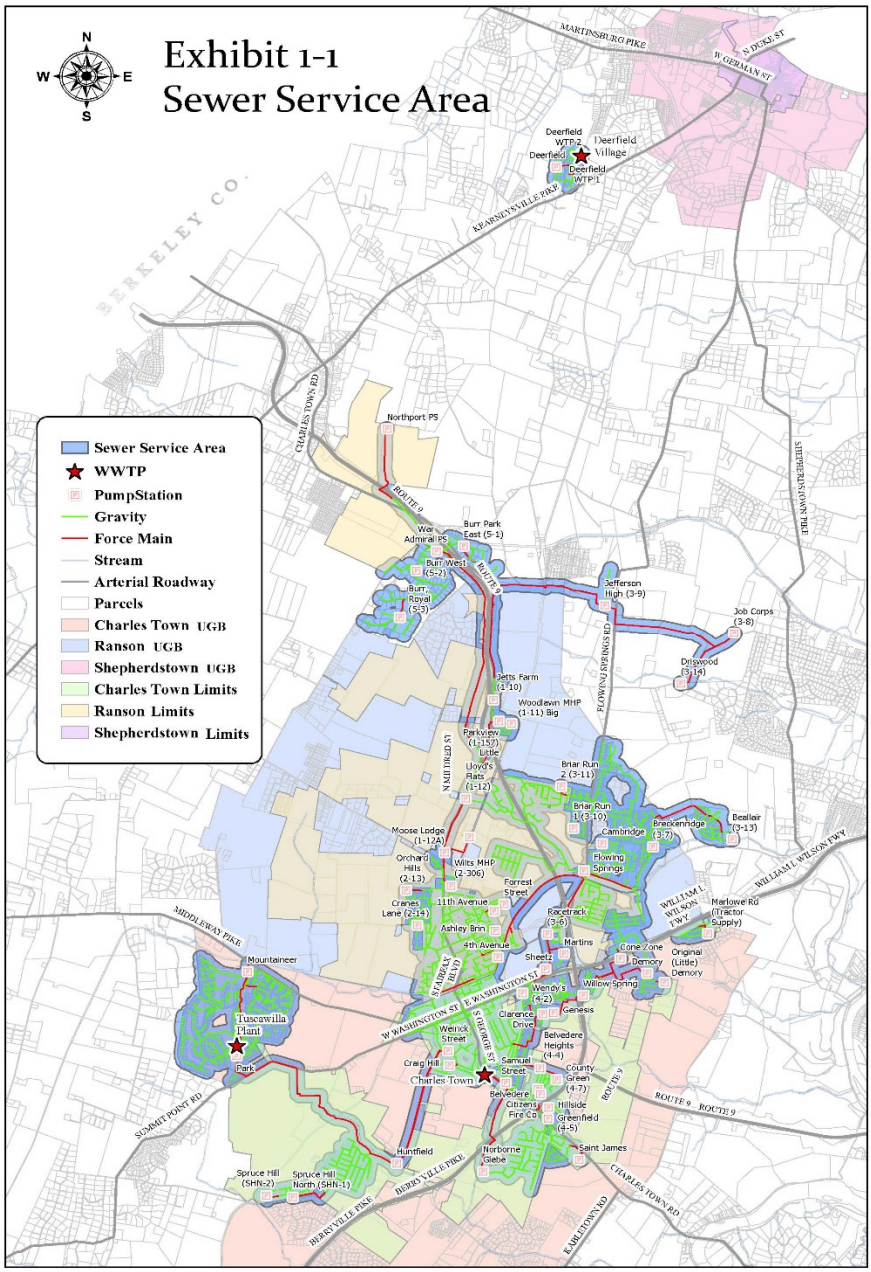
Sludge Disposal

Sludge Management is covered under the West Virginia NPDES No. WV0022349. The current permit, reissued on July 21, 2016, expires on June 30, 2021. The permit renewal application to WVDEP was submitted in December 2020 and CTUB will be working with WVDEP on the permit renewal in the first half of 2021. The permit renewal will likely incorporate provisions for alternatives to the current process for sludge disposal as the approved land application site owners may not wish to continue the partnership after the current agreement term ends in August 2022. Alternatives may include other land application sites or landfill disposal. These alternatives and costs will be reviewed in 2021. The requirements for sludge management reporting are

extensive and are covered in the permit. The Charles Town Plant currently accepts all of the waste sludge from Tuscawilla as well as the water treatment plant process waste. An upgrade to the sludge process is included with the Renewal and Replacement project. Additionally, the waste from the water treatment plant creates operational issues at the Charles Town Plant. Alternative disposal methods will be considered in 2021.

COLLECTION SYSTEM, TRANSMISSION MAINS AND PUMP STATIONS

CTUB provides wastewater service to over 8,000 sewer customers through a network of collection and transmission systems through over 125 miles (over 100 miles of gravity and over 25 miles of force main) and 47 pump stations to the three (3) treatment facilities noted in the previous section. Refer to Exhibit 1-1 and Appendix B for the current collection system service area and pump station locations. The service has been expanded to include the Route 9 Sewer Project from the latest SSP. This area extends up Route 9 towards Martinsburg approximately 3 miles from previous service boundary.



Collection System and Pumping Stations



The collection system includes gravity and force mains that range from 1.5 to 24 inches in diameter. The collection system comprises of varying pipe materials including asbestos-cement, clay, ductile, cast and PVC piping. There are significant portions of the collection system that are aging and will likely need of repairs or replacement. A sewer hydraulic model was completed in January 2021 that identified several portions of the conveyance system that may need to be addressed due to capacity concerns. Specifically, the study identified capacity concerns along the Evitt's Run interceptor as well as the gravity line through Jefferson Memorial Park. Additionally, studies have focused on manholes structures throughout the system that need to be repaired or replaced in the near future. To the extent possible these will be achieved within the annual operation and maintenance budgets. CTUB will continue to perform flow monitoring throughout the system to assess capacity constraints.

Pump stations and force mains are used to pump flows to another gravity collection system, to a master pump station or directly to the wastewater treatment facilities. There are 47 pump stations in the CTUB system. As a result of utility consolidation, efficiencies have been realized that allow for the installation of gravity sewer mains and decommissioning of pump stations. Where possible, the efficiencies will be pursued to reduce overall operation and maintenance expenses. To the extent possible these projects may be performed in-house to reduce overall project costs. Since 2019, two pump stations have been decommissioned resulting in significant operation and maintenance expenses. In the next two years, CTUB expects to decommission another four (4) pump stations with construction of gravity lines. One (1) new pump station is anticipated to be added in Magnolia Springs.

Fats, Oils and Grease

Overflows and sewer backups are commonly caused by fats, oil and grease (FOG). FOG gets into the sewer from household drains and neglected grease interceptors at businesses and restaurants. The FOG blocks sewer pipes, causing health hazards and leading to expensive fixes. CTUB will focus on community education and outreach to reduce the damage to the utility sewer system.

Inflow and Infiltration

Inflow occurs when stormwater flows directly into the sewer collection system. This may be through a manhole cover, or a cross connection between a storm drain and the sewer collection system. Infiltration is typically caused by ground water entering the collection system at defects in mains, laterals or manholes. CTUB has initiated efforts to evaluate Inflow and Infiltration (I&I) in the combined system with a most recent smoke testing study completed in 2019. Staff is working on completing all recommendations in the Condition Assessment Report which included repairs to laterals, mains and manholes to address I&I. Another component that remains to be addressed is disconnection of any cross connections of storm drains to the sewer system which are considered illegal connections. CTUB is working with the City of Charles Town staff and officials to determine the appropriate enforcement actions to remove the illegal connections from the sewer system.

PROJECT REVIEW

Completed Projects

Since the last issuance of the SSP, significant improvements have been made throughout the treatment and collection system. Necessary upgrades and improvements to the CTWWTP and TWWTP were completed to address WVDEP Inspection requirements as well as operation and maintenance improvements to the collection and pump station network have been made as a result of consolidation into a regional utility. These improvements include elimination of pump stations through installation of gravity lines which reduce operation and maintenance expenses as well as projects that address rehabilitation of aging pump stations and lines to further reduce utility expenses.

Table 5.1: Projects Completed since 2018 SSP

Year	Project Description
2018	CTWWTP Basin Lining
2018	New Gorman Rupp pump installation at Park Pump Station
2019	New Pump installation at Flowing Springs Pump Station
2019	Smoke Testing Efforts completed, including 122,025 linear feet of sewer mains, manholes and cleanouts.
2019	Orchard Hills Pump Station rehabilitation
2019	Cranes Lane Pump Station rehabilitation
2020	Route 9 Sewer Project Completed. Including two pump stations, 9,400 linear feet of gravity line and 16,000 linear feet of forcemain.
2020	Decommissioning of Euclid Pump Station
2020	Decommissioning of Parkview MHP Pump Station
2020	Installation of MBR Filters in Basin #3 at Tuscawilla Plant

It should be noted that with the completion of the Route 9 Sewer Project noted in Table 5.1, as well as the consolidation of utilities, a project to divert flows from the northern region into the Route 9 sewer line can be completed which will allow for additional capacity in other portions of the sewer system. This project is detailed in the *Current Development and Projects* section herein.

Additionally, as noted above CTUB has completed a first phase of a hydraulic wastewater model through RK&K Engineers. This model includes the larger diameter portions of the collection system along with all of the pump stations. Hydraulic models are generally used to assist with identification of areas where additional capacity is needed to convey projected long-term flows to the treatment facilities. As this hydraulic model was recently completed at the end of 2020, CTUB staff will be evaluating the results of this model over the next several months to identify additional capital improvements needed for the collection system likely after adoption of this SSP.

Current Development and Projects

There are numerous on-going sewer projects that CTUB is evaluating:

Inflow and Infiltration Studies

CTUB has completed a first phase of Inflow and Infiltration (I&I) investigation, through smoke testing, in selected areas of the collection system. The study which was conducted by Hydrostructures in 2019 identified numerous defects in the sewer system that needed to be repaired or investigated further. CTUB is nearly 95% complete with these efforts and will likely focus on other aging segments of the system to conduct similar studies with the goal of reducing I&I.

Sewer Modeling Efforts

CTUB completed an initial step in sewer modeling efforts late in 2020 that considered the larger portions of the system along with the pump stations. The model will be evaluated to determine where bottlenecks and capacity issues may exist in the system as funding allows. This effort aligns with recent projects such as cooperative efforts with the Magnolia Springs Development which have afforded operation and maintenance cost savings through upsizing of a new pump station and ability for CTUB to decommission two (2) existing upstream pump stations that would have required significant upgrades in coming years.

Shenandoah Junction Public Sewer Corporation (SJPS)

This private sewer corporation has expressed interest to connect to the CTUB system. This request will require payment of CIF's to CTUB, decommissioning of the existing wastewater plant and construction of a pump station by SJPS. The connection of 187 customers has been evaluated and the connection can be made with no modification of the existing CTUB system. It is unknown at this time when this connection might be made.

Cave Quarter Estates Utility Acquisition and Development Expansion

CTUB has evaluated route alternatives and cost for extending service to Cave Quarter Estates that includes 45 existing homes and 140 proposed single-family homes. While this development has not been annexed into the City of Charles Town, this land is in the Charles Town Growth Boundary. Connection to public water and sewer could be viable with the extension of services to and through adjacent annexed parcels. It is unknown at this time when this connection might be made.

2021 Collection System Project (formerly JCPSD Flowing Springs Project/Modified Flowing Springs Plan)

On March 23, 2017, the WV PSC issued an Order in CASE NO. 16-0616-PSD-PC-CN wherein the Commission granted the application for a certificate of convenience and necessity and approved a Post-Project rate increase. Funding for the Project consisted of (i) a $3,575,000 USDA RD loan at a 2.5 percent interest rate over 40 years. And (ii) a DEP SRF loan of $2,844,984 at .25 percent interest, and a .25 percent administrative fee for a term up to 40 years, and debt forgiveness in the amount of $500,000 per the January 17, 2017 DEP assurance letter. During the consolidation of utilities, CTUB committed to the WV PSC completing necessary components of the Flowing Springs project through submission of a Modified Flowing Springs Plan in March 2018. Since the utility consolidation and completion of the Route 9 sewer project, CTUB has evaluated efficiencies and operational alternatives to significantly reduce components and costs of the Modified Flowing Springs Plan. The Flowing Springs Project and Modified Flowing Springs plan have evolved into a 2021 Collection System projects which consists of necessary improvements to the CTUB collection system. The Route 9 Sewer Project is now complete, with the exception of minor punch-list items, to serve the Rockwool Facility and adjacent Jefferson Orchards property customers along the Route 9 corridor. The construction of this project allows for diversion of flows from northeastern region to the new Route 9 sewer infrastructure thereby freeing up capacity in other segments of the system for future customers. Table 5.2 includes a summary of the anticipated components and costs of this project.

Forrest Avenue Pump Station Relocation and Fairfax Crossing Parallel Gravity Project

As part of the acquisition of the City of Ranson Sewer System in July 2018, some preliminary evaluation of collection system improvements were anticipated to include approximately $2 million in projects. One of the projects included the relocation of the existing Forrest Avenue Pump station along with provisions for future capacity for areas within the sewer shed that could flow to the pump station. Additionally, as a result of the Route 9 Sewer project alignment easement acquisition through the Fairfax Crossing/Potomac Marketplace, CTUB committed to the installation of a parallel 10" gravity line from the railroad track bordering the western boundary of Fairfax Crossing to Route 9. This will include the installation of approximately 2,600 linear feet of 10" gravity line. Table 5.2 includes a summary of the anticipate components and costs of this project.

2021 Renewal and Replacement Project for CTWWTP and TWWTP

In 2019 Gwin, Dobson and Foreman (GDF) prepared an assessment of the CTWWTP and TWWTP facilities which indicated several opportunities for optimization and improvement as follows:

- Headworks screening at both plants are in need of upgrades. Operations at the Charles Town Plant are severely hindered by poor headworks screening and the previous operation of a grinder ahead of the screen. Fine and stringy material is passing through the headworks screen which leads to debris accumulation downstream and is causing havoc on the treatment units. Given the age and current operating condition of the grit system at Charles Town, a new grit removal facility should be considered. The Tuscawilla Plant requires improved fine screening equipment due to current screening operational and maintenance issues.





- The influent and effluent pump stations as well as the UV disinfection system at the Charles Town Plant are in need of replacement, as the units have reached the end of useful life.
- The membrane modules at the Tuscawilla Facility are in need of replacement due to excessive sludge buildup and irreversible fouling. It is recommended to implement a membrane module and hose replacement program along with enhanced cleaning operations and process adjustments to maximize membrane life and lower the operating transmembrane pressure (TMP).





- The Charles Town Plant currently accepts all of the waste sludge from Tuscawilla as well as the water treatment plant process waste. There is no backup for the sludge pump or belt filter press at the plant. A redundant dewatering system should be considered in the short term to ensure sludge produced by any of the facilities may continue to be processed during shut down or failure of the sludge pump or belt press. Additionally, the waste from the water treatment plant creates operational issues at the Charles Town Plant. Alternative disposal methods should be considered.
- Both facilities require significant SCADA system modifications to improve the treatment process along with additional online instrumentation devices which will aid in plant optimization.

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Table 5.2 below illustrates the anticipated costs associated with the 2021 projects:

Table 5.2: 2021 Projects Summary	
Route 9- Northern Region Improvements	
DESCRIPTION	TOTAL COST
RK&K Task 7 Parkview MHP Pump Station Decommission	To be completed in-house
RK&K Task 7 Jett's Farm Option 2: PS and FM Modifications	$362,300.00
RK&K Task 7 Lloyd's Flat Pump Station Decommission	To be completed in-house
RK&K Task 7 Moose Lodge Option 2: Forcemain and PS Mod.	$194,200.00
RK&K Task 4 Northern/Burr Flow Diversion	$580,600.00
Upgrade Existing Ranson FS PS	$300,000.00
Route 9 - Northern Region Improvements Total	$1,437,100.00
Eastern Region Improvements	
Upgrades to Existing Pump Station 3-6	To be completed in-house
Upgrades to Existing Pump Station 4-2	To be completed in-house
Miscellaneous Improvements	
RK&K Task 10 Jefferson Memorial Park forcemain	$200,000.00
Miscellaneous Improvements Sub-Total	$200,000.00
Construction Sub-Total	$1,637,100.00
Contingency (±10%)	$163,710.00
TOTAL CONSTRUCTION COST	$1,800,810.00
PROFESSIONAL FEES - Engineering, Accounting, Legal, etc.	$500,000.00
TOTAL COLLECTION PROJECT COST	$2,300,810.00

Ranson Projects	
DESCRIPTION	TOTAL COST
Fairfax Crossing parallel 10" gravity line	$650,000.00
Forrest Avenue Pump station relocation/Fairfax Crossing	$615,000.00
Construction Sub-Total	$1,265,000.00
Contingency and Professional Fees (30%)	$379,500.00
TOTAL RANSON PROJECT COST	$1,644,500.00

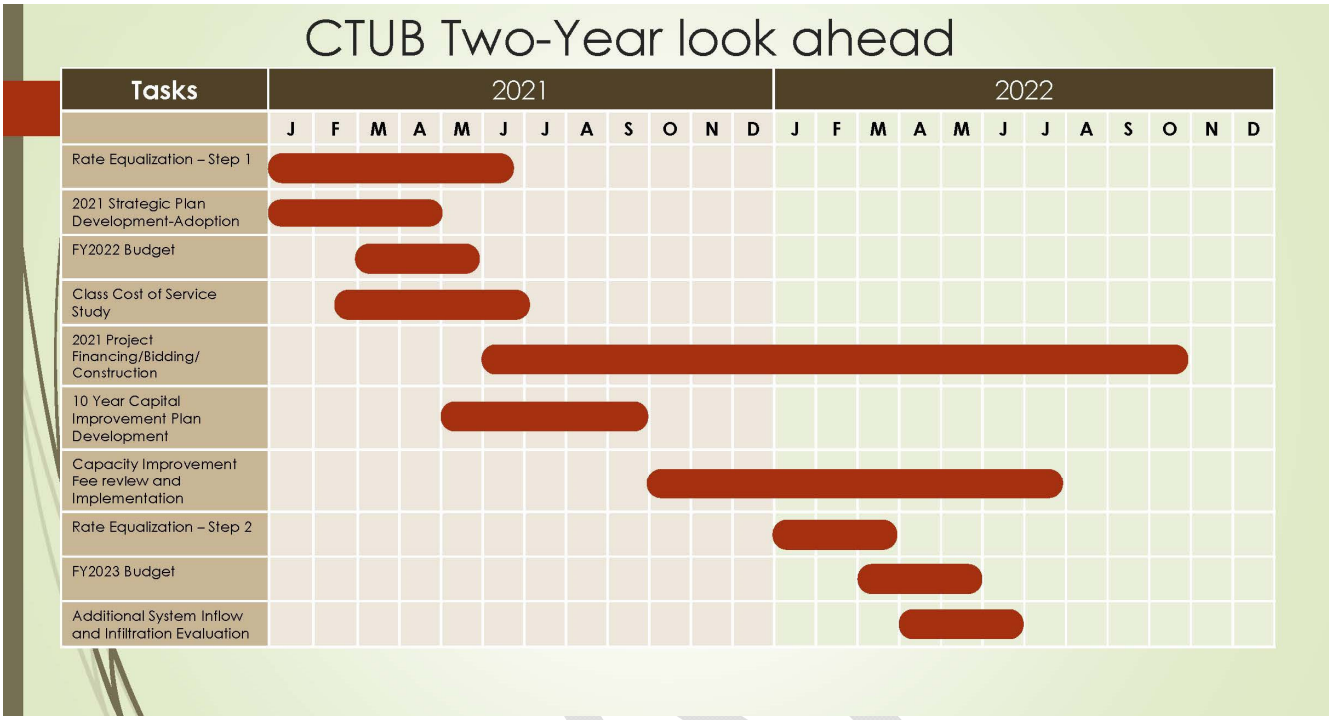
Renewal and Replacement Project	
DESCRIPTION	TOTAL COST
CTWWTP	$3,000,000.00
TWWTP	$1,063,820.00
TOTAL RENEWAL AND REPLACEMENT PROJECT COST	$4,063,820.00

TOTAL ALL PROJECTS	**$8,009,130.00**

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Project Schedule

A forecast of anticipated timeframes for completion of projects noted in the SSP are detailed in the diagram below:



This look-ahead is a forecast of anticipated top level strategic efforts. There are many factors that could affect this timeline.

Future Projects

As part of the consolidation into a regional utility in 2019, CTUB has initiated various efforts that will likely result in future projects that have not been formally vetted to date. As discussed in this SSP, the recent completion of a hydraulic wastewater model may result in additional capital projects for the collection and transmission system. The development of a 10-year Capital Improvement Plan (CIP) Expenditure Plan in conjunction with the evaluation of capacity improvement fees will provide a structure for the completion of these projects. The CIP will prioritize planning projects that are needed as a result of the following factors:

- Regulatory Compliance
- Condition/Probability of Failure
- Consequences of Failure/Risk
- Capacity / System Operational Efficiencies
- Improved Operations and Maintenance costs
- Safety
- Design Life / Best Replacement Practices
- Redundancy / Reliability
- Opportunity Projects
- Development Extensions

The CTUB Asset Management Plan will be updated to assist with the development and maintenance of a CIP.

CTWWTP Plant Expansion

Expansion of the CTWWTP is expected within the next 10 years based on the historical flow data in Table 1.4 as well as the development projections detailed in Table 1.2. Design efforts should be initiated in 2024/2025. In advance of the plant expansion, Gwin, Dobson and Foreman may be engaged to provide recommendations that may provide optimization enhancements to extend the service life of the existing facility, enhance process operations, provide additional capacity and improve treatment efficiencies. These targeted, cost-effective improvements may result in a more robust and reliable process for meeting regulatory standards until such time that a larger and more centralized treatment plant is constructed to meet planning period demands.

There are various factors that need to be evaluated with an expansion of the CTWWTP including location, size, type of facility and environmental protection. An expansion from 1.75 MGD to 3.5/4.0 MGD is estimated to cost between $15 million and $20 million in today's dollars. Every effort will be made to provide the most cost effective design to minimize any burden to ratepayers.

RATE EQUALIZATION, FUNDING AND FINANCIAL OPTIONS

Rate Equalization

During the consolidation of utilities, the City of Charles Town agreed to exercise its best efforts to equalize the rates and charges for water service of all water and sewer customers within 10 years after the closing date. To fulfill this obligation, CTUB and the Charles Town City Council will be working on strategies to initiate a stepped approach to rate equalization within the 1st quarter of 2021.

Rate equalization has an impact on each and every CTUB sewer customer. An added complexity is the equalization of three different utility rates and one having a significantly different rate structure (JCPSD single tier). The Charles Town and City of Ranson rate structures follow the tiered rate approach consistent with the WVPSC Commodity-Demand method which most water and sewer utilities follow in West Virginia. The Commodity-Demand method makes significant use of peak demand factors by customer class and isolates costs that are purely volume related and customer driven. Demand factors are significantly different for customer classes (i.e., residential, commercial). Peaking factors generally significantly decline when comparing the residential class to the commercial and other classes. This approach is the WVPSC recommended, most conventional and fairest for systems with multiple and material customer classes. The importance of this discussion on tiering is that the most practical and needed approach to rate equalization will be to transition the JCPSD single tier structure in a stepped manner to the multiple tiered structures of the City of Charles Town and City of Ranson. In addition to the recommendations below, CTUB staff and its financial advisors recommend maintaining a minimum debt/service coverage ratio of 130% above the minimum 115% required by bondholders and the WVPSC for the combined utility moving forward.

As part of the rate equalization process CTUB has authorized the completion of a Class Cost of Service Study which will identify the most appropriate rate structure and rate equality between the customer classes. This should be completed shortly after adoption of this SSP.

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Funding and Financial Planning

In addition to the rate equalization discussion, CTUB will be working with the Mayor and City Council on funding options for the projects discussed in this SSP:

- 2021 Renewal/Replacement Project
- 2021 Collection System Projects
- Forrest Avenue Pump Station relocation and Fairfax Crossing Parallel Gravity project

CTUB continues to pursue a strategy for funding upgrades and expansion in a manner that will minimize the burden to the current and future ratepayers. CTUB intends to fund the costs for the above projects through conventional rate impacts, payment of prior bonds and Capacity Improvement Fees. The development of a capital improvement plan will identify future capital purchases that are necessary for the operation of the sewer system. CTUB will be preparing a Capital Improvement Plan that will identify system needs and will aid in the evaluation of the Capacity Improvement fees. This plan and evaluation is anticipated to be underway in 2021.

Future CTWWTP expansion is expected to be necessary within the next 10 years. This will require a significant capital outlay and funding strategies in a future SSP and project discussion. It is anticipated that plant expansion could range from $15 to $20 million.

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APPENDIX A – GROWTH PROJECTIONS

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Appendix A - CTUB Sewer Strategic Plan 2021-2024 Development Forecast																											
Development	Total Design EDUs	Total Built as of 2021	20 year forecast to be built	Total Flow	Beyond 20 year forecast	Year 1 2021	Year 2 2022	Year 3 2023	Year 4 2024	Year 5 2025	Year 6 2026	Year 7 2027	Year 8 2028	Year 9 2029	Year 10 2030	Year 11 2031	Year 12 2032	Year 13 2033	Year 14 2034	Year 15 2035	Year 16 2036	Year 17 2037	Year 18 2038	Year 19 2039	Year 20 2040	Years 11-20 2031-2040	TOTAL @ Year 20	TOTAL REMAINING
American Heritage (Huntwell)	500	0	500	75,000	200	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0	0	160	300	200
Aspen Green	203	46	157	30,450	0	20	20	20	20	20	20	20	17	0	0	0	0	0	0	0	0	0	0	0	0	157	0
Beallair	372	112	260	55,800	0	20	20	20	20	20	20	20	20	20	20	20	20	20	0	0	0	0	0	0	60	260	0
Blackford Village	338	0	338	50,700	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	0	178	338	0
Breckenridge East	300	0	300	45,000	100	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	200	200	100
Briar Run	131	122	9	19,650	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
Burr Industrial Park & Bardane	200	170	30	30,000	0	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	30	0
Cambridge	134	85	49	20,100	0	5	5	0	0	0	0	0	0	0	0	5	5	5	5	5	5	5	4	0	0	39	49	0
Charles Town Infill	250	0	250	37,500	150	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	50	100	150
Clayhill Farm	300	0	300	45,000	20	0	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	0	180	280	20
Daniels Forest	192	0	192	28,800	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	12	0	0	0	0	92	192	0
Fritts Property	370	0	370	55,500	50	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200	320	50
Harvest Hills	392	6	386	58,800	166	0	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	20	200	220	166
Huntfield	3,200	421	2,779	480,000	2,459	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200	320	2459
Jefferson Heights North	262	0	262	39,300	122	0	0	20	20	15	15	15	15	15	15	10	0	0	0	0	0	0	0	0	10	140	0
Tate Manor	80	0	80	12,000	0	20	20	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	0
Lakeland Place / Lloyd's	600	0	600	90,000	220	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200	380	220
Jefferson Orchards	888	0	888	133,200	688	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	200	200	688
Langlet	1,000	0	1,000	150,000	800	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	200	200	800
Lloyd Property	500	0	500	75,000	300	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	200	200	300
Locust Knoll	359	0	359	53,850	59	0	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200	300	59
Magnolia Springs	300	0	300	45,000	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0	0	0	0	100	300	0
Norborne Glebe	1,050	246	804	157,500	484	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0	180	320	484
Old Town Ranson - Infill	250	0	250	37,500	150	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	50	100	150
Potomac Marketplace	54	0	54	8,100	0	0	5	5	5	5	5	5	5	5	5	5	4	0	0	0	0	0	0	0	9	54	0
President's Pointe	1,100	77	1,023	165,000	0	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	73	523	1,023	0
Prospect Place	170	0	170	25,500	0	0	0	0	0	9	9	25	25	25	25	25	27	0	0	0	0	0	0	0	52	170	0
Ranson Gateway / Boulevard	1,175	0	1,175	176,250	835	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200	340	835
Shenandoah Springs	705	259	446	105,750	46	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200	400	46
Stolipher	324	0	324	48,600	124	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	200	200	124
Washington Landing	274	0	274	41,100	0	0	0	0	50	50	50	50	50	24	0	0	0	0	0	0	0	0	0	0	0	274	0
Winchester Cold Storage	675	0	675	101,250	125	0	0	0	0	0	0	0	0	0	50	50	50	50	50	50	50	50	50	50	500	550	125
Windmill Crossing	150	146	4	22,500	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Total Projected Development	**7,086**	**728**	**6,358**	**1,062,900**	**2,123**	**96**	**101**	**101**	**191**	**199**	**219**	**235**	**235**	**209**	**235**	**275**	**276**	**245**	**245**	**245**	**225**	**225**	**225**	**225**	**228**	**0**	**4,235**	**2,123**

APPENDIX B – EXISTING SERVICE AREA

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Exhibit 1-1
Sewer Service Area

N
W
E
S

- Sewer Service Area
- WWTP
- PumpStation
- Gravity
- Force Main
- Stream
- Arterial Roadway
- Parcels
- Charles Town UGB
- Ranson UGB
- Shepherdstown UGB
- Charles Town Limits
- Ranson Limits
- Shepherdstown Limits

MARTINSBURG PIKE
N DUKE ST
W GERMAN ST
Deerfield WTP 2
Deerfield
Deerfield Village
Deerfield WTP 1
KEARNEYSVILLE PIKE
BERKELEY CO.
CHARLES TOWN RD
Northport PS
ROUTE 9
War Admiral PS
Burr Park East (5-1)
Burr West (5-2)
Burr, Royal (5-3)
ROUTE 9
Jefferson High (3-9)
Job Corps (3-8)
FLOWING SPRINGS RD
Driswood (3-14)
SHEPHERDSTOWN PIKE
Jetts Farm (1-10)
Woodlawn MHP (1-11) Big
Parkview (1-157)
Little Lloyd's Flats (1-12)
N MILDRED ST
Briar Run 2 (3-11)
Briar Run 1 (3-10)
Breckenridge
Cambridge (3-7)
Beallair (3-13)
Moose Lodge (1-12A)
Orchard Hills (2-13)
Wilts MHP (2-306)
Flowing Springs
Forrest Street
Cranes Lane (2-14)
11th Avenue
Racetrack (3-6)
WILLIAM L WILSON FWY
Marlowe Rd (Tractor Supply)
Ashley Brin
4th Avenue
Martins
Sheetz
Cone Zone
Demory
Original (Little) Demory
MIDDLEWAY PIKE
Mountaineer
S FAIRFAX BLVD
E WASHINGTON ST
W WASHINGTON ST
Wendy's (4-2)
Willow Spring
Genesis
Tuscawilla Plant
Weirick Street
S GEORGE ST
Clarence Drive
Belvedere Heights (4-4)
Park
Craig Hill
Charles Town
Samuel Street
County Green (4-7)
Belvedere
Citizens Fire Co
Hillside
Greenfield (4-5)
ROUTE 9
ROUTE 9
ROUTE 9
SUMMIT POINT RD
Huntfield
Norborne Glebe
Saint James
Spruce Hill (SHN-2)
Spruce Hill North (SHN-1)
BERRYVILLE PIKE
BERRYVILLE PIKE
CHARLES TOWN RD
KABLETOWN RD

GD&F
GWIN
DOBSON &
FOREMAN
ENGINEERS

April 5, 2021

Kristen M. Stolipher, Utility General Manager
Charles Town Utility Board
661 South George Street, Suite 101
Charles Town, WV 25414

RE: WTP Phase II Hydrogeological Study (ERI)
Engineering Proposal (Task Order)

Dear Mrs. Stolipher:

Per your request, Gwin, Dobson & Foreman, Inc. (GD&F) is pleased to present the following proposal (Task Order) to coordinate and conduct a Phase II hydrogeological study to search for potential groundwater wells to supplement the water treatment plant surface water source. This study involves a geophysical Electrical Resistivity Imaging (ERI) system.

Understanding of the Project

GD&F proposes to provide a detailed Phase II ERI study report which includes three (3) designated study areas identified in the Phase I study as WTP NE, WTP SW and Charles Town.

Proposed Services

GD&F will provide the following services:

- Hire a licensed professional hydrogeologist (Terracon) to conduct the study and coordinate with them on the study.
- Utilize ERI system which consists of an Advanced Geosciences, Inc. (AGI) SuperSting R8 control unit and a survey line with multiple electrodes.
- Perform approximately 9,960 linear feet of ERI survey at the three (3) sites.
- Identify subsurface fracture and fault zones and significant water bearing zones.
- Provide a summary report of the data collected.
- Site access and private property permission is by Owner.

Proposed Schedule

GD&F will begin immediately upon written authorization from the Board and will complete the Phase II ERI study within one (1) month from authorization.

3121 FAIRWAY DRIVE ALTOONA, PA 16602 814.943.5214 FAX 814.943.8494 WWW.GDFENGINEERS.COM

Proposed Cost

GD&F will provide the above scope of services for an estimated, not-to-exceed, fee of $25,000.00. Invoices will be submitted on a monthly basis based on the rates below. Payment will be made on an accrued hourly basis plus expenses. The expenses include direct expenses such as mileage, printing/copying, etc. as necessary to complete the services. Payment is due within thirty (30) days of invoicing.

Estimated Rates:

Professional Hydro Study/Report	=	$ 24,000.00
Professional Engineering	=	$ 1,000.00
Total Estimated Cost	=	$ 25,000.00

We appreciate the opportunity to submit this proposal. To authorize the services, please complete the following authorization section of this proposal and return a signed copy to our office. If you have any questions, please contact our office at your convenience.

Respectfully submitted,
GWIN, DOBSON & FOREMAN, INC.

Christopher M. Eckenrode

Christopher M. Eckenrode, P.E.
Senior Project Engineer

CME/amk
Prop/2021/CharlesTownWTPPhaseIIERIHydro_4-5-21.doc
cc: File

ACCEPTANCE OF PROPOSAL

The Charles Town Utility Board hereby accepts the above service and cost proposal.

_____ _____

Authorized Representative Date

_____

Attest/Witness

Charles Town WWTP Solids Handling Evaluation

March 2021

Option	1A New Belt Filter Press & Lime Equipment	1B New Belt Filter Press w/ Digestion Upgrades	2 Centrifuge w/ Digestion Upgrades	3 Rotary Press w/ Digestion Upgrades
Capital Improvements				
Purchase Cost	$277,000	$277,000	$456,900	$415,000
Lime Feed	$200,000	-	-	-
Digestion Upgrades	-	$1,500,000	$1,500,000	$1,500,000
Building Costs	$250,000	$250,000	$250,000	$250,000
Total Capital Cost	$727,000	$2,027,000	$2,206,900	$2,165,000
Annual Operations and Maintenance Costs[1]				
Daily Operating Time	8 hours	6 hours	6 hours	10 hours
Electricity[2]	$2,480	$44,600	$51,080	$44,520
Water	$44,928	$35,942	$2,051	$2,486
Lime	$13,000	-	-	-
Polymer	$49,608	$49,608	$49,608	$49,608
Sludge Disposal Costs[3]	$123,000 (18% solids)	$107,000 (18% solids/no lime)	$77,000 (25% solids)	$96,000 (20% solids)
Sludge DT/WT/#Loads	746/4,146/691	649/3,606/601	648/2,592/432	647/3,234/539
Labor ($30/hr)	$62,400 (8 hrs)	$46,800 (6 hrs)	$31,200 (4 hrs)	$46,800 (6 hrs)
Annual O&M Cost	$295,416	$283,950	$210,939	$239,414
PW of 10 Years O&M[4]	$2,716,172	$2,610,750	$1,939,457	$2,201,268
PW of 20 Years O&M[4]	$5,043,506	$4,847,752	$3,601,268	$4,087,409
Present Worth				
Capital & 10 Years O&M	$3,443,172	$4,637,750	$4,146,357	$4,366,268
Capital & 20 Years O&M	$5,770,506	$6,874,752	$5,808,168	$6,252,409

[1] All annual costs are based on operating 5 days per week. Annualized maintenance/replacement costs are similar enough between each option that they are assumed not to have an effect on the final comparison cost.

[2] The electricity cost is significantly less expensive for option 1A because this alternative does not include the additional operating costs of equipment added to upgrade the digestion process (SBR Mixers, additional WAS pump, digester blowers).

[3] Assumes 6 wet tons per load and $178 per load.

[4] All present worth calculations assumed an interest rate of 1.557%.

Each option listed above has benefits and disadvantages. The Belt Filter Press (BFP) has the lowest capital cost and is the easiest to perform maintenance on. However, the BFP requires the largest amount of space and drainage area because of the spray bars that clean the press and generates the lowest percent solids sludge. The BFP, while being the easiest to perform maintenance on, also requires the most overall maintenance and requires constant supervision while operating. The BFP also has the greatest annual operating costs requiring the most water and second highest energy usage. The BFP will also create the lowest percent solids prior to lime addition.

A Centrifuge while having the largest capital cost have the same sludge flow rates as the BFP and will have a lower annual operating cost. The Centrifuge, while not requiring much continuous maintenance, should be inspected by a manufacturer's representative annually and typically requires complete scroll replacement every 10 years. The scroll replacement must be done by a manufacturer certified installer and is costly. This makes the maintenance on centrifuges costly once every 10 years, but costs are comparable to the BFP for the same time period. The main advantages to the Centrifuge are: they require less building space, require little to no supervision while operating, and create the driest sludge.

The Rotary Press has the second highest capital cost and the lowest sludge flow rate, but generates the second driest sludge. Similar to a centrifuge, the rotary press requires little to no supervision while in operation. The rotary press has the least amount of maintenance due to having the slowest moving parts with the least number of moving parts. The only major disadvantage to the rotary press is that a single unit is likely not capable of meeting the current sludge flow demands of the system. A summary of the pros/cons to each system is summarized below.

Equipment	***Benefits***	***Disadvantages***
Belt Filter Press	• Low capital cost • Easy maintenance	• Large footprint and concrete curbing • Constant supervision • High annual operation costs • Low percent solids • Continuous maintenance • High water usage and return flow • Safety concerns associated with moving parts and mist during operation
Centrifuge	• Highest percent solids • Lower annual operation costs • Little supervision • Typically, only annual maintenance • Small footprint • Self-contained	• 10-year maintenance costs • Maintenance repairs require manufacturer reps • High capital cost • High electrical costs associated with drying
Rotary Press	• Medium footprint • Little supervision • High percent solids • Low maintenance • Self-contained	• Medium footprint • High capital cost • May not be able to meet current sludge flow rate demand with a single 8 channel unit

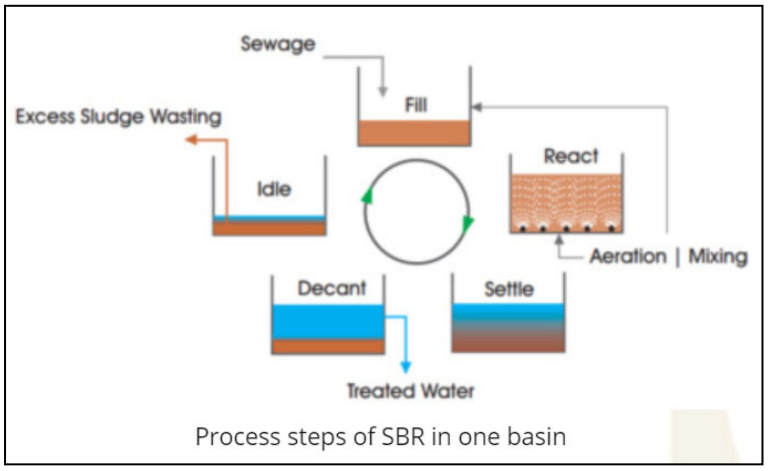
CHARLES TOWN WASTEWATER PLANT - PROCESSS TREATMENT ASSESSMENT

General - The following analysis focuses on the biological treatment process, its current performance and suggested optimization enhancements to extend the service life of the existing facility, enhance process operations, provide additional capacity and improve treatment efficiencies.

These targeted, cost-effective improvements will result in a more robust and reliable process for meeting regulatory standards until such time that a larger and more centralized treatment plant is constructed to meet planning period demands.

Process Description - The Sequencing Batch Reactor (SBR) technology has been in existence for 25 years and is a version of the suspended growth "activated sludge" wastewater treatment process.

The SBR process offers cost savings because of its fill-and-draw configuration. The SBR process treats sewage in "batches" which means all treatment is done in a tank with no flow going in or out until the process is complete and the treated wastewater is discharged. Please refer to the following figure of the SBR process.



Process steps of SBR in one basin

The first operation (Fill Cycle) involves raw sewage entering a tank partially filled with biologically active sludge left over from the last cycle. For nutrient removal, an anoxic fill cycle (no air) is provided prior to reaction/aeration. Next, after a quiescent period, the sewage-sludge mixture is aerated for 2-3 hours (Reaction Cycle). Then the air is turned-off and the wastewater is allowed to settle for several hours (Settling Cycle).

At the end of this cycle, the "clear water" on top is drawn-off (or decanted) for filtering and disinfection (Decant Cycle) and a small fraction of the settled sludge is withdrawn from the tank bottom and pumped to the aerobic sludge digesters (Sludge Wasting Cycle). Waste sludge is digested aerobically.

Historical Plant Influent Flow Data and Loading Review - Charles Town personnel provided Discharge Monitoring Reports from 2016 to 2019. Historic flows were evaluated using a Log Pearson Type III frequency analysis. Plant loadings for the period were also evaluated using a Log Pearson analysis. The proposed plant design flow parameters were determined as follows:

Flow Type	Influent Flow (MGD)	Remarks
Minimum Hourly Flow*	0.138	Minimum daily flow for the period from January 2016 - December 2019
Monthly Average Flow*	1.50	Monthly average flow for the period from from January 2016 - December 2019
Permitted Plant Capacity*	1.75	WVDEP Permitted Plant Capacity
Permitted Maximum 3 Month Average Flow	1.58	90% of Permitted Plant Capacity
Maximum Monthly Average Flow*	2.22	Maximum monthly average flow occurred in September 2018
Maximum Weekly Flow	1.39	Log Pearson Type III analysis of 50% probability occurrence of all from January 2016 - December 2019 flow events
35% Probability Occurrence, Peak Flow	1.55	Log Pearson Type III analysis of 35% (+/-) probability occurrence of all from January 2016 - December 2019 flow events
20% Probability Occurrence, Peak Flow	1.90	Log Pearson Type III analysis of 20% probability occurrence of all from January 2016 - December 2019 flow events
Maximum 3 Month Running Average	2.00	Log Pearson Type III analysis of 9% probability occurrence of all from January 2016 - December 2019 flow events
Maximum Daily Flow	2.20	Log Pearson Type III analysis of 5% (+/-) probability occurrence of all from January 2016 - December 2019 flow events
Peak Hourly Flow*	2.56	Log Pearson Type III analysis of 2% (+/-) probability occurrence of all from January 2016 - December 2019 flow events
Peak Instantaneous Flow*	4.34	Maximum system flow of 4.339 MGD recorded for from January 2016 - December 2019

Asterisk (*) Denotes Design Flow Parameters

During this same period the Charles Town Utility Board evaluated the plant effluent flows and noted that the maximum 3 month running average reached 1.56 MGD in 2019 and 1.67 MGD in 2018. While 2018 was a year of exceptional rainfall, the 2019 running average approached the permit conditions. This differed from the above values because the WVDEP values were based on effluent flow which has historically been less than the measured influent flow results. Based on the measured influent flow, the plant would have been considered hydraulically overrated.

The existing plant is also designed to meet the NPDES permit limits for BOD5, TSS and ammonia-nitrogen (NH_3), as well as meet annual TMDL limits for Total Nitrogen and Total Phosphorus.

Effluent Characteristics	Monthly Average Loading Rate, lbs./day	Max Daily Loading Rate, lbs./day	Monthly Average Concentration, mg/L	Max Daily Concentration, mg/L
BOD_5	301	601	20.6	41.2
TSS*	438	876	30	60
Ammonia-Nitrogen	60	120	4.1	8.2

The plant currently has the capacity and treatment capabilities to meet the daily limits as well as the annual TMDL limits based on the historical flow analysis without using the denitrifying filters. The plant's current effluent concentrations of total nitrogen and total phosphorus are 6.1 mg/L and 0.49 mg/L respectively. The historic daily average flow results for the annual plant TMDL limits are as follows:

Effluent Characteristics	Charles Town Plant (Outfall 001)
Average Daily Flow, MGD	1.48
Total Nitrogen, mg/L	6.10
Total Nitrogen, lbs./year	27,444
Total Phosphorus, mg/L	0.49
Total Phosphorus, lbs./year	2,216

While the plant meets the average daily flows, based on the historical effluent results, the plant would not meet the TMDL limit for TN at 1.75 MGD (32,495 lbs./year). Residential growth is expected to continue. The residential growth is not expected to impact the overall wastewater influent concentrations, which means the plant should be capable of producing the same effluent concentrations. This shows that as the plant continues to grow over the next 10 years, the average influent rate is expected to approach 1.71 MGD. This will require either upgrades to meet the hydraulic capacity or enhancements and optimization measures outlined herein.

Future Growth and Build-Out - Based on the projected growth EDU's provided by the Charles Town Utility Board, a review of the "Maximum 3 Month Running Average" flow rates was used to determine recommendations on when future expansions should occur and the anticipated future maximum daily flow rates for the Charles Town Plant. Some assumptions were made in reviewing the Charles Town Utility

Board spreadsheet data on planned development activities in the service area. The first being that the Charles Town Wastewater Treatment Plant (CTWWTP) serves roughly 17,500 people which is currently 31% of the population of Jefferson County. For planning purposes, it is assumed that the future population served by the Charles Town wastewater plant would be the same fraction.

Also, the peak flow-to-average daily flow ratio and the "Maximum 3 Month Running Average" flow to Average Daily flow ratios for the last 5 years were used to estimate the ratios for the future growth period. Using these assumptions and estimates, Charles Town would not be considered hydraulically overloaded until the year 2034 when the Maximum 3 Month Running Average flow rates reached 1.59 MGD. Refer to Table 6 below.

Projected Year	**2021**	**2030**	**2034**	**2035**	**2040**
Projected EDUs	66	1,776	2,937	3,212	4,312
Average Daily Flow	1.23	1.31	1.37	1.38	1.43
Maximum 3 Month Running Average	1.43	1.52	1.59	1.60	1.66
Maximum Daily Flow	2.54	2.70	2.82	2.84	2.95

Also, additional review of the historic and projected effluent flows and annual nutrient mass loadings show that they match with the previously reviewed nutrient mass loadings when compared to influent flows (see below). The plant has been meeting the annual nutrient mass loadings mainly by virtue of lower plant flow rates. Issues associated with meeting the effluent nutrient mass loadings will increase as flow increases which will require either the use of the denitrifying filters or optimization upgrades to the SBR process to continue to meet the nutrient mass loadings over the intervening time.

Projected Year	**2021**	**2030**	**2034**	**2035**	**2040**
TN (lbs/yr)	24,060	25,612	26,665	26,915	27,913
TP (lbs/yr)	1,864	1,984	2,065	2,085	2,162

Another item that should be taken into consideration with future growth and build-out is the biological loading on the plant and associated equipment. The plant currently sees an average influent BOD concentration of 344 mg/L which is significantly higher than average strength wastewater.

It should be noted that due in part to the higher strength influent, it may be possible to provide upgrades to the biological treatment process that could potentially prolong the life of the existing plant, reduce operating costs and provide better biological treatment. This, in turn, would insure more reliable effluent quality and improve and enhance the sludge digestion, dewatering and disposal processes. The optimization upgrades have the potential to provide additional treatment capacity and possible hydraulic rerating of the plant by WVDEP.

The following sections will discuss the existing process treatment and proposed optimization enhancements.

Typical SBR Process Considerations Performance – Because of the unique fill-and-draw nature of the SBR process, the following factors should be considered in SBR design and operation. Many of the items listed are deficiencies currently existing at the Charles Town wastewater treatment plant.

- SBR's are vulnerable to high strength waste loads and wet-weather flows that can dilute or washout process biomass during storm events.

- Based on a nationwide survey, the majority of SBR systems are used in smaller applications where wastewater flows are more contained and not subject to high peaking factors. In general, there are more than 1,000 SBR-type facilities operating in the United States. About 70% of these plants are less than 0.5 MGD capacity and 80% are less than 1 MGD. Comparatively few plants are greater than 10 MGD capacity.

- Several publications and texts provide cautionary factors when considering SRB systems. (Reference: WEF MOP #8/ASCE MEP #76, Metcalf & Eddy, Wastewater Engineer; USEPA Wastewater Technology Fact Sheet - SBR's). Many of these observations have been noted as impacting the performance of the existing Charles Town treatment plant.

    a. A higher level of operational sophistication is required (compared to conventional systems), especially for larger systems, of timing units and controls.

    b. Higher level of maintenance (compared to conventional systems) associated with more sophisticated instrumentation and controls, automated switches and automatic valves.

    c. Potential of discharging floating or settled sludge during the draw or decant phase with some SBR configurations.

    d. Because substrate concentration changes with time, the substrate utilization and oxygen demand rates change, progressing from high to low levels. The aeration system should be designed to reflect changing requirements in oxygen demand. Wet-weather systems are vulnerable to these changing substrate conditions as the influent becomes more diluted.

    e. Process control is more complicated due to the number and timing of the various cycles.

    f. Potential for sludge bulking at low food-to-microorganisms ratio.

    g. Inability to chlorinate return activated sludge for filamentous bacteria control.

    h. For biological nutrient removal, reaction rates will be depressed if the reactor is not thoroughly mixed, therefore, mechanical mixing is warranted.

i. Some SBR systems use less efficient aeration devices and are prone to plugging during selected operating cycles. For optimum nutrient removal, fine bubble diffused air, via membrane diffusers mounted in tank bottoms, should be considered at Charles Town.

Existing Process Operational and Performance Limitations - Based on discussions with plant operators and observations of the existing process, the following operational limitations and performance problems have been noted at the Charles Town SBR process:

- The Charles Town SBR's have coarse bubble diffusers which are more energy intensive and less efficient in terms of oxygen transfer than fine bubble diffusers. Fine bubble diffused aeration systems are a feature of SBR design when nutrient removal is required. Also, coarse bubble diffusers can result in non-filamentous foam production (due to higher shearing action) when influent contains high concentrations of surface acting agents (i.e., surfactants in detergents and cleaning products) generated in institutional and industrial discharges.

- The plant does not have aeration blowers controlled by key process parameters such as dissolved oxygen (DO) and oxygen reduction potential (ORP). Over-aeration can break biomass floc particles apart, causing pin floc or small, dispersed floc that does not settle well. Anoxic zones (settling phase) used for denitrification can also turn partially aerobic, or oxic, due to high DO thus resulting in lower nitrogen removal.

- New aeration blowers with variable frequency drives (VFD's) controlled by DO and ORP meters will better control the aeration cycle and result in less DO carryover to the anoxic nitrogen removal phase. Along with these benefits, better blower control will be less wasteful and more energy efficient.

- New high efficiency turbo blowers for the existing digester tank are being recommended as the existing 250 HP blowers are not energy efficient. These blowers must also feature backup power when relying on true sludge digestion, thus a new generator should be considered.

- Excess sludge wasted (or removed) from the biological process at a high rate. This results in thinner waste sludge in terms of solids content with a lower volatile solids fraction. This is opposed to sludge that is allowed to accumulate and compact resulting in a thicker sludge blanket with a higher volatile fraction. The best means to remove sludge from the process is via pumping which is more easily controlled that the current method of a piped gravity discharge.

- The excess and high rate wasting of sludge has a "domino effect" in the sludge handling system since the aerobic digesters are less efficient in stabilizing sludge (less volatile solids removal). The continuous wasting of sludge from the digesters to the dewatering system results in excessive use of the plant belt filter press. Finally, since the plant volatile solids reduction does not meet the pathogen reduction criteria for Class "B" biosolids, Charles Town must continuously add lime to

stabilize plant bio-solids. These problems are costly in terms of material costs and energy inefficiencies (digester blower and sludge operations).

- Aggravating the sludge digestion process is that the existing digesters do not have adequate decant mechanisms (i.e., adjustable, automatic decant valve) which could provide a denser and higher solids product for dewatering than the solids "carryover" that currently occurs in the thinner sludge that is processed by the belt filter press. A thinner sludge requires more polymer addition for conditioning purposes which is a wasteful and costly chemical addition.

- The anoxic phase of the SBR process is the principal means of nitrogen removal where nitrogen gas is released. The objective of mixing in anoxic and anaerobic zones is to maintain optimum conditions for nutrient removal. Maintaining anoxic/anaerobic zones requires mixing of the basin contents while avoiding the introduction of free oxygen. Submersible or propeller mixers are commonly use to achieve these purposes.

Recommended Optimization Enhancements and Costs – The following recommended optimization enhancements have the ability to extend the service life of the existing facility, enhance process operations, provide additional capacity, improve treatment efficiencies and provide a more robust and reliable treatment process.

1. **Fine Bubble Diffused Air System** – Install membrane fine bubble diffusers in the SBR tank bottoms involving an aeration grid, connecting piping and air supply. Estimated Cost - $250,000.

2. **New High Efficiency Digester Blowers** – Install two (2) new 200 HP high efficiency digester turbo blowers to serve the existing large digester tank. Estimated Cost - $225,000.

3. **New Emergency Generator to Run New Digester Blowers** – Install new diesel generator with associated wire and gear to place new Digester Blowers on backup power. Estimated Cost - $200,000.

4. **New Aeration Blowers** – Provision for new aeration blowers properly sized for process conditions and equipped with variable frequency drives to better control air supply to the SBR process reactors resulting in less DO carryover and more energy efficiency. Piping and valve modifications are also necessary. Work includes blower control system integrated with the plant SCADA system. Estimated Cost - $300,000.

5. **Process Instrumentation** – Installation of DO and ORP instrumentation probes to better measure biological activity in the SBR's with output to the aeration blowers to control air volume to the react (aeration) process. Estimated cost - $50,000.

6. **Anoxic Zone Mixing System** – Furnish submersible mixers in the anoxic zone to ensure optimum mixing conditions during the denitrification phase of the SRB process including electrical work. Estimated Cost - $150,000.

7. **Aerobic Digester Decant Mechanism** – Provision for adjustable decant mechanism to improve removal of supernatant from the aerobic digesters and provide for better digested sludge with a higher solids content prior to the sludge dewatering system. Estimated Cost - $100,000.

8. **SBR Control System Modifications** – Provide for integration of the above blower and mixer controls and plant instrumentation system (DO, ORP meters) with the plant SCADA system along with new SBR cycle times and control intervals. Estimated cost - $50,000.

9. **Waste Activated Sludge (WAS) System Improvements** – The need to better control waste activated sludge (WAS) removal from the SBR process would involve new WAS pumps including pump controls and piping. Estimated cost - $175,000.

The estimated construction cost of the recommended optimization enhancements is $1,500,000. Along with associated engineering and administrative costs of $200,000, the total estimated project cost is $1,700,000.

CHARLES TOWN UTILITY BOARD
WATER/SEWER SYSTEMS UPGRADE PROJECTS

RUMMEL, KLEPPER & KAHL, LLP

TASK NO. 17

PROFESSIONAL ENGINEERING & SURVEYING SERVICES

FACILITY PLAN

April 5, 2021

Being a part of Agreement Between
Charles Town Utility Board and Rummel, Klepper & Kahl, LLP
dated November 13, 2019

This Task No. 17 dated April 5, 2021 to the Agreement between Charles Town Utility Board (CTUB) and Rummel, Klepper, and Kahl, LLP (RK&K) dated November 13, 2019 is to provide professional engineering services for the development of a Facility Plan in accordance with State Revolving Fund (SRF) requirements for addressing the overall sewer needs within the northern portion of the greater Charles Town Utility Board collection system. Specific areas of focus within the collection system include:

- Burr East Pump Station,
- Jett's Farm Pump Station,
- Moose Lodge Pump Station,
- Flowing Springs Pump Station,
- Evitts Run Interceptor Gravity Line,
- Fairfax Crossing Parallel Line, and
- Forrest Avenue/11th Street Pump Station.

Scope of Services

The following summarizes RK&K's services as part of this Task:

1. RK&K will consult with CTUB Staff to define and clarify CTUB's requirements for the project, including design objectives and constraints, space, capacity and performance requirements, flexibility, and expandability, and any budgetary limitations, and identify available data, information, reports, facility plans, and site evaluations.

2. RK&K will identify potential solutions to meet CTUB's project requirements, as needed. The main areas of focus of the facility plan are the Burr East Pump Station, Jett's Farm Pump Station, Moose Lodge Pump Station, Flowing Springs Pump Station, Evitts Run Interceptor Gravity Line, Fairfax Crossing Parallel Line, and Forrest Avenue/11th Street Pump Station.

3. RK&K will incorporate recommendations and alternatives from previous reports associated with Task 004 Modified Flowing Springs, Task 007 Parkview Woodlawn, Task 010 Jefferson Memorial Park Force Main, Task 012 Forrest Avenue Pump Station, Task 015 Fairfax Crossing Parallel Line, and Task 016 Lloyd's Flat and Moose Lodge.

4. RK&K will study and evaluate the potential solution(s) to meet CTUB's project requirements.

5. RK&K will visit the site, or potential project sites, to review existing conditions and facilities, unless such visits are not necessary or applicable to meeting the objectives of the study and report phase.

6. RK&K will advise CTUB Staff of any need for CTUB to obtain, furnish, or otherwise make available to RK&K additional project-related data and information for RK&K's use in the study and evaluation of potential solutions to CTUB's project requirements, and preparation of a related report.

7. RK&K will identify, consult with, and analyze requirements of governmental authorities having jurisdiction to approve the portions of the project to be designed or specified by RK&K, including but not limited to mitigating measures identified in the facility plan for the project.

8. RK&K will prepare a report which will, as appropriate, contain schematic layouts, sketches, and conceptual design criteria with appropriate exhibits to indicate the agreed-to requirements, considerations involved, and RK&K's recommended solution(s). For each recommended solution RK&K will provide the following, which will be separately itemized: opinion of probable construction cost; proposed allowances for contingencies; the estimated total costs of design, professional, and related services to be provided by RK&K; and on the basis of information furnished by CTUB, a tabulation of other items and services included within the definition of total project costs.

9. RK&K will furnish three (3) review copies of the Report and other study and report phase deliverables to CTUB Staff within three (3) months of the effective date and review it with CTUB Staff. Within fifteen (15) working days of receipt, CTUB shall submit to RK&K any comments regarding the furnished items.

10. RK&K will revise the report and any other study and report phase deliverables in response to CTUB's and Agency's comments, as appropriate, and furnish three (3) copies and one (1) electronic copy of the revised report and any other study and report phase deliverables to CTUB Staff within one (1) month of receipt of CTUB Staff's and Agency's comments.

11. RK&K understands that CTUB will need to pursue project financing through the SRF program. As part of the SRF funding requirement, CTUB will be required to submit an application to the Infrastructure and Jobs Development Council (IJDC). RK&K will assist the CTUB through the IJDC application process including preparation of the application, addressing questions received, and participating in review meetings.

Schedule

Subject to CTUB review time, RK&K anticipates three months to complete the facility plan from issuance of notice to proceed. RK&K anticipates the IJDC application process to take an additional two to three months.

Estimated Person-Hours per Phase by Category, Engineer's Consultant Costs and Other Direct Costs

A fee derivation is attached as Page 4 which includes RK&K's estimated person-hours by category and other direct costs anticipated to complete the work for this project.

Materials and Resources Required of CTUB

- CTUB will be responsible for providing the updated 2021 Wastewater Strategic Plan.
- CTUB will be responsible for providing existing pump station flow data.
- CTUB will be responsible for providing available mapping to facilitate RK&K's design.
- CTUB will be responsible for any and all construction related materials and equipment.

Estimated Not-To-Exceed Fee

RK&K will provide the scope of services described above at an amount equal to Engineer's Direct Labor Costs times a factor of 2.7 for the services of Engineer's personnel engaged on the Project, plus Reimbursable Expenses. RK&K's current certified payrates for personnel to be assigned to this project is included as Exhibit B to Original Agreement dated November 13, 2019.

The total estimated Not-to-Exceed fee to perform the work is $49,600.00 as shown on RK&K's enclosed fee derivation.

Authorization

This No. 17, Facility Plan, dated April 5, 2021 and being a part of the Agreement between Charles Town Utility Board and Rummel, Klepper & Kahl, LLP for Engineering Services for Water/Sewer Systems Upgrade Projects dated November 13, 2019, is approved by the following duly authorized officials:

Engineer: RUMMEL, KLEPPER & KAHL, LLP

_____ 04/05/2021

John W. Cole, PE — Date
Manager, Municipal Engineering

Owner: Charles Town Utility Board

_____ _____

Daryl Hennessy — Date
Chairman

RUMMEL, KLEPPER KAHL, LLP
FEE DERIVATION
CHARLES TOWN UTILITY BOARD
TASK 17
FACILITY PLAN

April 5, 2021

Scope of Services	Manager	Associate Engineer	Senior Designer	CADD	Misc. Exp.	Task Total Hours
Technical Assistance						
General Project Assistance						
Site Visits		8	8		$ 300.00	**16**
Prepare Draft Facility Plan	4	180	160	24		**368**
Review Meetings	4	12				**16**
Incorporate Comments and Prepare Final	2	20	4			**26**
Funding Assistance						
Funding Assistance	10	20				**30**
Total Hours	**20**	**240**	**172**	**24**	**$ 300.00**	**456**

NTE Cost	**$ 49,600.00**

CHARLES TOWN UTILITY BOARD
WATER/SEWER SYSTEMS UPGRADE PROJECTS

RUMMEL, KLEPPER & KAHL, LLP

TASK NO. 07
SCOPE OF WORK CHANGE NO. 02

PROFESSIONAL ENGINEERING & SURVEYING SERVICES

PARKVIEW-WOODLAWN PROJECT
JETTS FARM PUMP STATION MODIFICATIONS

April 5, 2021

Being a part of Agreement Between
Charles Town Utility Board and Rummel, Klepper & Kahl, LLP
dated November 13, 2019

This Scope of Work Change No. 02 to Task No. 07 dated April 5, 2021 to the Agreement between Charles Town Utility Board (CTUB) and Rummel, Klepper, and Kahl, LLP (RK&K) dated November 13, 2019 is to provide professional engineering and surveying services for assisting with the modifications to the Jett's Farm Pump Station and the installation of the Jett's Farm force main in concurrence with RK&K's Parkview-Woodlawn Top Level Budget for Option 2 dated June 3, 2020.

Scope of Services

The following summarizes RK&K's services as part of this Task:

1. RK&K will perform a field survey to locate existing rights-of-way and property lines, utilities, topographic features and other relevant features.
2. RK&K will prepare preliminary plans for modifications to the Jett's Farm Pump Station and conveyance of sewage to the new War Admiral force main.
3. RK&K will submit the preliminary design to the CTUB Staff for review, approval and authorization to proceed to final design plans.
4. RK&K will prepare the plans, specifications, and contract documents in accordance with CTUB sewer design standards.
5. RK&K will perform courthouse research (online) along with preparing the necessary easement plat(s) and description(s) for the project.
6. RK&K will contact environmental review agencies and other stakeholders, if needed, to obtain clearances for construction of project.
7. RK&K will submit the final design to the CTUB Staff for review and approval.
8. RK&K will revise the final design, incorporating review comments, and prepare the necessary bidding related documents.

9. RK&K will assist CTUB in advertising project for bid, conducting prebid meeting, preparing minutes of meeting, issuing addendums, attending bid opening, preparing bid tabulation and recommending award of contract.

10. RK&K will provide conformed drawing files (in dwg format) of the bidding plans to the CTUB for record purposes.

11. RK&K will prepare notice of award for submission to Contractor, agreement, review of contract documents (bonds, insurance, etc.) and notice to proceed.

12. Construction Engineering Services

    a. RK&K will submit a scope of work change to this task order for construction phase services once the overall project has been defined.

Schedule

Subject to weather, permitting and CTUB review time, RK&K anticipates three months to perform the field survey, study, preparation of drawing, etc. from issuance of notice to proceed. Impacts to the schedule may occur outside of RK&K's and CTUB's ability to control (i.e. regulatory and permitting approvals).

Estimated Person-Hours per Phase by Category, Engineer's Consultant Costs and Other Direct Costs

A labor derivation is attached as Page 4 which includes RK&K's estimated person-hours by category and other direct costs anticipated to complete the work for this project.

Materials and Resources Required of CTUB

- CTUB will be responsible for providing available mapping to facilitate RK&K's design.
- CTUB will be responsible for paying any permitting fees and regulatory agency costs.
- CTUB will be responsible for any and all construction related materials and equipment.

Estimated Not-To-Exceed Fee

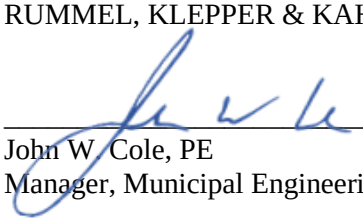
RK&K will provide the scope of services described above at an amount equal to Engineer's Direct Labor Costs times a factor of 2.7 for the services of Engineer's personnel engaged on the Project, plus Reimbursable Expenses. RK&K's current certified payrates for personnel to be assigned to this project is included as Exhibit B to Original Agreement dated November 13, 2019.

The total estimated Not-to-Exceed fee to perform the work is $53,300.00 as shown on RK&K's enclosed labor derivation.

Authorization

This Scope of Work Change No. 02, Jett's Farm Pump Station Modifications to Task No. 07, Parkview-Woodlawn Project, dated April 5, 2021 and being a part of the Agreement between Charles Town Utility Board and Rummel, Klepper & Kahl, LLP for Engineering Services for Water/Sewer Systems Upgrade Projects dated November 13, 2019, is approved by the following duly authorized officials:

Engineer: RUMMEL, KLEPPER & KAHL, LLP



_____ 04/05/2021

John W. Cole, PE — Date
Manager, Municipal Engineering

Owner: Charles Town Utility Board

_____ _____

Daryl Hennessy — Date
Chairman

RUMMEL, KLEPPER KAHL, LLP
LABOR DERIVATION
CHARLES TOWN UTILITY BOARD
TASK 7
SCOPE OF WORK CHANGE 02
JETT'S FARM PUMP STATION MODIFICATIONS

April 5, 2021

Scope of Services	Manager	Associate Engineer	Senior Designer	CADD	Senior Survey Technician	Survey Party Chief	Survey Technician	Task Total Hours
Technical Assistance								
Meeting	4	8	8					**20**
Surveying / Mapping / Easement		8	8	4	50	40	40	**150**
Design								
Title Page		0.5		2				**3**
General Notes	1	2		6				**9**
Quanties / R-W Easements		1		4				**5**
Sheet Index		1		4				**5**
Electrical (2 sheets)	1	2	12					**15**
Jett's Farm PS (4 sheets)	2	4	80					**86**
Force Main (3 sheets)	2	8		60				**70**
Grinder (2 sheets)	1	8	4	12				**25**
Erosion & Sediment Control		1		16				**17**
Traffic Control	1	4		16				**21**
Details		1		8				**9**
Technical Specifications	4	16	24					**44**
Permitting / Regulatory Review								
DOH	0.5	4		4				**9**
Health	0.5	4		6				**11**
Bidding Assistance	8	32	20					**60**
Total Hours	**25**	**105**	**156**	**142**	**50**	**40**	**40**	**558**
Total Fee	**$ 5,250.00**	**$ 10,868.00**	**$ 16,224.00**	**$ 12,780.00**	**$ 3,400.00**	**$ 2,640.00**	**$ 2,080.00**	**$ 53,242.00**

$ 53,300.00

159 Plaza Drive | Keyser, WV 26726 | P 304.788.3370 | F 304.788.3577 | www.rkk.com

June 3, 2020

Ms. Jane Arnett, Utility Manager
Charles Town Utility Board
661 S. George Street
Charles Town, WV 25414

Re: Charles Town Utility Board
Parkview - Woodlawn Project
Top Level Budget

Ms. Arnett,

At the request of the Board, RK&K reviewed the available information on the existing sewer collection system and prepared a "top level" budget for decommissioning the Parkview MHP Pump Station and redirecting flow into the new Route 9 Sewer Project. The "top level" budget also included evaluating the Jett's Farm Pump Station and decommissioning of the Lloyd's Flatt and Moose Lodge Pump Stations.

Enclosed with this letter is a drawing identifying the proposed modifications to redirect sewage into the new Route 9 Sewer Project and to decommission the two pump stations, as well as probable construction cost.

Below is a summary of RK&K's findings:

SEWER SERVICE

As shown on the enclosed documents, options were considered for each component of the conveyance system between the Parkview MHP Pump Station and the Moose Lodge Pump Station. Brief descriptions for each of the various options are as follows:

Parkview MHP Pump Station Decommission

This option consists of the demolition of the Parkview MHP Pump Station and the construction of approximately 840 LF of 6" gravity sewer line and 4 manholes from the Parkview MHP Pump Station location to the Woodlawn Pump Station. The cost for this option is $190,000, as identified within the enclosed cost estimate.

Jett's Farm Option 1: Pump Station and Force Main Modifications

The Modified Flowing Spring Project includes redirecting flow from the northern pump stations (Burr East, Burr Royal, Burr West, Driswood, Job Corps, Jefferson High School) to the new War Admiral Pump Station instead of continuing towards the Jett's Farm Pump Station. This will greatly reduce the flow at the Jett's Farm Pump Station, and therefore, modifications to the pump station and force main must be made.

This option consists of replacing the pumps, controls, piping, and valve vault at the Jett's Farm Pump Station. This option also includes the installation of approximately 4,300 LF of 3" HDPE force main inserted inside the existing 6" force main from the Jett's Farm Pump Station to the discharge manhole (MH 37) on War Admiral Boulevard. Pump and haul will be utilized while the existing 6" force main is slip lined with the new 3" force main. Also included with this option is connecting the single residential grinder unit at 2466 North Mildred Street into the new 3" HDPE force main. The cost for this option is $560,000, as identified within the enclosed cost estimate.

Jett's Farm Option 2: Pump Station and Force Main Modifications

The Modified Flowing Spring Project includes redirecting flow from the northern pump stations (Burr East, Burr Royal, Burr West, Driswood, Job Corps, Jefferson High School) to the new War Admiral Pump Station instead of continuing towards the Jett's Farm Pump Station. This will greatly reduce the flow at the Jett's Farm Pump Station, and therefore, modifications to the pump station and force main must be made.

This option consists of replacing the pumps, controls, piping, and valve vault at the Jett's Farm Pump Station and installation of approximately 2,200 LF of 3" force main from the Jett's Farm Pump Station through a casing under Route 9 to the new Route 9 force main. There is an old existing casing that was abandoned under Charles Town Road South of Jett's Farm Pump Station, but no existing casings are present under Route 9.

This option also includes abandoning the existing 6" force main from the Jett's Farm Pump Station to the residence at 2466 North Mildred Street and installing a grinder pump and 870 LF of 1.5" force main from the residence to MH 37. The cost for this option is $580,000, as identified within the enclosed cost estimate.

Lloyd's Flat Pump Station Decommission

This component is integral to each of the options previously discussed and consists of the demolition of the Lloyd's Flat Pump Station and the construction of approximately 90 LF of 8" gravity sewer line from the existing manhole MH 45 beside the Lloyd's Flat Pump Station to the new Route 9 manhole SMH CH-06. This option also includes abandoning the existing 6" force main to MH 45A. The cost for this option is $100,000, as identified within the enclosed cost estimate.

Moose Lodge Option 1: Pump Station Decommission and Gravity Installation

The Lloyd's Flat Pump Station Decommission redirects flow into the new Route 9 Sewer Project, so that the Moose Lodge Pump Station will only serve 1 industrial and 4 commercial customers. This option consists of the demolition of the Moose Lodge Pump Station and the construction of approximately 1,820 LF of 8" gravity sewer line and 6 manholes from MH 45B beside the Moose Lodge Pump Station to MH R3. This option also includes abandoning approximately 1,390 LF of the existing 6" force main from the Moose Lodge Pump Station to MH R3. The cost for this option is $560,000, as identified within the enclosed cost estimate.

Moose Lodge Option 2: Force Main and Pump Station Modifications

The Lloyd's Flat Pump Station Decommission redirects flow into the new Route 9 Sewer Project, so that the Moose Lodge Pump Station will only serve 1 industrial and 4 commercial customers. Therefore, the pump station and the force main will experience far less flow and will require modifications. This option consists of the demolition of the existing pump station, installation of a new package pump station, and installation of approximately 1,390 LF of 1.5" force main inside of the existing 6" force main. The cost for this option is $310,000, as identified within the enclosed cost estimate.

Flowing Springs Pump Station Evaluation

The Flowing Springs Pump Station receives flow from the west from a 15-inch gravity sewer that serves various subdivisions and the new Rt 9 Project, from the east from an 8-inch force-main from the Breckenridge Pump Station, and from the south from an 8-inch gravity sewer that serves the Shenandoah Springs subdivision.

The pumps at the Flowing Springs Pump Station are rated at 900 GPM according to the 2018 Hatch Route 9 Sewer Project Design Report and currently pump between 600 and 800 GPM according to flow data on the OmniSite from February 29, 2020 to May 20, 2020. The wet well is 27' deep with a diameter of 10'. The force main leaving the pump station is initially 12" and transitions to an 18" and 24" gravity sewer that flows to the WWTP.

Once the Modified Flowing Spring Project, the Route 9 Project, and the Parkview-Woodlawn Project are completed, all flow from the northern area will be directed to the Flowing Springs Pump Station. Based on predicted changes in flow from these projects, the pumps at the Flowing Springs Pump Station may be at or over the current capacity. The RK&K Sewer Model Task 05 will evaluate the Flowing Springs Pump Station, the Flowing Springs force main, and the gravity sewer to the Wastewater Treatment Plant. It is recommended that evaluation of these system components is completed prior to sending additional flow to the Flowing Springs Pump Station.

RECOMMENDATION

RK&K's recommendation is that the Parkview MHP Pump Station Decommission, Jett's Farm Option 2: Pump Station and Force Main Modifications, Lloyd's Flat Pump Station Decommission, and Moose Lodge Option 1: Pump Station Decommission and Gravity Installation are constructed. The cost for this recommendation is $1,420,000 as identified within the enclosed cost estimate.

Jett's Farm Option 2 is recommended over Jett's Farm Option 1 because CTUB's Godwin Pumps can be utilized to bypass pump with Option 2, but Option 1 will require pump and haul. Installing a new 3" force main, rather than inserting a 3" force main in the existing 6" force main will allow the existing 6" force main to be used during construction. Moose Lodge Option 1 is recommended over Moose Lodge Option 2 due to the long-term savings associated with maintenance costs. Although the initial construction cost is higher to install a gravity line, a gravity line is much more cost effective to maintain than a pump station.

RK&K also recommends that the RK&K Sewer Model Task 05 is completed prior to construction of the Parkview-Woodlawn Project to ensure that the Flowing Springs Pump Station and downstream infrastructure can handle the additional flow from the interception at the Lloyd's Flat Pump Station area.

During the Board's review, should you have any questions or require additional information, please do not hesitate to contact me at 304.788.3370 or rdodge@rkk.com.

Very truly yours,
RUMMEL. KLEPPER & KAHL. LLP

Rhiannon A. Dodge, EIT
Associate Engineer

John W. Cole, PE
Manager, Municipal Engineering

Enc.

CITY OF CHARLES TOWN
CHARLES TOWN UTILITY BOARD
Parkview-Woodlawn

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	PARKVIEW OPTION 1				
	Mobilization	1	LS	$ 2,000	$ 2,000
	Erosion & Sediment Control	1	LS	$ 2,000	$ 2,000
	6" SDR 35 PVC Gravity Sewer	840	LF	$ 45	$ 37,800
	Manhole	4	EA	$ 7,500	$ 30,000
	Demo Existing Parkview Pump Station	1	LS	$ 25,000	$ 25,000
	System Tie-in Connection	2	EA	$ 7,500	$ 15,000
	Miscellaneous Items (Asphalt, etc.)	1	LS	$ 5,000	$ 5,000
				Construction Subtotal	**$ 116,800**
	Contingency	20%		$	23,360
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**140,160**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**42,000**
	Easements and Acquisition ($5/LF)			**$**	**4,200**
				Say	**$ 190,000**

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	JETT'S FARM OPTION 1				
	Mobilization	1	LS	$ 9,000	$ 9,000
	Erosion & Sediment Control	1	LS	$ 7,000	$ 7,000
	3" DR 21 HDPE Force Main	4,300	LF	$ 30	$ 129,000
	Air Release Valve Assembly	2	EA	$ 3,500	$ 7,000
	Flushing Valve	4	EA	$ 3,500	$ 14,000
	Pump Station Modifications	1	LS	$ 122,000	$ 122,000
	Pump and Haul	1	LS	$ 25,000	$ 25,000
	System Tie-in Connection	2	EA	$ 7,500	$ 15,000
	Traffic Control	1	LS	$ 5,000	$ 5,000
	Miscellaneous Items (Asphalt, etc.)	1	LS	$ 22,000	$ 22,000
				Construction Subtotal	**$ 355,000**
	Contingency	20%		$	71,000
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**426,000**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**127,800**
				Say	**$ 560,000**

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	JETT'S FARM OPTION 2				
	Mobilization	1	LS	$ 5,000	$ 5,000
	Erosion & Sediment Control	1	LS	$ 4,000	$ 4,000
	3" DR 21 HDPE Force Main	2,200	LF	$ 30	$ 66,000
	6" Steel Casing (Bore & Jack)	390	LF	$ 250	$ 97,500
	Flushing Valve	2	EA	$ 3,500	$ 7,000
	Pump Station Modifications	1	LS	$ 122,000	$ 122,000
	1.5" SDR 21 PVC Force Main	870	LF	$ 25	$ 21,750
	Grinder Pump	1	LS	$ 8,000	$ 8,000
	System Tie-in Connection	2	EA	$ 7,500	$ 15,000
	Traffic Control	1	LS	$ 5,000	$ 5,000
	Miscellaneous Items (Asphalt, etc.)	1	LS	$ 11,000	$ 11,000
				Construction Subtotal	**$ 362,300**
	Contingency	20%		$	72,460
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**434,760**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**130,400**
	Easements and Acquisiton ($5/LF)			**$**	**11,000**
				Say	**$ 580,000**

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	LLOYD'S FLAT OPTION 1				
	Mobilization	1	LS	$ 1,000	$ 1,000
	Erosion & Sediment Control	1	LS	$ 1,000	$ 1,000
	8" SDR 35 PVC Gravity Sewer	90	LF	$ 125	$ 11,250
	System Tie-in Connection	2	EA	$ 7,500	$ 15,000
	Demo Existing Lloyd's Flat Pump Station	1	LS	$ 25,000	$ 25,000
	Traffic Control	1	LS	$ 5,000	$ 5,000
	Miscellaneous Items (Asphalt, etc.)	1	LS	$ 1,000	$ 1,000
				Construction Subtotal	**$ 59,300**
	Contingency	20%		$	11,860
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**71,160**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**21,300**
	Easements and Acquisition ($5/LF)			**$**	**500**
				Say	**$ 100,000**

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	MOOSE LODGE OPTION 1				
	Mobilization	1	LS	$ 4,000	$ 4,000
	Erosion & Sediment Control	1	LS	$ 3,000	$ 3,000
	Demo Existing Moose Lodge Pump Station	1	LS	$ 25,000	$ 25,000
	8" SDR 35 PVC Gravity Sewer	1,820	LF	$ 125	$ 227,500
	Manhole	6	EA	$ 7,500	$ 45,000
	Manhole Extension	14	LF	$ 175	$ 2,450
	System Tie-in Connection	2	EA	$ 7,500	$ 15,000
	16" Steel Casing (Bore & Jack)	40	LF	$ 350	$ 14,000
	Traffic Control	1	LS	$ 5,000	$ 5,000
	Miscellaneous Items (Asphalt, etc.)	1	LS	$ 10,000	$ 10,000
				Construction Subtotal	**$ 351,000**
	Contingency	20%		$	70,200
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**421,200**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**126,300**
	Easements and Acquisition			**$**	**9,200**
				Say	**$ 560,000**

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	MOOSE LODGE OPTION 2				
	Mobilization	1	LS	$ 3,000	$ 3,000
	Erosion & Sediment Control	1	LS	$ 3,000	$ 3,000
	1.5" SDR 21 PVC Force Main	1,390	LF	$ 25	$ 34,750
	System Tie-in Connection	2	EA	$ 7,500	$ 15,000
	Package Pump Station	1	LS	$ 126,400	$ 126,400
	Traffic Control	1	LS	$ 5,000	$ 5,000
	Miscellaneous Items (Asphalt, etc.)	1	LS	$ 7,000	$ 7,000
				Construction Subtotal	**$ 194,200**
	Contingency	20%		$	38,840
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**233,040**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**69,900**
				Say	**$ 310,000**

CONCEPTUAL LEVEL COST ESTIMATE
June 3, 2020

No.	Description	Quantity	Unit	Unit Price	Total Price
	OVERALL RECOMMENDATION				
	Parkview	1	LS	$ 116,800	$ 116,800
	Jett's Farm Option 2	1	LS	$ 362,300	$ 362,300
	Lloyd's Flat	1	LS	$ 59,300	$ 59,300
	Moose Lodge Option 1	1	LS	$ 351,000	$ 351,000
				Construction Subtotal	**$ 889,400**
	Contingency	20%		$	177,880
	TOTAL ESTIMATED CONSTRUCTION COST*			**$**	**1,067,280**
	Soft Costs (Design, Permitting, Surveying, etc.)	30%		**$**	**320,000**
	Easements and Acquisition			**$**	**24,900**
				Say	**$ 1,420,000**


WV 9
S.R. 340
16th St.
WOODLAWN PUMP STATION
PARKVIEW PUMP STATION
PARKVIEW OPTION:
INSTALL GRAVITY LINE FROM PARKVIEW PUMP STATION TO WOODLAWN GRAVITY LINE, ABANDON FORCEMAIN AND DEMOLISH PUMP STATION
JETTS FARM PUMP STATION
JETTS FARM OPTION 1:
JETTS FARM OPTION 2:
MODIFICATIONS TO PUMPS, CONTROLS, PIPING AND VALVE VAULT
Charles Town Rd.
JETTS FARM OPTION 2:
330 LF CASING BORE & JACK - (CHARLES TOWN RD., BIKE PATH AND WV 9)
War Admiral Blvd.
JETTS FARM OPTION 2:
60 LF CASING BORE & JACK - (CURRIE RD.)
CONNECT TO EXIST. FORCEMAIN
Currie Rd.
JETTS FARM OPTION 1:
REPLACE EXISTING
6" FORCEMAIN FROM
JETTS FARM PUMP STATION
TO DISCHARGE MANHOLE
WITH 3" FORCEMAIN
JETTS FARM OPTION 2:
2200 LF 3" FORCEMAIN
JETTS FARM OPTION 2:
GRINDER PUMP &
870 LF 1 1/2" FORCEMAIN
LLOYDS FLATS PUMP STATION
LLOYDS FLAT OPTION:
ABANDON EXISITING FORCEMAIN
LLOYDS FLAT OPTION:
TIE EXISTING GRAVITY INTO NEW RT. 9 GRAVITY LINE AND DEMOLISH PUMP STATION
MOOSE LODGE OPTION 2:
REPLACE EXISTING 4" FORCEMAIN WITH SMALLER SIZE FORCEMAIN
MOOSE LODGE OPTION 1:
REPLACE EXISTING FORCEMAIN WITH GRAVITY SEWER AND MANHOLES
MOOSE LODGE OPTION 2:
PUMP STATION MODIFICATIONS DUE TO REDUCTION IN FLOW
MOOSE LODGE OPTION 1:
CONVERT TO GRAVITY AND DEMOLISH PUMP STATION
MOOSE LODGE PUMP STATION
WV 115
Old Leetown Pike

Charles Town
Utility Board
661 S. George Street, Suite 101 Charles Town, WV 25414
Phone: (304) 725-2316 ♦ Fax: (304) 725-7150 ♦ Web: www.ctubwv.com

MEMORANDUM TO THE BOARD OF DIRECTORS

FROM: Kristen Stolipher, Utility General Manager
SUBJECT: Utility General Manager's Report
DATE: April 14, 2021

ADMINISTRATIVE

- Property transfer/auction – March 27, 2021
  - Tuscawilla House $185,000
  - Patrick Henry Parcel $30,000
- Customer Counts
  - Sewer 8,022 (1,961 billed by JUI)
  - Water 6,293
- DRAFT Sewer Strategic Plan – Presentation to Council on April 19th.

WATER

- Phase II Hydrogeologic Study

SEWER

- Renewal and Replacement project Workshop held on April 7, 2021.
- WVDEP/IJDC funding update

INFORMATION

- **Capacity Improvement Fee collection: See attached.**
- **Water and Sewer Treatment Plant Flows: See attached.**

LEGAL SERVICES CONTRACT

THIS AGREEMENT is made by and between the Charles Town Utility Board, a public utility and political subdivision of the State of West Virginia, and Attorney Tim Stranko, PLLC, a West Virginia limited liability professional corporation.

THESE PARTIES AGREE THAT:

Attorney Tim Stranko, PLLC, shall serve the Charles Town Utility Board as Legal Counsel in accordance with the highest legal and ethical standards.

1. Services to be rendered under this Agreement include:

    a. Comprehensive legal support and risk management of routine and extraordinary Board operations, as directed by the General Manager.
    b. Attendance, reports and participation at regularly announced and special meetings of the Board or other governing bodies, as directed by the General Manager.
    c. Litigation of matters before administrative bodies of the State as directed by the General Manager, including, but not limited to, the Public Service Commission, the Unemployment Compensation Review Board, the Workers Compensation Review Board, the Ethics Commission and the Environmental Quality Board.
    d. Management and coordination of legal and rate making services provided by third party consultants, insurers and appointed Counsel.
    e. Support of the Board's legislative initiatives, including state and local bill drafting and advocacy.
    f. Negotiation and preparation of tariffs, agreements and other documents in support of Board initiatives to ensure the continued success of the Board at the lowest possible cost to its ratepayers.
    g. Maintenance of licensing and adequate legal malpractice insurance in compliance with the laws of the State of West Virginia and the Rules of the Supreme Court of Appeals of West Virginia.

2. In exchange for these services, the Board shall pay Attorney Tim Stranko, PLLC a fee for legal service of **Two Hundred and fifty 00/100 Dollars** per hour, billed at 15-minute minimum charge.

3. The Board shall pay upon demand (with supporting documentation) expenses incurred, including travel costs at **One Hundred and 00/100 Dollars** per hour, mileage (at prevailing IRS rate), filing fees, deposition charges, copying costs, postage, and related legal and personal expenses. No hourly charge shall be assessed for up to two trips per month.

4. The term of this Agreement is indefinite, and thus either Party may be excused of performance of these terms, with or without reason, by providing with written notice to the other Party.

5. This writing is the full and final Agreement made by these Parties, superseding all previous contracts, whether written or oral, and may be amended only by written Agreement signed by both Parties.

6. It is the intent of the Parties that the terms herein are effective beginning 2/11/21.

WITH INTENT TO MAKE A LEGALLY BINDING AGREEMENT, this document is endorsed and executed by these parties as indicated below:

CHARLES TOWN UTILITY BOARD

Kristen Stolipher
General Manager

Date: 2/11/21

ATTORNEY TIM STRANKO, PLLC

Timothy P. Stranko
Managing Member

Date: 2/11/21

kstolipher

From: Timothy Stranko <TStranko@wvcitylaw.com>
Sent: Thursday, March 11, 2021 5:40 PM
To: kstolipher; Hoy Shingleton
Subject: ODC Conflicts Opinion

Received this afternoon per my February request. As we have discussed, ODC sees our query as hypothetical, and evaluates potential conflicts on a transactional basis.

The key takeaway is, from my perspective, there is no "significant risk" that my work for CTUB or Ranson will be "materially limited" by my responsibilities to the other client. IF such an unlikely occasion arises, I will immediately inform both parties and recuse myself from further participation on behalf of either entity.

best regards,
Tim

Attorney Tim Stranko, PLLC
WV Bar ID# 7236

From: Joanne Vella <jvella@wvodc.org>
Sent: Thursday, March 11, 2021 11:36 AM
To: Timothy Stranko <TStranko@wvcitylaw.com>
Subject: RE: Request

Good morning, Tim,

Please accept my apology for the delayed response in writing. Although we have discussed the informal ethics advice I have given you on two prior occasions via telephone, I am writing to memorialize the same, per your request.

Pursuant to Rule 1.7(a), a lawyer shall not represent a client if the representation involves a concurrent conflict of interest. A concurrent conflict of interest exists if: (1) the representation of one client will be directly adverse to another client; or (2) there is a significant risk that the representation of one or more clients will be materially limited by the lawyer's responsibilities to another client, a former client or a third person or by a personal interest of the lawyer.

Pursuant to Rule 1.7(b), notwithstanding the existence of a concurrent conflict of interest under paragraph (a), a lawyer may represent a client if: (1) the lawyer reasonably believes that the lawyer will be ablet o provide competent and diligent representation to each affected client; (2) the representation is not prohibited by law; (3) the representation does not involve the assertion of a claim by one client against another client represented by the lawyer in the same litigation or other proceeding before a tribunal; and (4) each affected client gives informed consent, confirmed in writing.

As I advised, at this stage, I believe your inquiry is a hypothetical in that you are inquiring generally whether a conflict exists that would prohibit you from representing both the City of Ranson and the Charles Town Utility Board. Should a potential conflict arise, you would need to follow Rule 1.7 to determine whether a concurrent conflict of interest would exist. I caution you that should a concurrent conflict exist, you should be mindful that it likely would not be waivable pursuant to Rule 1.7(b)(4), because a municipality could not give informed consent, confirmed in writing, to waive such a conflict.

Thank you,
Joanne

Joanne M. Vella
Lawyer Disciplinary Counsel
City Center East, Suite 1200 C
4700 MacCorkle Avenue, S.E.
Charleston, West Virginia 25304
Phone - (304) 558-7999
Fax - (304) 558-4015
www.wvodc.org
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If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

From: Timothy Stranko <TStranko@wvcitylaw.com>
Sent: Monday, February 22, 2021 11:55 AM
To: Joanne Vella <jvella@wvodc.org>
Subject: Request

Hi Joanne, I hope you are well and staying dry! Nothing but soggy here in Motown today.

Please recall my previous query, attached for your convenient review. The requesting client asks for a written reply/response from ODC. Would you provide same?

Thanks and best regards,
Tim

Attorney Tim Stranko, PLLC
WV Bar ID# 7236

Customer Name	Location	Lot Number	CIF Date Paid	Number of Sewer EDUs	Sewer CIF Amount Paid	Number of Water EDU's	Water CIF Amount Paid
Dan Ryan Builders	Tate Manor	1-6	1/4/2021	6	$ 6,762.00	6	$ 15,456.00
Dan Ryan Builders	Briar Run	387-389, 391	1/4/2021	4	$ 12,828.00		
Dan Ryan Builders	Tate Manor	7-12	1/25/2021	6	$ 6,762.00	6	$ 15,456.00
Dan Ryan Builders	Tate Manor	13-18	1/25/2021	6	$ 6,762.00	6	$ 15,456.00
Stanley Martin	Presidents Pointe	51-56	2/12/2021	6	$ 16,512.00		
DRH	Magnolia Springs	38-41	2/17/2021	4	$ 10,304.00	4	$ 4,508.00
Dan Ryan Builders	Tate Manor	19-24	2/24/2021	6	$ 6,762.00	6	$ 15,456.00
Dan Ryan Builders	Tate Manor	25-29	2/24/2021	5	$ 5,635.00	5	$ 12,880.00
DRH	Magnolia Springs	21,23, 32-35, 42-48	3/5/2021	13	$ 33,488.00	13	$ 14,651.00
DRH	Magnolia Springs	22	3/12/2021	1	$ 1,127.00	1	$ 2,576.00
DRH	Magnolia Springs	8-10, 18-20, 24-28, 36-37, 66-70	3/17/2021	18	$ 20,286.00	18	$ 46,368.00
Rockwool	Rockwool		3/31/2021	104.7	$ 117,959.33		
			Total	**179.7**	$ 245,187.33	**65**	$ 142,807.00

Charles Town Utility Board
2021 Capacity Improvement Fee Collections/EDU for Sewer

Month	Commercial	Residential	Total Number of EDU's	Total Sewer CIF Collected	CIF Paid to Ranson	Total
Jan-21		22	22	$ 33,114.00		$ 33,114.00
Feb-21		21	21	$ 39,213.00	$ 9,750.00	$ 29,463.00
Mar-21		32	136.7	$ 172,860.33		$ 172,860.33
Apr-21						$ -
May-21						$ -
Jun-21						$ -
Jul-21						$ -
Aug-21						$ -
Sep-21						$ -
Oct-21						$ -
Nov-21						$ -
Dec-21						
Total 2021	**0**	**75**	**179.7**	**$ 245,187.33**	**$ 9,750.00**	**$ 235,437.33**

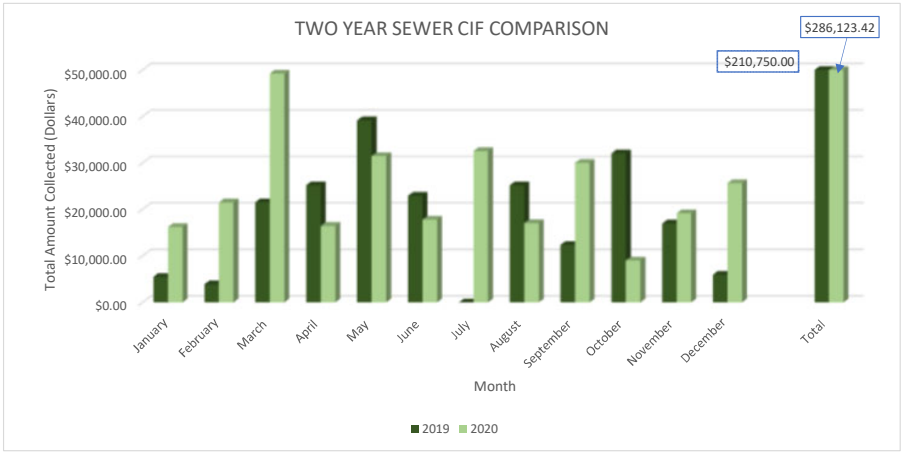
Charles Town Utility Board
2021 Capacity Improvement Fee Collections/EDU for Water

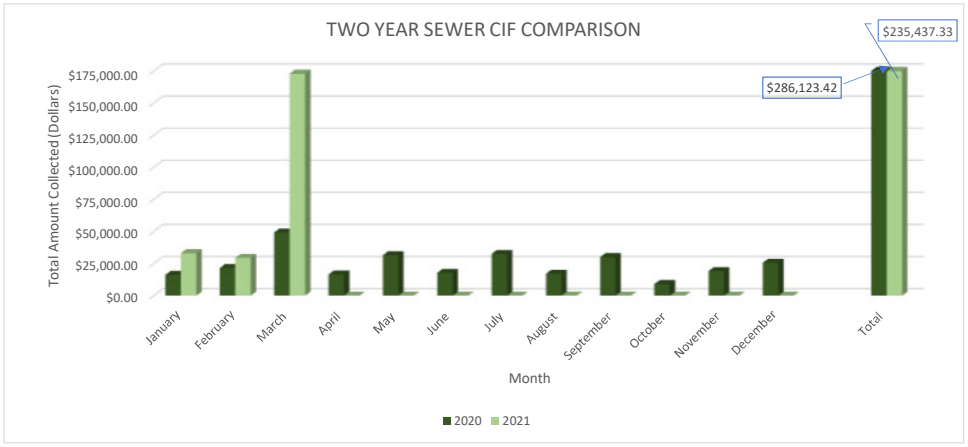
Month	Commercial	Residential	Total Number of EDU's	Total Water CIF
Jan-21		18	18	$ 46,368.00
Feb-21		15	15	$ 32,844.00
Mar-21		32	32	$ 63,595.00
Apr-21				
May-21				
Jun-21				
Jul-21				
Aug-21				
Sep-21				
Oct-21				
Nov-21				
Dec-21				
Total 2021	**0**	**65**	**65**	**$ 142,807.00**

As of April 8, 2021
Sewer CIF Tracking

Charles Town Utility Board 2020 Capacity Improvement Fee Collections/EDU for Sewer						
Month	**Commercial**	**Residential**	**Total Number of EDU's**	**Total Sewer CIF Collected**	**CIF Paid to Ranson**	**Total**
Jan-20		7	7	$21,084.00	$4,875.00	$16,209.00
Feb-20		8	8	$24,746.00	$3,250.00	$21,496.00
Mar-20		16	16	$49,232.00		$49,232.00
Apr-20		21	21	$58,702.00	$42,250.00	$16,452.00
May-20		16	16	$44,487.00	$13,000.00	$31,487.00
Jun-20	1	6	7	$17,803.40		$17,803.40
Jul-20		11	11	$32,547.00		$ 32,547.00
Aug-20		5.31	5.31	$17,040.00		$ 17,040.00
Sep-20		19.26	19.26	$39,776.02	$9,750.00	$ 30,026.02
Oct-20		8	8	$18,766.00	$9,750.00	$ 9,016.00
Nov-20		17	17	$45,159.00	$26,000.00	$ 19,159.00
Dec-20		8	8	$25,656.00		$ 25,656.00
Total 2020	**1**	**137**	**143.57**	**$394,998.42**	**$108,875.00**	**$286,123.42**

Charles Town Utility Board 2021 Capacity Improvement Fee Collections/EDU for Sewer						
Month	**Commercial**	**Residential**	**Total Number of EDU's**	**Total Sewer CIF Collected**	**CIF Paid to Ranson**	**Total**
Jan-21		22	22	$33,114.00		$33,114.00
Feb-21		21	21	$39,213.00	$9,750.00	$29,463.00
Mar-21		32	136.7	$172,860.33		$172,860.33
Apr-21						$0.00
May-21						$0.00
Jun-21						$0.00
Jul-21						$ -
Aug-21						$ -
Sep-21						$ -
Oct-21						$ -
Nov-21						$ -
Dec-21						$ -
Total 2021	**0**	**75**	**179.7**	**$245,187.33**	**$9,750.00**	**$235,437.33**

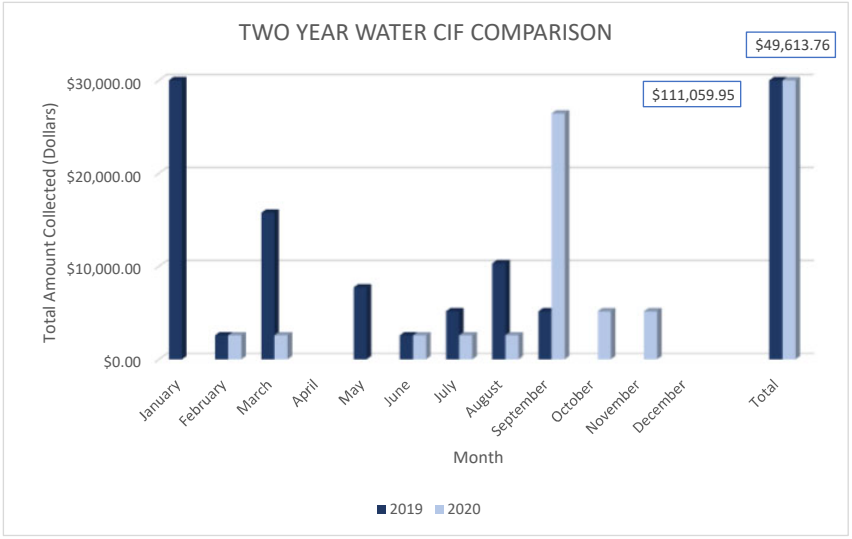


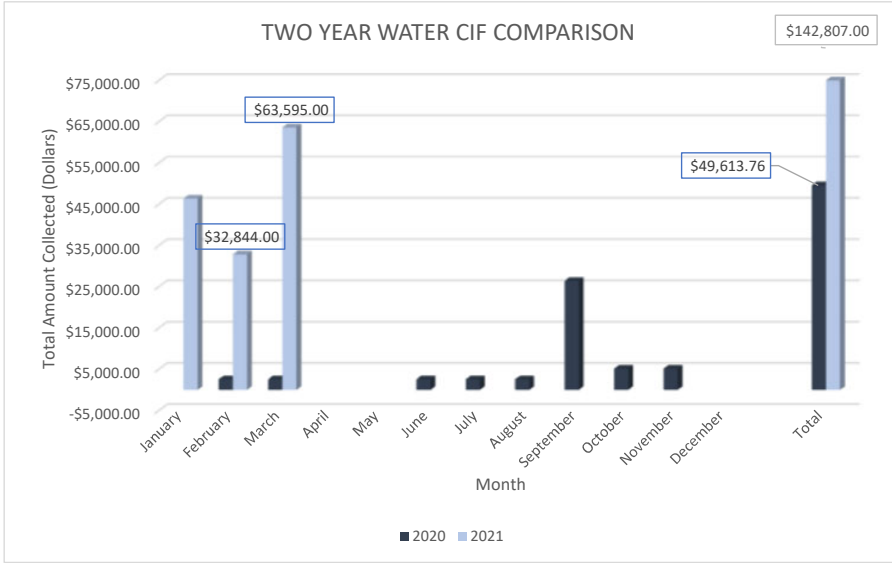


As of April 8, 2021
Water CIF Tracking

Charles Town Utility Board 2020 Capacity Improvement Fee Collections/EDU for Water				
Month	**Commercial**	**Residential**	**Total Number of EDU's**	**Total Water CIF**
Jan-20				
Feb-20		1	1	$ 2,576.00
Mar-20		1	1	$ 2,576.00
Apr-20				
May-20				
Jun-20		1	1	$ 2,576.00
Jul-20		1	1	$ 2,576.00
Aug-20		1	1	$ 2,576.00
Sep-20		10.26	10.26	$ 26,429.76
Oct-20		2	2	$ 5,152.00
Nov-20		2	2	$ 5,152.00
Dec-20				
Total 2020	**0**	**19**	**19.26**	**$ 49,613.76**

Charles Town Utility Board 2021 Capacity Improvement Fee Collections/EDU for Water				
Month	**Commercial**	**Residential**	**Total Number of EDU's**	**Total Water CIF**
Jan-21		18	18	$ 46,368.00
Feb-21		15	15	$ 32,844.00
Mar-21		32	32	$ 63,595.00
Apr-21				
May-21				
Jun-21				
Jul-21				
Aug-21				
Sep-21				
Oct-21				
Nov-21				
Dec-21				
Total 2021	**0**	**65**	**65**	**$ 142,807.00**





CHARLES TOWN UTILITY BOARD
WATER TREATMENT PLANT FLOW DATA

CHARLES TOWN WATER PLANT FLOW DATA						
YEAR	Total Design (MGD)	TOTAL ANNUAL FLOW (MG)	AVERAGE DAILY (MGD)	Total Design minus Average Daily	Total Available (gpd)	Total Available (EDU's)
2019	2.8	644.32	1.77	1.03498	1,034,980	6,900
2020	2.8	615.64	1.68	1.12	1,117,946	7,453
2021	2.8	146.22	1.62	1.18	1,175,584	7,837

2019		
	Total	AVERAGE
JANUARY	52,264,325	1,685,946
FEBRUARY	48,901,884	1,746,496
MARCH	52,112,735	1,681,056
APRIL	51,316,538	1,710,551
MAY	56,973,829	1,837,865
JUNE	55,111,832	1,837,061
JULY	57,587,563	1,857,663
AUGUST	58,291,878	1,880,383
SEPTEMBER	53,642,580	1,788,086
OCTOBER	54,262,184	1,750,393
NOVEMBER	50,656,056	1,688,535
DECEMBER	53,202,360	1,716,205
Annual Total	644,323,764	1,765,020

2020		
	Total	AVERAGE
JANUARY	53,689,445	1,731,918
FEBRUARY	49,700,448	1,713,809
MARCH	51,009,216	1,645,459
APRIL	46,966,864	1,565,562
MAY	50,753,036	1,637,195
JUNE	52,587,142	1,752,905
JULY	54,394,477	1,754,661
AUGUST	54,972,785	1,773,316
SEPTEMBER	50,996,141	1,699,871
OCTOBER	51,222,251	1,652,331
NOVEMBER	49,014,344	1,633,811
DECEMBER	50,338,278	1,623,815
Annual Total	615,644,427	1,682,054

2021		
	Total	AVERAGE
JANUARY	50,030,727	1,613,894
FEBRUARY	45,304,029	1,618,001
MARCH	50,881,983	1,641,354
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER		
OCTOBER		
NOVEMBER		
DECEMBER		
Annual Total	146,216,739	1,624,416

GLEN HAVEN WATER PLANT FLOW DATA						
YEAR	Total Design (MGD)	TOTAL ANNUAL FLOW (MG)	AVERAGE DAILY (MGD)	Total Design minus Average Daily	Total Available (gpd)	
2020	0.0216	1.04	0.01	0.01	13,120	
2021	0.0216	0.69	0.01	0.01	13,695	-

2020		
	Total	AVERAGE
JANUARY		
FEBRUARY		
MARCH		
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER	283,900	9,158
OCTOBER	265,000	8,548
NOVEMBER	250,800	8,360
DECEMBER	243,500	7,855
Annual Total	1,043,200	8,480

2021		
	Total	AVERAGE
JANUARY	242,200	7,813
FEBRUARY	203,500	7,268
MARCH	241,800	8,636
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER		
OCTOBER		
NOVEMBER		
DECEMBER		
Annual Total	687,500	7,905

CAVALAND WATER PLANT FLOW DATA						
YEAR	Total Design (MGD)	TOTAL ANNUAL FLOW (MG)	AVERAGE DAILY (MGD)	Total Design minus Average Daily	Total Available (gpd)	
2020	0.036	0.59	0.00	0.03	31,210	
2021	0.036	0.43	0.00	0.03	31,060	

2020		
	Total	AVERAGE
JANUARY		
FEBRUARY		
MARCH		
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER	141,900	4,577
OCTOBER	140,300	4,526
NOVEMBER	151,500	5,050
DECEMBER	155,200	5,006
Annual Total	588,900	4,790

2021		
	Total	AVERAGE
JANUARY	150,900	4,868
FEBRUARY	132,900	4,746
MARCH	145,800	5,207
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER		
OCTOBER		
NOVEMBER		
DECEMBER		
Annual Total	429,600	4,940

CHARLES TOWN UTILITY BOARD
WASTEWATER TREATMENT PLANT FLOW DATA

CHARLES TOWN WASTEWATER PLANT FLOW DATA						
YEAR	Total Design (MGD)	TOTAL ANNUAL FLOW (MG)	AVERAGE DAILY (MGD)	Total Design minus Average Daily	Total Available (gpd)	Total Available (EDU's)
2015	1.75	384	1.05	0.7	700,000	4,667
2016	1.75	419	1.14	0.61	610,000	4,067
2017	1.75	393	1.08	0.67	670,000	4,467
2018	1.75	491	1.34	0.41	410,000	2,733
2019	1.75	459	1.26	0.49	490,000	3,267
2020	1.75	419.7	1.15	0.60	603,333	4,022
2021	1.75	105.2	1.19	0.56	560,000	3,733

TUSCAWILLA WASTEWATER PLANT FLOW DATA						
YEAR	Total Design (MGD)	TOTAL ANNUAL FLOW (MG)	AVERAGE DAILY (MGD)	Total Design minus Average Daily	Total Available (gpd)	Total Available (EDU's)
2015	0.5	48	0.13	0.37	370,000	2,467
2016	0.5	49	0.13	0.37	370,000	2,467
2017	0.5	48	0.14	0.36	360,000	2,400
2018	0.5	78	0.21	0.29	290,000	1,933
2019	0.5	55.24	0.15	0.35	350,000	2,333
2020	0.5	1.09	0.16	0.34	340,000	2,267
2021	0.5	6.96	0.096666667	0.403333333	403,333	2,689

Total EDU's available between CT and Tuscawilla	
2015	7,133
2016	6,533
2017	6,867
2018	4,667
2019	5,600
2020	6,289
2021	

2019		
	Total	AVERAGE
JANUARY	51.37	1.66
FEBRUARY	43.72	1.56
MARCH	44.32	1.43
APRIL	37.29	1.24
MAY	45.1	1.45
JUNE	33.83	1.13
JULY	39.09	1.26
AUGUST	33.33	1.08
SEPTEMBER	30.89	1.03
OCTOBER	32.86	1.06
NOVEMBER	30.65	1.02
DECEMBER	36.55	1.18
Annual Total	459	1.26

2020		
	Total	AVERAGE
JANUARY	39.05	1.26
FEBRUARY	36.74	1.27
MARCH	36.76	1.19
APRIL	33.32	1.11
MAY	35.50	1.15
JUNE	33.44	1.11
JULY	34.45	1.11
AUGUST	32.65	1.05
SEPTEMBER	32.43	1.08
OCTOBER	33.91	1.09
NOVEMBER	33.49	1.12
DECEMBER	37.96	1.22
Annual Total	419.7	1.15

2021		
	Total	AVERAGE
JANUARY	35.83	1.22
FEBRUARY	32.98	1.18
MARCH	36.39	1.17
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER		
OCTOBER		
NOVEMBER		
DECEMBER		
Annual Total	105.2	1.19

2019		
	Total	AVERAGE
JANUARY	6.25	0.2
FEBRUARY	4.98	0.18
MARCH	7.53	0.24
APRIL	5.28	0.18
MAY	7.88	0.25
JUNE	3.75	0.12
JULY	4.2	0.14
AUGUST	3.75	0.12
SEPTEMBER	3.64	0.12
OCTOBER	3.97	0.13
NOVEMBER	3.66	0.12
DECEMBER	0.35	0.01
Annual Total	55.24	0.15

2020		
	Total	AVERAGE
JANUARY		
FEBRUARY		
MARCH		
APRIL		
MAY		
JUNE		
JULY		
AUGUST	1.09	0.16
SEPTEMBER		
OCTOBER		
NOVEMBER		
DECEMBER		
Annual Total	1.09	0.16

2021		
	Total	AVERAGE
JANUARY	0.52	0.07
FEBRUARY	2.22	0.08
MARCH	4.22	0.14
APRIL		
MAY		
JUNE		
JULY		
AUGUST		
SEPTEMBER		
OCTOBER		
NOVEMBER		
DECEMBER		
Annual Total	6.96	0.10

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT	AMOUNT
			TOTAL:	65,751.92
TUSCAWILLA HILLS HOA INC	HOA DUES APRIL 2021	WATER FUND	WATER	36.00
			TOTAL:	36.00
ILLINOIS STATE TREASURER'S OFFICE	UNCLAIMED PROPERTY	WATER FUND	NON-DEPARTMENTAL	95.31
			TOTAL:	95.31
DEPT OF FINANCIAL SERVICES	UNCLAIMED PROPERTY	WATER FUND	NON-DEPARTMENTAL	194.18
			TOTAL:	194.18
US PAVING, LLC	PAVING: 2/04, 3/12, 3/23/2	WATER FUND	WATER	9,118.00
	PAVING: 3/26/21	WATER FUND	WATER	4,800.00
	PAVING: 3/29/21	WATER FUND	WATER	9,730.00
	PAVING: 3/20/21	WATER FUND	WATER	2,640.00
	PAVING: 3/17/21	WATER FUND	WATER	3,500.00
			TOTAL:	29,788.00
VALLEY CREDIT SERVICE, INC.	MAR COLLECTIONS	WATER FUND	WATER	768.64
	PSD MAR COLLECTIONS	SEWER FUND	SEWER	164.29
	MAR COLLECTIONS	SEWER FUND	SEWER	768.64
			TOTAL:	1,701.57
WINCHESTER EQUIPMENT COMPANY	SUPPLIES FOR WEEDEATERS	WATER FUND	WATER	543.36
			TOTAL:	543.36
WIRELESS NETWORKS GROUP, INC.	MISC SVCS, MAR	WATER FUND	WATER	10,250.00
			TOTAL:	10,250.00

========== FUND TOTALS ==========	
50 WATER FUND	234,430.23
60 SEWER FUND	134,111.13
GRAND TOTAL:	368,541.36

TOTAL PAGES: 5

APPROVED BY: _____

APPROVED BY: _____

This Packet: $ 368,541.36
Security Deposit Refunds: 1,492.50

Total: $ 370,033.86

Note:

Highlighted invoices to be reimbursed for the Tuscawilla MBR Project - Basin #3;

Highlighted invoice to be reimbursed for the R&R Project

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT	AMOUNT
			TOTAL:	592.00
MISS UTILITY OF WV, INC.	MESSAGE FEES: MAR	WATER FUND	WATER	177.80
			TOTAL:	177.80
JOHN MURPHY, JR	PER DIEM WV CLSS C CERTIFI	SEWER FUND	SEWER	275.00
			TOTAL:	275.00
THOMAS NALLS	MAR TANK LOT RENT	WATER FUND	NON-DEPARTMENTAL	3,485.26
			TOTAL:	3,485.26
LOGICAL CONCEPTS, INC	XR50 & WIRELESS @ MULT PS'	SEWER FUND	NON-DEPARTMENTAL	8,397.48
	JACKRABBIT,FLWNGSPRGS MONI	SEWER FUND	SEWER	443.00
			TOTAL:	8,840.48
PACE ANALYTICAL SERVICES, LLC	TESTING: PWSID#-WV3301905	WATER FUND	WATER	209.95
	TESTING: CT WEEKLY	SEWER FUND	SEWER	176.22
	TESTING: TUSC MONTHLY	SEWER FUND	SEWER	85.85
	TESTING: CT WEEKLY	SEWER FUND	SEWER	176.22
	TESTING: TUSC WEEKLY	SEWER FUND	SEWER	85.85
	TESTING: CT WEEKLY	SEWER FUND	SEWER	179.19
	TESTING: TUSC WEEKLY	SEWER FUND	SEWER	85.85
	TESTING: CT WEEKLY	SEWER FUND	SEWER	173.19
			TOTAL:	1,172.32
PRECISION PUMP & VALVE SERVICE, INC.	REBUILD CLA VLV@ RAW WA ST	WATER FUND	WATER	6,000.00
	RMV/INSTL RAW WA TURBINE	WATER FUND	WATER	9,810.00
			TOTAL:	15,810.00
CORPORATION OF RANSON	MAR UB COLLECTIONS	WATER FUND	NON-DEPARTMENTAL	2,863.27
			TOTAL:	2,863.27
RK & K ENGINEERS	TO15 FAIRFAX XING PARALLEL	SEWER FUND	NON-DEPARTMENTAL	932.45
	TO16 LLYOD'S FLAT& MOOSE L	SEWER FUND	NON-DEPARTMENTAL	9,637.81
	TO14 MNHLEVAL@EVITTS/BRWNV	SEWER FUND	SEWER	4,848.13
			TOTAL:	15,418.39
ROSS H BARE	SVC CLL BRCKNRDG CK INTRMT	SEWER FUND	SEWER	150.00
	DUPLEX PS CNTRLS MTRLS/SPP	SEWER FUND	SEWER	2,477.15
			TOTAL:	2,627.15
LAW OFFICES OF HOY SHINGLETON, L.C.	GENERAL 3/01 - 3/31/21	SEWER FUND	SEWER	2,535.00
			TOTAL:	2,535.00
TIMOTHY P STRANKO	RATEMAKING/GENERAL MAR '21	SEWER FUND	SEWER	4,562.50
			TOTAL:	4,562.50
GERALD TAYLOR CO., INC.	PUMP/ TRANSPORT	WATER FUND	WATER	205.03
	PUMP/ TRANSPORT	WATER FUND	WATER	205.03
	PUMP/ TRANSPORT	WATER FUND	WATER	350.60
	SUPERVAC	SEWER FUND	SEWER	1,542.29
			TOTAL:	2,302.95
THE CI THORNBURG CO, INC.	METER READING- VEHICLE UNI	WATER FUND	NON-DEPARTMENTAL	25,000.00
	SENSUS ANALYTICS ANNUAL	WATER FUND	WATER	24,862.00
	1" SRII TRPL MTRS, TRNSCVR	WATER FUND	WATER	15,889.92

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT		AMOUNT
	PCARD 4726	SEWER FUND	SEWER		659.31
	PCARD 4726	SEWER FUND	SEWER		772.29
	PCARD 4726	SEWER FUND	SEWER		364.00
	PCARD 4726	SEWER FUND	SEWER		48.76
	PCARD 4726	SEWER FUND	SEWER		50.61
				TOTAL:	9,338.62
FIRE SAFETY EQUIPMENT SUPPLY	SVC, SVC CALL, PARTS	WATER FUND	WATER		149.50
	SVC, SVC CALL, PARTS	SEWER FUND	SEWER		119.50
				TOTAL:	269.00
FRONTIER COMMUNICATIONS	304-876-2120-111514-4	WATER FUND	WATER		95.21
	304-876-9970-121914-4	WATER FUND	WATER		95.21
				TOTAL:	190.42
GUTTMAN ENERGY	W/E 3/21/21	WATER FUND	WATER		946.86
	W/E 3/28/21	WATER FUND	WATER		605.31
	W/E 4/04/21	WATER FUND	WATER		227.05
	W/E 3/21/21	SEWER FUND	SEWER		432.72
	W/E 3/28/21	SEWER FUND	SEWER		815.45
	W/E 4/04/21	SEWER FUND	SEWER		514.40
				TOTAL:	3,541.79
GWIN DOBSON & FOREMAN INC	WTP HYDROGEOLOCIAL STUDY	WATER FUND	NON-DEPARTMENTAL		9,845.00
	WWTP UPGRADE	SEWER FUND	NON-DEPARTMENTAL		4,464.28
				TOTAL:	14,309.28
HACH COMPANY	dd PRO, dd120WATER PWS,SVC	WATER FUND	WATER		22,152.30
	ee PHOSVER, AMMONIA TNT	SEWER FUND	SEWER		456.59
				TOTAL:	22,608.89
HOLIDAY INN EXPRESS	J.MURPHY 5/2/21-5/7/21	SEWER FUND	SEWER		770.17
				TOTAL:	770.17
PROTOUCH COMMUNICATIONS, LLC	MAR SVCS: AFTER-HOURS EMER	WATER FUND	WATER		123.04
				TOTAL:	123.04
INWOOD QUARRY, INC.	I8 PICKUPS: 3/24/21	WATER FUND	WATER		561.12
	C2 PICKUPS: 4/09/21	WATER FUND	WATER		558.45
				TOTAL:	1,119.57
IRON MOUNTAIN, INC	SHREDDING, STORAGE	WATER FUND	WATER		200.45
	SHREDDING, STORAGE	SEWER FUND	SEWER		200.45
				TOTAL:	400.90
JAMES RIVER EQUIPMENT	EQUIPMENT RENTAL	SEWER FUND	SEWER		3,200.00
				TOTAL:	3,200.00
JEFFERSON UTILITIES, INC	12-0820-00	SEWER FUND	SEWER		135.36
	12-0820-00	SEWER FUND	SEWER		45.12
				TOTAL:	180.48
KENNETH SHADE	4" BACKWATERVALVE PRTS,LBR	SEWER FUND	SEWER		125.00
				TOTAL:	125.00
MICRO-TECH DESIGNS, INC.	VTSCADA TROUBLESHOOT ENGNR	SEWER FUND	SEWER		592.00

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT	AMOUNT
	8299 31 008 0138502	SEWER FUND	SEWER	117.05
			TOTAL:	234.11
CORE & MAIN	PVC TRANS GASKET	WATER FUND	WATER	14.04
	BALLCORP, FLANGED PLUG VAL	SEWER FUND	NON-DEPARTMENTAL	9,261.66
	MRT BX KEY STD&LG SLTD	SEWER FUND	SEWER	205.80
	MAXADAPTOR 7"	SEWER FUND	SEWER	1,186.56
	4X4 PVC SDR35 SWR WYR GXG	SEWER FUND	SEWER	46.20
	CPLG, GASKET, SDR35, FRAME	SEWER FUND	SEWER	195.08
	CPLG, FRAME& COVER	SEWER FUND	SEWER	37.07
	SHEAR RING, PIPE, GSKTCP,	SEWER FUND	SEWER	803.32
	CPLG, SDR35, SDR26, CLNOUT	SEWER FUND	SEWER	832.37
	FRAME & COVER	SEWER FUND	SEWER	68.92
			TOTAL:	12,651.02
COYNE CHEMICAL	AMMONIUMSULFATE 40%, CP-83	WATER FUND	WATER	3,901.40
	ZETAG 8868 FS	SEWER FUND	SEWER	6,454.23
	CES PACL 2000	SEWER FUND	SEWER	10,621.20
			TOTAL:	20,976.83
CRYSTAL SPRINGS	MONTHLY SVC@ WWTP	WATER FUND	WATER	0.05
	MONTHLY SVC@661 S GEORGE S	WATER FUND	WATER	35.27
	MONTHLY SVC@661 S GEORGE S	SEWER FUND	SEWER	35.27
			TOTAL:	70.59
CUMMINS, INC	HUNTFIELD PS: RPLC TERM SW	SEWER FUND	SEWER	1,186.32
			TOTAL:	1,186.32
WV DEPT OF HEALTH & HUMAN SERVICES	BACTERIOLOGICAL TESTING	WATER FUND	WATER	100.00
	BACTERIOLOGICAL TESTING	WATER FUND	WATER	40.00
	BACTERIOLOGICAL TESTING	WATER FUND	WATER	120.00
			TOTAL:	260.00
EAST MOUNTAIN HEALTH PHYSICIANS, INC	J.MURPHY HEP A & B VACCINE	SEWER FUND	SEWER	220.00
			TOTAL:	220.00
ENCOVA INSURANCE	INSTALLMENT	WATER FUND	WATER	3,252.48
	INSTALLMENT	SEWER FUND	SEWER	2,555.52
			TOTAL:	5,808.00
ERA	PH	SEWER FUND	SEWER	105.72
			TOTAL:	105.72
FASTENAL	STAINLESS STEEL BOLTS	SEWER FUND	NON-DEPARTMENTAL	1,094.32
			TOTAL:	1,094.32
FERGUSON US HOLDINGS, INC	MAGNOLIA SPRGS PS SUPPLIES	SEWER FUND	SEWER	477.86
			TOTAL:	477.86
FIFTH THIRD BANK	PCARD 4726	WATER FUND	WATER	1,686.62
	PCARD 4726	WATER FUND	WATER	426.20
	PCARD 4726	WATER FUND	WATER	136.01
	PCARD 4726	WATER FUND	WATER	1,473.79
	PCARD 4726	WATER FUND	WATER	220.23
	PCARD 4726	SEWER FUND	SEWER	1,702.38
	PCARD 4726	SEWER FUND	SEWER	1,798.42

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT	AMOUNT
AMERIGAS	TANK RENTAL: SPRUCE HILL N	SEWER FUND	SEWER	139.00
			TOTAL:	139.00
ANTIETAM ELECTRIAL CONTRACTORS, INC	TUSC WWTP ELECTRICAL WORK	SEWER FUND	NON-DEPARTMENTAL	1,474.53
			TOTAL:	1,474.53
ARDEN EQUIPMENT REPAIR, INC.	EQUIP LAWN MWR, MISC LOCAT	SEWER FUND	SEWER	1,188.72
			TOTAL:	1,188.72
ASSURED PARTNERS	4TH QTR PACKAGE INSTALLMEN	WATER FUND	WATER	12,929.00
	4TH QTR PROFFESSIONAL INST	WATER FUND	WATER	1,425.50
	4TH QTR EXCESS INSTALLMENT	WATER FUND	WATER	807.00
	4TH QTR PACKAGE INSTALLMEN	SEWER FUND	SEWER	12,929.00
	4TH QTR PROFFESSIONAL INST	SEWER FUND	SEWER	1,425.50
	4TH QTR EXCESS INSTALLMENT	SEWER FUND	SEWER	807.00
			TOTAL:	30,323.00
BIEDLER'S ELECTRIC MOTOR REPAIR, INC.	RPR 125HP 444TS 1600RPM MO	SEWER FUND	SEWER	4,900.00
	CRANES LN RPR GRNDR PMP	SEWER FUND	SEWER	1,137.52
			TOTAL:	6,037.52
JP & RF BURNS PARTNERSHIP	MAR LOADS - 52	SEWER FUND	SEWER	9,308.00
	LIME FOR BURNS FARM	SEWER FUND	SEWER	1,453.00
			TOTAL:	10,761.00
CHARLES TOWN UTILITY BOARD	MARCH FUNDING	WATER FUND	NON-DEPARTMENTAL	9,642.90
			TOTAL:	9,642.90
CITY ELECTRIC SUPPLY CO	SUPPLIES FOR PLANT	SEWER FUND	SEWER	58.86
	SUPPLIES FOR PLANT	SEWER FUND	SEWER	172.41
	SUPPLIES FOR WWTP	SEWER FUND	SEWER	1,130.00
			TOTAL:	1,361.27
CITY NATIONAL BANK	LOCKBOX SVCS: MAR	WATER FUND	WATER	1,595.17
	LOCKBOX SVCS: MAR	WATER FUND	WATER	705.88
	LOCKBOX SVCS: MAR	SEWER FUND	SEWER	1,595.17
	LOCKBOX SVCS: MAR	SEWER FUND	SEWER	705.88
			TOTAL:	4,602.10
CITY OF CHARLES TOWN	ANNUAL LOAN PYMNT	WATER FUND	NON-DEPARTMENTAL	10,180.00
	UB COLLECTIONS - MAR	WATER FUND	NON-DEPARTMENTAL	16,919.63
	APRIL RENT@ 661 S GEORGE S	WATER FUND	WATER	1,275.00
	FEB UTILITIES@ 661 S GEORG	WATER FUND	WATER	551.90
	ANNUAL LOAN PYMNT	SEWER FUND	NON-DEPARTMENTAL	2,636.00
	APRIL RENT@ 661 S GEORGE S	SEWER FUND	SEWER	1,275.00
	FEB UTILITIES@ 661 S GEORG	SEWER FUND	SEWER	551.90
			TOTAL:	33,389.43
CLIFFS CLEANING SERVICE	MAR CLEANING	WATER FUND	WATER	125.00
	MAR CLEANING	WATER FUND	WATER	456.25
	MAR CLEANING	SEWER FUND	SEWER	200.00
	MAR CLEANING	SEWER FUND	SEWER	100.00
	MAR CLEANING	SEWER FUND	SEWER	456.25
			TOTAL:	1,337.50
COMCAST BUSINESS	8299 31 008 0138502	WATER FUND	WATER	117.06